EXHIBIT NO. **11**

APPLICATION NO. HUM-MAJ-1-08

HUMBOLDT COUNTY LCP AMENDMENT (SAMOA TOWN PLAN)

"REVISED REMOVAL ACTION WORKPLAN FOR LEAD IN SOIL SAMOA PENINSULA BROWNFIELD, SAMOA, HUMBOLDT COUNTY, CALIFORNIA, NCRWQCB CASE NO. 1NHU890, GLOBAL ID: SI0602323372" PREPARED BY WINZLER & KELLY FOR MR. SEAN ARMSTRONG, DANCO CONSTRUCTION, DATED 7/24/09 (1 of 44)

REVISED REMOVAL ACTION WORKPLAN
FOR LEAD IN SOIL
SAMOA PENINSULA BROWNFIELD
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WINZLER & KELLY

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July 24, 2009

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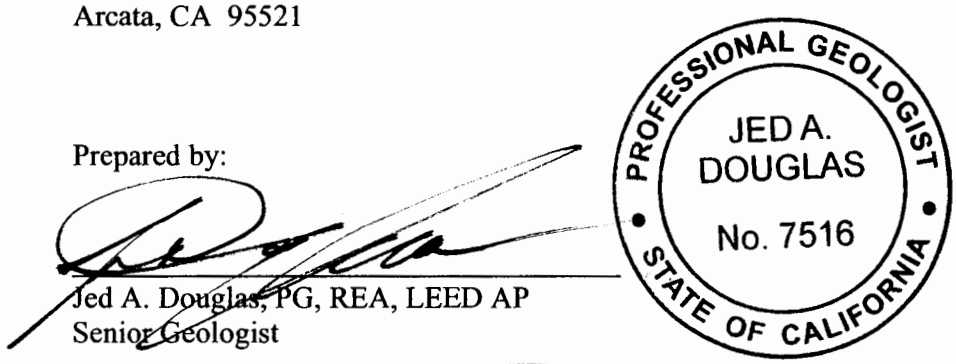

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Executive Summary

This report presents the Removal Action Workplan (RAW) to address the lead impacted soil surrounding the houses at the Samoa Townsite, located on the Samoa Peninsula outside Eureka, California. The Samoa Pacific Group, LLC intends to redevelop and rehabilitate the buildings in Samoa for primarily residential purposes. Previous investigations at several buildings have indicated that the surface soil immediately surrounding the buildings is impacted by lead, derived from the lead based paint on the buildings exterior walls. Concentrations of lead in surface and shallow soil exceed safe levels of exposure for residents of the Townsite. Therefore, lead impacted soil exceeding 150 parts per million is proposed to be excavated and off hauled for disposal at an appropriately licensed landfill. This RAW has been prepared by Winzler & Kelly on behalf of Danco Construction, the developer for Samoa Pacific Group, LLC.

Removal Action Objectives

Human health and environmental risks have been identified in shallow soils at the site that exceed established regulatory levels for human exposure. The identified exposure pathways are inhalation of fugitive dust, ingestion of soil, or direct contact with the soil. Groundwater sampling and laboratory analysis conducted at one of the houses did not indicate that lead is present in groundwater, and lead in soil appears not to be leaching into groundwater at the site. Additionally, there is no current exposure pathway for groundwater, as potable water is supplied to area residents by a municipal system.

Three alternatives were evaluated for remediating the exposure to elevated concentrations of lead in soil:

- Alternative 1: Excavation and Off-Site Disposal
- Alternative 2: On-Site Phytoremediation
- Alternative 3: Excavation and Capping with Land Use Restrictions

Recommended Alternative

The recommended alternative, after consideration of costs, effectiveness, and implementability was determined to be Alternative 1. Impacted soil is proposed to be excavated from the areas which exceed the remedial action objectives. Additionally, lead based paint will be abated by preparing the building exterior walls for painting (scrape and removal existing loose paint), capturing and properly disposing of lead based paint chips prior to soil excavation. The cost to implement the recommended excavation alternative has been estimated to be approximately $25,000 per residential building. This cost does not include the cost to scrape and repaint the buildings, which is necessary to perform regardless of which alternative is selected.

1.0 INTRODUCTION

This Removal Action Workplan (RAW) was prepared by Winzler & Kelly on behalf of Danco Construction (Danco) in response to a request from the North Coast Regional Water Quality Control Board (NCRWQCB). This RAW was designed to address the presence of elevated concentrations of lead in soil surrounding various homes and buildings in the Samoa Townsite. Additionally, lead based paint is known or expected to be present on each of the buildings. Lead in soil originated from lead based paint historically used to paint the exteriors of homes and buildings within the town site.

In 2005, an initial Phase II Environmental Site Assessment was conducted in the town of Samoa, by Winzler & Kelly, under a Cooperative Agreement with the United States Environmental Protection Agency - Region IX, and the Humboldt County Community Development Services Department. The findings of the initial investigation indicated that there were lead impacts in and around several buildings and areas of the town. These impacts included the presence of lead based paint (LBP) on most project area buildings and elevated concentrations of lead in soil adjacent to some of those buildings. Additional soil sampling for lead in soil was conducted in 2007, 2008, and 2009 by Winzler & Kelly and Freshwater Environmental.

1.1 Removal Action Process

The RAW process, objectives, and regulatory background are described in the following sections.

1.1.1 Regulatory Basis for the RAW

According to the California Health and Safety Code, a RAW is defined as "a workplan prepared or approved by DTSC or a California Regional Water Quality Control Board which is developed to carry out a removal action, in an effective manner, that is protective of the public health and safety and the environment." A RAW is appropriate when the cost of implementing the chosen action is less than $1,000,000; whereas, if the estimated cost is greater than $1,000,000, then a Remedial Action Plan should be prepared.

The estimated cost of the selected removal alternative recommended for this site at this time is less than $1,000,000. Therefore, the RAW format has been selected.

1.1.2 Objectives of the RAW

The objectives of this RAW are to:

- Present and evaluate existing site conditions in the Samoa Townsite;
- Establish appropriate Removal Action Objectives (RAO) for protection of human health and the environment; and
- Evaluate alternatives and identify recommendations for a removal action at the site that is protective of human health and the environment.

1.1.3 Elements of the RAW

In order to accomplish objectives and satisfy regulatory requirements, this RAW contains the following elements:

- A description of the nature and extent of site contamination;
- Goals to be achieved by the removal action;
- An alternatives analysis, including alternatives considered, selected, and rejected, the basis for selection and rejection, a discussion of effectiveness, ability to implement, and cost of each alternative; and,
- A description and discussion of the recommended alternative and a plan for implementation.

1.2 Site Description

The town of Samoa (Figure 1) is relatively small and still has the appearance of a company lumber mill town. The town contains 98 residences, an elementary school, post office, restaurant, playground, tennis courts, soccer field, basketball courts, a former storehouse/fire station, and former gasoline station (Figure 2). The town is bordered on the east and south by current and former industrial lumber mill facilities. Largely undeveloped coastal dunes exist to the north and to the west.

Samoa is a former mill town dating back to 1890, which was built adjacent to lumber mill operations. Other industrial operations were also located proximal during the town's history. In 1892, the Samoa Land and Improvement Company bought 270 acres of land in Samoa, including waterfront land, to promote development of Samoa as a town. In 1893, Vance Redwood Company bought the property, built a sawmill, and extended railroad service to Samoa. In 1900, A. B. Hammond bought Vance Redwood Company, including the sawmill, dry kilns, and two logging camps, establishing a large sash & door factory. In 1912, Hammond Lumber began purchasing the town site and constructing company houses. Hammond continued to operate the mill, adding a planing mill, molding plant, sorter sheds, warehouses, shops, and steamship dockage. A ship building plant was established along the waterfront, and the plant constructed several ships during World War I. The ship building plant was demolished by 1924. Also in 1924, Hammond Lumber Company completed the purchase of all the houses in Samoa and managed the entire town.

In 1956, Georgia-Pacific Lumber Company bought the town and mill from Hammond. A new plywood mill was constructed by 1959. In 1963, construction began on a 500-ton per day Kraft bleached pulp mill just south of Samoa, which was operational between 1965 and 1968. In 1973, Georgia-Pacific divested ownership of the Samoa facilities to Louisiana-Pacific, who then managed the town. In 1998, the pulp mill, town of Samoa, and adjacent industrial lands were purchased by Simpson Timber Company. In 2001, 65 acres, including the town of Samoa, was bought by the Samoa Pacific Group, LLC. In September 2001, Samoa Pacific completed the purchase of an additional 150 acres of adjacent dune and industrial land.

The adjoining properties to the northeast and east were occupied by mill buildings and lumber operations dating back to the turn of the century. Land to the south were primarily undeveloped dune lands until portions of the land were further developed for mill use, primarily for lumber and log storage, beginning in the late 1950s.

West of Samoa is open coastal dune land adjoining the Pacific Ocean. A parking area for coastal access, a water pumping facility, and water lines of the Humboldt Bay Municipal Water District are located on an otherwise vacant parcel, as is the leach field for the western portion of the Samoa wastewater treatment facility.

1.2.1 Land Use

Most of the town of Samoa is located east of New Navy Base Road and west of Vance Avenue, with a portion of the town located east of Vance Avenue and west of North Bayview Avenue (See Figures 1 and 2). There are presently approximately 98 dwelling units, generally located on APN 401-031-46. The residential areas also include a playground, tennis courts, soccer field, and basketball courts. The southerly portion of APN 401-031-46, and parcels 401-031-59 and –60, extending southward, are currently vacant lots previously used for the storage of dry stack lumber and as log decks. A portion of APN 401-031-59 contains the oxidation pond and percolation basin for the eastern Samoa wastewater treatment system. The Peninsula Union elementary school is located on APN 401-031-16, which is located immediately north of the residential parcels.

The former storehouse/fire station, former gasoline station, 'bus garage' and the current post office are located in a central 'downtown' area, as is a large 'carpenter shop', which is currently used for town maintenance. The Samoa Cookhouse restaurant and a gift shop are located on APN 401-031-38. A long established railway line runs between the residential and downtown section of Samoa and the industrial parcels to the east. The parcel along the east side of the railroad line, APN 401-031-55 encompasses current and former mill/industrial facilities, including the former Hammond mill complex and succeeding mill operations.

1.3 Site Owner

The Samoa Townsite is owned by the Samoa Pacific Group, LLC (SPG).

1.4 Purpose

Based on information generated by several investigations dating back to 2005, the NCRWQCB have determined that further action is required at the site. Elevated concentrations of lead detected in soil are of concern. Lead based paint (LBP) on the buildings is also a concern. A removal action report will be submitted to the NCRWQCB for review and certification upon successful implementation of this RAW.

2.0 SITE CHARACTERIZATION

The results of previous investigations have documented the spatial distribution of lead in soil at a representative number of the Townsite buildings. Previous soil sampling events were performed at over 17 locations, chosen to be representative of the various types of buildings present within the Townsite. The number of current and historical soil sampling locations represents approximately 15% of the total number of buildings existing within the Townsite. Additional characterization of lead concentrations in soil remains to be performed at buildings not previously investigated. Groundwater has previously been evaluated at eight locations. Of the eight locations where groundwater samples were analyzed for total lead, seven of the locations had their groundwater samples reported as below laboratory detection limits (5.0 micrograms per liter [µg/L, or parts per billion]). The one location where lead was reported in groundwater was at the soccer field, where a former oil change facility was located and waste oil was reportedly released directly to the soil. The low concentration of lead in groundwater reported at this location (29 µg/L) is most likely related to the waste oil release rather than from lead paint.

One additional location was evaluated for lead in groundwater prior to the preparation of this RAW. The primary purpose of the additional groundwater sample analysis was to use the collected groundwater as a leaching agent to determine if lead in soil could be leaching into groundwater. This was performed since a rainwater sample was not available, and the groundwater beneath the site was assumed to be representative of rainwater that percolated through the soil. One soil boring (VA-1 on Figure 2) was drilled at the location of the previously reported highest concentration of lead in soil (#2 Vance Avenue, 2,350 milligrams per kilogram [mg/kg]). Groundwater was encountered at a depth of approximately 10.5 feet below ground surface (bgs). A groundwater sample was collected and analyzed for total lead, and the laboratory reported that lead was not present in the groundwater sample (<1.0 micrograms per liter [µg/l]). The laboratory also reported that the groundwater had a pH of 6.3, which is on the acidic side of the pH scale from neutral. Two surface soil samples were collected from behind the firehouse on Cutten Street, where previous soil sample data indicated the presence of lead between 150 and 400 mg/kg. The two soil samples were analyzed for total lead and for soluble threshold limit concentration (STLC), to determine if lead was leaching from the soil. The STLC test was performed twice for each soil sample, using deionized water and the groundwater collected from boring VA-1. Both of the STLC analysis performed for each of the two soil samples was reported as below the laboratory reporting limit of 100 µg/l. This indicates that lead is likely not leaching from site soil into the groundwater. Laboratory analytical results are attached in Appendix A.

2.1 Site Geology & Hydrogeology

Based upon notes and boring logs collected during previous investigations performed within the town of Samoa, the soil underlying the area predominantly consist of poorly to moderately developed organic horizon (O or A horizons) up to 1 foot bgs overlying a poorly sorted, sub-angular to rounded, medium grained sand to the total explored depth of approximately 20 feet bgs. In some areas no organic horizons were encountered due to historic and present industrial use.

Developmental fill was encountered at various parcels throughout Samoa. Woody debris was encountered to depths of approximately 7 feet bgs in 2 borings installed at the Soccer Field. Soils consisting of sandy clay were noted in the boring placed east of the sewer system's former Bark Filter. These were the only locations investigated where typical native soils were not encountered.

The site is bordered to the west by the Pacific Ocean and to the east by Humboldt Bay. The ground surface elevation between the two water bodies is a maximum of approximately 40 feet above sea level. Groundwater was encountered at depths ranging from 2 feet bgs to 12 feet bgs during previous sampling events. Areas wherein groundwater was encountered at a deeper depth were likely the result of the borings being placed in areas of higher topographic elevation rather than an actual fluctuation in area groundwater levels. Groundwater flow direction is expected to fluctuate between east and west (between the Pacific Ocean and Humboldt Bay) based upon tidal elevations.

2.2 Background Concentrations

Local background concentrations of lead in soil are generally unknown, except for one non-industrial area north of the Samoa Townsite where background sampling was performed. One soil sample was collected and analyzed for lead from an area immediately adjacent to the Pacific Ocean. The soil sample was reported to contain lead at concentrations ranging from <2.4 to <3.5 mg/kg.

However, it has been generally established that within the state of California, background concentrations of lead range from approximately 3.0 to 148 mg/kg. This data is based on a study performed in 2005 in which over 10,000 soil samples collected from various military facilities in California were evaluated for background concentrations of heavy metals.

2.3 Nature and Extent of Contamination

Surface soil surrounding the various buildings of the Samoa Townsite has been impacted by lead from lead-based paint which has sloughed from the exterior walls of the buildings. Lead above 400 mg/kg is generally present solely in the surface soil samples historically analyzed from immediately beneath the drip line of various homes. Beyond 5 feet from the drip line, typical lead concentrations in surface soil are below 300 mg/kg. At 15 feet from the dripline, concentrations are typically below 150 mg/kg. Although both native and exotic flora present at various homes within Samoa appeared healthy, several areas have been reported where lead is present above 150 mg/kg. Groundwater does not appear to be impacted by lead, as discussed above in Section 2.0.

Lead based paint is known or expected to be present on virtually every building exterior within the Townsite. Abatement will be performed based on the assumption that each building exterior wall contains LBP.

Potential human receptors at the Townsite consist of residents, temporary construction/utility workers, landscape workers, contractors, and building maintenance workers. Potential ecological receptors include local flora and fauna present around the perimeters of the various buildings.

2.4 Human Health Risk Assessment Screening

Winzler & Kelly evaluated potential soil cleanup levels based on established regulatory enforceable concentrations. The United States Environmental Protection Agency (EPA) updated their preliminary remediation goals in the spring of 2009. The EPA updated and renamed their cleanup goals to Regional Screening Levels (RSLs) in April of 2009. The current RSL for lead and lead compounds in residential soil is 400 mg/kg. The following is taken from the April 2009 users guide for the RSLs. "*EPA therefore evaluates lead exposure by using blood-lead modeling, such as the Integrated Exposure-Uptake Biokinetic Model (IEUBK). The EPA Office of Solid Waste has also released a detailed directive on risk assessment and cleanup of residential soil lead. The directive recommends that soil lead levels less than 400 mg/kg are generally safe for residential use. Above that level, the document suggests collecting data and modeling blood-lead levels with the IEUBK model. For the purposes of screening, therefore, 400 mg/kg is recommended for residential soils.*"

In 2006, the EPA developed a standard for lead in bare soil in children's play areas of 400 mg/kg. This regulation applies to cleanup projects using federal funds. The soil screening level (SSL) for lead represents a conservative estimate for a level that would be protective of public health in residential soils based on an analysis of the direct ingestion pathway for children. Additionally, Title 21 of the California Code of regulations, Division 1, Chapter 8, Section 35036 defines lead contaminated dust "*means bare soil that contains an amount of lead equal to, or in excess of, four hundred parts per million (400 ppm) in children's play areas and one thousand parts per million (1000 ppm) in all other areas.*"

The NCRWQCB has suggested that the California Human Health Screening Levels (CHHSLs) be utilized for the cleanup goal at the site. The CHHSL for lead in residential soil (developed in January 2005) is 150 mg/kg. The following is taken directly from the **Use of California Human Health Screening Levels in Evaluation of Contaminated Properties**, January 2005. "*The CHHSLs presented in the lookup tables are NOT regulatory "cleanup standards"... Use of the CHHSLs and this document is voluntary on the part of those who choose to use them... The presence of a chemical at concentrations in excess of a CHHSL does not indicate that adverse impacts to human health are occurring or will occur but suggests that further evaluation of potential human health concerns is warranted... Regulatory agencies cannot be compelled to use the CHHSLs as final cleanup standards for a contaminated property.*"

The CHHSLs are concentrations of 54 hazardous chemicals in soil that the California Environmental Protection Agency (Cal/EPA) considers to be below thresholds of concern for risks to human health. However, the thresholds of concern used to develop the CHHSLs are based on an excess lifetime cancer risk of "one in a million". Lead is currently considered a

"non-carcinogen", meaning that exposure to lead in any amount does not cause cancer in humans.

The California Office of Environmental Health Hazard Assessment (OEHHA) publishes Public Health Goals (PHGs) for carcinogenic chemicals, and states "*For noncarcinogens, an exact numerical public health risk cannot be calculated. The PHG for these chemicals is set at a level which is believed to be without significant public health risk to individuals exposed to that chemical over a lifetime.*"

In summary, although the regulatory established level of 400 mg/kg (400 parts per million) has been deemed protective of human health and the environment by the US EPA, the NCRWQCB has indicated a desire to use the CHHSL for lead as the cleanup goal, based on the Cal/EPA screening numbers developed to aid estimation of cleanup costs. Therefore, we recommend that 150 mg/kg be used as the removal action objective. Soil containing concentrations of lead at or above 150 mg/kg would be subject to the selected remedial alternative discussed below.

2.4.1 Exposure Assessment

The greatest risk to human receptors at the Townsite is exposure to impacted soil through dermal contact, ingestion, and inhalation from dust particles. Current and future users of the Townsite include residential inhabitants and utility and maintenance workers. Since impacted soil is primarily shallow, generally between the surface and six-inches bgs, occasionally extending as deep as 1-foot bgs, an exposure pathway exists for these human receptors. Children playing in areas of bare ground could potentially be exposed to unreasonably high lead concentrations. Unacceptable levels of exposure may occur unless cleanup activities commence.

2.4.2 Risk Evaluation

Soil with concentrations of lead above EPA accepted levels can contribute to elevated blood-lead concentrations in resident children. These shallow soils pose an unacceptable human health risk to current and future users of the site unless remediated.

3.0 REMOVAL ACTION OBJECTIVES

Removal action objectives (RAO) serve to protect human health and the environment and reduce potential for exposure to lead in soil that may be encountered at the site. RAO are intended to mitigate identified potential threats to human health and the environment that is consistent with potential future uses of the site. Potential future uses of the site include private residences and commercial operations such as retail facilities.

Human health and environmental risks have been identified in shallow soils at the site that exceed CHHSLs established by the Cal/EPA. The identified exposure pathways are inhalation of fugitive dust or direct contact with the soil. Lead in soil was determined not to leach into groundwater at the site, and there is no current exposure pathway for groundwater as potable water is supplied to area residents by a municipal system.

The CHHSLs are utilized as the benchmark to establish RAO for the site. For individual buildings, it is proposed that impacted soil be removed that exceeds the residential CHHSL. Where applicable, soil with lead concentrations that exceed 150 mg/kg shall be removed.

Lead based paint will be removed to the extent practical on each building and captured for disposal per regulations. The exterior walls of each building will be subsequently painted, to encapsulate remaining LBP.

4.0 ALTERNATIVE EVALUATION

The purpose of this section of the RAW is to identify and evaluate feasible and practicable removal action alternatives that will best achieve the RAO presented in section 3.0. Removal action alternatives were identified and evaluated on the basis of their level of effectiveness, degree to which alternatives can be implemented and estimated cost of each alternative.

4.1 Identification and Analysis of Removal Action Alternatives

Lead above 150 mg/kg is generally present in the surface soil samples historically analyzed from immediately beneath the drip line of various homes and out to approximately 15. Beyond 15 feet past the drip line, typical lead concentrations in surface soil drop below 150 mg/kg. Several remedial options were evaluated concerning the presence of elevated concentrations of lead in soil at the site. Although both native and exotic flora present at various homes within Samoa appeared healthy, several areas have been reported where lead is present above 150 mg/kg. Elevated levels of lead in soil preclude consideration of a no-action alternative, as heavy metals do not normally naturally degrade over time.

The following alternative removal actions were evaluated to minimize potential risks to those who may come in contact with lead in soil. The recommended alternative (excavation and offsite disposal) is discussed in detail in Section 4.4.

Alternative 1: Excavation and Off-Site Disposal

Alternative 2: On-Site Phytoremediation

Alternative 3: Excavation and Capping with Land Use Restrictions

4.1.1 Alternative 1: Excavation and Off-Site Disposal

This alternative entails excavation and transportation of impacted soil to an off-site, appropriately licensed landfill facility. Winzler & Kelly reviewed the extensive historical soil analytical data collected from approximately 15% of the buildings within the Townsite. Based on the historical analytical results, Winzler & Kelly selected a representative subset of the previously sampled buildings to evaluate for remedial alternatives. Each of the three buildings selected for remedial alternatives have elevated concentrations of lead in soil, and Winzler & Kelly calculated that soil removal volumes would potentially range from approximately 50 to 75 cubic yards.

Because of the shallow nature of soil impacts, it is estimated that materials excavated will require removal and proper disposal. Clean overburden is not expected and therefore there is no need to segregate excavated materials.

Three buildings were evaluated for remedial cost estimating purposes. Lateral and vertical extent of lead impact was evaluated to determine the amount of soil necessary for excavation in order to reach the cleanup goal. The following table shows a break down of impacted soil metrics for each area evaluated.

Metrics for Proposed Excavation

Building	Square feet of impacted soil	Cubic yards of impacted soil
#2 Vance Ave	1,500	56
#11 N. Bayview	2,000	71
Firehouse	1,800	67

Metrics estimated by visual interpolation of historical analytical data.

Excavated materials would be stockpiled on 10 mil plastic sheeting adjacent to the individual excavations. Waste characterization would be performed by collecting one soil sample from each stockpile and then compositing a maximum of four stockpile samples into one composite sample for laboratory analysis. Each composite sample would be analyzed for total lead, and for the Waste Extraction Test (WET) if total results exceed 50 mg/kg.

After excavation of impacted soil, confirmation soil samples would be collected from the sidewalls and bottom of each excavation to document the effectiveness of the remedial action. One confirmation sample would be collected from each of the four excavations sidewalls, and one 4-point composite from the bottom of the excavation. The samples would be analyzed for total lead.

Groundwater is not expected to accumulate in the bottom of the excavations due to the known depth of groundwater relative to proposed excavation depths. The minimum depth to groundwater measured to date is approximately two feet and the maximum expected excavation depth is one foot.

Following confirmation from the laboratory that the impacted soil has been removed to the soil cleanup criteria established for this project, topsoil will be placed into the excavation, without compaction being performed.

4.1.2 Alternative 2: On-Site Phytoremediation

Phytoremediation was evaluated as an option for remediating elevated lead concentrations in soil. Phytoremediation involves planting of specific species of plants which have the capability to accumulate metals while producing a high biomass. Research in this field has shown that this method typically removes approximately 100 mg/kg of lead from the soil per growing season, for a given area treated. It is subsequently required to harvest the entire plant, including the roots, and dispose of the harvested plant material as hazardous waste.

4.1.3 Alternative 3: Excavation and Capping with Land Use Restrictions

This alternative would involve excavation and removal of the contaminated soil to residential cleanup standards, capping, and filing a land use covenant to restrict future use of areas of the site where contaminant concentrations remain above the accepted cleanup standards. Alternative 3 would require excavation of various quantities of impacted soil, dependent on the concentrations present around a particular structure. Typically, a fifteen foot wide area around the perimeter of each building would be excavated to between four and six inches. A reinforced concrete apron would be framed and poured over the excavated area, effectively encapsulating the remaining lead impacted soil and preventing exposure. An inspection program would be developed with annual reporting requirements that include a visual field inspection of the apron to ensure that cracks, settling, or other ground motions have not compromised the physical integrity of the apron. Periodic maintenance work on the apron would be completed on an as needed basis to ensure its integrity.

Engineering (capping) and institutional (land use) controls would be implemented to ensure that populations with potential of exposure remain separated from impacted soil under specific land uses and during future construction activities potentially involving landscaping or drainage work. A land use covenant would be filed with the Humboldt County Recorder's office as an institutional control to ensure that the engineering controls would be maintained and implemented to restrict future uses that could have a significant exposure potential.

Institutional controls would include filing a Land Use Covenant with the Humboldt County Recorder. The Land Use Covenant would require implementation of an Operation and Maintenance Plan (OMP), which would include provisions for inspecting and maintaining the apron. Annual inspections would be necessary and the Samoa Group would conduct or oversee those inspections. An Operations and Maintenance Agreement would be required between the Samoa Group and the NCRWQCB to ensure proper implementation of the OMP.

Engineering controls would include a Soil Management Plan (SMP) that delineates the procedures for managing any future excavated soil to ensure the protection of human health and the environment. The SMP would require adherence to a site-specific health and safety plan for future landscape or construction activities.

Evaluation Criteria

An independent evaluation of each removal action alternative was conducted. A detailed discussion of the effectiveness, implementability, and cost of each alternative is provided below.

4.1.4 Effectiveness

The following factors are considered in the evaluation of the effectiveness of each alternative:

- Overall Protection of Human Health and the Environment – This factor evaluates whether the removal alternative would provide adequate protection of human health and the environment and would be able to achieve RAO for the site.

- Short-Term Effectiveness – This factor evaluates the effects of the removal action during the construction and implementation phase until RAO are met. Short-term effectiveness considers protection of workers and the exposed population during removal activities and environmental impacts associated with implementing the removal action.

- Long-Term Effectiveness and Permanence – This factor evaluates controls established for the site that serve to manage risk posed by the residual or untreated waste that remains on-site after the removal action has occurred.

- Reduction of Toxicity, Mobility, or Volume – This factor evaluates whether the removal action results in significant reduction in toxicity, mobility, or volume of the hazardous waste.

4.1.5 Implementability

Implementability evaluates the technical and administrative feasibility of implementing the alternative. This includes the availability of the necessary equipment, materials, and services, ability to monitor performance and effectiveness of selected technology that is utilized to implement the alternative, ability to obtain necessary permits, and ability to gain approval from regulatory agencies, state and local governments, and the local community.

4.1.6 Cost

This factor evaluates the relative and absolute cost of implementing each alternative based on estimated construction, operation, and maintenance costs. It does not evaluate the estimated costs of agency and government interactions to operate and maintain any technologies used to implement an alternative.

4.2 Analysis of Removal Action Alternatives

4.2.1 Comparative Effectiveness Evaluation

Physical removal of lead impacted soil from relatively small areas associated with the various buildings is expected to be a prompt, cost-effective method to achieve remediation. For the relatively limited size of each impacted area, excavation is likely an effective remedial option. Effectiveness can be directly measured by the analytical laboratory results of soil samples collected from the sides and bottom of each excavation.

Alternative 1 is the simplest alternative among the three alternatives and has the highest probability of effectiveness in protecting future users of the site because the impacted soil would be removed from the site. Whereas, under Alternatives 2 and 3, contaminated materials would remain at the site for an extended period of time where there would be potential for human health risks. The potential for achieving RAO with phytoremediation (Alternative 2) could take in excess of 20 years to phytoremediate the areas with the greatest lead concentrations. Therefore, Alternative 2 carries a higher assumed risk and lower expectation of effectiveness. Alternative 3, Excavation and Capping with Land Use Restrictions, although initially effective, is susceptible to mechanical and chemical weathering processes that would eventually fail. In addition, the apron would require ongoing regular monitoring, on a permanent basis. Therefore, there is increased potential for exposure of future users.

4.2.2 Comparative Implementability Evaluation

The initial work associated with the Alternatives, which includes standard earthmoving techniques, soil sampling procedures, planting, and import of clean fill material, could all be implemented as common practice. Implementation of Alternative 1 would also require transport and disposal of impacted soil at an approved, permitted landfill facility. A commitment from a landfill facility can be achieved once laboratory reports from the waste stream composite samples are approved by the facility and a letter of commitment is issued by the facility prior to transport.

Implementation of Alternative 2 would require the NCRWQCB to approve the phytoremediation technology, in addition to preparing a Contingency Management Plan if remediation cleanup objectives were not accomplished over a reasonable timeframe. For implementation of Alternative 3, the NCRWQCB would require land use restrictions to be filed with the County Recorder and preparation and implementation of a Risk Management Plan. In addition, the current land owners would also need procedures to implement engineering and institutional controls that would ensure the long-term integrity of the cap for permanent storage of contaminants at the site. Although each of the alternatives could be implemented through reasonable diligent efforts, Alternatives 2 and 3 are likely more difficult to implement than Alternative 1.

4.2.3 Comparative Cost Evaluation

A summary of cost estimates for each alternative is provided below.

Alternative 1 – Excavation and Off-Site Disposal $25,000 per building
Alternative 2 – Phytoremediation $60,000 per building
Alternative 3 – Excavation and Capping with Land Use Restrictions $30,000 per building

A simple cost comparison indicates that Alternative 1 is the least costly alternative.

4.3 Recommended Alternative

Based on the comparative analysis described in Section 4.3, Alternative 1, Excavation and Off-Site Removal, is the preferred and recommended removal action alternative. Alternative 1 was selected because it: is technically feasible, allows unrestricted future use, requires no maintenance or monitoring, and is the most cost effective. Overall, Alternative 1 poses the lowest risk to human health and the environment among the three alternatives.

5.0 Removal Action Implementation

Implementation of the removal action requires completion of a series of tasks that are described in the following sections. These tasks include: selection of excavation locations and limits, obtaining permits, preparing notifications, site preparation, excavation methodology, control measures, air monitoring during excavation, and field variances.

5.1 Determination of Excavation Locations & Limits

Excavation limits of impacted soil at each building will be determined using a combination of existing soil analytical data, soil data to be collected at residences that have not previously been sampled, and confirmation sampling at the time of the proposed removal action. Preliminary determinations of excavation limits at several buildings have been made by compiling known soil analytical data generated to date. Although excavation limits may be modified at the time of excavation based on confirmation sampling, it is unlikely that impacted soil will extend significantly beyond the proposed limits as the lateral and vertical delineation of impacted soil has been or will be substantially determined.

Field criteria for determining actual lateral and vertical excavation limits will be based on visual inspection for paint chips in the soil.

5.4 Lead based Paint Abatement

Due to the historic nature of the buildings in Samoa, and the desire to preserve the architectural heritage, encapsulation of the existing lead based paint by modification to the building exteriors was not considered. Therefore, the sole alternative is to paint over the existing LBP, after loose paint has scraped off to properly prepare the surface to accept new paint. Properly trained workers will be employed to clean and prepare the exterior of the buildings, while LBP removed from the structures will be captured on plastic sheeting placed around the foundation. Removed LBP will be properly disposed of at a licensed disposal facility. The LBP abatement will be performed on each of the buildings prior to soil excavation to prevent lead from impacting the newly placed topsoil.

5.5 Control Measures

Site control measures for controlling dust will include the use of water trucks and sprayers before and after earthwork activities that involve impacted soil. In addition, earthwork equipment will require on-site cleaning. Equipment rinsate will be stored in 55-gallon DOT approved steel drums for permitted and approved off-site removal.

5.6 Air Monitoring During Earthmoving Operations

Air monitoring would be implemented during the removal action in order to protect workers as well as local residents. Appropriate personal protective equipment (PPE) and safety measures to prevent exposure to lead would be utilized. Site personnel would be informed regarding potential hazards from exposure to hazardous air contaminants generated during excavation work. In addition, air contaminants would be identified and measured at locations outside of the soil removal areas and decontamination exclusion zone(s). Air monitoring would be initially conducted during work activities to measure lead in dust generated during removal activities. This is performed by placing a personal sampling pump on an equipment operator, to derive a representative sample over an 8-hour workday. The sample is subsequently analyzed by the laboratory to determine if permissible exposure limits have been exceeded. If engineering controls for dust suppression are effective and the sample results are below exposure limits, air monitoring should only be performed on a random periodic basis as additional excavation activities occur.

Air monitoring would be conducted to monitor the effectiveness of dust control measures implemented at the site. Total dust content in up- and down-wind air would be monitored on an hourly basis during earthmoving operations. Air monitoring would verify compliance with CAL/OSHA Permissible Exposure Limits (PEL) for dust (10 mg/m^3), which is the difference between up- and down-wind total dust concentration. Engineering controls would be increased or modified to ensure that total dust generated on-site was below the PEL. If engineering controls could not be implemented to achieve this goal, then removal action operations would be suspended until conditions allowed resumption of operations that did not exceed PEL.

5.7 Field Variances

Variance from the RAW would be discussed and approved by NCRWQCB prior to taking action that deviates from the RAW. An exception to this caveat is a field situation that may arise that requires an emergency (immediate) response. The site or acting site supervisor would make the determination if an emergency action is required. In the event that an emergency response is deemed necessary and implemented, the NCRWQCB would be notified within 48 hours of the variance action. Upon complete implementation of the RAW, field variances from the RAW would be documented in the Removal Action Completion Report.

6.0 SAMPLING AND ANALYSIS PLAN

6.1 Confirmation Sampling of Excavated Areas

After each excavation is completed and assuming that no other impact beyond either the targeted depth or the lateral extent of excavation is identified, confirmation sampling would be performed in each excavation area. Confirmation samples will be collected at a frequency of one sample per 500 square feet of aerial extent, with a maximum of four samples being composited into one sample for analysis. If laboratory analysis of confirmation samples indicate that the RAO have been exceeded, then additional excavation would be required. Consequently, additional confirmation samples would be collected and analyzed when excavation activities are completed.

Soil samples would be collected using a stainless steel slide hammer equipped with stainless steel sample tubes. The slide hammer would be decontaminated before and after each use. Sample tubes would be sealed with Teflon sheeting and plastic end caps immediately after sample collection is completed. Sample tubes would be clearly labeled with the date, time, sample number, and placed in a cooler chilled to approximately 4 degrees Celsius. The samples would be transported under Chain-of-Custody procedures using the proper documentation to a California-certified laboratory for the following analysis:

- Total lead by EPA method 6010

Composite soil sampling for excavated soil will be based on landfill requirements. Winzler & Kelly does not anticipate that it will be feasible or necessary to segregate clean from impacted soils due to the discreet nature and shallow depth of impact. Therefore, soils excavated from the site will be disposed of at an off-site disposal facility capable of accepting lead impacted soil.

7.0 SITE TRAFFIC CONTROL

Prior to entering a public roadway, each haul truck would be tarped and the soil would be sprayed with water to suppress dust emissions during travel. The decontamination area would be located as close as possible to the loading area so as to minimize the potential for dispersing impacted soil. The site supervisor would be responsible for inspecting each piece of hauling equipment to ensure that the materials are sufficiently covered and sprayed with an optimum

amount of water to suppress dust but not cause soil to liquefy and leak out of the trucks. Flag person(s) would assist equipment operators and truck drivers to safely leave the site, if necessary. Transportation would be coordinated in such a manner that hauling equipment would be in communication with the site supervisor.

7.1 Record Keeping

The removal action contractor would be responsible for maintaining a field logbook. The field logbook will document personnel on-site, equipment arrival and departure times, excavation location and dimensions, excavation start and completion times, excavation personnel, soil loading periods and operators, and other pertinent project information. The logbook shall be complete and accurate to the extent that field operations can be reconstructed. Logbooks will be bound, each page consecutively numbered including a date and time, each daily entry shall be legible, written in blue or black ink and signed by the author of the entry and by the site supervisor. Each entry shall be factual, accurate, and objective. Each error shall be crossed out with a single horizontal line and each correction shall be initialed and dated by the author. A copy of all logbook entries shall be placed in the Removal Action Completion Report.

8.0 Health and Safety Plan

Contractors would be responsible for operating in accordance with the most current state and federal standards for Hazardous Waste Operations and Emergency Response (CCR Title 8, Section 5192; 29 CFR Section 1910.120). On-site personnel would be responsible for operating in accordance with pertinent regulations established by OSHA as well as California OSHA requirements (including Construction Safety Orders), and other applicable federal, state, and local laws and regulations.

Specific requirements such as PPE, as needed, and a site specific HASP would be prepared, submitted and approved by NCRWQCB prior to initiation of field work. The HASP would be prepared in accordance with health and safety standards specified by the federal and California OSHA. HASP provisions are mandatory for personnel actively involved with remediation activities at the site. Remediation personnel would read the HASP and sign the Plan Acceptance Form attached to the HASP prior to initiation of the RAW implementation.

9.0 Proposed Implementation Schedule

Upon receipt of approval by the NCRWQCB, the Samoa Group will implement the RAW on an intermittent basis. It is anticipated that RAW implementation will occur for a select number of buildings, when soils are dry and groundwater elevation is at a seasonal low point. The removal work is anticipated to be performed on a maximum of six buildings at any given time. LBP abatement will be performed prior to soil removal at each building, to ensure that fugitive paint chips will be removed along with the impacted soil. After LBP abatement occurs at a specific building, a four point composite soil sample will be collected from soil within the building 'dripline' of those buildings that have not been evaluated for lead in soil. If the analytical results for the composite soil sample indicate the presence of lead in soil above 150 mg/kg, soil excavation will be implemented, as described in this RAW.

10.0 REMOVAL ACTION COMPLETION REPORT

After RAW implementation, a report summarizing excavation activities will be prepared. The excavation report will include: site observations, description of methods, tabulated laboratory analytical data, discussion of findings, and copies of permits, waste disposal manifests, contractor logbook entries, and laboratory analytical reports. The excavation report will be prepared and submitted to the NCRWQCB within 45 days of the receipt of laboratory analytical reports.

11.0 REFERENCES

Freshwater Environmental Services, Soil and Groundwater Sampling, June 4, 2009

EPA Region IX, Regional Screening Levels Table 1 - Soil, April 2009

Winzler & Kelly, Final Report, Soil XRF Screening of Five Buildings, July 7, 2008

California Code of Regulations, April 30, 2008

Winzler & Kelly, Additional Phase II Environmental Site Assessment, April 2007

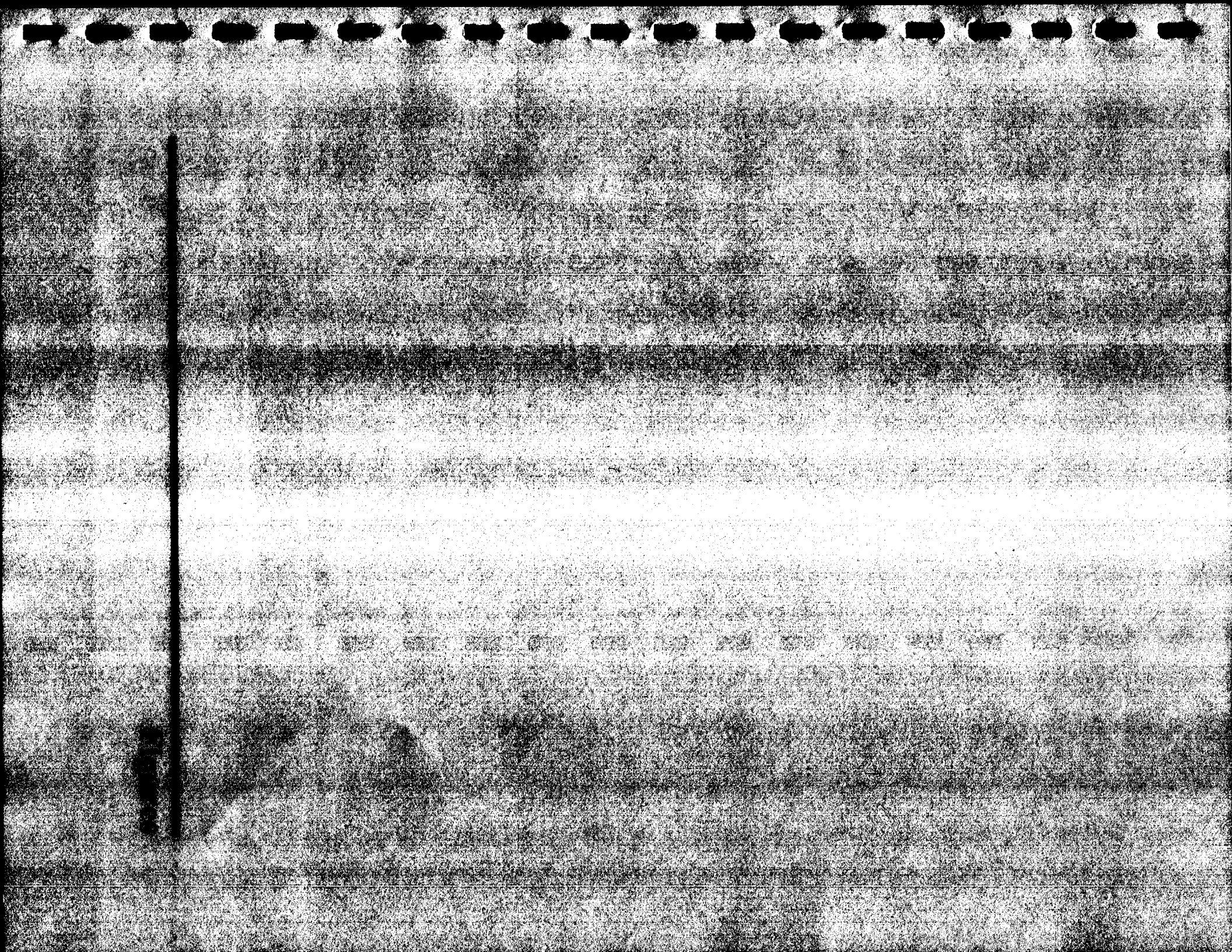
Winzler & Kelly, Phase II Environmental Site Assessment, June 2005

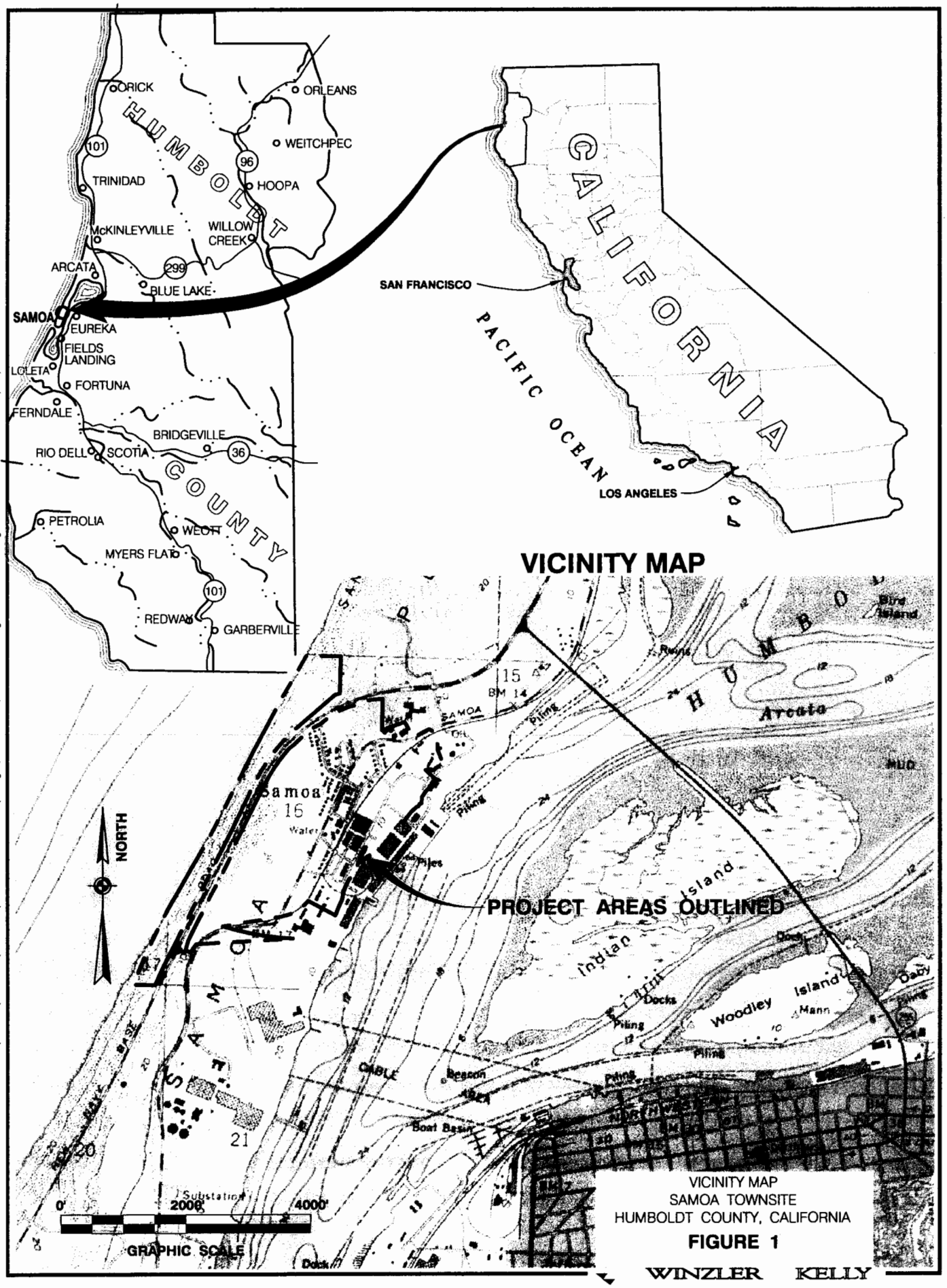
Hunter, Davis and Roach, Inorganic Chemicals in Groundwater and Soil: Background Concentrations at California Air Force Bases, March 10, 2005.

OEHHA, California Human Health Screening Levels for Soil and Comparison to Other Potential Environmental Concerns, Table 1, January 2005

EPA, Additional Performance Characteristics Analyses, where Candidate Standards for lead in Play-Area Soils are Considered, December 2000
http://www.epa.gov/oppt/lead/pubs/403risksupp.htm

Gregorio B. Begonia, Jackson State University, Comparative Lead Uptake and Response of Some Plants Grown on Lead Contaminated Soils, 1997.





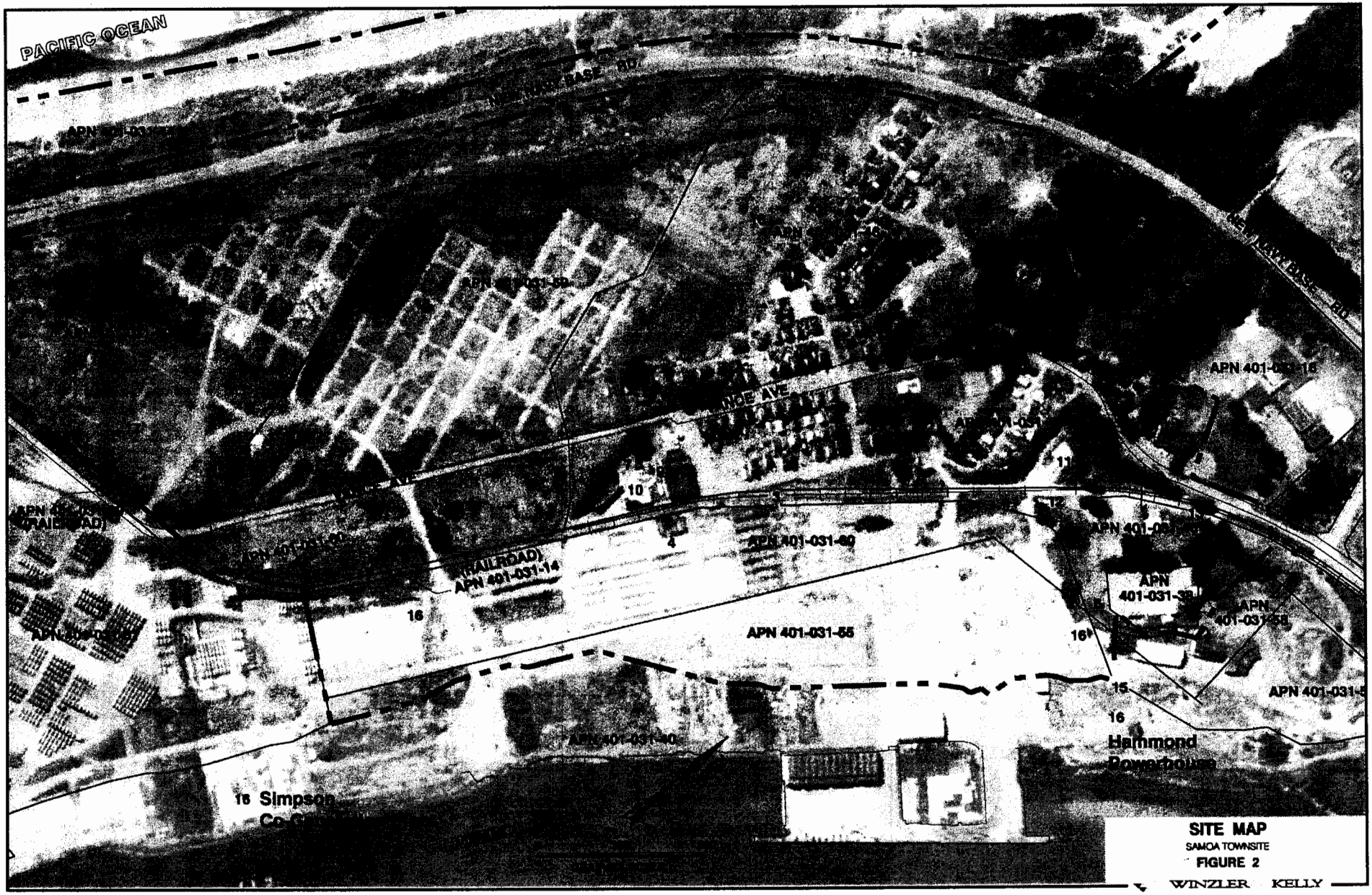
VICINITY MAP
SAMOA TOWNSITE
HUMBOLDT COUNTY, CALIFORNIA

FIGURE 1

WINZLER KELLY

7/2/2009

J:\CAD\JOBS\2005\0166705001\dwg\Samoa\11110 Figure 1.0.dwg



SITE MAP
SAMOA TOWNSITE
FIGURE 2
WINZLER KELLY

FILE: J:\CAD\JOBS\2005\0166705001\dwg\Samoa\Figure 2 07-2009.dwg DATE: 08 09 3:14pm

Appendix A

HUMBOLDT COUNTY DIVISION of ENVIRONMENTAL HEALTH - HAZARDOUS MATERIALS UNIT
WELL and BORING PERMIT APPLICATION

Facility ID # 1NHU890 Permit # 89-N

Facility Name: Town of Samoa

Site Address: Samoa, California 95564

Site Owner: Samoa Pacific Group, LLC. Telephone: 707-822-9000

Address: 5251 Ericson Way, California APN: 401-031-39, 46, 55, 56, 59, 63

RP Name: Samoa Pacific Group, LLC. Telephone: 707-822-9000

Address: 5251 Ericson Way, California

Consultant: Freshwater Environmental Services Telephone: 707 839-0091

Address: 78 Sunny Brae Center, Arcata, CA 95521 Reg.#/Type: P.G. 7990

Driller: Hand-Augering by Freshwater Environmental Services Telephone:

Address: 78 Sunny Brae Center, Arcata, CA 95521 C-57 Lic.#:

# On-site			# Off-site		
Wells		Borings 3	Wells		Borings

Activity: ☒ Construct ☐ Destroy ☐ Repair/Modify Electrode Type:

Well Type: ☐ Monitoring Well ☐ Injection Well ☐ Vapor Extraction ☐ Geologic Boring
☐ Extraction Well ☐ Piezometer ☐ Vapor Point ☐ Soil Gas Survey
☐ Vadose Well ☐ Cathodic Protection ☐ Direct Push Boring ☒ Temporary Well Point

Investigation Type: ☒ Site Assessment ☐ Disposal Practice ☐ UST ☐ Other*
☐ Surface Contamination ☐ Surface Impoundment ☐ AST
*Specify:

Investigation Phase: ☐ Initial ☒ Subsequent ☐ Remediation ☐ Closure

Suspected Contaminants: Lead

Disposal/Containment for Soil Cuttings: 55-gallon DOT drum

Disposal/Containment for Rinsate: 55-gallon DOT drum

Disposal/Containment for Development Water: 55-gallon DOT drum

Permits will not be processed with out the following information:

☒ Scaled Construction Detail
☒ Detailed Site Plan
☒ Lead Agency Approval Letter
☐ Off Site Well Requirements:
☐ Legal Right of Entry
☐ Off Site Address/Location
☐ Encroachment Permit
☐ Coastal Zone Permit
☒ Appropriate Fees
☒ Copy of Workplan (if not on file at HCDEH)

Proposed Work Date: June 5, 2009

rev. 6/98

HUMBOLDT COUNTY DIVISION of ENVIRONMENTAL HEALTH - HAZARDOUS MATERIALS UNIT
WELL and BORING PERMIT APPLICATION

Facility ID # 1NHU890 **Permit #** 89-N

I hereby agree to comply with all laws, ordinances and regulations of the county of Humboldt and State of California pertaining to water well construction. I will contact the Humboldt County Hazardous Materials Unit at (707) 445-6215 five (5) working days prior to commencing this work. I will furnish to the County of Humboldt, Division of Environmental Health, and the owner a legible copy of the State Water Well Completion Report (form DWR 188) within fifteen (15) days after completion of work to obtain final approval of the well(s). I acknowledge that the application will become a permit ONLY after site approval by the Local Implementing Agency (HCDEH, NCRWQCB, DTSC, EPA). I understand this permit is not transferable and expires one hundred twenty (120) days from the date of issuance.

Certificates of Insurance:

☐ A currently effective General Liability Certificate of Insurance is on file with this office, endorsed to include the Humboldt County Division of Environmental Health as additional named insured.

☐ A currently effective Worker's Compensation Certificate of Insurance is on file with this office, endorsed to include the Humboldt County Division of Environmental Health as additional named insured.

Signature of Well Driller - no proxies - original signature only in blue ink _____ Date _____

- **Well identification number and type must be affixed to exterior surface of security structure.**
- **The applicant is responsible for notifying Underground Services Alert at least 48 hours prior to the scheduled work date.**
- **A State of California Department of Water resources Well Completion Report (Form DWR 1-88) must be filed within 15 days of completion of work for all well completions and destructions.**
- **A licensed California C-57 Well Driller is required for all wells and direct push work.**

FOR OFFICE USE ONLY

Permit Approval: Marian Crawford **Date:** 6-3-2009

Fee: $164.00 (ck# 2357) **Date:** 6/3/09 **Receipt:** 0013817

Initial Inspection: _____ **Date:** _____

Final Inspection: _____ **Date:** _____

Log of Boring VA-1

Date Started: June 4, 2009
Date Completed: June 4, 2009

Driller: Freshwater Environmental Services
Drilling Method: Hand-Auger

Recovery	Depth (ft)	Description	USCS	Remarks
	0			**Ground Surface**
100%	1	Fine sand, subangular to subrounded, ~ 10% gravel up to 1.5" diameter, angular to rounded, roots near surface, ~5 silt, dry 10YR 3/1 (very dark gray).	SP	
	2			
	3			
	4			
	5	Sand, fine to medium, subangular to subrounded, moist, 10YR 4/1 (dark gray).	SP	
	6			
	7			**Water Sample:** VA-1 collected using a peristaltic pump with dedicated tubing. Approximately 3 gallons were purged prior to collecting sample. Water was clear after ~ 1 gallon.
	8			
	9			
	10			Measured Water Level 10.59' below ground level on 6-4-09
	11	Becoming wet.		
	12			**BOH ~ 12'**
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20			
	21			
	22			
	23			
	24			
	25			
	26			

Total Depth: ~ 12 feet
Well Completion: Boring plugged with 3/8" bentonite pellets.

VA-1

Freshwater Environmental Services

#2 Vance Ave - Samoa, CA

Date: 6-9-09 | By: SJT

Log of Boring **FH-1**

Date Started: June 4, 2009
Date Completed: June 4, 2009

Driller: Freshwater Environmental Services
Drilling Method: Shovel

Recovery	Depth (ft)	Description	USCS	Remarks
	0			**Ground Surface**
100%	0.1	Organics and roots, ~ 5% sand, fine to medium, subangular to subrounded, dry, 10YR 3/2 (very dark grayish brown).	PT	**Soil Sample:** FA-1-0.0'-0.5'
	0.2			
	0.3	Sand, fine to medium, subangular to subrounded, ~ 25% gravel up to 1" diameter, dry, 10YR 3/2 (very dark grayish brown).	SP	Screened with No. 10 sieve with 2.0 mm (0.0787 inch) mesh.
	0.4			
	0.5			**BOH ~ 0.5'**

Total Depth: ~ 0.5 feet

FA-1

Freshwater Environmental Services

Firehouse - Samoa, CA

Date: 6-9-09 | By: SJT

Log of Boring **FH-2**

Date Started: June 4, 2009
Date Completed: June 4, 2009

Driller: Freshwater Environmental Services
Drilling Method: Shovel

Recovery	Depth (ft)	Description	USCS	Remarks
	0			**Ground Surface**
100%	0.1	Organics and roots, ~ 5% sand, fine to medium, subangular to subrounded, dry, 10YR 3/2 (very dark grayish brown). Paint chips up to ¼" visible.	PT	**Soil Sample:** FA-2-0.0'-0.5'
	0.2			
	0.3	Sand, fine to medium, subangular to subrounded, ~ 25% gravel up to 1" diameter, dry, 10YR 3/2 (very dark grayish brown).	SP	Screened with No. 10 sieve with 2.0 mm (0.0787 inch) mesh.
	0.4			
	0.5			**BOH ~ 0.5'**

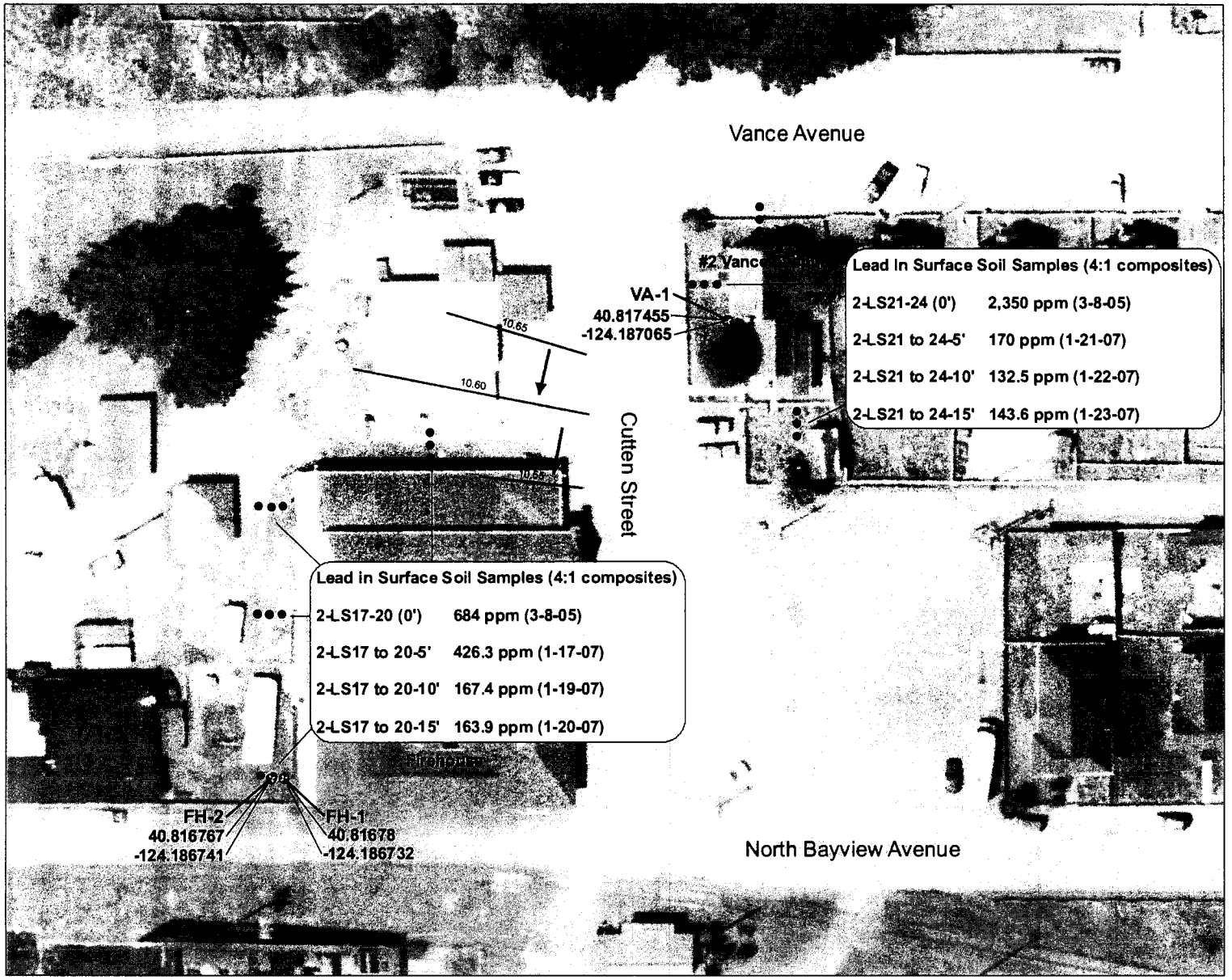
Total Depth: ~ 0.5 feet

FA-2

Freshwater Environmental Services

Firehouse - Samoa, CA

Date: 6-9-09 | By: SJT



LEGEND

- Sample locations
- Approximate location of previous samples
- Approximate direction of groundwater gradient (5-1-09)

Geographic coordinates of boring locations in decimal degrees based on 1983 North American Datum

Base Image Data Source: Obtained from City of Eureka Engineering/GIS Department Image date March 2, 2007.

ALL LOCATIONS APPROXIMATE

Feet
0 5 10 20 30 40 50 60 70 80 90 100

Samoa Pacific Group, LLC.

Figure 1
Lead Sampling
Detail Map

Date: 6-4-09

By: SJT

Freshwater Environmental Services

NORTH COAST LABORATORIES LTD.

June 10, 2009

Samoa Pacific Group LLC
5251 Ericson Way
Arcata, CA 95521

Attn: Sean Armstrong

RE: Samoa Townsite

Order No.: 0906117
Invoice No.: 82718
PO No.: 8985/8986
ELAP No.1247-Expires June 2010

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	VA-1
01B	VA-1(Dissolved)
02A	FH-1-0.0' - 0.05'/TTLC
02B	FH-1-0.0' - 0.05'/STLC Using DI
02C	FH-1-0.0' - 0.05'/STLC Using VA-1
03A	FH-2-0.0' - 0.05' /TTLC
03B	FH-2-0.0' - 0.05'/STLC Using DI
03C	FH-2-0.0' - 0.05'/STLC Using VA-1

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s) | QA Unit | Jesse G. Chaney, Jr. Laboratory Director

Date: 10-Jun-2009
WorkOrder: 0906117

ANALYTICAL REPORT

Client Sample ID: VA-1 **Received:** 6/4/2009 **Collected:** 6/4/2009 10:32
Lab ID: 0906117-01A

Test Name: pH **Reference:** Std. Meth. 20th Ed. 4500-H B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
pH	6.3	N/A	pH Units	1.0		6/4/2009

Client Sample ID: VA-1(Dissolved) **Received:** 6/4/2009 **Collected:** 6/4/2009 10:32
Lab ID: 0906117-01B

Test Name: ICP-MS Metals **Reference:** EPA 200.8 Rev 5.4 (1998)

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Lead	ND	5.0	µg/L	1.0	6/4/2009	6/8/2009

Client Sample ID: FH-1-0.0' - 0.05'/TTLC **Received:** 6/4/2009 **Collected:** 6/4/2009 9:10
Lab ID: 0906117-02A

Test Name: EPA 6010B **Reference:** EPA 6010B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Lead	70	10	µg/g	1.0	6/9/2009	6/10/2009

Client Sample ID: FH-1-0.0' - 0.05'/STLC Using DI **Received:** 6/4/2009 **Collected:** 6/4/2009 9:10
Lab ID: 0906117-02B

Test Name: EPA 6010B **Reference:** EPA 6010B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Lead	ND	100	µg/L	1.0	6/5/2009	6/10/2009

Client Sample ID: FH-1-0.0' - 0.05'/STLC Using VA-1 **Received:** 6/4/2009 **Collected:** 6/4/2009 9:10
Lab ID: 0906117-02C

Test Name: EPA 6010B **Reference:** EPA 6010B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Lead	ND	100	µg/L	1.0	6/5/2009	6/10/2009

Client Sample ID: FH-2-0.0' - 0.05' /TTLC **Received:** 6/4/2009 **Collected:** 6/4/2009 9:15
Lab ID: 0906117-03A

Test Name: EPA 6010B **Reference:** EPA 6010B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Lead	52	10	µg/g	1.0	6/9/2009	6/10/2009

NORTH COAST LABORATORIES
5680 West End Road • Arcata, California 95521-9202 • 707-822-4649 • FAX 707-822-6831
Printed on Recycled Paper

Date: 10-Jun-2009
WorkOrder: 0906117

ANALYTICAL REPORT

Client Sample ID: FH-2-0.0' - 0.05'/STLC Using DI **Received:** 6/4/2009 **Collected:** 6/4/2009 9:15
Lab ID: 0906117-03B

Test Name: EPA 6010B **Reference:** EPA 6010B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Lead	ND	100	µg/L	1.0	6/5/2009	6/10/2009

Client Sample ID: FH-2-0.0' - 0.05'/STLC Using VA-1 **Received:** 6/4/2009 **Collected:** 6/4/2009 9:15
Lab ID: 0906117-03C

Test Name: EPA 6010B **Reference:** EPA 6010B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Lead	ND	100	µg/L	1.0	6/5/2009	6/10/2009

NORTH COAST LABORATORIES
5680 West End Road • Arcata, California 95521-9202 • 707-822-4649 • FAX 707-822-6831
Printed on Recycled Paper

North Coast Laboratories, Ltd.

Date: 10-Jun-2009

CLIENT: Samoa Pacific Group LLC
Work Order: 0906117
Project: Samoa Townsite

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-22303** Batch ID: **22303** Test Code: **6ICPS** Units: **µg/g** Analysis Date: **6/10/2009 11:20:00 AM** Prep Date: **6/9/2009**
Client ID: Run ID: **INICP1_090610A** SeqNo: **836793**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.980	10									J

Sample ID: **MB-22292** Batch ID: **22292** Test Code: **6ICPX** Units: **µg/L** Analysis Date: **6/10/2009 1:18:00 PM** Prep Date: **6/5/2009**
Client ID: Run ID: **INICP1_090610B** SeqNo: **836811**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	100									

Sample ID: **MB-22293** Batch ID: **22293** Test Code: **6ICPX** Units: **µg/L** Analysis Date: **6/10/2009 1:36:00 PM** Prep Date: **6/5/2009**
Client ID: Run ID: **INICP1_090610B** SeqNo: **836816**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	100									

Sample ID: **MB-22289** Batch ID: **22289** Test Code: **ICPMSW** Units: **µg/L** Analysis Date: **6/8/2009 4:53:00 PM** Prep Date: **6/4/2009**
Client ID: Run ID: **ICPMS_090608B** SeqNo: **836464**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 10-Jun-2009

CLIENT: Samoa Pacific Group LLC
Work Order: 0906117
Project: Samoa Townsite

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID: **LCS-22303** Batch ID: **22303** Test Code: **6ICPS** Units: **µg/g** Analysis Date: **6/10/2009 11:24:00 AM** Prep Date: **6/9/2009**
Client ID: Run ID: **INICP1_090610A** SeqNo: **836794**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	99.83	10	100	1.98	97.8%	85	115	0			

Sample ID: **LCS-22292** Batch ID: **22292** Test Code: **6ICPX** Units: **µg/L** Analysis Date: **6/10/2009 1:21:00 PM** Prep Date: **6/5/2009**
Client ID: Run ID: **INICP1_090610B** SeqNo: **836812**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1,045	100	1,000	0	104%	85	115	0			

Sample ID: **LCSD-22292** Batch ID: **22292** Test Code: **6ICPX** Units: **µg/L** Analysis Date: **6/10/2009 1:25:00 PM** Prep Date: **6/5/2009**
Client ID: Run ID: **INICP1_090610B** SeqNo: **836813**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1,016	100	1,000	0	102%	85	115	0			

Sample ID: **LCS-22293** Batch ID: **22293** Test Code: **6ICPX** Units: **µg/L** Analysis Date: **6/10/2009 1:40:00 PM** Prep Date: **6/5/2009**
Client ID: Run ID: **INICP1_090610B** SeqNo: **836817**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1,077	100	1,000	0	108%	85	115	0			

Sample ID: **LCSD-22293** Batch ID: **22293** Test Code: **6ICPX** Units: **µg/L** Analysis Date: **6/10/2009 1:44:00 PM** Prep Date: **6/5/2009**
Client ID: Run ID: **INICP1_090610B** SeqNo: **836818**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1,081	100	1,000	0	108%	85	115	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Samoa Pacific Group LLC
Work Order: 0906117
Project: Samoa Townsite

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: **LCS-22289** Batch ID: **22289** Test Code: **ICPMSW** Units: **µg/L** Analysis Date: **6/8/2009 4:57:00 PM** Prep Date: **6/4/2009**
Client ID: Run ID: **ICPMS_090608B** SeqNo: **836465**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	544.7	5.0	500	0	109%	85	115	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

NORTH COAST LABORATORIES LTD.
5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

PDF

LABORATORY NUMBER: 0906117

Attention: Stan Thiesen
Results & Invoice to: Invoice to Samoa Pacific Group, LLC.
Address: Attn: Sean Armstrong
5251 Ericson Way, Arcata, CA 95521
Phone: 707 822-9000
Copies of Report to: Stan Thiesen
stan@freshwaterenvironmentalservices.com
Sampler (Sign & Print): Orrin Plocher

TAT: [ ] 24 Hr [ ] 48 Hr [ ] 5 Day [X] 5-7 Day
[ ] STD (2–3 Wk) [ ] Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms [ ]
Preliminary: FAX [ ] Verbal [ ] By:
Final Report: FAX [ ] Verbal [ ] By:

PROJECT INFORMATION
Project Number:
Project Name: Samoa Townsite
Purchase Order Number: Please bill direct to Samoa Pacific, LLC.

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*
	VA-1	06/04/2009	10:32	GW
	VA-1	06/04/2009	10:35	GW
	FH-1-0.0'-0.05'	06/04/2009	09:10	S
	FH-2-0.0'-0.05'	06/04/2009	09:15	S

ANALYSIS	CONTAINER	PRESERVATIVE
Lead TTLC (EPA 6010)	16 oz glass jar	none
Dissolved Lead (EPA 200.8)	2 250-ml plastic	none
Groundwater for STLC testing	4 1-liter glass	none
pH	2 250-ml plastic	none

Lead TTLC (EPA 6010)	Dissolved Lead (EPA 200.8)	Groundwater for STLC testing	pH
	X		X
		X	
X			
X			

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

SAMPLE CONDITION/SPECIAL INSTRUCTIONS

Sample VA-1 to be analyzed for dissolved lead after filtering and preservation by North Coast.
Samples FH-1-0.0'-0.05' and FH-2-0.0'-0.05' to be analyzed for lead by EPA 6010.
STLC testing for samples FH-1-0.0'-0.05' and FH-2-0.0'-0.05' using deionized water and groundwater from VA-1-GW (collected in 1-liter glass containers).
Just collected + rcvd. Temp: 7.0°C
GeoTracker Global ID: SL0602323372
Please record cooler temperature: Celsius

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
Orrin Plocher	6/4/09 1200		6/4/09 1205

SAMPLE DISPOSAL
[X] NCL Disposal of Non-Contaminated
[ ] Return [ ] Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

EXHIBIT NO. **12**

APPLICATION NO. HUM-MAJ-1-08

HUMBOLDT COUNTY LCP AMENDMENT (SAMOA TOWN PLAN)

LETTER DATED 11/10/09 WITH ATTACHMENTS, FROM KASEY ASHLEY, SR. ENGINEERING GEOLOGIST, REGIONAL WATER QUALITY CONTROL BOARD, PERTAINING TO THE BOARD'S REQUIREMENTS FOR THE SITE CLEANUP PROCESS FOR THE SAMOA PENINSULA BROWNFIELD (1 of 75)

California Regional Water Quality Control Board
North Coast Region
Bob Anderson, Chairman

www.waterboards.ca.gov/northcoast
5550 Skylane Boulevard, Suite A, Santa Rosa, California 95403
Phone: (877) 721-9203 (toll free) • Office: (707) 576-2220 • FAX: (707) 523-0135

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

November 10, 2009

RECEIVED
NOV 12 2009
CALIFORNIA
COASTAL COMMISSION

Melanie Faust
California Coastal Commission
710 E Street, Suite 200
Eureka, CA 95501

Dear Ms. Faust:

Subject: Clarifications on Regional Water Quality Control Board Site Cleanup Process for the Samoa Peninsula Brownfield

File: Samoa Peninsula (Town of Samoa), Samoa, California
Case No. 1NHU890

Regional Water Quality Control Board (Regional Water Board) staff has appreciated working with you in the permitting process for the Town of Samoa. The following letter clarifies the process used by the Regional Water Board staff in the investigation and cleanup of discharges to the environment.

Section 13304 of the California Water Code contains the authority to require discharges to clean up wastes discharged or abate the effects of the waste. State Water Resources Control Board Resolution 92-49 "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304" was adopted in 1992 and amended on April of 1994 and October of 1996. This document sets out the procedures that are followed for investigation of wastes and clean up procedures. In addition, Title 27 of the California Code of Regulations requires cleanup of contamination in soils to background where feasible.

There are two areas of the Town of Samoa where significant levels of contamination were identified and remedial activities will occur in the future. These two areas are the Soccer Field and the Housing. The owners of the Town of Samoa have proposed a combination of removal of contaminated soil and/or groundwater and capping low levels in place for the Soccer Field and removal of contaminated soils for the Housing areas.

There are also eight areas of the Town of Samoa where low level contamination was identified in soils and/or groundwater. Please see attached map of the eight areas. The contamination has been defined on the property owned by the Town of Samoa and is of limited areal extent. This low level contamination has likely been in place for at least several decades or longer.

Regional Water Board staff reviewed the various investigation documents submitted for the Town of Samoa following the criteria set out in the above laws and policy documents. Staff made a determination that no further action was necessary to protect human health and safety, the environment, and waters of the state at this time based on the current land use of the eight areas in question. This determination is not based on the ability of a discharger to afford the cleanup of waste.

Due to the fact that the eight areas are not going to be cleaned up to background, Regional Water Board staff finds that the property is not suitable for unrestricted use and a land use restriction is necessary for the protection of public health or safety and the environment. A land use restriction is recorded or required to be recorded under Assembly Bill 2436 as filed with Secretary of State on September 16, 2002. These documents have been drafted for the eight locations. Please see the attached sample deed restrictions.

The low levels of contaminants in soils are either already located beneath the seasonal high groundwater level or are within five feet of seasonal high groundwater. Several areas have groundwater contamination and no soil contamination. A rise in sea level in the future will not make a material change in the amount of contaminants in groundwater. In fact, the addition of more groundwater may likely dilute the low level concentrations already identified. In addition, none of the eight areas in question are immediately adjacent to Humboldt Bay or the Pacific Ocean. The age of the discharges and the current sampling information indicate that it is highly unlikely that groundwater contamination will extend to either the bay or the ocean.

There are no specific monitoring requirements in the deed restrictions. However, in the event that land use or circumstances change in the future, the deed restriction language requires the following:

> F. *Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.*

The deed restrictions also detail enforcement actions and actions to terminate the deed restrictions in the event that land use or contamination changes in the future.

If you have any further questions, please contact me at (707)576-2673.

Sincerely,

Kasey Ashley

Kasey Ashley P.G.
Senior Engineering Geologist

091110_KA_kasamoa12

Enclosures: Site Map
Eight Draft Deed Restrictions

cc: Andrew Whitney, Economic Development Division, County of Humboldt, 520 E Street, Eureka, CA 95501
Orrin Plocher, Freshwater Environmental Services, 78 Sunny Brae, Arcata, CA 95521
Jed Douglas, Winzler & Kelly, 633 Third Street, Eureka, CA 95501-0417
Mr. Dan Johnson, Samoa Pacific Group LLC, 5251 Ericson Way, Arcata, CA 95521

Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION
ON PROPERTY

Cookhouse Garages, Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated off Cookhouse Road, in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. This Covenant is an environmental covenant provided for by Civil code section 1471 and required by the Board pursuant to Water Code section 13307.1 because the Burdened Property is contaminated by hazardous materials as defined in section 25260 of the Health and Safety Code.

B. Contamination of the Burdened Property. Soil at the Burdened Property was contaminated by unknown activities possibly related to vehicle maintenance conducted by previous occupants of the town of Samoa. These operations resulted in very low level contamination of soil with semi-volatile organic chemicals including benzo(a) pyrene and flouranthene which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260.

C. Exposure Pathways. The contaminants addressed in this Covenant are present in soil on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact, or surface-water runoff, resulting in dermal contact, inhalation, or ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the controls described in the Soil Contingency Plan, including any future amendments thereto, as incorporated herein as Exhibit B.

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D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property was previously used for vehicle storage and for recreational uses, such as xxxx, behind the garages where the vehicles were kept. Adjacent land uses are commercial land uses, such as xxxx.

E. Disclosure and Sampling. The Covenantor made full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has conducted extensive sampling of the Burdened Property.

F. Use of Burdened Property. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may remain deposited on portions of the Burdened Property.

G. Soil Contingency Plan. Freshwater Environmental Services prepared a Soil Contingency Plan Dated October 13, 2009, on behalf of Covenantor for the Property. The Soil Contingency Plan, including any future amendments thereto, is incorporated herein as Exhibit B. The purpose of the Soil Contingency Plan is..... [describe what this is/what it is for]

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ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. These Restrictions, as set forth in Article III, are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence of hazardous materials on the land. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors, assigns, and lessees thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be bound by the Restrictions and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property, and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the

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Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and its staff, and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, structures, roads, driveways, gradings, regradings, and paved areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Burdened Property or any portion thereof shall conduct or permit any excavation work on the Burdened Property, unless expressly permitted in writing by the Board. Any contaminated soils brought to the surface by grading, excavation, trenching, or backfilling shall be managed by the Owner, Owner's agency, Occupant or Occupant's agent in accordance with all applicable provisions of local, state and federal law;

b. All uses and development of the Burdened Property shall be consistent with the Soil Contingency Plan prepared by Freshwater Environmental Serves dated October 13, 2009, which is hereby incorporated in Exhibit B, including future amendments thereto.

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c. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

d. No Owner or Occupant of the Burdened Property shall act in any manner that threatens or is likely to aggravate or contribute to the existing environmental conditions of the Burdened Property. All excavation will be done in accordance with the Soil Contingency Plan, prepared by Freshwater Environmental Services dated October 13, 2009 (Exhibit B) including future amendments thereto.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the Restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove, or cause to be modified or removed, any Improvements commenced or constructed in violation of that paragraph. Violation of this Covenant shall also be grounds for the Board to file civil actions against the Owner or Occupant as provided by law.

3.3 Notice in Agreements. After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the property. Any such instrument shall contain the following statement:

> The land described herein contains hazardous materials in soils under the property, and is subject to a Covenant and Environmental Deed Restriction dated as of _____, 2009, and recorded on _____, 2009, in the Official Records of Humboldt County, California, as Document No. _____, which Covenant and Environmental Restriction imposes certain covenants, conditions, and restrictions on usage of the property described herein. Freshwater Environmental Services prepared a Soil Contingency Plan dated October 13, 2009, for the land described in Exhibit A, and incorporated as Exhibit B. This statement is not a declaration that a hazard exists.

ARTICLE IV
VARIANCE AND TERMINATION

4.1 Variance. Any Owner or, with the Owner's written consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

4.2 Termination. Any Owner or, with the Owner's written consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

4.3 Term. Unless terminated in accordance with paragraph 4.2 above, by law or otherwise,

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this Covenant shall continue in effect in perpetuity.

ARTICLE V
MISCELLANEOUS

5.1 No Dedication Intended. Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

5.2 Notices. Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (a) when delivered, if personally delivered to the person being served or an official of a government agency being served, or (b) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

5.3 Partial Invalidity. If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

5.4 Article Headings. Headings at the beginning of each numbered article of this Covenant are solely for the convenience of the parties and are not a part of the Covenant.

5.5 Recordation. This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Humboldt within ten (10) days of the date of execution.

5.6 References. All references to Code sections include successor provisions.

5.7 Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to effect the purpose of this instrument and the policies and purposes of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that

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would render the provision valid shall be favored over any interpretation that would render it invalid.

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By: _____

Title: Executive Officer
Date: _____

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STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

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EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

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EXHIBIT B

SOIL CONTINGENCY PLAN, FRESHWATER ENVIRONMENTAL SERVICES

October 13, 2009

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Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION ON PROPERTY

Former Hammond Powerhouse, Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. The Burdened Property contains hazardous materials.

B. Contamination of the Burdened Property. Soil and groundwater at the Burdened Property were contaminated by historic use of petroleum containing materials conducted by previous occupants of the town of Samoa. These operations resulted in contamination of soil with petroleum compounds including Total Petroleum Hydrocarbon (TPH) as diesel and TPH as motor oil which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260. These operations also resulted in contamination of groundwater with TPH as motor oil which constitutes a hazardous material as that term is defined in Health & Safety Code Section 25260..

C. Exposure Pathways. The contaminants addressed in this Covenant are present in soil and groundwater on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact, or surface-water runoff, resulting in dermal contact, inhalation, or ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the controls described herein.

D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property is used

for industrial purposes and is adjacent to industrial land uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

G. Freshwater Environmental Services prepared a Soil and Groundwater Contingency Plan Dated October 23, 2009, for Covenator for the Property and is incorporated herein in Exhibit B.

ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Property or any portion thereof shall conduct any excavation work on the Property, unless expressly permitted in writing by the Board. Any contaminated soils brought to the surface by grading, excavation, trenching, or backfilling shall be managed by Covenantor or his agent in accordance with all applicable provisions of local, state and federal law and consistent with the Soil and Groundwater Contingency Plan Dated October 23, 2009 prepared by Freshwater Environmental Services (incorporated herein in Exhibit B)..

b. No Owners or Occupants of the Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses, unless expressly permitted in writing by the Board.

c. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

d. No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property.

e. All uses and development of the Burdened Property shall be consistent with the Soil and Groundwater Contingency Plan prepared by Freshwater Environmental Serves dated October 23, 2009, which is hereby incorporated in Exhibit B including future amendments thereto.

f. The Owner shall notify the Board of each of the following: (1) The type, cause, location and date of any remedial measures taken on the Burdened Property pursuant to the requirements of the Board, which could affect the ability of such remedial measures, to perform their respective function and (2) the type and date of repair of such disturbance. Notification to the Board shall be made by registered mail within ten (10) working days of both the discovery of such disturbance and the completion of repairs;

g. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

h. All excavation work will be done in accordance with the Soil and Groundwater Contingency Plan, prepared by Freshwater Environmental Services dated October 23, 2009, for the land described herein in Exhibit B.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove any Improvements constructed in violation of that paragraph. Violation of the Covenant shall be grounds for the Board to file civil actions against the Owner as provided by law.

3.3 Notice in Agreements. After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the property. Any such instrument shall contain the following statement:

> The land described herein contains hazardous materials in soils under the property, and is subject to a deed restriction dated as of _____, 2009, and recorded on _____, 2009, in the Official Records of Humboldt County, California, as Document No. _____, which Covenant and Restriction imposes certain covenants, conditions, and restrictions on usage of the property described herein. Freshwater Environmental Services prepared a Soil and Groundwater Contingency Plan dated October 23, 2009, for the land described herein and incorporated therein by reference and is Exhibit B. This statement is not a declaration that a hazard exists.

ARTICLE IV
VARIANCE AND TERMINATION

4.1 Variance. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

4.2 Termination. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

4.3 Term. Unless terminated in accordance with paragraph 4.2 above, by law or otherwise, this Covenant shall continue in effect in perpetuity.

ARTICLE V
MISCELLANEOUS

5.1 No Dedication Intended. Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

5.2 Notices. Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (1) when delivered, if personally delivered to the person being served or official of a government agency being served, or (2) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

5.3 Partial Invalidity. If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

5.4 Article Headings. Headings at the beginning of each numbered article of this Covenant

are solely for the convenience of the parties and are not a part of the Covenant.

5.5 Recordation. This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Humboldt within ten (10) days of the date of execution.

5.6 References. All references to Code sections include successor provisions.

5.7 Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to effect the purpose of this instrument and the policy and purpose of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By: _____

Title: Executive Officer
Date: _____

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared Samoa Pacific Group, LLC., personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

EXHIBIT B

SOIL AND GROUNDWATER CONTINGENCY PLAN, FRESHWATER ENVIRONMENTAL SERVICES,

October 23, 2009

Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION ON PROPERTY

Lorenzo Buildings, Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated 1 Cutten Street, in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. The Burdened Property contains hazardous materials.

B. Contamination of the Burdened Property. Soil and groundwater at the Burdened Property were contaminated by vehicle maintenance storage, use of petroleum containing materials, and use of underground and above ground gasoline storage tanks conducted by previous occupants of the town of Samoa. These operations resulted in contamination of soil with petroleum compounds and semi-volatile organic chemicals including Total Petroleum Hydrocarbon (TPH) as diesel, TPH as motor oil, TPH as gasoline, benzene, toluene, ethylbenzene, and xylenes and benzo(a) pyrene which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260. These operations also resulted in contamination of groundwater with the volatile organic compound tetrachloroethene (PCE), TPH as gasoline, benzene, toluene, ethylbenzene, and xylenes which also constitutes hazardous materials as that term is defined in Health & Safety Code Section 25260..

C. Exposure Pathways. The contaminants addressed in this Covenant are present in soil and groundwater on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact, or surface-water runoff, resulting in dermal contact, inhalation, or ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the

controls described herein.

D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property is used for storage of materials and equipment and is adjacent to commercial and residential land uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

G. Freshwater Environmental Services prepared a Soil and Groundwater Contingency Plan Dated October 23, 2009, for Covenator for the Property and is incorporated herein in Exhibit B.

ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases

of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Property or any portion thereof shall conduct any excavation work on the Property, unless expressly permitted in writing by the Board. Any contaminated soils brought to the surface by grading, excavation, trenching, or backfilling shall be managed by Covenantor or his agent in accordance with all applicable provisions of local, state and federal law and consistent with the Soil and Groundwater Contingency Plan Dated October 23, 2009 prepared by Freshwater Environmental Services and is incorporated herein in Exhibit B.

b. No Owners or Occupants of the Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses unless expressly permitted in writing by the Board.

c. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

d. No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property.

e. All uses and development of the Burdened Property shall be consistent with the Soil and Groundwater Contingency Plan prepared by Freshwater Environmental Serves dated October 23, 2009, which is hereby incorporated in Exhibit B including future amendments thereto.

f. The Owner shall notify the Board of each of the following: (1) The type, cause, location and date of any remedial measures taken on the Burdened Property pursuant to the requirements of the Board, which could affect the ability of such remedial measures, to perform their respective function and (2) the type and date of repair of such disturbance. Notification to the Board shall be made by registered mail within ten (10) working days of both the discovery of such disturbance and the completion of repairs;

g. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

h. All excavation work will be done in accordance with the Soil and Groundwater Contingency Plan, prepared by Freshwater Environmental Services dated October 23, 2009, for the land described herein and incorporated in Exhibit B.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove any Improvements constructed in violation of that paragraph. Violation of the Covenant shall be grounds for the Board to file civil actions against the Owner as provided by law.

3.3 Notice in Agreements. After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the property. Any such instrument shall contain the following statement:

> The land described herein contains hazardous materials in soils under the property, and is subject to a deed restriction dated as of _____, 2009, and recorded on _____, 2009, in the Official Records of Humboldt County, California, as Document No. _____, which Covenant and Restriction imposes certain covenants, conditions, and restrictions on usage of the property described herein. Freshwater Environmental Services prepared a Soil and Groundwater Contingency Plan dated October 23, 2009, for the land described herein and incorporated therein by reference and is Exhibit B. This statement is not a declaration that

a hazard exists.

ARTICLE IV
VARIANCE AND TERMINATION

4.1 Variance. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

4.2 Termination. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

4.3 Term. Unless terminated in accordance with paragraph 4.2 above, by law or otherwise, this Covenant shall continue in effect in perpetuity.

ARTICLE V
MISCELLANEOUS

5.1 No Dedication Intended. Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

5.2 Notices. Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (1) when delivered, if personally delivered to the person being served or official of a government agency being served, or (2) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

5.3 Partial Invalidity. If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such

portion had not been included herein.

5.4 Article Headings. Headings at the beginning of each numbered article of this Covenant are solely for the convenience of the parties and are not a part of the Covenant.

5.5 Recordation. This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Humboldt within ten (10) days of the date of execution.

5.6 References. All references to Code sections include successor provisions.

5.7 Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to effect the purpose of this instrument and the policy and purpose of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By: _____

Title: Executive Officer
Date: _____

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared Samoa Pacific Group, LLC., personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

EXHIBIT B

SOIL AND GROUNDWATER CONTINGENCY PLAN, FRESHWATER ENVIRONMENTAL SERVICES,

October 23, 2009

Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION
ON PROPERTY

Railroad and Former Rigging Shop, Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated off of Bay View Avenue, in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. The Burdened Property contains hazardous materials.

B. Contamination of the Burdened Property. Soil and groundwater at the Burdened Property were contaminated by historic placement of unknown fill material conducted by previous occupants of the town of Samoa. These operations resulted in contamination of soil with Total Petroleum Hydrocarbons (TPH) as diesel, zinc, and arsenic which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260. These operations resulted in contamination of groundwater with petroleum compounds and dissolved metals chemicals including TPH as diesel, TPH as motor oil, zinc, and arsenic which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260.

C. Exposure Pathways. The contaminants addressed in this Covenant are present in soil and groundwater on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact during excavation or drilling activities, that could result from ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the remediation and controls described herein.

D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property is

vacant industrial property and is adjacent to industrial land uses and residential land uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights,

which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses, unless expressly permitted in writing by the Board.

b. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

c. No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove any Improvements constructed in violation of that paragraph. Violation of the Covenant shall be grounds for the Board to file civil actions against the Owner as provided by law.

3.3 Notice in Agreements. After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the property. Any such instrument shall contain the following statement:

> The land described herein contains hazardous materials in soils under the property, and is subject to a deed restriction dated as of _____, 2009, and recorded on _____, 2009, in the Official Records of Humboldt County, California, as Document No. _____, which Covenant and Restriction imposes certain covenants, conditions, and restrictions on usage of the property described herein. This statement is not a declaration that a hazard exists.

ARTICLE IV
VARIANCE AND TERMINATION

4.1 Variance. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

4.2 Termination. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

4.3 Term. Unless terminated in accordance with paragraph 4.2 above, by law or otherwise, this Covenant shall continue in effect in perpetuity.

ARTICLE V
MISCELLANEOUS

5.1 No Dedication Intended. Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

5.2 Notices. Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (1) when delivered, if personally delivered to the person being served or official of a government agency being served, or (2) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

5.3 Partial Invalidity. If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

5.4 Article Headings. Headings at the beginning of each numbered article of this Covenant are solely for the convenience of the parties and are not a part of the Covenant.

5.5 Recordation. This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Humboldt within ten (10) days of the date of execution.

5.6 References. All references to Code sections include successor provisions.

5.7 Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to effect the purpose of this instrument and the policy and purpose of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By:_____

Title: Executive Officer

Date:_____

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared Samoa Pacific Group, LLC., personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION
ON PROPERTY

Sewer System Effluent Discharge Area , Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated off of Vance Avenue, in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. The Burdened Property contains hazardous materials.

B. Contamination of the Burdened Property. Groundwater at the Burdened Property was contaminated by historic use of the sewer system conducted by previous occupants of the town of Samoa. These operations resulted in contamination of groundwater with petroleum compounds and dissolved metals including Total Petroleum Hydrocarbons (TPH) as diesel, TPH as motor oil, TPH as gasoline, benzene, zinc, and nickel which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260.

C. Exposure Pathways. The contaminants addressed in this Covenant are present in groundwater on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact during excavation or drilling activities, that could result from ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the remediation and controls described herein.

D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property is the sewer system and is adjacent to industrial land uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual

hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses, unless expressly permitted in writing by the Board.

b. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

c. No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove any Improvements constructed in violation of that paragraph. Violation of the Covenant shall be grounds for the Board to file civil actions against the Owner as provided by law.

3.3 Notice in Agreements. After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases

relating to the property. Any such instrument shall contain the following statement:

> The land described herein contains hazardous materials in soils under the property, and is subject to a deed restriction dated as of _____, 2009, and recorded on _____, 2009, in the Official Records of Humboldt County, California, as Document No. _____, which Covenant and Restriction imposes certain covenants, conditions, and restrictions on usage of the property described herein. This statement is not a declaration that a hazard exists.

ARTICLE IV
VARIANCE AND TERMINATION

4.1 Variance. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

4.2 Termination. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

4.3 Term. Unless terminated in accordance with paragraph 4.2 above, by law or otherwise, this Covenant shall continue in effect in perpetuity.

ARTICLE V
MISCELLANEOUS

5.1 No Dedication Intended. Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

5.2 Notices. Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (1) when delivered, if personally delivered to the person being served or official of a government agency being served, or (2) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

5.3 Partial Invalidity. If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

5.4 Article Headings. Headings at the beginning of each numbered article of this Covenant are solely for the convenience of the parties and are not a part of the Covenant.

5.5 Recordation. This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Humboldt within ten (10) days of the date of execution.

5.6 References. All references to Code sections include successor provisions.

5.7 Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to effect the purpose of this instrument and the policy and purpose of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By:_____

Title: Executive Officer
Date:_____

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared Samoa Pacific Group, LLC., personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION ON PROPERTY

Soccer Field Garages, Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated off Vance Avenue, in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. The Burdened Property contains hazardous materials.

B. Contamination of the Burdened Property. Soil at the Burdened Property was contaminated by unknown activities possibly related to vehicle maintenance conducted by previous occupants of the town of Samoa. These operations resulted in contamination of soil with petroleum compounds including Total Petroleum Hydrocarbon (TPH) as diesel and TPH as motor oil which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260.

C. Exposure Pathways. The contaminants addressed in this Covenant are present in soil on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact, or surface-water runoff, resulting in dermal contact, inhalation, or ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the controls described herein.

D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property is currently used for storage and a soccer field is located in front of the garages and is adjacent to residential land uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

G. Freshwater Environmental Services prepared a Soil Contingency Plan Dated October 13, 2009, for Covenator for the Property and is incorporated herein in Exhibit B.

ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Property or any portion thereof shall conduct any excavation work on the Property, unless expressly permitted in writing by the Board. Any contaminated soils brought to the surface by grading, excavation, trenching, or backfilling shall be managed by Covenantor or his agent in accordance with all applicable provisions of local, state and federal law;

b. All uses and development of the Burdened Property shall be consistent with the Soil Contingency Plan prepared by Freshwater Environmental Serves dated October 13, 2009, which is hereby incorporated in Exhibit B including future amendments thereto.

c. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

d. No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property. All excavation work will be done in accordance with the Soil Contingency Plan, prepared by

Freshwater Environmental Services dated October 13, 2009, for the land described herein and incorporated in Exhibit B.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove any Improvements constructed in violation of that paragraph. Violation of the Covenant shall be grounds for the Board to file civil actions against the Owner as provided by law.

3.3 Notice in Agreements. After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the property. Any such instrument shall contain the following statement:

> The land described herein contains hazardous materials in soils under the property, and is subject to a deed restriction dated as of _____, 2009, and recorded on _____, 2009, in the Official Records of Humboldt County, California, as Document No. _____, which Covenant and Restriction imposes certain covenants, conditions, and restrictions on usage of the property described herein. Freshwater Environmental Services prepared a Soil Contingency Plan dated October 13, 2009, for the land described herein and incorporated therein by reference and is Exhibit B. This statement is not a declaration that a hazard exists.

ARTICLE IV
VARIANCE AND TERMINATION

4.1 Variance. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

4.2 Termination. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

4.3 Term. Unless terminated in accordance with paragraph 4.2 above, by law or otherwise, this Covenant shall continue in effect in perpetuity.

ARTICLE V
MISCELLANEOUS

5.1 No Dedication Intended. Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

5.2 Notices. Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (1) when delivered, if personally delivered to the person being served or official of a government agency being served, or (2) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

5.3 Partial Invalidity. If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

5.4 Article Headings. Headings at the beginning of each numbered article of this Covenant are solely for the convenience of the parties and are not a part of the Covenant.

5.5 Recordation. This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Humboldt within ten (10) days of the date of execution.

5.6 References. All references to Code sections include successor provisions.

5.7 Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to effect the purpose of this instrument and the policy and purpose of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By:_____

Title: Executive Officer

Date:_____

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared Samoa Pacific Group, LLC., personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

EXHIBIT B

SOIL CONTINGENCY PLAN, FRESHWATER ENVIRONMENTAL SERVICES

October 13, 2009

Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION ON PROPERTY

Soccer Field, Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated Vance Avenue, in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. The Burdened Property contains hazardous materials.

B. Contamination of the Burdened Property. Soil and groundwater at the Burdened Property were contaminated by vehicle maintenance, storage, and use of petroleum containing materials conducted by previous occupants of the town of Samoa. These operations resulted in contamination of soil with petroleum compounds and metals including Total Petroleum Hydrocarbon (TPH) as diesel, TPH as motor oil, arsenic, and lead which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260. These operations also resulted in contamination of groundwater with the petroleum compounds and dissolved metals including TPH as gasoline, TPH as diesel, TPH as motor oil, arsenic, chromium, lead, and nickel which also constitute hazardous materials as that term is defined in Health & Safety Code Section 25260..

C. Exposure Pathways. The contaminants addressed in this Covenant are present in soil and groundwater on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact, or surface-water runoff, resulting in dermal contact, inhalation, or ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the controls described herein.

D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property is used for recreational purposes and is adjacent to residential land uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

G. Freshwater Environmental Services prepared a Soil and Groundwater Contingency Plan Dated October 23, 2009, for Covenator for the Property and is incorporated herein in Exhibit B.

ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding

on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Property or any portion thereof shall conduct any excavation work on the Property, unless expressly permitted in writing by the Board. Any contaminated soils brought to the surface by grading, excavation, trenching, or backfilling shall be managed by Covenantor or his agent in accordance with all applicable provisions of local, state and federal law and consistent with the Soil and Groundwater Contingency Plan Dated October 23, 2009 prepared by Freshwater Environmental Services incorporated herein in Exhibit B..

b. No Owners or Occupants of the Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses, unless expressly permitted in writing by the Board.

c. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection,

surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

d. No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property.

e. All uses and development of the Burdened Property shall be consistent with the Soil and Groundwater Contingency Plan prepared by Freshwater Environmental Serves dated October 23, 2009, which is hereby incorporated in Exhibit B including future amendments thereto.

f. The Owner shall notify the Board of each of the following: (1) The type, cause, location and date of any remedial measures taken on the Burdened Property pursuant to the requirements of the Board, which could affect the ability of such remedial measures, to perform their respective function and (2) the type and date of repair of such disturbance. Notification to the Board shall be made by registered mail within ten (10) working days of both the discovery of such disturbance and the completion of repairs;

g. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

h. All excavation work will be done in accordance with the Soil and Groundwater Contingency Plan, prepared by Freshwater Environmental Services dated October 23, 2009, for the land described herein and incorporated in Exhibit B.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove any Improvements constructed in violation of that paragraph. Violation of the Covenant shall be grounds for the Board to file civil actions against the Owner as provided by law.

3.3 Notice in Agreements. After the date of recordation hereof, all Owners and Occupants shall execute a written instrument which shall accompany all purchase agreements or leases relating to the property. Any such instrument shall contain the following statement:

> The land described herein contains hazardous materials in soils under the property, and is subject to a deed restriction dated as of _____, 2009, and recorded on _____, 2009, in the Official Records of Humboldt County, California, as Document No. _____, which Covenant and Restriction imposes certain covenants, conditions, and restrictions on usage of the property described herein. Freshwater Environmental Services prepared a Soil and Groundwater Contingency Plan dated October 23, 2009, for the land described herein and incorporated therein by reference and is Exhibit B. This statement is not a declaration that a hazard exists.

ARTICLE IV
VARIANCE AND TERMINATION

4.1 Variance. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or any portion thereof may apply to the Board for a written variance from the provisions of this Covenant.

4.2 Termination. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

4.3 Term. Unless terminated in accordance with paragraph 4.2 above, by law or otherwise, this Covenant shall continue in effect in perpetuity.

ARTICLE V
MISCELLANEOUS

5.1 No Dedication Intended. Nothing set forth herein shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property or any portion thereof to the general public.

5.2 Notices. Whenever any person gives or serves any notice, demand, or other communication with respect to this Covenant, each such notice, demand, or other communication shall be in writing and shall be deemed effective (1) when delivered, if personally delivered to the person being served or official of a government agency being served, or (2) three (3) business days after deposit in the mail if mailed by United States mail, postage paid certified, return receipt requested:

Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

5.3 Partial Invalidity. If any portion of the Restrictions or terms set forth herein is determined to be invalid for any reason, the remaining portion shall remain in full force and effect as if such portion had not been included herein.

5.4 Article Headings. Headings at the beginning of each numbered article of this Covenant are solely for the convenience of the parties and are not a part of the Covenant.

5.5 Recordation. This instrument shall be executed by the Covenantor and by the Executive Officer of the Board. This instrument shall be recorded by the Covenantor in the County of Humboldt within ten (10) days of the date of execution.

5.6 References. All references to Code sections include successor provisions.

5.7 Construction. Any general rule of construction to the contrary notwithstanding, this instrument shall be liberally construed in favor of the Covenant to effect the purpose of this instrument and the policy and purpose of the Water Code. If any provision of this instrument is found to be ambiguous, an interpretation consistent with the purpose of this instrument that would render the provision valid shall be favored over any interpretation that would render it invalid.

IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By: _____

Title: Executive Officer
Date: _____

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared Samoa Pacific Group, LLC., personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY

EXHIBIT B

SOIL AND GROUNDWATER CONTINGENCY PLAN, FRESHWATER ENVIRONMENTAL SERVICES,

October 23, 2009

Recording Requested By:

Samoa Pacific Group, LLC

When Recorded, Mail To:
Catherine Kuhlman, Executive Officer
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

COVENANT AND ENVIRONMENTAL RESTRICTION ON PROPERTY

Former Unlined Burn Pit, Samoa, California

This Covenant and Environmental Restriction on Property (this "Covenant") is made as of the ____ day of _____, 2009 by Samoa Pacific Group, LLC ("Covenantor") who is the Owner of record of that certain property situated on Vance Avenue, in the City of Samoa, County of Humboldt, State of California, which is more particularly described in Exhibit A attached hereto and incorporated herein by this reference (such portion hereinafter referred to as the "Burdened Property"), for the benefit of the California Regional Water Quality Control Board for the North Coast Region (the "Board"), with reference to the following facts:

A. The Burdened Property contains hazardous materials.

B. Contamination of the Burdened Property. Groundwater at the Burdened Property was contaminated by historic use of an unlined burn pit conducted by previous occupants of the town of Samoa. These operations resulted in contamination of groundwater with petroleum compounds and dissolved metals including Total Petroleum Hydrocarbons (TPH) as diesel, TPH as motor oil, and dissolved zinc which constitute hazardous materials as that term is defined in Health & Safety Code Section 25260.

C. Exposure Pathways. The contaminants addressed in this Covenant are present in groundwater on the Burdened Property. Without the mitigation measures which have been performed on the Burdened Property, exposure to these contaminants could take place via in-place contact during excavation or drilling activities, that could result from ingestion by humans. The risk of public exposure to the contaminants has been substantially lessened by the remediation and controls described herein.

D. Adjacent Land Uses and Population Potentially Affected. The Burdened Property is vacent and is adjacent to industrial land uses.

E. Full and voluntary disclosure to the Board of the presence of hazardous materials on the Burdened Property has been made and extensive sampling of the Burdened Property has been conducted.

F. Covenantor desires and intends that in order to benefit the Board, and to protect the present and future public health and safety, the Burdened Property shall be used in such a manner as to avoid potential harm to persons or property that may result from hazardous materials that may have been deposited on portions of the Burdened Property.

ARTICLE I
GENERAL PROVISIONS

1.1 Provisions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property and every portion thereof shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article III are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Board and all Owners and Occupants. Each and all of the Restrictions are imposed upon the entire Burdened Property unless expressly stated as applicable to a specific portion of the Burdened Property. Each and all of the Restrictions run with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Board.

1.2 Concurrence of Owners and Lessees Presumed. All purchasers, lessees, or possessors of any portion of the Burdened Property shall be deemed by their purchase, leasing, or possession of such Burdened Property, to be in accord with the foregoing and to agree for and among themselves, their heirs, successors, and assignees, and the agents, employees, and lessees of such owners, heirs, successors, and assignees, that the Restrictions as herein established must be adhered to for the benefit of the Board and the Owners and Occupants of the Burdened Property and that the interest of the Owners and Occupants of the Burdened Property shall be subject to the Restrictions contained herein.

1.3 Incorporation into Deeds and Leases. Covenantor desires and covenants that the Restrictions set out herein shall be incorporated in and attached to each and all deeds and leases of any portion of the Burdened Property. Recordation of this Covenant shall be deemed binding on all successors, assigns, and lessees, regardless of whether a copy of this Covenant and Agreement has been attached to or incorporated into any given deed or lease.

1.4 Purpose. It is the purpose of this instrument to convey to the Board real property rights, which will run with the land, to facilitate the remediation of past environmental contamination and to protect human health and the environment by reducing the risk of exposure to residual

hazardous materials.

ARTICLE II
DEFINITIONS

2.1 Board. "Board" shall mean the California Regional Water Quality Control Board for the North Coast Region and shall include its successor agencies, if any.

2.2 Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking areas, constructed or placed upon any portion of the Burdened Property.

2.3 Occupants. "Occupants" shall mean Owners and those persons entitled by ownership, leasehold, or other legal relationship to the exclusive right to use and/or occupy all or any portion of the Burdened Property.

2.4 Owner or Owners. "Owner" or "Owners" shall mean the Covenantor and/or its successors in interest, who hold title to all or any portion of the Burdened Property.

ARTICLE III
DEVELOPMENT, USE AND CONVEYANCE OF THE BURDENED PROPERTY

3.1 Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

a. No Owners or Occupants of the Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses, unless expressly permitted in writing by the Board.

b. The Covenantor agrees that the Board, and/or any persons acting pursuant to Board orders, shall have reasonable access to the Burdened Property for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code.

c. No Owner or Occupant of the Burdened Property shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Burdened Property.

3.2 Enforcement. Failure of an Owner or Occupant to comply with any of the restrictions, as set forth in paragraph 3.1, shall be grounds for the Board, by reason of this Covenant, to have the authority to require that the Owner modify or remove any Improvements constructed in violation of that paragraph. Violation of the Covenant shall be grounds for the Board to file civil actions against the Owner as provided by law.

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relating to the property. Any such instrument shall contain the following statement:

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ARTICLE IV
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4.2 Termination. Any Owner or, with the Owner's consent, any Occupant of the Burdened Property or a portion thereof may apply to the Board for a termination of the Restrictions as they apply to all or any portion of the Burdened Property.

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ARTICLE V
MISCELLANEOUS

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Samoa Pacific Group, LLC.
5251 Ericson Way
Arcata, California 95521

Regional Water Quality Control Board
North Coast Region
Attention: Executive Officer
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

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IN WITNESS WHEREOF, the parties execute this Covenant as of the date set forth above.
Covenantor: _Samoa Pacific Group, LLC.

By: _____
Title: _____
Date: _____

Agency: State of California
Regional Water Quality Board,
North Coast Region

By:_____

Title: Executive Officer

Date:_____

STATE OF CALIFORNIA)
)
COUNTY OF _____)

On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared Samoa Pacific Group, LLC., personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

STATE OF CALIFORNIA)
)
COUNTY OF _____)

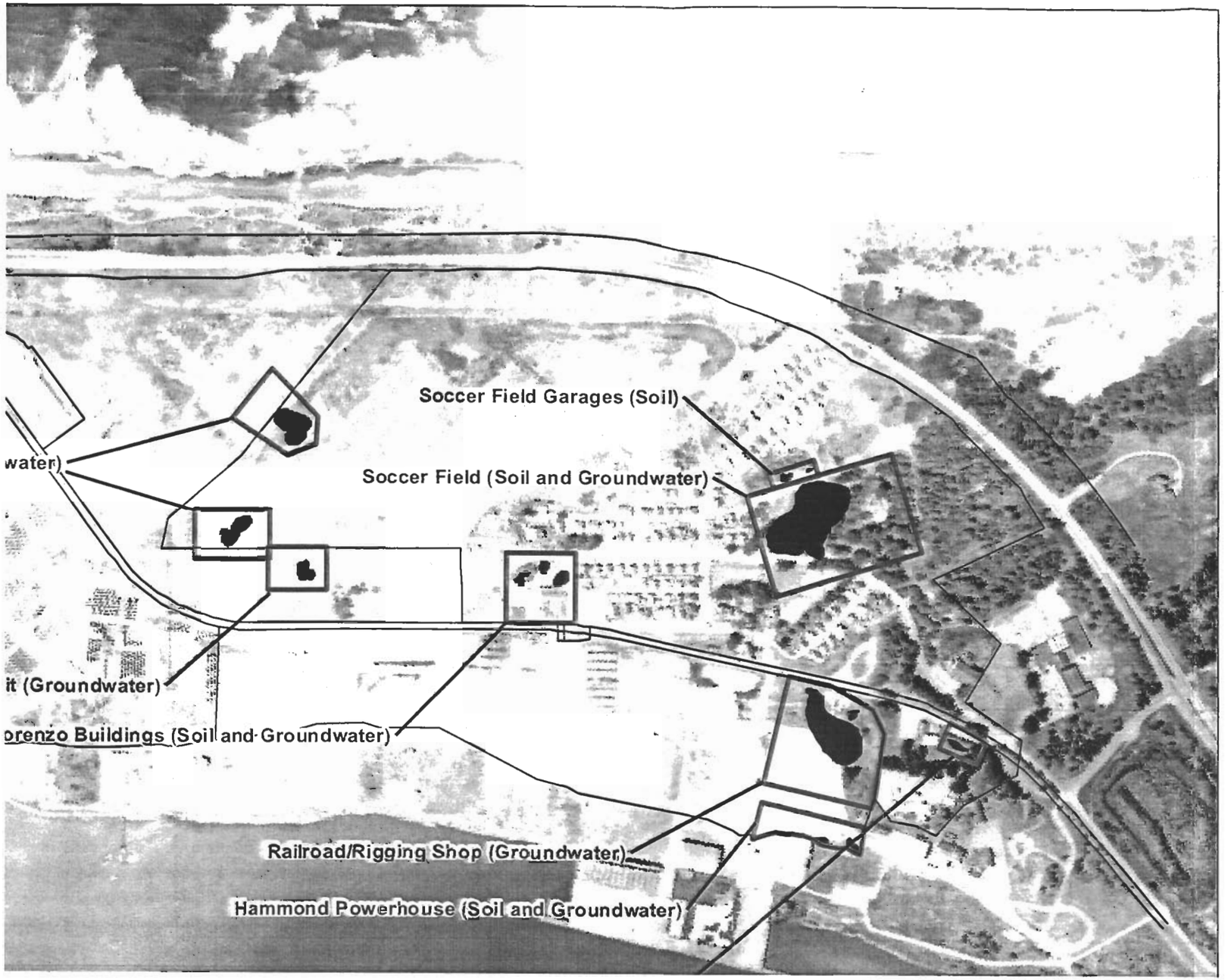
On _____, 2009 before me, the undersigned a Notary Public in and for said state, personally appeared [ ], personally known to me or proved to me on the basis of satisfactory evidence to be the person who executed the within instrument.

WITNESS my hand and official seal.

_____
Notary Public in and for said
County and State

EXHIBIT A

LEGAL DESCRIPTION OF PROPERTY



LEGEND

- Approximate boundaries of deed-restricted areas
- Delineated areas exceeding COC screening levels
- Approximate Parcel Boundaries

Base Image Data Source:
Obtained from City of Eureka Engineering/GIS Department
Image date March 2, 2007.

ALL LOCATIONS APPROXIMATE

W N S E

Feet
0 100 200 400 600 800 1,000 1,200

Samoa Pacific Group, LLC.

Figure 1

EXHIBIT NO. **13**

APPLICATION NO. HUM-MAJ-1-08

HUMBOLDT COUNTY LCP AMENDMENT (SAMOA TOWN PLAN)

"THIRD PARTY REVIEW OF SAMOA TOWN MASTER PLAN TSUNAMI VULNERABILITY REPORT" PREPARED BY JOSE BORRERO, FREDRIC RAICHLEN, HARRY YEH (UNDATED). COPY SUBMITTED TO THE COASTAL COMMISSION BY HUMBOLDT COUNTY, 3/8/07.

(1 of 32)

THIRD PARTY REVIEW OF SAMOA TOWN MASTER PLAN TSUNAMI VULNERABILITY REPORT

by
Jose Borrero, Fredric Raichlen, Harry Yeh

RECEIVED
MAR 0 8 2007
CALIFORNIA
COASTAL COMMISSION

EXECUTIVE SUMMARY

The third party review of the tsunami vulnerability of the Samoa Town Plan was undertaken to investigate the framework of assumptions that led to an elevation of +30 ft MSL for the lowest habitable floor for residential occupancy in Samoa Town suggested by GeoEngioneers (GE). This review will be presented along with certain suggestions. Generally we found that the tsunami vulnerability report by GeoEngineers depended strongly on geological evidence of tsunami attack from past events and a view of the dune system to the west of the Town as providing a "tsunami barrier". This has prompted us to use a sophisticated numerical model of the area that incorporates two Cascadia Subduction Zone earthquakes (magnitudes 8.5 and 9.0) into the model to define inundation zones on the North Spit.

The review that was undertaken has three major sections as presented herein:

- Review of the section in the GeoEngineers' report dealing with the geological aspects of tsunami mitigation.
- The development of a numerical model and a discussion of the results of applying this model using the current topography of the north peninsula to investigate inundation patterns for two CSZ earthquakes (magnitudes 8.5 and 9.0).
- Review of the section of GeoEngineers' report devoted to mitigation and safety.

(In these sections appropriate selections from the GeoEngineers' report and the PG&E (2002) report are presented for the convenience of the reader with our comments presented in bold-face font.)

CONCLUSIONS

The following major conclusions were drawn from the combined review of the GeoEngineers' report and the application of the numerical model used in this review.

- Our numerical simulations predict the maximum tsunami elevation on the seaward face of the seaward dunes of about 20 feet to 24 feet. This is consistent with the geologic evidence that was used as the basis in the GeoEngineers' report. This agreement provides us with some degree of confidence in our estimate. Consequently, we recommend eliminating the factor of safety used by GeoEngineers, i.e., a somewhat arbitrary factor of safety of 1.5. Instead of this factor of safety, we added the effect of maximum tides (3 feet to 4 feet re MSL) to the prediction. This results in the maximum predicted tsunami inundation elevation of 24 ft to 28 ft MSL for the general area of the Samoa Town Master Plan.

- We must caution that there are still many uncertainties involved in our predicted tsunami elevation for a number of reasons. First, the tsunami source we used in our simulation is based on the estimated co-seismic seafloor displacement resulted from the rupture of main fault, which is not an exact science. Furthermore, the rupture in a splay fault could create enhanced seafloor displacement; thereby much greater tsunami may result. There also is a possibility that strong seismic motions may trigger a large submarine landslide, which could generate excessively large tsunamis locally. In addition, in some aspects of the numerical study we assumed a coseismic uplift of the North Spit which may or may not be accurate. Therefore, the estimate by GeoEngineers of the 30 ft elevation for habitable floors for the Samoa Town Master Plan site is reasonable considering all of the uncertainties involved in such a tsunami inundation prediction.

- Unlike the phenomenon of river floods, tsunamis are rare events and a minimal amount of data, if any at all, are available for a given locality. Hence a probabilistic (or risk) analysis for a given site is usually impractical. The best practice to establish a design tsunami condition must be based on the combination of a theoretical understanding of the problem, rational numerical modeling, past field experience, and engineering judgment. We believe that the geological evidence of the study by GeoEngineers and PG&E combined with the results of our numerical model study provide a certain degree of confidence in estimating the tsunami vulnerability of the Samoa Town Master Plan site.

- Even if the tsunami source were identified, local tsunami effects could not be predicted accurately because the flows interact strongly with the complex three-dimensional bathymetry and topography of the area. This is especially true for the prediction of the effects of a tsunami on the east side of Samoa. If the tsunami entered Humboldt Bay through the entrance from the south end of North Spit and propagated northward along the 30-ft deep dredged channel it is possible that the east side of Samoa could be more vulnerable than the west side. This is because of the low elevation of some of the developed area. An accurate prediction of inundation for such a complex tsunami propagation process is difficult. In Section II where the numerical model results are presented and discussed it can be seen that the numerical model can handle this aspect of tsunami effects in only an approximate manner.

- We emphasize that a sufficient number of the assembly sites (shelters) be constructed at strategically planned locations for vertical evacuation. These structures must be designed by qualified professional engineers and can be multi-use or stand alone structures. They should be located based on expected arrival times of a tsunami.

- It is not clear if the ground elevation of the new Emergency Services building should be above 40 feet MSL or that of the upper floor that will be used for evacuation. It is emphasized that there must be multiple assembly sites

- Evacuation routes to the shelters must be carefully planned not only for the residents but also for beach visitors in the event of an earthquake.

- Inside of the shelters, warning signs stating that "tsunami effects last for several hours" must be posted.

- The Samoa Town Plan should not allow any fences in the township, except for those required, and those must be low enough not to hinder evacuation.

- The Safety Plan should include annual evacuation drills and the Plan should be reviewed and updated annually.

I. REVIEW OF THE GEOLOGICAL INDICATIONS OF TSUNAMI VULNERABILITY

In the review of this section of the report we considered the important elements of the geological investigations and the run-up considerations that led to the estimate of the inundation elevation of +30 ft MSL suggested by GeoEngineers. Some important points brought out by GeoEngineers in this section of their report will be presented and discussed.

- **To a large extent the determination of the maximum inundation elevation at the site of the Samoa Town Master Plan is based on the Master of Science thesis of Leroy (1999) and the report of PG&E relating to the Humboldt Bay ISFSI site (Independent Spent Fuel Storage Installation) (December 27, 2002).**

- **It is not clear in either the GeoEngineers' report, PG&E report, or Leroy (1999) whether the authors have made a distinction between run-up and inundation. These can be two distinct phenomena that must be clearly stated in referring to potential flooding scenarios for the Samoa Town Master Plan area. Run-up refers to the elevation to which a wave, e.g., a tsunami, will propagate up a slope (or in this case a dune-face). Inundation is the elevation of flooding due to the wave that may or may not be the same as the run-up.**

The presence of inconsistent sand layers in coastal marsh deposits provides indications of large waves inundating the coastal area of northern California during the late Holocene, including events in the 300 and 1100 yr BP (before present) range.

- **Although this does not refer directly to the Samoa Town Master Plan area it does suggest that major waves occurred at the time of tectonic events occurring around 300 and 1100 yr BP. This observation basically layed the groundwork for the *possibility* of the inundation of the North Spit by tsunamis.**

It is stated that in the Samoa peninsula (the North Spit) paleoseismic evidence was observed in the area of the Mad River Slough approximately four miles north of the Samoa Town Master Plan site. Paleoseismic evidence refers to ground subsidence or uplift associated with past tectonic events and does not, *per se*, refer to historic tsunami events.

- **Leroy (1999) postulates that the Samoa peninsula area experiences co-seismic *uplift* across much of the area due to CSZ earthquake, thereby providing additional protection from dune overtopping in the Samoa Town Master Plan site and from inundation from Humboldt Bay.**

It is stated that there is a general lack of clean sand layers at the base of younger wetland deposits overlying older buried wetland deposits adjacent to the forested dunes in the northern portion of the plan area.

- **This suggests that the dunes seaward of the Samoa Town Master Plan area were not *overtopped* by the tsunami run-up associated with the event of 300 years ago, i.e., 1700. In the event of a major earthquake along the Cascadia Subduction Zone with a magnitude of 9.0 and the generation of a massive tsunami it is probable that, at least, the region of the coast north of Samoa would be inundated. Even though there are high dunes and a forested region north of the Samoa Town Master Plan site providing some protection from local tsunamis, massive waves generated by a magnitude 9.0 CSZ earthquake may travel overland from the north toward the south affecting the North Spit.**

- **In an indirect way, attention has been given to the potential for tsunami flooding of the Samoa Town from the east, i.e., from Humboldt Bay. This is from evidence of the overtopping of the South Spit by past extreme events. There is another caveat, and that is that the dune field is not two dimensional so even though certain dune heights are discussed in the GeoEngineers' report, the dunes in fact are three dimensional, i.e., there are regions in the seaward dune field with peaks that range in height. Therefore, there is a possibility of flow through the lower elevation sections of the dunes. In addition, dune erosion caused by the initial waves in a tsunami wave train may occur that can result in overtopping by subsequent waves. Therefore, the expected run-up on the seaward face of the dunes is important to establish.**

Leroy (1999) states, in the section entitled: "Evaluation of the Spits as Tsunami Barricade", that " the only likely tsunami deposits found to date are on the bay margin against the southeastern portion of the South Spit".

- **Our interpretation of this is that tsunami deposits have not been found elsewhere on the North Spit, but overtopping of the South Spit is possible with related flooding of the North Spit.**

The statement is made that dune development is believed to occur primarily after a seismic event that uplifts the shoreline.

- **This does not address the possibility that major storm wave events in combination with winds can play an important role in the formation and accretion or the erosion of the seaward dune field. In addition, as mentioned earlier, the impingement of tsunamis on the dunes, even in non-overtopping events, can modify the dune shape and enhance (or deter) run-up from subsequent earthquakes and tsunamis.**

- **The estimate of run-up in the GeoEngineers' report is somewhat confusing. It is stated that this is based on considerations of the overtopping of the South Spit with an average elevation of about 15 ft (4.5 m) MSL and a maximum elevation of about 20 ft (6 m) MSL. (This implies bay-side flooding.) This is used as the basis for the inundation level in the Samoa Town Master Plan area. To the maximum of about 20 ft MSL a factor of safety of 1.5 is applied to arrive at a height of 30 ft above MSL being the height for mitigation considerations. (We**

are not in favor of assigning an arbitrary factor of safety to such results.) Indeed it is stated that the 10 ft added to the 20 ft elevation is approximately the difference between high and low tides. We consider this to be excessive. Actually the mean tidal range at Samoa (40° 50' N ;124° 11' W) is 5.4 ft and the spring tidal range is 7.3 ft. Referring to MSL, this would result in a spring tidal range of about 3 ft to 4 ft above MSL. Thus, a reasonable level would be about 24 ft re MSL rather than 30 ft re MSL as stated in the report. The estimate of PG&E of a 31 ft run-up on the seaward dune face due to a CSZ earthquake and resultant tsunami is used by GeoEngineers to support their recommended base elevation for buildings of 30 ft. This approach is considered somewhat questionable, since the GeoEngineers recommendation is based on the factor of safety of 1.5. We believe that an estimate based on the run-up on the seaward dune face is a more reliable approach. It is seen in Section II (the section treating the numerical model) that this is the approach taken by us.

The PG&E report (December 27, 2002) that dealt with the ISFSI (Independent Spent Fuel Storage Installation) site at Humboldt Bay was reviewed in regard to the facts that could be applied to the North Spit relative to the question of inundation at the Samoa Town Master Plan site. Several of their conclusions are summarized in the following with the page reference to their report shown in italics at the end of the comment.

- **The conjecture is presented regarding the escarpment on the west of the dunes and whether it could have been caused by a tsunami. From their description we tend to agree with PG&E that major storm wave events could have caused this, although a causative tsunami cannot be completely ruled out.** ***(personal communication of GeoEngineers with Dr. Carver)***

- **In the review of paleotsunami evidence found by PG&E geologists PG&E stated that no tsunami evidence was found at Mad River Slough, Eureka Slough, or at the Humboldt Bay Power Plant. There was evidence of three tsunamis in the South Bay region. They further state:** "Evidence of paleotsunamis are also evident in the sand dunes of the North Spit. No evidence of past tsunami inundation was found at High Praire Creek or at six sites investigated around the north and east sides of Humboldt Bay." ***(PG&E Report Pg. 9-58 and Table 9-2)***

- **It is stated that the dunes on the northern part of the North Spit range from 53 ft to 72 ft re MLLW (or about 49 ft to 68 ft re MSL). Observations show that these dunes had never been overtopped by past tsunamis. PG&E states that this places an upper limit on run-up on the seaward face of these dunes. As discussed earlier, this does not eliminate the possibility of inundation at the Samoa Town Master Plan site from the bay-side by tsunami propagation through the entrance to Humboldt Bay or through lower elevations in the three-dimensional dune field.** ***(PG&E Report Pg. 9-19)***

- **PG&E bases its estimate of the inundation in Humboldt Bay on the work of Leroy (1999) reviewed earlier. They state the run-up height "had to be**

higher that 18 to 23 ft re MLLW (about 14 to 19 ft re MSL) for about the past millennium. (*PG&E Report Pg. 9-32)*

- **The tidal range of 10 ft used in the GeoEngineers' report appears excessive as discussed earlier. (*PG&E Report Pg. 9-39)***

- **The PG&E report estimates the open-coast run-up height based on various analyses. They state that a CSZ magnitude 8.8 earthquake would result in a run-up of 31 ft re MSL. This elevation is used by GeoEngineers to support their estimate of 20 ft re MSL plus a factor of safety of 50% resulting in a safe elevation for structures of 30 ft re MSL. *(PG&E Report Pg. 9-39).* (As mentioned earlier this question will be discussed by us in Section II of this report.)**

The statement is made on Page 6 of the GeoEngineers' report (October 17, 2006) that based on a literature review the expected run-up (not inundation) for a Magnitude 9 earthquake on the CSZ is approximately 31 ft re MSL which they state is at the middle of the range developed by PG&E.

- **It is not clear what literature was reviewed by GeoEngineers to arrive at this estimate other than the thesis of Leroy (1999) and the PG&E report of 2002.**

The GeoEngineers' report speaks of an attenuation factor of a tsunami of 95% in the Samoa Town Master Plan area.

- **In our opinion this is speculation. Based on these estimates the elevation of the lowest habitable floor was given as 30 ft MSL. It is our opinion that with little knowledge of the dissipation mechanism for tsunami flow overland it is reasonable not to consider attenuation due to surface effects.**

It is stated by GeoEngineers that the estimate of inundation would be placed on a firmer base by conducting numerical model studies.

- **The results of the limited numerical investigation by us using currently available topography of the study area are presented in Section II. (Any more comprehensive numerical study would have to be conducted under a separate contractual understanding.)**

II. NUMERICAL MODELING OF SCENARIO EVENTS

In order to assess the validity of the tsunami inundation and runup levels used in the vulnerability report we conducted a numerical modeling study of tsunami inundation in the Humboldt Bay region for two seismic sources.

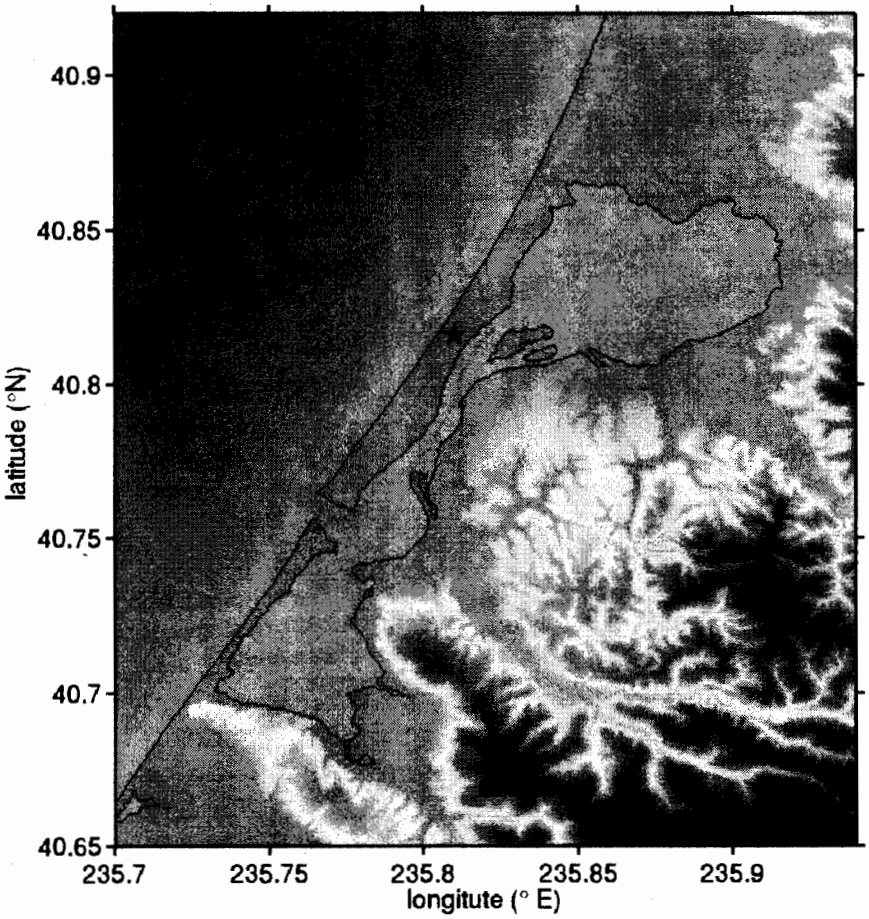


Figure 1: Map showing the region considered in the numerical model. The star indicates the study site.

The Numerical Model

Numerical modeling of tsunamis consists of three parts; generation, propagation and coastal effects that include runup and inland inundation. We assume an instantaneous, static initial condition of the water surface calculated from the earthquake displacement field using Okada [1985]'s model for a fault rupture at depth. For tsunami propagation and runup, we use the model MOST, which solves the 2+1 non-linear shallow water wave equations in rectangular or spherical coordinates (Titov and Gonzales, 1997 and Titov and Synolakis, 1997). Runup calculations are performed using a moving shoreline algorithm to evolve the wave front over dry land (Titov and Synolakis, 1998). Runup and inundation are computed over the post earthquake deformed topography.

We used a system of three nested grids. The bathymetry and topography data were merged in a GIS from the highest resolution and re-gridded to a uniform 1-arc second (~25 m) resolution. The nested grid configuration allows for more efficient computation of propagation in areas where local runup is not of interest. The outermost grid was re-sampled to a resolution of 30-arcsec, the intermediate grid to 15-arcsec, while innermost grid down to 1-arcsec (23 by 31 m at 41.7° N). Details of the multi grid computations are discussed in Borrero et al. [2001, 2005].

Seismic Sources

We modeled two faulting scenarios to assess the local tsunami hazard from a CSZ rupture. The first scenarios was a M_W = 8.5 event based on the SP1 source described in Bernard et al., 1994 for a rupture of the southern segments of the CSZ and including slip partitioning on the Little Salmon Fault. We also consider a second scenario with M_W = 9.0 which is similar to the hypothesized 1700 AD event described in Satake et al. [2003] combined with the model of Bernard et al. [1994]. For the northern part, the fault area is 800 km by 100 km with a uniform slip of 8 m. The southern part is made up of multiple faults per Bernard et al. [1994] and it is identical to SP1. The associated deformation fields for these scenarios are shown in Figure 2 with the detailed faulting parameters for each listed in Table 1. The two scenarios are essentially the same for the southern segments of the CSZ. The difference in magnitude is made up in the 9.0 event by extending the rupture northward some 800 km.

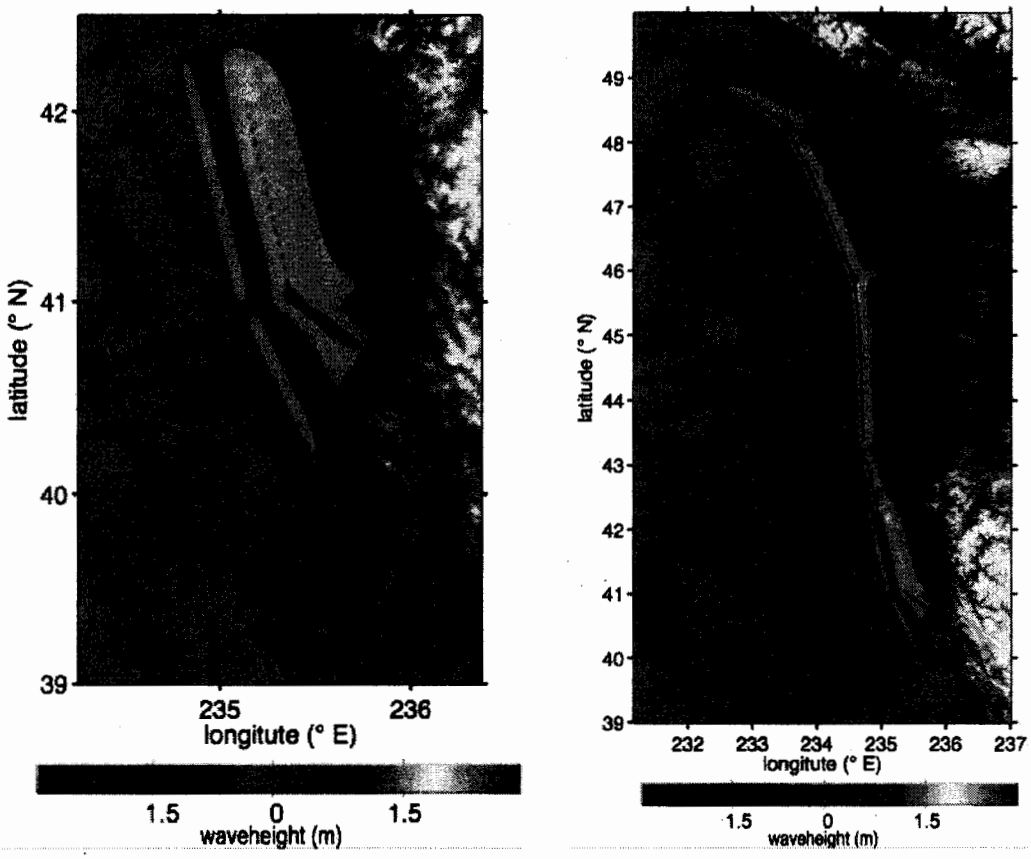


Figure 2: Initial surface deformation for the two scenarios modeled. M_W = 8.5 on the left and M_W = 9.0 on the right.

Tsunami Source	L (km)	W (km)	disp (m)	M_W
SP1	----	----	----	8.5
segment 1	150	30	4	
segment 2	150	10	4	
segment 3	150	70	8	
segment 4	90	30	4	
segment 5	90	70	8	
segment 6	90	10	4	
Extended event	----	----	----	9
SP1	240	100	6.6	
extension	800	100	8	

Table 1: The detailed faulting parameters of the two scenarios used in modeling. M_W = 8.5 scenario is consist of six segments and M_W = 9.0 uses eight more additional segments to extend the rupture towards north.

The Numerical Model Results

Inundation

Figure 3 – 10 compare the model results obtained from the two scenarios. Figures 3 – 6 are for the M_W = 8.5 event, while Figures 7 – 10 are for the M_W = 9.0 event. Figures 3 and 7 shows the inundated areas, the depth of the inundation over land and the overall runup for each of the two scenarios. For each of the cases modeled the proposed Samoa Town Master Plan area was not inundated. Our model suggests that for these events the dunes on the northern sand spit are high enough to prevent inundation directly from the sea. This is shown in Figures 5 and 9. These figure show cross sections of maximum tsunami wave height plotted along with the local topography. The profile number is shown at the top of each figure, and the location of each profile is presented in Figures 4 and 8 for the two different tectonic events.

It is also interesting to note that the region is not inundated from the lagoon side either. In addition, animations of the time histories of water levels from the numerical simulations do not show this area being flooded. We attribute this to the degree of local co-seismic uplift which is incorporated into the model. Because the ground level was raised during the seismic event, the end result is that waves which would have otherwise inundated the area are unable to flood over the new land level. This effect was observed in recent tsunami events such as the March 28, 2005 Nias-Simeulue tsunami where local ground uplift was on the order of 2 – 4 m. Thus, the amount of uplift associated with the CSZ earthquakes is important to the inundation process, and this will be discussed later.

Figures 6 and 10 show time series histories of water levels on either side of the North Spit. The time histories are shown relative to ground levels before the earthquake event, i.e., no assumed coseismic uplift of the North Spit is considered. The time series are taken from locations in water that is deep enough so the full cycle of the wave can be observed, i.e., Gage 1 was located at 7.6 m depth and Gage 2 was located at 4.55 m depth. Both sites are uplifted about 1.2 m during the earthquake.

Model Caveats

While these two specific scenarios do not produce destructive levels of inundation at the study site, this should not be interpreted as an indication that this site is safe from all possible tsunami events. This simulation depicts the results from a very specific set of conditions and assumptions. Real tsunami events are by nature extremely variable and unpredictable.

This is stated very clearly in the 1994 Bernard et. al. report when they note that due to averaging in the determination of fault plane solutions, "tsunami wave amplitudes will be much higher than a fault plane generating mechanism might indicate". Furthermore, the PG&E study states: "Potential tsunamis from the Cascadia subduction zone could generate wave runup along the open coast at Humboldt Bay. The height would probably be greater if the earthquake also triggered one or more large submarine landslides off the adjacent coast; however, no evidence of such larger, landslide-

generated tsunamis in the past 2,000 and probably the past 3,600 years has been found in Humboldt Bay". It is impossible in this study to properly account for all of the potential variables inherent in tsunami inundation; submarine landslides are one potential variable.

The PG&E study summarizes that tsunami wave heights from a large rupture on the CSZ would be on the order of '30 – 40 feet'. A tsunami of this height would overtop the southern spit but not overtop the northern spit. The possibility of a large coseismically induced landslide cannot be ignored. There is evidence of extremely high runup values (66 – 69 feet) at Orick, located to the north of Humboldt Bay. The reason for the extremely high runup here is not known. An enhanced tsunami caused by a coseismic landslide or bathymetric focusing are two possibilities.

The PG&E report notes that "recent detailed bathymetric mapping of the Cascadia continental margin has revealed several enormous landslide masses off shore of Oregon that have features interpreted as indicative of large and sudden movements of thousands of square miles of the lower continental slope" "The presence of these large offshore submarine landslides suggests a mechanism for generating anomalously large tsunamis at infrequent intervals" They go on to state that "no geologic evidence for such tsunamis has been found in the late Holocene coastal stratigraphy in northwestern California or other places along the Cascadia coast".

Chapter 9 of the PG&E report gives an overview of tsunami modeling efforts performed for this region and compares these results to runup data from observed tsunamis throughout the world. One must be careful in interpreting these worldwide results as runup is controlled to a first order by the local bathymetry. Based on empirical data alone, a tsunamigenic earthquake of magnitude 8.8 on the Cascadia subduction zone "would generate average maximum runup heights along the northern California coast of 31 feet MSL (35 feet MLLW). The runup range for magnitude 8.5 to 9.2 is 28 to 37 feet [32 to 41 feet MLLW])".

PG&E studied several different tsunami modeling studies performed for the Humboldt Bay area. The results are summarized briefly below.

1) **Wiegel, 1965** – ***postulated a tsunami runup of 25 ft form a locally generated magnitude 8 earthquake with a return period of 800 years***. PG&E state "He concluded, "Based upon present evidence, there appears to be little likelihood of the generation of a large tsunami in a region near Humboldt Bay." It should be noted that at the time of his analysis, in late 1964, the existence of the Cascadia subduction zone as a potential local tsunami source was yet to be recognized."

2) **PG&E, 1966** – "Using a Corps of Engineers procedure (Camfield, 1980) and Brandsma and others' ***maximum tsunami wave of +5.2 feet*** at a point offshore in water of moderate depth (600 feet), PG&E (1985b) computed the wave runup at the mouth of Humboldt Bay to be 16.1 feet above mean lower low water. This runup height would decrease as the wave propagated through the bay to the PG&E power plant site, although no quantitative analysis of the attenuation was done."

3) **Houston and Garcia, 1980** - Predicted tsunamis for the west coast of the U.S. for flood insurance purposes. PG&E state "Houston and Garcia's (1980) ***100-year tsunami runup at the entrance to Humboldt Bay was estimated to be 10.6 feet above mean lower low water, and the 500-year tsunami runup was estimated to be 20.7 feet above mean lower low water.*** Similar to the above procedure, no specific analysis was performed to predict water levels at the power plant site itself."

4) **Whitmore, 1993** – PG&E states: "In the numerical analysis by Whitmore (1993), Cascadia subduction zone source parameters were used to compute inundation wave amplitudes along the coast of Washington, Oregon, northern California, and adjacent areas to the north and south. The largest event analyzed was magnitude 8.8 that ruptured from central Washington to between Eureka and Crescent City. The fault rupture was 400 miles long, dipped 13 degrees, and the maximum seafloor uplift was 12 feet. At points along the coast opposite the modeled earthquake, the ***maximum computed tsunami amplitude was 19 feet***, with an ***average maximum amplitude of about 15 feet***. Maximum amplitudes were computed at three locations within Humboldt Bay (Eureka: 1.7 feet, Fields Landing: 0.66 feet, and Bucksport, between Eureka and Fields Landing: 2.8 feet). ***The maximum amplitude of 8.7 feet was calculated on the ocean side of the North Spit***, just to the south of the end of the modeled fault rupture."

5) **NOAA, Bernard et al., 1994** – PG&E State "The planned approach for the study (Bernard and others, 1994), included application of seismic source models for the Cascadia subduction zone to predict the generation of significant tsunami waves impinging on Humboldt Bay and Crescent City, followed by numerical modeling of inundation in these two areas of interest. ***The initial results of the seismic source modeling indicated the Cascadia subduction zone produced tsunami wave amplitudes that were judged to be unreasonably small.*** Therefore, Bernard and others (1994) evaluated the complexities of recent tsunamis generated by earthquakes in Nicaragua (1992), Indonesia (1992), and Japan (1993), and used an empirical approach to estimate the incident wave amplitudes at Humboldt Bay. ***Using tsunami observations associated with the 1964 Alaska and 1993 Hokkaido earthquakes, they judgmentally derived a 10-meter (33-foot) incident wave at a 50-meter (164- foot) water depth to be used in inundation models***.

6) ***Lamberson and others (1998)*** – As Described in PG&E, "Roland Lamberson, Professor at Humboldt State University, has developed, along with his students, a numerical tidal model calibrated for Humboldt Bay. During 1997, they performed a pilot study (Lamberson and others, 1998) to assess the feasibility of using their current finite-difference tidal model to simulate tsunami wave amplitudes and water velocities inside Humboldt Bay. ***They tested their model at low tide (0 set at mean lower low water), using an arbitrary input set of three large (4 to 6 meter amplitude) waves at the mouth of Humboldt Bay, having a period of 15 minutes.*** At the entrance to Humboldt Bay the third wave had the maximum wave height of 8 meters (26 feet MLLW). ***A wave overtopping the spits was not included in their model***, although the input wave clearly would have washed over the South Spit and the southern portion of the North Spit. In their model, the maximum flooding at the ISFSI site occurred during the second wave,

and had an elevation of 5 meters (16.4 feet) above mean lower low water. Current velocities at the ISFSI site were a maximum of 2 meters (6.6 feet) per second. Lamberson and others (1998) concluded their model performed well."

7) ***Myers and others (1999)*** – From the PG&E Report: "Edward Myers, a Ph.D. student, and a team of researchers from the Oregon Graduate Institute developed a finite element model for propagation of Cascadia subduction zone tsunami waves from their source near the plate interface off the coast of the Pacific northwest, to the coast. To generate the tsunamis, they used various rupture models for the Cascadia subduction zone as presented in Priest and others (2000). These models assume a geometry of the plate interface and vary the rupture dimensions by adjusting the locations and amounts of slip on the seaward and landward transition zones around a central locked zone. They estimated regions and amounts of seafloor uplift corresponding with each of these rupture scenarios, assumed the sea floor uplift was directly transferred to the sea surface as the initial conditions for their model. They then propagated the tsunami wave trains through their finite element grid toward the coast, and reported the estimated wave heights and run-up velocities associated with each of the scenarios. In their study, the authors reported their results for a number of locations along the coast from Cape Mendocino to the northern Olympic Peninsula. These results depend on a relatively coarse finite element grid, and are most useful to estimate tsunami-focusing mechanisms offshore, but are considered approximate for estimation of runup at the coast (A. Baptista, personal communication, 2002). The authors chose two sites for detailed estimation of runup characteristics: Seaside and Newport, Oregon. The finite element grid was much denser than the regional grid at these two sites to permit detailed estimation of runup routes, flow velocities, and runup heights. The authors report that predicted wave heights and runup velocities are very sensitive to grid density, reinforcing the notion that estimates of run-up outside of Seaside and Newport should be considered approximate. Furthermore, Dr. Baptista (Personal communication, 2002) reports that runup velocities predicted by these models are much less accurate than wave heights. ***This model predicts wave heights at the coast at Humboldt Bay between 17 and 30 feet (MLLW) and flow velocities between 3 and 13 ft/s, but they did not model runups within Humboldt Bay***. At Klamath, near Lagoon Creek, they predict wave heights between 17 and 46.5 feet (MLLW) and flow velocities between 6.5 and 15 ft/s, but preferably around 10 ft/s.

Finally the PG&E Report summarizes the tsunami hazard with the following statement: "The runup height from a local Cascadia-generated tsunami on the open coast at the mouth of Humboldt Bay is estimated to be as much as 30 to 40 feet above mean lower low water at the bay entrance. This estimate considers evidence of paleotsunamis at the North Spit, and assumes overtopping and erosion of the sand barriers and marsh at the South Spit. It compares well with the predicted runup height estimates from historical tsunamis in continental margin settings in Alaska, Chile, Peru, and Colombia, as well as runup estimates for paleotsunamis at Lagoon Creek and Crescent City."

Conclusion

We believe that the PG&E report is accurate and comprehensive. Our modeling supports the evidence that the north spit has not been overtopped by direct tsunami

attack, however this does not mean that it can never happen, especially in the light of the extreme (~69 ft) rununp heights believed to have occured at nearby Orick and the horrendous effects of the 2004 Boxing Day tsunami in Sumatra. Furthermore, the particular source models we used for this preliminary study were based on the source models of Bernard et al., 1994, which the authors themselves remark may be too small to accurately represent the hazard. Larger events can be arbitrarily constructed that will result in larger runup and possibly overtopping of the north spit dunes, especially towards the southern end of the north spit where maximum dune elevations are lower.

Our judgement is that the 30 ft elevation for habitable floors for the Samoa Town Master Plan is conservative. This area is undeniably in a high risk area for tsunamis and earthquakes. Any future developments in this area, such as the Samoa Town Master Plan, should carefully weigh the tsunami hazard before allowing an increase in population density there.

References

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Satake, K., K. Wang, and B. F. Atwater (2003), Fault slip and seismic moment of the 1700 Cascadia earthquake inferred from Japanese tsunami descriptions., J. of Geophysical Research, 108 (B11), E–7,1–17.208

Titov, V. V., and F. Gonzales (1997), Implementation and testing of the method of splitting tsunami (MOST) model, Technical Memorandum ERL PMEL 112, NOAA.

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Numerical Model Results

$M_W = 8.5$ case

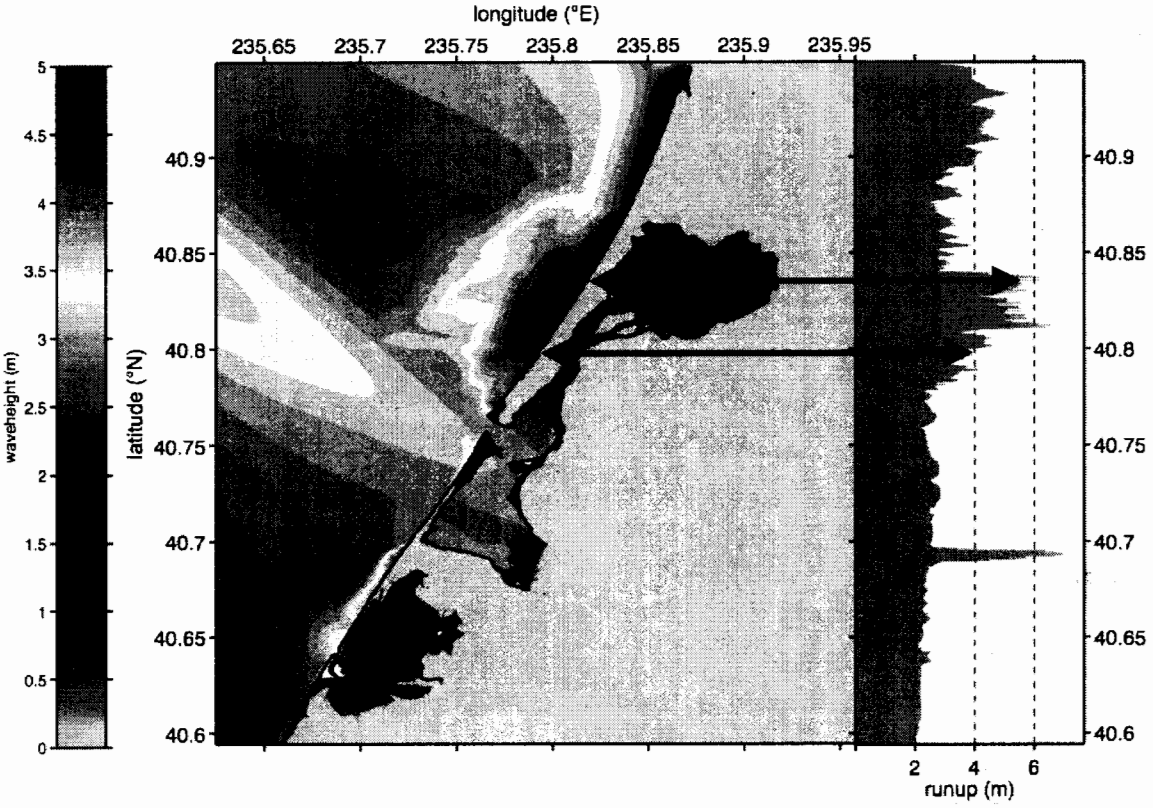


Figure 3: Maximum waveheights offshore, inundated areas and onshore runup for the $M_w = 8.5$ case.

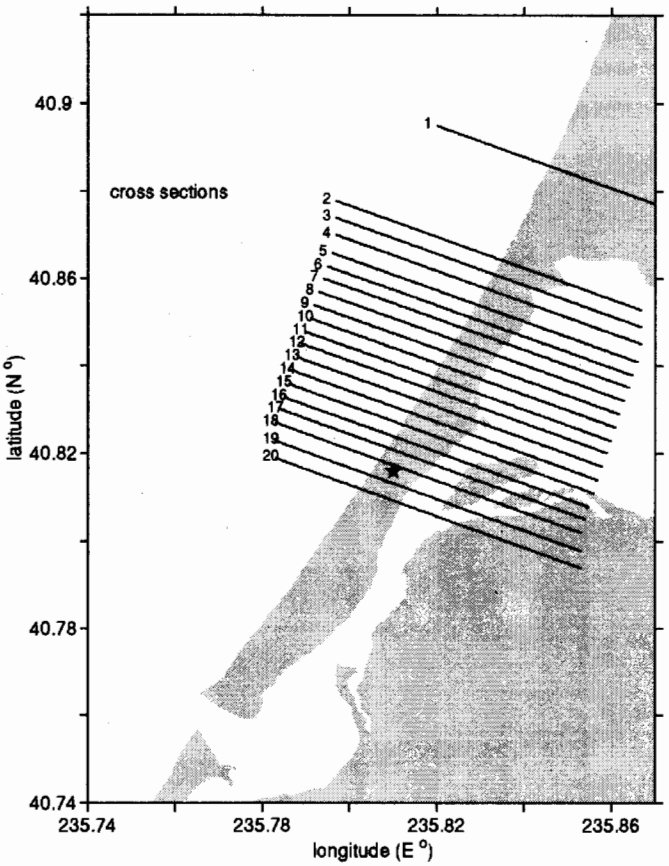
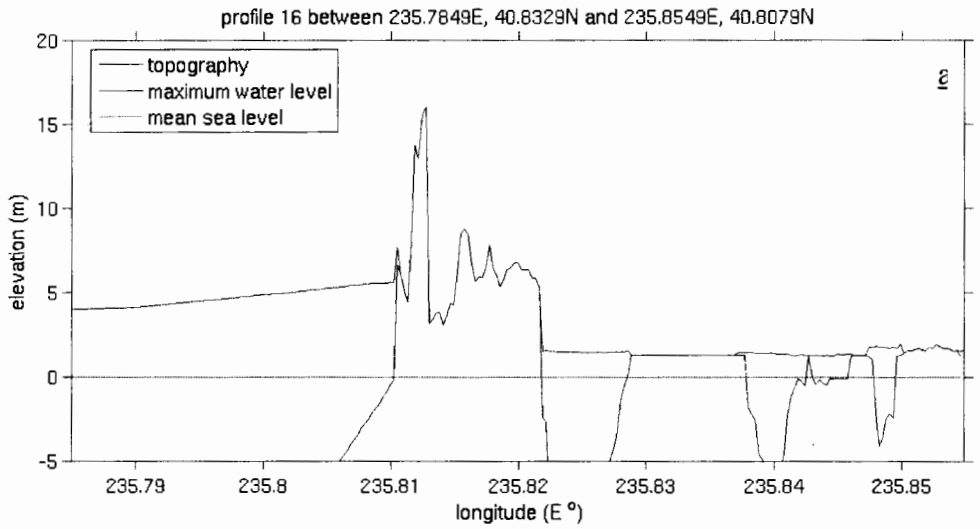
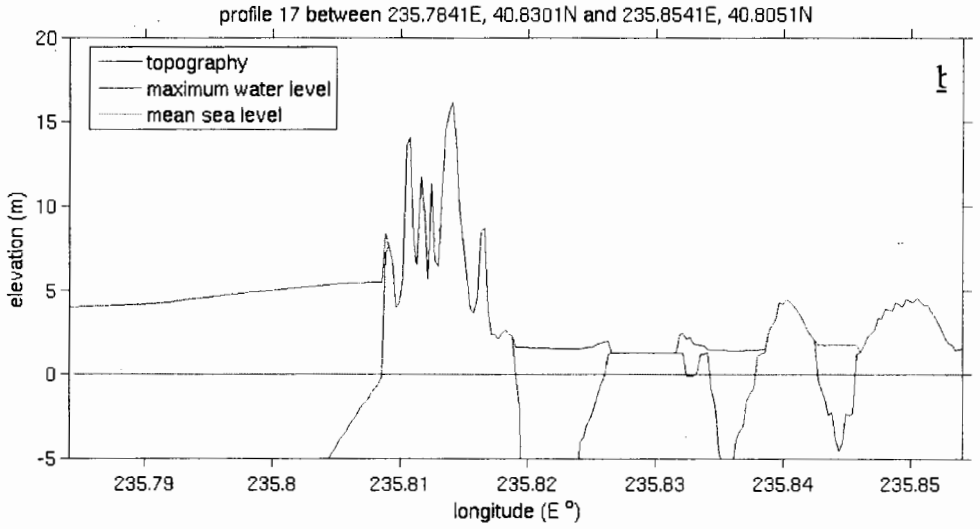
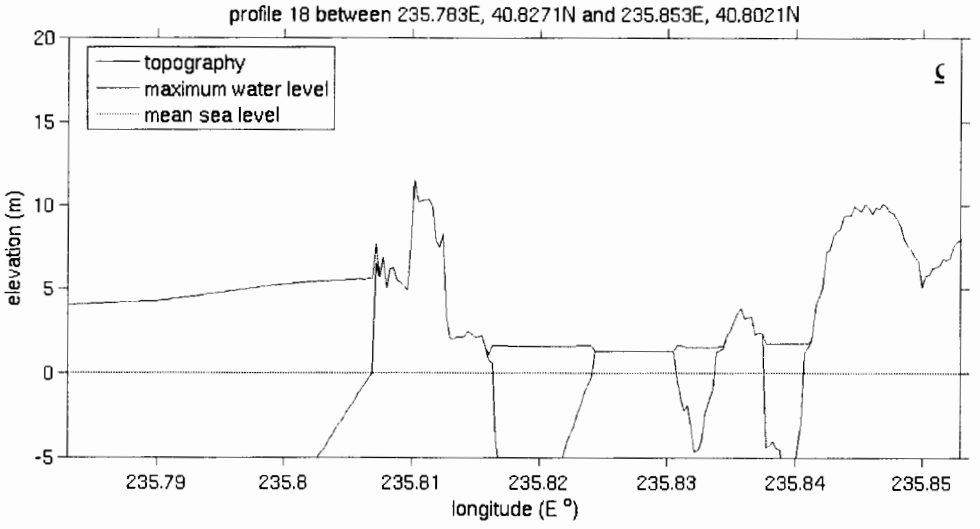


Figure 4: Locations of cross shore profiles. Profiles 16 – 20 cover the study area and are shown below for each case.


profile 16 between 235.7849E, 40.8329N and 235.8549E, 40.8079N
topography
maximum water level
mean sea level
elevation (m)
longitude (E °)
a


profile 17 between 235.7841E, 40.8301N and 235.8541E, 40.8051N
topography
maximum water level
mean sea level
elevation (m)
longitude (E °)
b


profile 18 between 235.783E, 40.8271N and 235.853E, 40.8021N
topography
maximum water level
mean sea level
elevation (m)
longitude (E °)
c

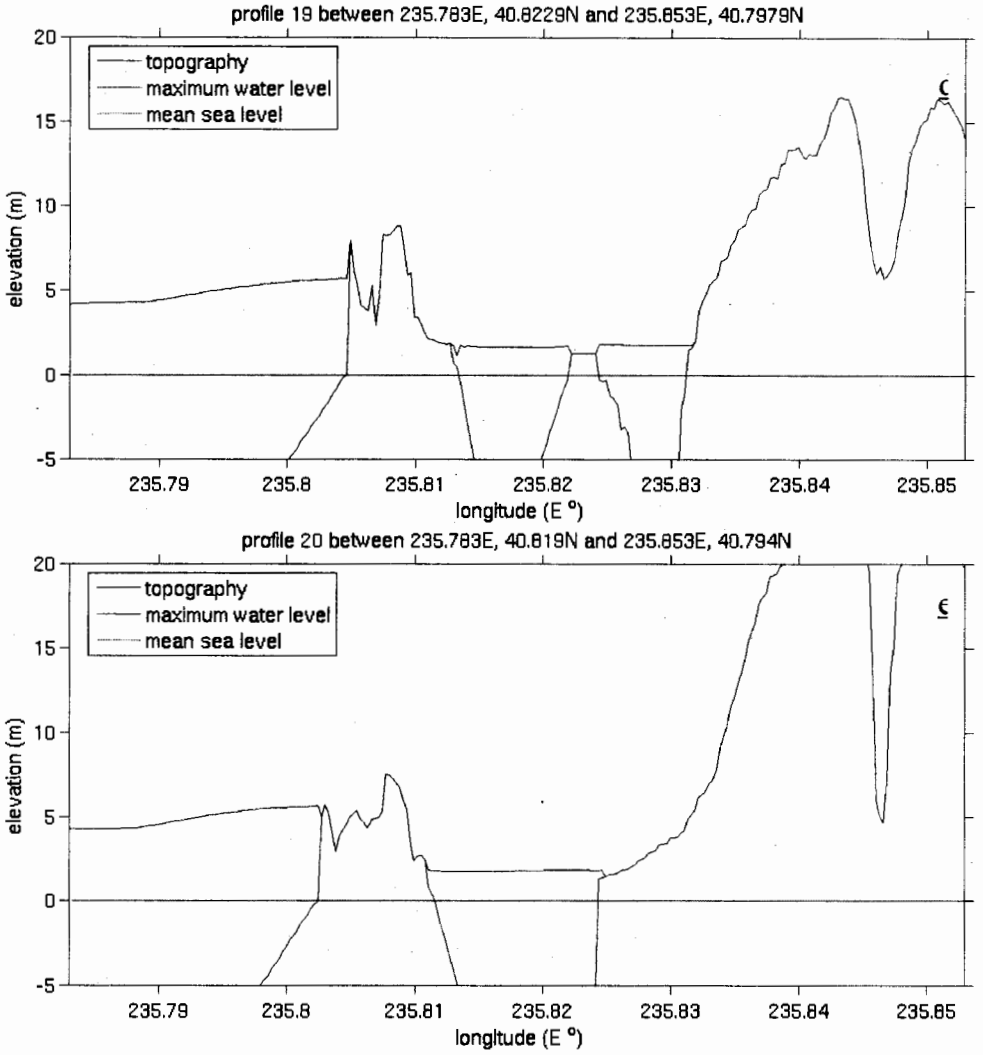


Figure 5 (a-e): Profiles of maximum water levels plotted against mean sea level and local topography for Scenario 1 ($M_W = 8.5$). Note how dune regions are not overtopped by tsunami surges approaching from the seaward side.

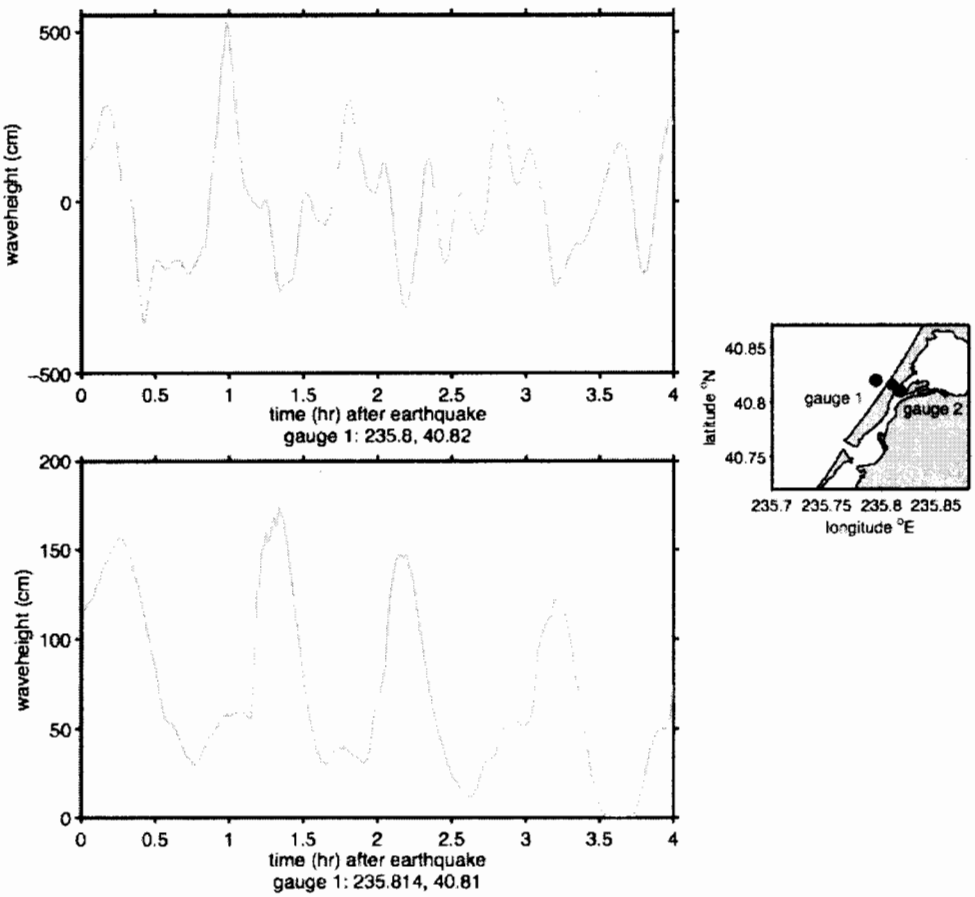


Figure 6: Time histories of water levels on either side of the north spit for the $M_w = 8.5$ event.

$M_W = 9.0$ Scenario

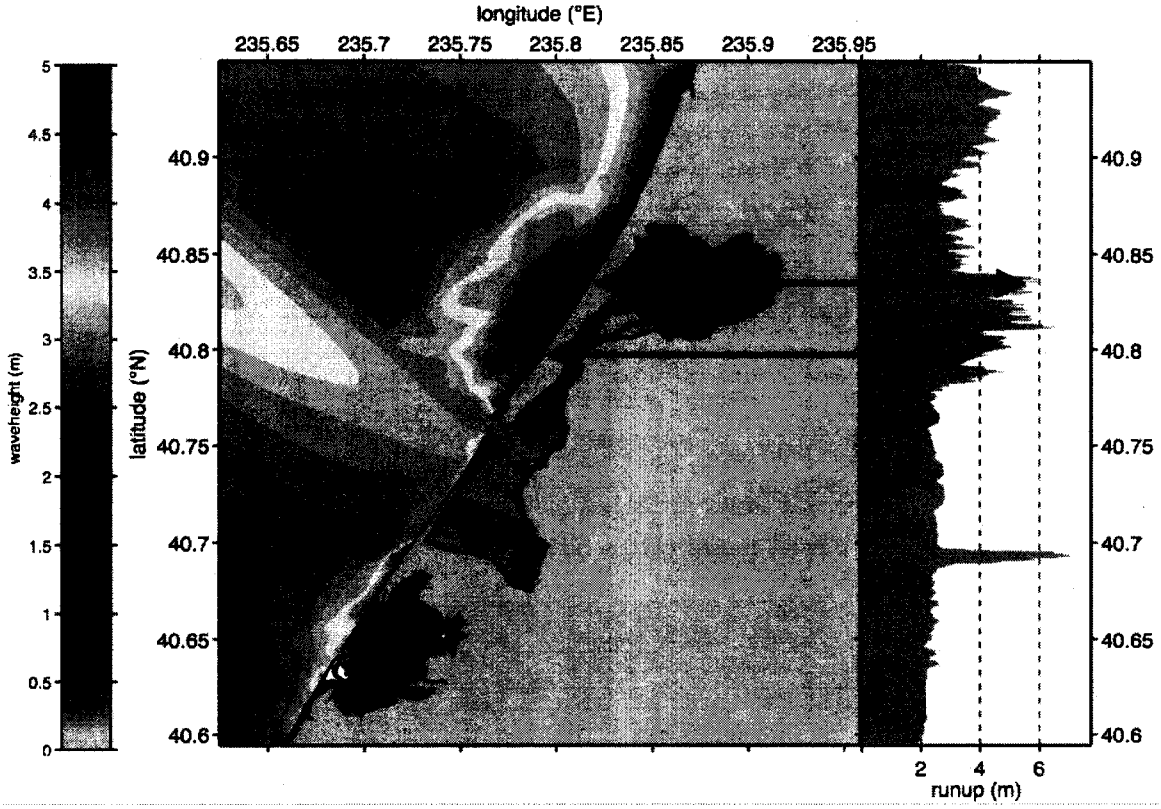


Figure 7: Maximum wave heights offshore, inundated areas and onshore runup for the $M_w = 9.0$ case.

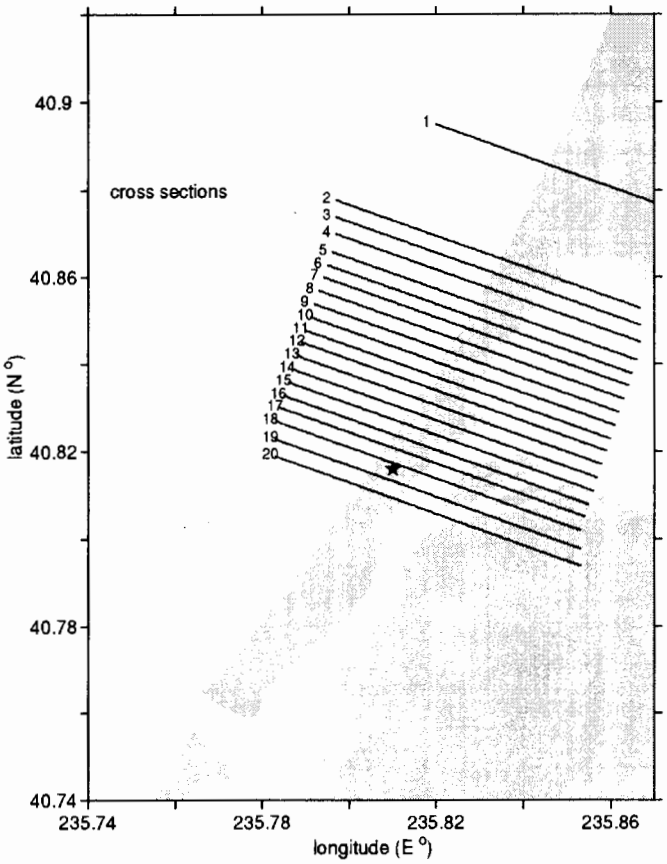
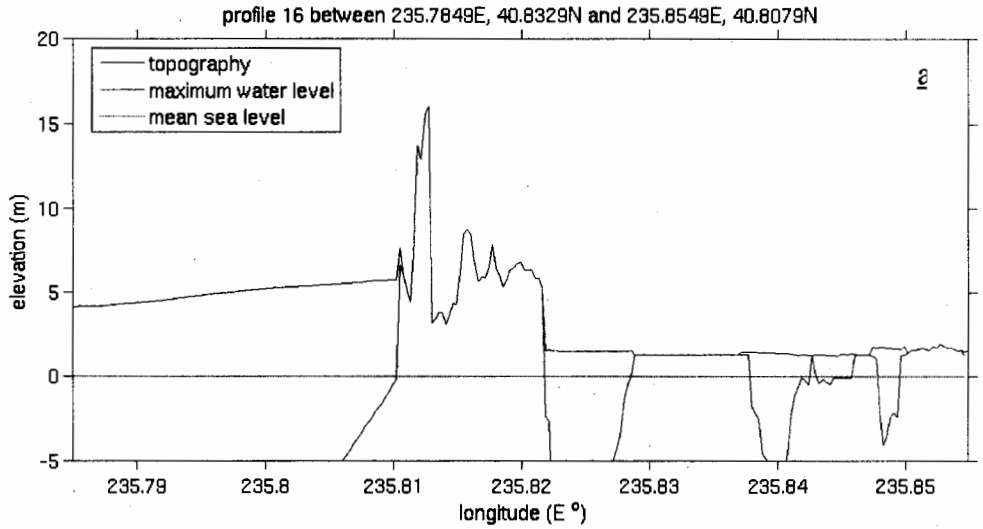
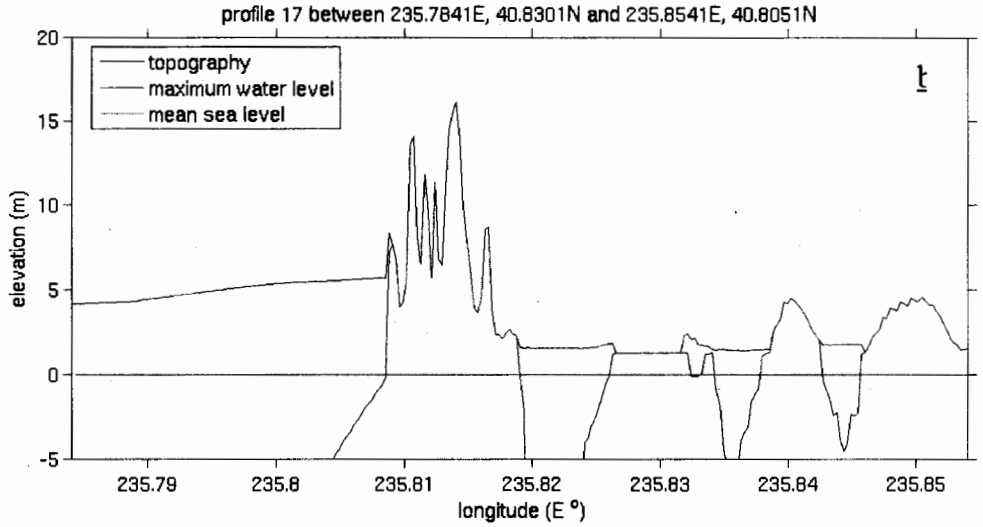
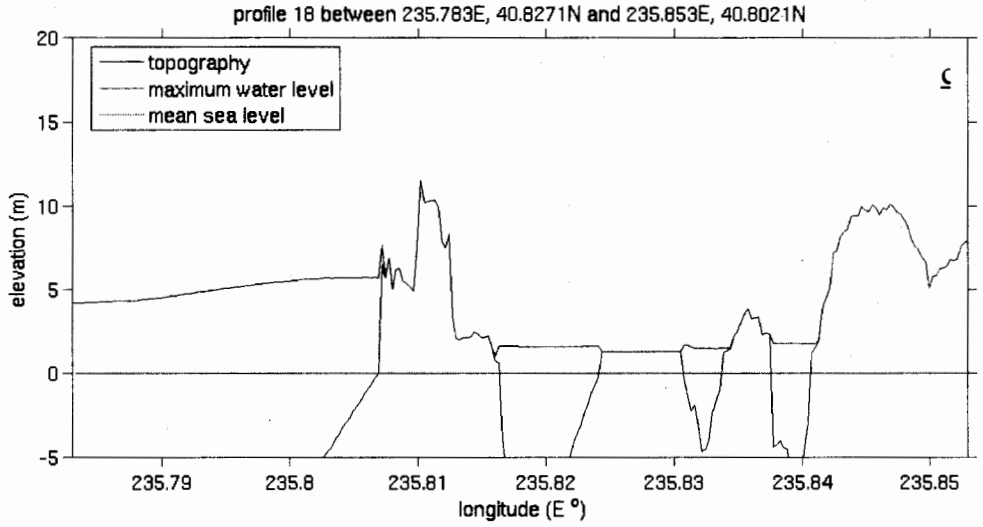


Figure 8: Locations of cross shore profiles. Profiles 16 – 20 cover the study area and are shown below for each case.


profile 16 between 235.7849E, 40.8329N and 235.8549E, 40.8079N
topography
maximum water level
mean sea level
elevation (m)
longitude (E °)
a


profile 17 between 235.7841E, 40.8301N and 235.8541E, 40.8051N
topography
maximum water level
mean sea level
elevation (m)
longitude (E °)
b


profile 18 between 235.783E, 40.8271N and 235.853E, 40.8021N
topography
maximum water level
mean sea level
elevation (m)
longitude (E °)
c

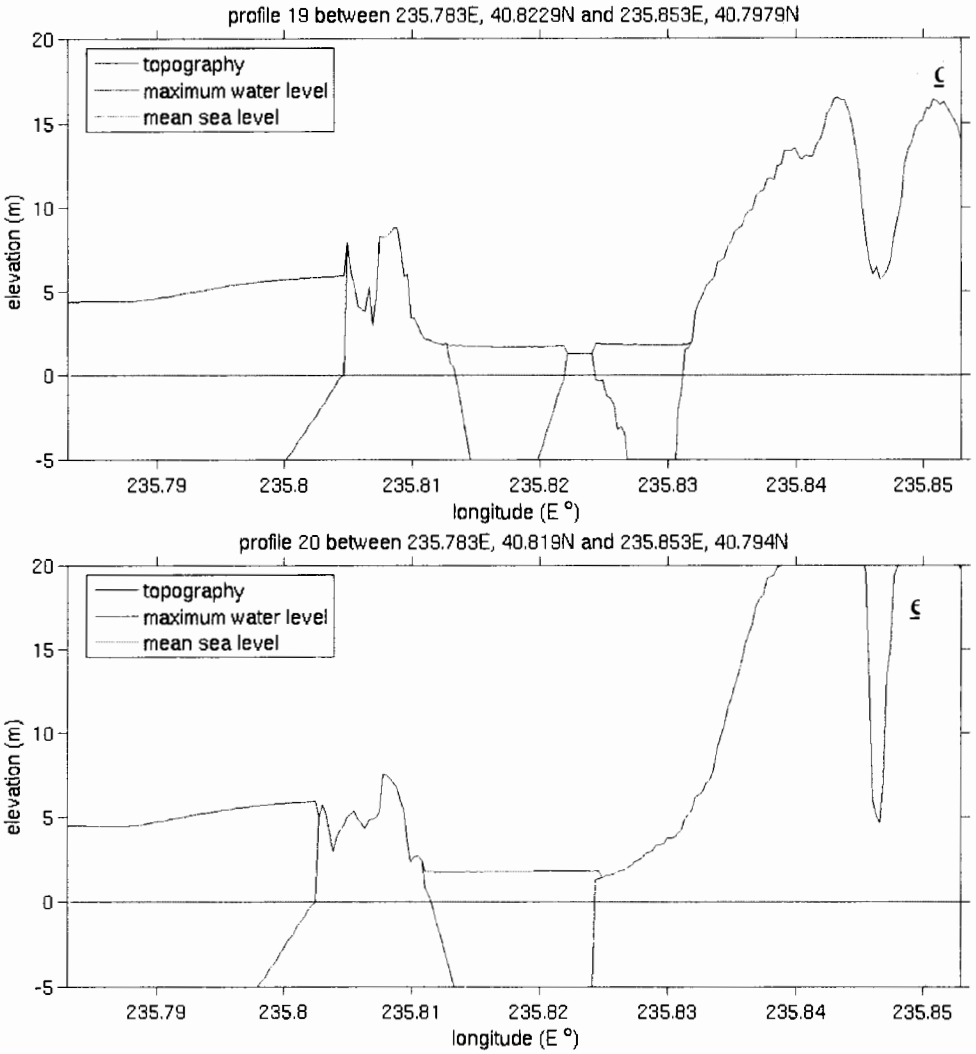


Figure 9 (a-e): Profiles of maximum water levels plotted against mean sea level and local topography for Scenario 2 (M_w = 9.0). Note how dune regions are not overtopped by tsunami surges approaching from the seaward side.

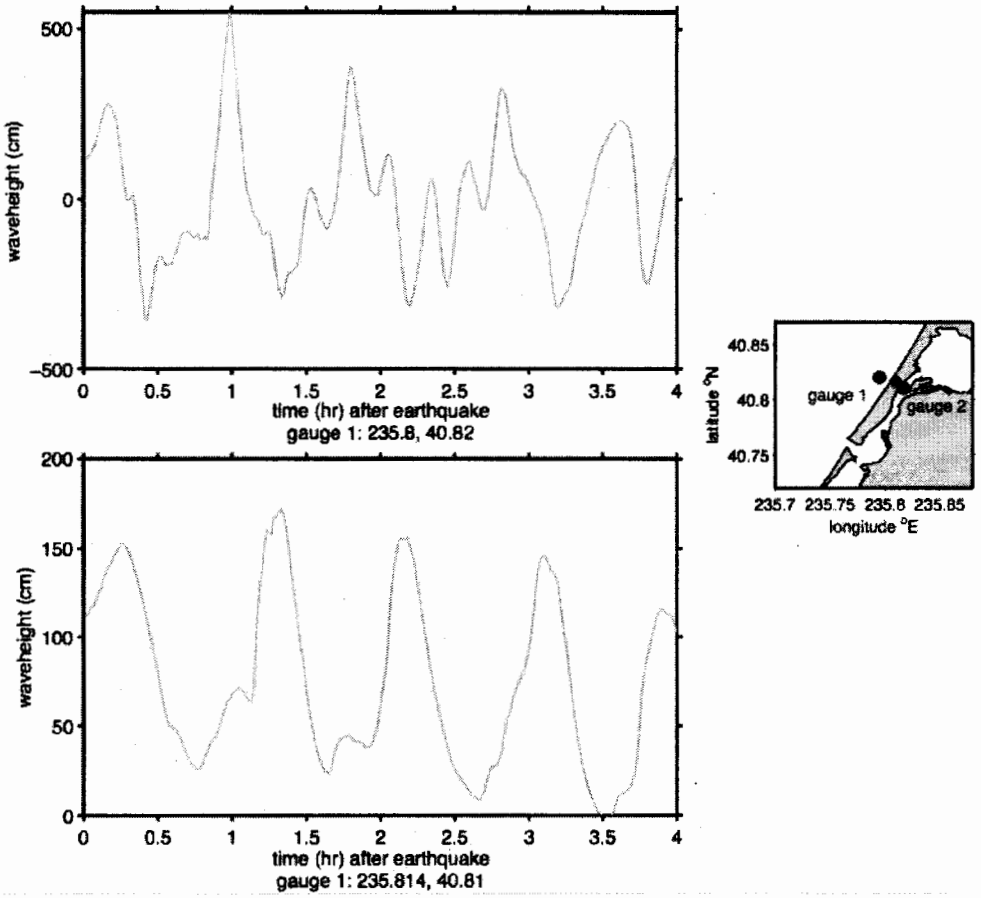


Figure 10: Time histories of water levels on either side of the north spit for the $M_w = 9.0$ event.

III. MITIGATION AND SAFETY

GENERAL

The Samoa Town Master Planning approach presents two types of mitigation strategies: a) measures to minimize damage and b) measures to promote safety.

MITIGATION MEASURES

As discussed by the State of California Seismic Safety Commission (2005), there are no U.S. building codes that provide design guidelines to reduce or prevent damage to structures from tsunami hazards. They contrast differences expressed in FEMA's Coastal Construction Manual (FEMA 55) and the National Tsunami Hazard Mitigation Program "Background Paper #5: Building Design" with respect to the feasibility of designing for tsunami impacts. While the FEMA publication states it is impractical, the National Tsunami Mitigation Program paper suggests that proper design can significantly reduce the impact of a tsunami on buildings. This paper also reports that only the City and County of Honolulu have implemented building requirements for tsunami. In lieu of appropriate building codes for the design of structures, avoidance of the hazard by siting structures above the anticipated runup elevation is suggested.

Although there is no established building code for tsunami mitigation, studies of damage from historic tsunamis indicate that building survivability varies with construction type (Yeh et al., 2005). The data show that wood frame construction experienced considerable damage and was frequently destroyed even when the tsunami inundation was small, even only a few feet deep. On the other hand, well-engineered reinforced concrete structures sustained only minor damage for most cases. Recent data, including those of the 2004 Indian Ocean Tsunami, support this conclusion. (Ref: Yeh, H., Robertson, I., and Preuss, J., 2005, Development of Design Guidelines for Structures that Serve as Tsunami Vertical Evacuation Sites, Open File Report 2005-4, Washington Division of Geology and Earth Resources, State of Washington (contract 52-AB-NR-200051), Olympia, Washington.)

The recommendation of siting all structures above the anticipated inundation elevation does not guarantee the safety of the area. It is because the prediction of inundation cannot be made accurately, as we discussed in Section II. Although the west side of the Samoa Town Master Plan site seems protected by dunes, there are several weak spots with marginal elevations as low as 20 ft (6 m). Once a tsunami penetrates such spots, the breached channels could be widened due to scouring action and the currents may rush into the town with significantly speed. Therefore, the entire area of the Samoa Town Plan must be designated as a tsunami risk

zone.

Critical for the protection of the populous is to provide a sufficient number of strategically located tsunami refuge structures (= assembly sites as described by GeoEngineers). Vertical evacuation to the refuge structures should save lives not only for the residents, but also for beach visitors.

Tsunami refuges can be multi-use or stand-alone structures. For example, the new Emergency Services building (recommended by GeoEngineers), Check-in Registration Building near New Navy Base Road, some of the buildings in Business Park and other public facilities can be considered as the multi-use buildings used for vertical evacuation. An example of the stand-alone structure is shown in Fig. 1. Those buildings must be reinforced concrete or steel frame structures in accordance with the proper seismic code, providing sufficiently high elevation of the refuge floor. Because of the locality, careful consideration must be made for their foundation design to protect against tsunami-induced scour and liquefaction caused by the ground shaking.

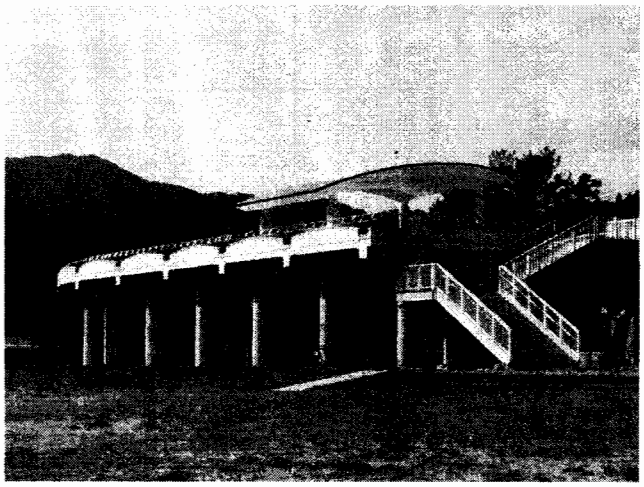


Figure 1 – Tsunami Shelter at Shirahama Beach Resort (Photo by N. Shuto)

Because accurate tsunami behaviors are difficult to predict, tsunami risk areas should be planned so as to provide individuals with every possible opportunity to escape under unexpected circumstance. With such considerations, the reviewers suggest that no fence for the residential houses be allowed in the township (even if allowed, they must be very low picket fences) and the Samoa Town Master Plan area must be graded so that there will be no spot where the grade is steeper than 1V:2H.

Guidelines for Single-family Use

Planning criteria were developed for uses that could prevent potential life loss. Single family occupancy use (lowest habitable floor) will be restricted to above Elevation 30 feet MSL.

Guidelines for Multi-family Use

Habitation uses will be located above Elevation 30 feet msl. In the case of multi-family and resort use buildings the first floor level can be used for non-residential use such as parking. Residential use could occur on the second story.

> **The 30-ft criterion for the maximum tsunami elevation was made by imposing a safety factor of 1.5 to the estimate of the maximum tsunami elevation: the 1.5 safety factor was determined arbitrarily without clear justification.**
>
> **Our numerical simulation for the CSZ events of M_W 8.8 and 9.0 also shows that the maximum tsunami elevation at the ocean-side beach would be approximately 20ft. This agreement with the GeoEngineers' report provides some confidence in their proposed tsunami mitigation elevations.**

Guidelines for Public and Critical Facilities

It is recommended that critical facilities be constructed above Elevation 40 feet because they are centers of population concentrations and/or may be necessary for first response and recovery.

MEASURES TO REDUCE TSUNAMI AMPLITUDE AND VELOCITY

Anecdotal evidence from recent tsunami events including the December 26, 2004 Indian Ocean Tsunami strongly indicates that natural features such as off shore reefs, dunes, dense forested areas and wetlands help to reduce both velocity and inundation. In India, there were reports that dense stands of mangrove forests provided protection and helped to reduce velocity and run up elevations. Conversely, there were numerous reports, such as multiple communities in Sri Lanka, that compared the high damage levels experienced by communities where there had been destruction of dunes and off-shore reefs, with low (or even no) damage levels in communities where such features were present.

> **The above statement is simply a general trend and should not be emphasized. In fact, there are many exceptions found from field observations. Tsunami behaviors are complex and cannot be generalized especially when considering the height of damaging tsunami waves.**

Preservation and/or enhancement of eco-system features by Samoa Town Master Plan to reduce tsunami wave effects include:

- Dune Preservation

  No development is proposed west of New Navy Base Road.

  Designated pathways and trails to Samoa Beach will be constructed in order to avoid creation of non-designated trails. This measure will be stipulated as a condition of subdivision approval.

  Interpretative signage at the parking areas to inform recreation users of

sensitive biological resources in the plan area. This measure will be stipulated as a condition of subdivision approval.

The parking area along Navy Base Road appears a weak spot where tsunamis may penetrate. There are a few more low-elevation spots along the dune (west side of Navy Base Road) because of the existing access trail to the beach. Careful considerations must be taken to design the escape routes for beach goers.

- Vegetation

  Preservation and enhancement of vegetation in dune areas adjacent to New Navy Base Road and elsewhere will strengthen existing dunes and reduce likelihood of degradation. Plantings will both reduce effects of tsunami while contributing to soil stabilization. Details are provided in the EIR.

  For proposed Natural Resource and Public Recreation areas, a vegetation planting plan will be developed to reduce the potential for mobilizing large woody debris that could impact structures below the 26 foot elevation. Planting of deep rooted species such as shore pine and shrubs instead of Eucalyptus trees (which are very brittle) in these areas would reduce potential impacts. Also, some species of Eucalyptus trees are highly flammable. Removal of "danger" species within the plan area is proposed.

The reviewers are puzzled by the criterion of elevation 26 ft that was made for floatable debris. How did the authors determine this elevation?

- Wetlands

  Wetlands create added opportunities for friction as well as for water detention.

  Existing wetlands on the site will be expanded.

  To improve the functional value of the two small wetlands adjacent developed dunes will be restored to native landscapes, fill material will be removed and native vegetations will be panted within the setback area.

SAFETY MEASURES

Because of the concern about the need for public education to promote evacuation and safety planning for a locally generated tsunami from the CSZ, Bernard et al. (1994) completed inundation modeling of a hypothetical wave to evaluate regional impacts to northern California. For Humboldt Bay an offshore wave height of 30 feet (approximately 10 meters) in water 150 feet deep was assumed. The model used a relatively coarse grid with spacing 100 meters and a topographic elevation model that assumed regular/even topography. As such it was unable to take into consideration the effects of dunes and other irregularities characterizing the Samoa Peninsula. The modeling results where used as the basis for a planning scenario of a great CSZ earthquake along the North Coast of California (Toppozada et al., 1995).

More recent safety planning efforts (Lori Dengler and Jay Patton (estimate: 2005) refined the expected tsunami hazard (See Appendix A of this document). This document (like the

previous effort) clearly states that it is to be used only for emergency planning purposes; it is not intended to be used for site design. It is also not clear if the authors adjusted the zonation to reflect mean sea level (msl) versus mean low low water (mllw) used for the studies that their map was based on. Dengler and Patton (2005) report that over 150 paleotsunami sediment core samples have been taken along the margins of the bay and in the Mad River Slough. The only places where identifiable tsunami sands have been found are in the South Bay region immediately adjacent to the spit and in the Hookton Slough area.

Safety aspects of the Samoa Town Master Plan are intended to maximize response effectiveness and evacuation opportunities. Four types of Safety Measures have been proposed:

Central location chosen for the Emergency Services Vehicle Storage Facility

The facility housing the Emergency Services Vehicles is centrally located with respect to harbor facilities and to expected response demands. It should be constructed at or above Elevation 40 feet. In the event of a tsunami the vehicles will be removed from the storage facility to assist with response. The building will then become available for assembly.

Designated Assembly Sites

Assembly sites are safe buildings above the expected tsunami run up elevation where people could take refuge and remain until they are notified that it is safe to leave. Assembly sites should be buildings that have sanitary facilities and be large enough to accommodate refugees for several hours. The assembly sites should be located so that people can travel by foot within approximately 5 to 8 minutes.

> **Locations of the assembly buildings must be determined based on the expected tsunami arrival times. Our preliminary numerical simulation indicates that the first tsunami could arrive within 10 minutes after the CSZ earthquake but the largest would be the subsequent wave that would arrive 1 hour after the quake. Also accessibility for handicapped persons must be considered in the design of assembly buildings.**

Specific sites meeting these criteria should be completed during preparation of the Safety Plan and following completion of the peer review. We understand the peer review may include tsunami inundation modeling which could help refine locations of potential evacuation sites.

At this time, we understand that the new Emergency Services building has been identified as one structure to be used for shelter. Therefore, we recommend that the floor elevation for assembly at the new Emergency Services building be constructed above Elevation 40 feet MSL.

> **It is not clear if the ground elevation of the new Emergency Services building should be above 40 ft MSL, or that of the upper floors that will be**

used for evacuation. It must be emphasized that there must be multiple assembly sites; the Emergency Services building alone is insufficient.

In addition, use of the proposed water tower will be prohibited for vertical evacuation because of its proximity to the commercial gas station and potential for a fire hazard. Signage will be installed.

It appears that the location of the Emergency Services building is currently planned right next to the water tower and the same block as the gas station.

Evacuation Routes

Strong ground motion from the earthquake essentially constitutes the warning from a CSZ earthquake. Based on this assumption the amount of time available for evacuation will be very short. An evacuation route plan will be prepared for the plan area which will include information on tsunami warning devices. The plan will be kept on file at the Samoa Peninsula Fire department (SPFD) in the Samoa Block Building. Key SPFD emergency services personnel shall be trained in tsunami evacuation procedures. Throughout the plan area, directional signage will be posted on designated paths that show non-vehicular evacuation routes to designated assembly sites.

Both the residents and visitors must be considered for evacuation planning. This means that the Samoa Town Master Plan should include the evacuation routes from the beach area.

Safety Plan

A Tsunami Safety Plan will be submitted the County as a condition of subdivision approval.

- The tsunami evacuation plan, including designated routes will also include information on tsunami warning devices and techniques and a public information and education program targeted at Samoa residents and visitors.

- The applicant will submit a proportional share of the fee towards a fund for the installation and maintenance of a warning siren in the town of Samoa. (If funding for a warning siren becomes available prior to the collection of sufficient funds from each newly proposed residence, the fund can be used for tsunami education, identification of evacuation routes, signage and subsidized weather radios to residents of Samoa.)

The Safety Plan should include annual evacuation drill and the Plan should be reviewed and updated annually.

EXHIBIT NO. **14**

APPLICATION NO. HUM-MAJ-1-08

HUMBOLDT COUNTY LCP AMENDMENT (SAMOA TOWN PLAN)

"REVISED TSUNAMI VULNERABILITY EVALUATION, SAMOA TOWN MASTER PLAN, HUMBOLDT COUNTY, CALIFORNIA" PREPARED BY GEOENGINEERS FOR SAMOA-PACIFIC PARTNERSHIP, LLC, DATED 10/17/06 (1 of 24)

REVISED TSUNAMI VULNERABILITY EVALUATION
SAMOA TOWN MASTER PLAN
HUMBOLDT COUNTY, CALIFORNIA

OCTOBER 17, 2006

FOR
SAMOA-PACIFIC PARTNERSHIP, LLC

GeoEngineers

File No. 10586-001-00

Revised Tsunami Vulnerability Evaluation
Samoa Town Master Plan
Humboldt County, California
File No. 10586-001-00

October 17, 2006

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REVISED TSUNAMI VULNERABILITY EVALUATION
SAMOA TOWN MASTER PLAN
HUMBOLDT COUNTY, CALIFORNIA
FOR
SAMOA PACIFIC PARTNERSHIP

INTRODUCTION

At the request of the Samoa Pacific Partnership, we have completed a two phase analysis to reduce damage and increase safety against tsunami for residents, business, and visitors to the Samoa Town. For Phase I of the evaluation, GeoEngineers Inc. summarized issues pertaining to the tsunami hazard for Planwest Partners as part of the Environmental Impact Report [EIR] ("Samoa Town Master Plan Final Master Environmental Impact Report" dated April 14, 2006 and the "Samoa Town Master Plan Recirculation Environmental Impact Report" dated May 12, 2006). We included in our evaluation a description of earthquake sources likely to generate a tsunami[1]. This report was revised to clarify that Peninsula School is an existing structure and not part of the present Samoa Town Master Plan project, to clarify the recommended other elevation, for occupied areas of residential structures and to clarify the recommended elevation of the emergency services facilities and designated assembly areas.

The current (Phase II) effort prepared by GeoEngineers Inc. with Planwest Partners presents the geological data and rationale used to establish criteria for the project with respect to "worst case" tsunami run-up elevations.[2] It also describes mitigation and safety measures applied to the Samoa Town Master Plan based on the site plan and mitigation strategies documented in the 2006 EIR documents.

This document is divided into two parts to evaluate the tsunami vulnerability. In Part I of this evaluation, we present data that we used to establish the design event. During preparation of this report, we were provided a copy of Pacific Gas & Electric Company report in support of a proposed facility in Humboldt Bay. We present the basis for the criteria in the EIR In Part II, we discuss the mitigation elements for the Site Plan and the discuss safety and evacuation. Our evaluation is based on a review of available literature, plans provided to us by the project proponent, our knowledge of the area, and professional experience.

PART I: DEFINE EXPOSURE

SEISMIC SETTING: THE DESIGN EVENT

The seismic setting of the Samoa Town Master Plan area is described in Chapter 2.07 of the "Samoa Town Master Plan Final Master Environmental Impact Report" dated April 14, 2006 and the "Samoa Town Master Plan Recirculation Environmental Impact Report" dated May 12 2006. The following is a summary of the seismic setting extracted from that chapter for those unfamiliar with the project or area.

The north coast of California is an area of high seismic activity with at least five distinct sources of earthquakes. Earthquakes capable of causing slight to moderate damage originating within the Gorda Plate and along the Mendocino Fault have a combined recurrence interval of approximately 5.5 years, based on historical records (Dengler, et al., 1992). Earthquake sources that could affect the plan area are:

---

[1] Prepared by GeoEngineers Inc. (team consisted of Jane Preuss AICP, with Craig Erdman, PG, CEG, a Professional Geologist and Certified Engineering Geologist and Elson "Chip" T. Barnett PG, a Professional Geologist.

[2] GeoEngineers with Planwest Partners [same team--Jane Preuss joined Planwest Partners in 2005])

1. Faults within the Gorda Plate
    - The stresses produced by the differential motions of the plates causes internal deformation in the Gorda Plate that has resulted in the majority of damaging earthquakes in the Humboldt Bay region (Dengler et al., 1992).
2. The Mendocino Transform Fault Zone
    - The Mendocino Fault Zone extends west from near Cape Mendocino. At its closest point it is located approximately 39 miles southwest of the plan area. It is the second most frequent source of damaging earthquakes in the region.
3. The San Andreas Transform Fault Zone
    - The northern end of the San Andreas Fault Zone is located approximately 43 miles south of the plan area. The San Andreas Fault Zone is capable of producing large earthquakes similar to the 1906 San Francisco Earthquake, which caused significant damage in the Humboldt Bay region.
4. Faults within the North American Plate
    - Fault activity investigations of these indicate that several episodes of movement have occurred within the last 2,000 years; however, there is no historic record (i.e. the last 200 years) of activity on these faults.
5. The Cascadia Subduction Zone (CSZ) where the Gorda and Juan de Fuca Plates are subducted beneath the North American Plate
    - The CSZ is the potential source of the largest magnitude earthquakes in the Humboldt Bay region. It extends from Cape Mendocino northward to Vancouver Island and from approximately 32 miles west of the plan area to over 100 miles east of the plan area. It forms the boundary between the North American plate and the oceanic crust formed by the Juan De Fuca and Gorda plates. The North American plate and the oceanic plates are moving towards each other, forming what geologists refer to as a convergent plate margin. The North American plate is moving over oceanic plates, and the oceanic plates are sliding (subducting) underneath the North American plate.

A great earthquake (magnitude 8 to 9) along the CSZ, similar to the events about 1100 and 300 years ago, is selected as the design event capable of producing a tsunami that could affect the plan area. Recurrence intervals (RI) for such a seismic event range from 150 to 540 years (Toppozada et al., 1995; Darienzo and Peterson, 1995; Petersen et al., 1996; Atwater and Hemphill-Haley, 1997), which equates to a probability of recurrence of about 0.2 to 0.7 percent annually. In comparison, engineers have typically used peak ground accelerations with a 10 percent probability of exceedence in a 50-year period for developing seismic design criteria for structures. This equates to a seismic event with a recurrence interval of about 1 in 500 years, or about 0.2 percent annually. According to Peterson et al. (1996), a rupture along the entire CSZ is expected to have a Magnitude 8.8 (expected to recur every 500 years), while a rupture of only the southern segment would have a magnitude of 8.3 (expected to recur every 150 years).

GEOLOGIC INDICATIONS OF TSUNAMI

Earthquakes along subduction zones at convergent plate margins are capable of generating significant and destructive tsunami. Geologic strata can help scientists identify events that occurred prior to written records, such as past earthquakes (paleoseismic events) and past tsunami (paleotsunami). Extensive studies have occurred along the Pacific Northwest coast to identify potential indications of past earthquakes and tsunami. Based on these studies, buried wetland deposits (peat and tidal marsh deposits)

and drowned forests have been identified at numerous sites along the CSZ in Vancouver (Canada), Washington, Oregon and northernmost California (USA) including the vicinity of the plan area (Atwater, 1987, Clague and Bobrowsky, 1994a, Peterson and Darienzo, 1990, and Jacoby and others, 1995). The buried forest and wetland deposits along coastal areas are interpreted as evidence of paleoseismic activity (Atwater, 1987, Clague and Bobrowsky, 1994a, Peterson and Darienzo, 1990, and Jacoby and others, 1995). Researchers have also observed a clean sand layer at the base of younger marsh deposits and overlying the buried wetland deposits at many of the sites studied. The buried sand layer is interpreted as an indicator of paleotsunami inundation. The age constraints on the various geomorphic features of the North Spit support a scenario in which regional tectonic cycles have played an integral role in development of the sand dunes on the spits. Dune sequences on the North and South Spits along with dune sequences at Clam Beach could reflect at least two complete seismic cycles of the Cascadia subduction zone in the last 2000 years, with tectonic events occurring around 1100 and 300 year BP (Leroy 1999). The presence of anomalous sand layers in coastal marsh deposits provides indications for large waves inundating the coastal area of northern California during the late Holocene, including events in the 300 and 1,100 yr BP range (Carver et al., 1998).

Local evidence of paleoseismic and paleotsunami activity in the vicinity of the plan area - on the Samoa Peninsula and the surrounding Humboldt Bay area - is reported by Vick (1988), Jacoby et al. (1995), and Leroy (1999). Paleoseismic evidence was observed in the buried wetlands in the area of Mad River Slough (Vick, 1988 and Jacoby et al., 1995). Investigations of buried wetlands in the Mad River Slough area identify zones where local coseismic (accompanying an earthquake) subsidence has occurred. There was no clean sand layer at the base of younger wetland deposits and overlying older, buried wetland deposits adjacent to forested dunes in the northern portion of the plan area. It is interpreted that the Samoa Peninsula in the northern portion of the plan area was not overtopped by the tsunami 300 years ago.

TSUNAMI RUN-UP ELEVATION: DISCUSSION OF DUNE OVERTOPPING

The North and South Spits of Humboldt Bay are primarily composed of sand dunes. On the North Spit there are three identifiable phases of dune aggregation represented by four main dune sequences. Leroy (1999) reports paleotsunami evidence in the dune complex of the Samoa Peninsula, including the plan area. He also indicates that localized areas of the Samoa Peninsula were not overtopped by the tsunami that occurred about 300 years ago. Leroy (1999) interprets that the older dune sequences were of sufficient elevation to have prevented overtopping by that tsunami. The older dune sequences are located in the northern and central portion of the Samoa Peninsula and include the northern portion (approximately two-thirds) of the plan area. The older dunes are typically forested, with maximum elevations of about 70 feet (21 m) above sea level (asl). By contrast, Leroy (1999) interprets that low-lying areas in the Humboldt Bay area adjacent to the South Spit and outside the plan area but within the vicinity were overtopped by the tsunami generated about 300 years ago.

According to data and interpretations summarized by Leroy (1999), the Samoa peninsula area experiences co-seismic uplift across much of the area, with co-seismic subsidence occurring within the Freshwater and South Bay synclines. Leroy interprets the evidence to indicate that a seismic event approximately 1100 years ago preserved the wave-cut escarpment and gravel deposits along the western edge of Dune Sequence D. In other words, this feature represents an older beach that was apparently uplifted during a seismic event about 1100 years ago. Leroy (1999) suggests that uplift at this time may have occurred from Clam Beach (north of the Samoa peninsula) south to Table Bluff (at the south end of the South Spit). Interseismic subsidence is inferred by Leroy (1999) and others to occur across the area (i.e. earth subsidence occurs between seismic events).

Dune development is believed to occur primarily after a seismic event that uplifts the shoreline, causing the shoreline to migrate westward and exposing source material for dunes.

The only known area where potential tsunami deposits have been observed is on the southeast side of the South Spit. Leroy (1999) does not show the exact location of the potential tsunami deposit consisting of sand, but states that "Although many cores have been taken in Humboldt Bay, the only *likely* tsunami deposits found to date are on the bay margin, against the southeastern portion of the South Spit. {Italics added.}

Based on the presence of these two sand layers within marsh and estuarine deposits in South Bay, it appears possible that the South Spit was overtopped by tsunami circa 1100 year BP and circa 300 years BP. The dunes on the South Spit are at an average Elevation 4 to 4.5 meters (13 to 15 feet); with one area as high as approximate Elevation 7 meters (23 feet). Most of the maximum elevations are around 5 to 6meters with a low of 3.5 meters reported by Leroy.

As mentioned above, no sand deposits were observed in explorations in the Mad River Slough (Vick, 1989; Jacoby et al., 1995), where at least four buried soil horizons are present and where adjacent dunes are at an average Elevation of 15 meters or greater. The buried soil horizons are interpreted to be the result of co-seismic subsidence.

Based on the above evidence pertaining to overtopping plus lack of sand deposits observed in the Mad River Slough, Leroy (1999) constrained the height of a tsunami from about 4.5 meters to less than 15meters (15 to 50 feet) assuming 1) overtopping of the South Spit and 2) that Dune complex D (on the North Spit) formed a barricade to tsunami (no tsunami deposits in the Mad River Slough). Leroy (1999) assessed that dunes from Samoa to the south end of the North Spit could act as a barricade or could be overtopped, depending on wave height and tidal stage. The dunes in the Samoa area have been modified by previous grading activities (GeoEngineers, 2000a).

The unstated assumption for the maximum inundation height is that the tsunami flowed all the way up to but not over the crest of the dunes. This assumption does not seem reasonable to GeoEngineers because 1) no scour/vegetation loss on the west side of Dune Complex D has been reported and 2) no difference has been reported in soil development/soil loss observed in soil pits on the west side of Dune Complex D versus elsewhere in the complex. Therefore, the maximum is, in the opinion of GeoEngineers, likely lower.

The wave-cut escarpment appears (based on elevation points marked on Leroy's maps) to be at approximate Elevation 2 to 7 meters (6.5 to 23 feet). Leroy (1999) observed a tree stump at the outer edge of the wave-cut escarpment and completed age-dating. The tree died off sometime around 300 years BP, apparently from burial by Dune Sequence A. The age of the tree provides a maximum age for Dune Sequence A. Since this feature (and the tree) appears not to have been obliterated at the time of the last interpreted Cascadia event 300 years ago, we interpret the maximum height of the wave-cut terrace to be near the maximum inundation height of the associated tsunami.

Leroy (1999) argues that the South Spit is "at the minimum elevation at which it can remain stable." Assuming the present heights of the Samoa Peninsula (North Spit) and the South Spit are representative of previous stable configurations of the spits, the tsunami is inferred to have overtopped an area with an average elevation of about 15 feet (approximately 4.5 m) and a maximum elevation of about 20 feet (approximately 6 m).

RUN-UP ELEVATION IN THE PLANNING AREA

Based on the paleotsunami evidence of dune overtopping the tsunami run-up elevation of 20 feet was interpreted to be the maximum dune height overtopped by a tsunami about 300 years along the South Spit (Leroy, 1999). There was no evaluation of wave occurrence relative to tidal stage and storm surge available at the time of our initial evaluation. A 10-foot factor of safety was therefore added to the height of the design event (difference between approximate high and low tides), for a total run-up height of 30 feet above mean sea level (msl). The complexity of vertical response to a great CSZ earthquake in the plan area is a function of numerous tectonic components, as previously discussed. Because of the difficulty in predicting local fault response (potential uplift) and a regional elastic response (potential subsidence), no vertical displacement in response to a great CSZ earthquake was assumed. However, there may be some uplift since the plan area is on the upthrown block of the Little Salmon fault.

REVIEW OF PACIFIC GAS & ELECTRIC REPORT

The Pacific Gas & Electric report (2002) provides a comprehensive summary of tsunami events affecting the Pacific Northwest and specific information pertinent to the ISFSI site, and also pertinent to the Samoa Peninsula. We were also able to discuss some of the findings in the report with William Page of Pacific Gas & Electric and with Dr. Gary Carver during separate telephone calls on September 27, 2006. Some of the key information includes:

- The studies completed for the PG&E report (including the thesis prepared by Thomas Leroy in 1999) used Mean Low Low Water (MLLW) as opposed to Mean Seal Level (MSL) used for most U.S. Geological Survey topographic maps and most engineering projects. The Samoa Master Plan uses a vertical datum of Mean Sea Level. MLLW is about 3.7 feet lower than MSL in the project area (PG&E, 2002).
- Dr. Carver (personal communication, 2006) states that he did not re-interpret the escarpment on the outer face of the dunes on the North Spit to be from a tsunami. He still maintains the escarpment notched into the dunes on the North Spit is from normal coastal processes (e.g. storm surges). Instead, he states that his runup elevation is based on a widely distributed layer of pebbles and cobbles found across the west face of the dunes on the North Spit. According to Dr. Carver, one location was surveyed relative to debris deposits (interpreted to be Mean High High Water [MHHW]) that was believed to be the highest elevation. The pebbles and gravel layer is interpreted to be the lag deposit from a tsunami. The surveyed highest extent of the pebble and gravel layer is approximately Elevation 38 feet MHHW, or about Elevation 34 feet MSL. Dr. Carver states that some drift of the material may have occurred over time. There are other uncertainties, such as whether or not the deposit has experienced uplift since the time of its deposition. It is also not certain if the elevation of the lag deposit is constant or varies across the North Spit. The age of the deposit is uncertain, according to our conversation with Dr. Carver, it sounds like the pebble and gravel layer is buried in a soil horizon. Dr. Carver could not remember the radiocarbon date of trees that provide a minimum age. He referred me back to the PG&E report and to Mr. Page to obtain copies of letters Dr. Carver wrote to Mr. Page.
- It is not clear if the North Spit dune complex has experienced net uplift or perhaps differential uplift. It might be possible to evaluate the potential for differential uplift by evaluating the wave-cut escarpment. Dr. Carver states that no one has evaluated the elevation of the wave-cut escarpment, in part because of the long distance involved and the isolated exposure of the inner edge. We concurred that the most feasible way to survey the escarpment elevation, as well as the elevation of the pebble and gravel layer, is by using a survey-grade global positioning system.
- They summarize six tsunami events recorded on the west coast of North America. These events appear to range about 200 to 850 years apart.

- The event about 300 years ago occurred at low tide. The PG& E report, "there is some evidence that significant earthquakes occur at low tide," citing a written communication by George Plafker (2002).
- In the PG&E report, they used a normal tidal range of 6.9 feet for the Humboldt Bay area, versus the maximum difference of about 10 feet we used.
- The authors of the PG&E report present the estimate of open-coast runup height based on six different analyses that are summarized in Table 9-4 of their report. These include information from geologic data from northern California, oral histories, tsunami modeling of the Humboldt Bay area, back-calculated water depths of tsunami at Lagoon Creek, topographic and geologic constraints on the North and South Spit and empirically-derived runup heights from world-wide data. The resulting runup height is approximately 30 to 40 feet MLLW, or about 26 to 36 feet MSL. The authors state that a Cascadia Subduction Zone rupture with Magnitude 8.8 would result in a runup of 31 feet (MSL). Using Figure 9-19 in the PG&E report, we find that a Magnitude 9.0 Cascadia event (the design event with a recurrence interval of approximately 500 years) should have a runup to approximate Elevation 31 feet (MSL). We are not certain of the discrepancy, and why they plot the Cascadia event off of the trend line rather than on it.

Based on the literature review we have completed, it appears that the expected runup for a Magnitude 9 Cascadia event is approximately Elevation 31 feet msl, which is also the mid-range for the range developed by PGE. Some uncertainties exist based on world-wide trends and for local site conditions. Because of the presence of foredunes, some surface roughness creates friction. This friction will reduce turbulence and slow the tsunami surge. Therefore, a small amount of attenuation, on the order of about 0.95 might be expected within the majority of the Samoa Town Master Plan area. By applying an attenuation factor to the anticipated inundation Elevation 31 foot elevation msl, the resulting runup is approximately Elevation 29.5 feet; which we rounded up to Elevation 30 feet msl. Therefore, we recommend that the lowest habitable floor for residential occupancy should be above Elevation 30 feet msl.

Some of these uncertainties could be evaluated by completing field studies to survey the upslope limit of the pebble and gravel deposits described by Dr. Carver (personal communication, 2006) and to further evaluate effects of uplift in the area. Furthermore, it may be possible that runup heights are greater where features block inundation inland (e.g. dunes). Therefore, inundation may be lower in the slightly lower-lying Samoa Master Plan area than to the north where established dunes are present. The trade-off is that the water velocities may be slightly higher in the Plan area. Computer-based modeling of tsunami using the local information to evaluate wave height could also provide a better indication of the inundation height in the vicinity of the Samoa Town Master Plan, but should utilize more accurately surveyed information before it is accomplished.

PART 2: MITIGATION AND SAFETY

GENERAL

The Samoa Town Master Planning approach presents two types of mitigation strategies: a) measures to minimize damage and b) measures to promote safety.

MITIGATION MEASURES

As discussed by the State of California Seismic Safety Commission (2005), there are no U.S. building codes that provide design guidelines to reduce or prevent damage to structures from tsunami hazard. They contrast differences expressed in FEMA's Coastal Construction Manual (FEMA 55) and the National Tsunami Hazard Mitigation Program "Background Paper #5: Building Design" with respect to the feasibility of designing for tsunami impacts. While the FEMA publication states it is impractical, the

National Tsunami Mitigation Program paper suggests that proper design can significantly reduce the impacts of tsunami on buildings. This paper also reports that only the City and County of Honolulu has implemented building requirements for tsunami. In lieu of appropriate building codes for design of structures, avoidance of the hazard by siting structures above the anticipated runup elevation is suggested.

Use Guidelines for Single-family Use

Planning criteria were developed for uses that could result in potential life loss. Single family occupancy use (lowest habitable floor) will be restricted to above Elevation 30 feet msl.

Use Guidelines for Multi-family Use

Habitation uses will be located above Elevation 30 feet msl. In the case of multi-family and resort use buildings the first floor level can be used for non-residential use such as parking. Residential use could occur on the second story.

Use Guidelines for Public and Critical Facilities

It is recommended that critical facilities be constructed above Elevation 40 feet because they are centers of population concentrations and/or may be necessary for first response and recovery.

MEASURES TO REDUCE TSUNAMI AMPLITUDE AND VELOCITY

Anecdotal evidence from recent tsunami events including the December 26, 2004 Indian Ocean Tsunami strongly indicates that natural features such as off shore reefs, dunes, dense forested areas and wetlands help to reduce both velocity and inundation. In India, there were reports that dense stands of mangrove forests provided protection and helped to reduce velocity and run up elevations. Conversely, there were numerous reports, such as multiple communities in Sri Lanka, that compared the high damage levels experienced by communities where there had been destruction of dunes and off-shore reefs, with low (or even no) damage levels in communities where such features were present.

Preservation and/or enhancement of eco-system features by Samoa Town Master Plan to reduce tsunami wave effects include:

- Dune Preservation
  - No development is proposed west of New Navy Base Road.
  - Designated pathways and trails to Samoa Beach will be constructed in order to avoid creation of non-designated trails. This measure will be stipulated as a condition of subdivision approval.
  - Interpretative signage at the parking areas to inform recreation users of sensitive biological resources in the plan area. This measure will be stipulated as a condition of subdivision approval.
- Vegetation
  - Preservation and enhancement of vegetation in dune areas adjacent to New Navy Base Road and elsewhere will strengthen existing dunes and reduce likelihood of degradation. Plantings will both reduce effects of tsunami while contributing to soil stabilization. Details are provided in the EIR.
  - For proposed Natural Resource and Public Recreation areas, a vegetation planting plan will be developed to reduce the potential for mobilizing large woody debris that could impact structures below the 26 foot elevation. Planting of deep rooted species such as shore pine and shrubs instead of Eucalyptus trees (which are very brittle) in these areas would reduce

potential impacts. Also, some species of Eucalyptus trees are highly flammable. Removal of "danger" species within the plan area is proposed.

- Wetlands
  - Wetlands create added opportunities for friction as well as for water detention.
  - Existing wetlands on the site will be expanded.
  - To improve the functional value of the two small wetlands adjacent developed dunes will be restored to native landscapes, fill material will be removed and native vegetations will be panted within the setback area.

SAFETY MEASURES

Because of the concern about the need for public education to promote evacuation and safety planning for a locally generated tsunami from the CSZ, Bernard et al. (1994) completed inundation modeling of a hypothetical wave to evaluate regional impacts to northern California. For Humboldt Bay an offshore wave height of 30 feet (approximately 10 meters) in water 150 feet deep was assumed. The model used a relatively coarse grid with spacing 100 meters and a topographic elevation model that assumed regular/even topography. As such it was unable to take into consideration the effects of dunes and other irregularities characterizing the Samoa Peninsula. The modeling results where used as the basis for a planning scenario of a great CSZ earthquake along the North Coast of California (Toppozada et al., 1995).

More recent safety planning efforts (Lori Dengler and Jay Patton (estimate: 2005) refined the expected tsunami hazard (See Appendix A of this document). This document (like the previous effort) clearly states that it is to be used only for emergency planning purposes; it is not intended to be used for site design. It is also not clear if the authors adjusted the zonation to reflect mean sea level (msl) versus mean low low water (mllw) used for the studies that their map was based on. Dengler and Patton (2005) report that over 150 paleotsunami sediment core samples have been taken along the margins of the bay and in the Mad River Slough. The only places where identifiable tsunami sands have been found are in the South Bay region immediately adjacent to the spit and in the Hookton Slough area.

Safety aspects of the Samoa Town Master Plan are intended to maximize response effectiveness and evacuation opportunities. Four types of Safety Measures have been proposed:

Central location chosen for the Emergency Services Vehicle Storage Facility

The facility housing the Emergency Services Vehicles is centrally located with respect to harbor facilities and to expected response demands. It should be constructed at or above Elevation 40 feet. In the event of a tsunami the vehicles will be removed from the storage facility to assist with response. The building will then become available for assembly.

Designated Assembly Sites

Assembly sites are safe buildings above the expected tsunami run up elevation where people could take refuge and remain until they are notified that it is safe to leave. Assembly site sites should be buildings that have sanitary facilities and be large enough to accommodate refugees for several hours. The assembly sites should be located so that people can travel by foot within approximately 5 to 8 minutes.

Specific sites meeting these criteria should be completed during preparation of the Safety Plan and following completion of the peer review. We understand the peer review may include tsunami inundation modeling which could help refine locations of potential evacuation sites.

At this time, we understand that the new Emergency Services building has been identified as one structure to be used for shelter. Therefore, we recommend that the floor elevation for assembly at the new Emergency Services building be constructed above Elevation 40 feet msl.

In addition, use of the proposed water tower will be prohibited for vertical evacuation because of its proximity to the commercial gas station and potential for a fire hazard. Signage will be installed.

Evacuation Routes

Strong ground motion from the earthquake essentially constitutes the warning from a CSZ earthquake. Based on this assumption the amount of time available for evacuation will be very short. An evacuation route plan will be prepared for the plan area which will include information on tsunami warning devices. The plan will be kept on file at the Samoa Peninsula Fire department (SPFD) in the Samoa Block Building. Key SPFD emergency services personnel shall be trained in tsunami evacuation procedures. Throughout the plan area, directional signage will be posted on designated paths that show non-vehicular evacuation routes to designated assembly sites.

Safety Plan

A Tsunami Safety Plan will be submitted to the County as a condition of subdivision approval.

- The tsunami evacuation plan, including designated routes will also include information on tsunami warning devices and techniques and a public information and education program targeted at Samoa residents and visitors.
- The applicant will submit a proportional share of the fee towards a fund for the installation and maintenance of a warning siren in the town of Samoa. (If funding for a warning siren becomes available prior to the collection of sufficient funds from each newly proposed residence, the fund can be used for tsunami education, identification of evacuation routes, signage and subsidized weather radios to residents of Samoa).

LIMITATIONS

This report has been prepared for use by Samoa Pacific Partnership, LLC for evaluation of tsunami hazards and mitigation relative to the Samoa Town Master Plan, in Humboldt County, California. This report is not intended for use by others, and the information contained herein is not applicable to other sites. Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record.

Please refer to the appendix titled Report Limitations and Guidelines for Use for additional information pertaining to use of this report.

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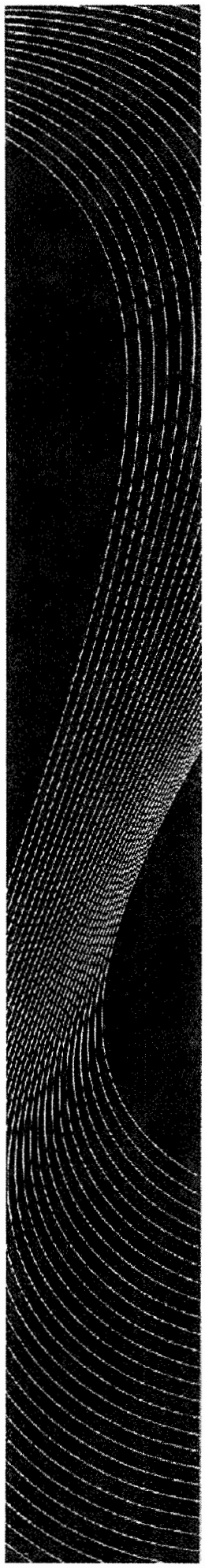

APPENDIX A
BACKGROUND ON EMERGENCY PREPAREDNESS

APPENDIX A
BACKGROUND ON EMERGENCY PREPAREDNESS

MAPPING HUMBOLDT COUNTY'S TSUNAMI HAZARD

Lori Dengler and Jay Patton, Geology Department, Humboldt State University

WHY IS IT IMPORTANT TO MAP TSUNAMI HAZARD?

Twenty-one tsunamis have been observed or recorded on California's North Coast since 1855. All but four were teletsunamis originating from sources elsewhere in the Pacific. Crescent City in Del Norte County has suffered more tsunami damage in the past 150 years than any other area of the US West coast outside of Alaska. Prior to 1992 only distant source tsunamis were considered by the local emergency planning community a significant risk. The 1992 Cape Mendocino earthquake (Mw 7.1) changed this perception. The earthquake, located on or near the Cascadia subduction zone megathrust fault system, produced a modest local tsunami that was recorded at the tide gauges on the North Spit and at Crescent City and observed by eyewitnesses. Although the tsunami was not damaging, it did raise the concern of scientists and emergency planners about the impact of a larger earthquake/tsunami from the Cascadia subduction zone. The National Oceanographic and Atmospheric Administration (NOAA) conducted numerical modeling of the Humboldt Bay and Crescent City areas (Bernard and others, 1994) to estimate the likely extent of inundation as part of a CDMG (now California Geological Survey) earthquake planning scenario for a magnitude 8.4 earthquake on the Cascadia subduction zone and numerous paleoseismic investigations have looked for evidence of prehistoric earthquakes and tsunamis in the region.

With increased awareness of the tsunami hazard, there has been confusion about areas at risk and areas of safety. Some areas of high hazard have no evacuation planning or tsunami education efforts. Several local schools have developed tsunami evacuation plans even though the location of the school poses no risk. Unnecessary evacuation increases exposure to other earthquake hazards. The hazard maps produced by this project are intended for educational purposes, to improve awareness of tsunami hazards and to encourage responsible emergency planning efforts by illustrating the range of possible tsunami events based on the best currently available information.

ABOUT THE MAPS

The Humboldt County Tsunami Hazard Maps combine the results of past studies to depict the relative tsunami hazard of coastal Humboldt County in Northern California. Unlike inundation maps with a single line to show the inland extent of flooding, these maps use a four-color scheme to represent relative risk.

- Highest hazard areas (red) have experienced tsunami or storm wave inundation in historic times and include beaches and low coastal bluffs on the open coast and low areas adjacent to Humboldt Bay and major river deltas. The high hazard zones are also mapped as zone A (100 year flooding) on FEMA Flood Insurance Rate Maps.
- Moderate hazard areas (orange) are areas likely to be flooded by a major tsunami generated by the Cascadia subduction zone based on published paleotsunami studies, numerical modeling (Bernard and others, 1994) and observations of recent tsunamis elsewhere. Current estimates of major Cascadia earthquake recurrence averages about 500 years and range from 200 to 800 years. The most recent great Cascadia earthquake is believed to have occurred in 1700.

- Low hazard areas (yellow) show no evidence of flooding in the paleotsunami record and are likely to provide refuge in all but the most extreme event.
- No hazard areas (grey) are too high in elevation and/or too far inland to be at risk.

A continuous gradational color scale with blurred boundaries help to convey the continuum of possible events and the uncertainty in delineating distinct inundation lines. We emphasize numerous sources of uncertainty in hazard delineation. The ambient tide condition will raise or lower the background sea level by 8 or more feet and will be further affected by El Niño conditions and large storm events and swells. The size and character of faulting in a specific event may also amplify or reduce the size of the resulting tsunami. Only recently has the impact of landsliding been recognize in contributing to tsunami hazards. As large Cascadia event is likely to generate local slumping. The size and location of such slumps can greatly increase tsunami amplitude locally.

The maps are GIS based to facilitate ready adaptation by planners and emergency managers. The maps are intended for educational purposes, to improve awareness of tsunami hazards and to encourage emergency planning efforts of local and regional organizations by illustrating the range of possible tsunami events.

DEFINING HAZARD AREA BOUNDARIES:

This project recognizes the complexity of tsunami hazards. Not only can tsunamis hit the coast at high velocity, the fluctuating surges of water can cause infilling and draw downs of bays and send surges of water miles inland along large coastal rivers. The nature of the hazard and the likely elevations impact will differ in these various areas.

We define four different zones and develop criteria to delineate the hazard area boundaries:

Open Coast Zone: The open coastline directly exposed to the ocean. Includes all areas within 2 km of the coast. This area is vulnerable to inundation and high velocity tsunami waves.

Bay Zone: The margins of Humboldt Bay and lagoons more than 2 km from the coast. This area is vulnerable to rapid changes in water level, fluctuating currents and flooding.

Special Study Zone: Pacific Gas and Electric Company Power Plant and King Salmon opposite the mouth of Humboldt Bay. This area is vulnerable to both Open Coast and Bay effects. Studies of the tsunami hazard have been conducted by PG&E.

Coastal Estuary Zone: Coastal flood plain areas from the end of the Open Coast Zone to elevations inland of 35m. This area is vulnerable to tsunami river bores. Flooding potential strongly dependent on ambient tide and water levels.

Upland Zone: All areas more than 2km inland from the coast not included in the Bay or Coastal Estuary Zones. This zone is not vulnerable to tsunami hazards but will be affected by other earthquake effects if a large Cascadia earthquake occurs.

1. Hazard area boundaries are initially defined for each zone above based on elevation:

Zone	Description	High	Moderate	Low	None
Open Coast	Everywhere within 2km of coast			10 - 35 m elev	above 35 m elev
Coastal Estuary	Low lying flat topography of river valleys and bottomlands			6 - 15 m elev	above 15 m elev
	Low lying flat Bay topography adjacent to Humboldt Bay			3 - 5 m elev	above 5 m elev
Special Study Zone	Area studied by PG&E			7.5 - 20 m elev	above 20 m elev
Uplands	All other areas inland of Open Coast zone				all elevations

2. Hazard boundaries are adjusted using the following:

FEMA Q3 flood maps.

All high hazard zones should also be defined as Zone A (100 year flooding) in the Q3 maps.

NOAA Tsunami Inundation modeling

In 1994, NOAA conducted numerical modeling of the tsunami hazard in the Humboldt Bay region as part of the California division of Mines and Geology Earthquake Planning Scenario for an earthquake on the Cascadia subduction zone. We adjusted the moderate hazard area in some areas to agree with the 1994 study. However, we do not consider the inundation mapping accurate in the Samoa Peninsula region as it used topographic data from USGS 7 1/2 minute quadrangles that do not accurately delineate the dune topography.

Paleotsunami studies

A number of paleoseismic and paleotsunami investigations have been conducted in the Humboldt Bay region since 1980. Many of the studies were supported by Pacific Gas & Electric Company as part of their Humboldt Bay Power Plant hazard assessment. Over 150 paleotsunami sediment core samples have been taken along the margins of the bay and in the Mad River Slough. The only places where identifiable tsunami sands have been found are in the South Bay region immediately adjacent to the spit and in the Hookton Slough area. In addition, a Masters thesis (Leroy, 1999) examined the relative ages of soil and dune deposits on both spits. The paleoseismic studies show no evidence for significant overtopping of the Samoa Peninsula from the town of Samoa north.

See map areas as defined above for the Northern Samoa Peninsula.

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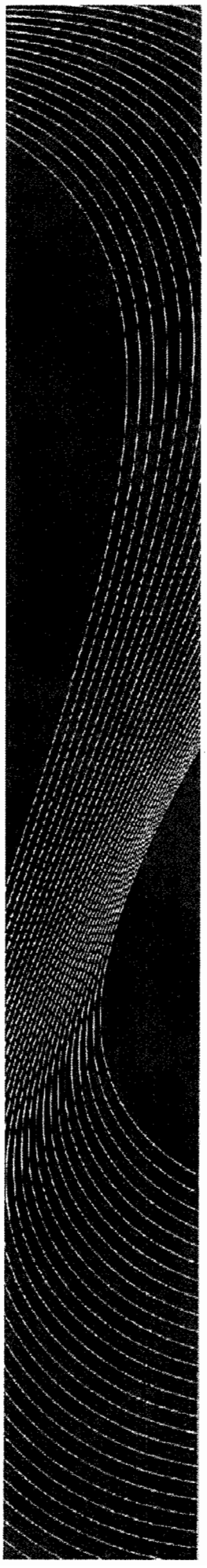
APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE



APPENDIX B

REPORT LIMITATIONS AND GUIDELINES FOR USE[3]

This appendix provides information to help you manage your risks with respect to the use of this report.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for the exclusive use of Samoa Town Partnership and their authorized agents. This report may be made available to contractors and regulatory agencies for review. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, a geotechnical or geologic study conducted for a civil engineer or architect may not fulfill the needs of a construction contractor or even another civil engineer or architect that are involved in the same project. Because each geotechnical or geologic study is unique, each geotechnical engineering or geologic report is unique, prepared solely for the specific client and project site. Our report is prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted geotechnical practices in this area at the time this report was prepared. This report should not be applied for any purpose or project except the one originally contemplated.

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report has been prepared for the proposed Samoa Town Master Plan. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;
- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

[3] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org .

SUBSURFACE CONDITIONS CAN CHANGE

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying a report to determine if it remains applicable.

MOST GEOTECHNICAL AND GEOLOGIC FINDINGS ARE PROFESSIONAL OPINIONS

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

GEOTECHNICAL ENGINEERING REPORT RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the preliminary construction recommendations included in this report. These recommendations are not final, because they were developed principally from GeoEngineers' professional judgment and opinion. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for this report's recommendations if we do not perform construction observation.

Sufficient monitoring, testing and consultation by GeoEngineers should be provided during construction to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes should the conditions revealed during the work differ from those anticipated, and to evaluate whether or not earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective method of managing the risks associated with unanticipated conditions.

A GEOTECHNICAL ENGINEERING OR GEOLOGIC REPORT COULD BE SUBJECT TO MISINTERPRETATION

Misinterpretation of this report by other design team members can result in costly problems. You could lower that risk by having GeoEngineers confer with appropriate members of the design team after submitting the report. Also retain GeoEngineers to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering or geologic report. Reduce that risk by having GeoEngineers participate in pre-bid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE EXPLORATION LOGS

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering or geologic report, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

CONTRACTORS ARE RESPONSIBLE FOR SITE SAFETY ON THEIR OWN CONSTRUCTION PROJECTS

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and to adjacent properties.

READ THESE PROVISIONS CLOSELY

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering or geology) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site.

GEOTECHNICAL, GEOLOGIC AND ENVIRONMENTAL REPORTS SHOULD NOT BE INTERCHANGED

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perf orm a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding a specific project.

BIOLOGICAL POLLUTANTS

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Client desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.

Sheet 1

Sheet 2

Sheet 3

Sheet 4

Sheet 5

Sheet 6

Corridor Area

Certain Natural Resources with B zone

Legend

- RS Residential Single Family (53.3 ac.)
- RM Residential Multi Family (3.5 ac.)
- MC Industrial Coastal Dependent (33.5 ac.)
- CR Commercial Recreation (9.7 ac.)
- PF Public Facilities (10.1 ac.)
- CG Commercial General (4.6 ac.)
- MB Business Park (19.2 ac.)
- NR Natural Resources (34.9 ac.)
- PR Public Recreation (4.4 ac.)

NOTE:
1.5 ACRES OF PUBLIC RECREATION TOTAL IS FROM VISITOR USE AREA LOCATED OUTSIDE OF PROJECT AREA

HUMBOLDT BAY

NOTE:
Color copies of maps Are available at the Commission's website www.coastal.ca.gov - Public Meetings

Exhibit 16 (7 pages total) **HUM-MAJ-01-08**
CORRIDOR AREA ESHA: General Location
(Sheets 1-6 show the Corridor Area boundaries in more detail. Base Map for this page is the Samoa Town Master Plan Zoning Map submitted originally by Humboldt County on April 23, 2008 and is used here solely for the purpose of illustrating the Corridor Area that is shown more specifically on the following Sheets 1-6.

Corridor Area

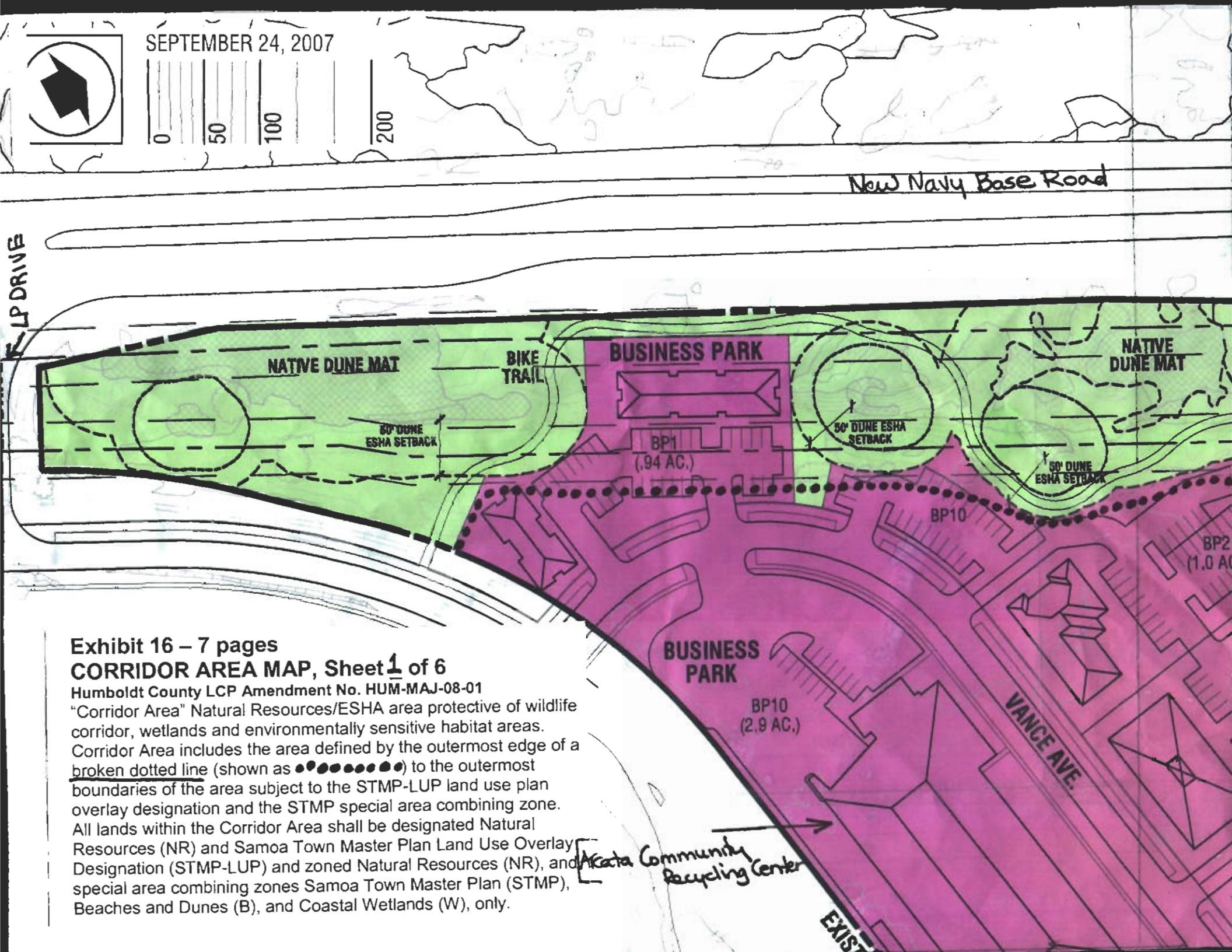


Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 1 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as ●●●●●●●●) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

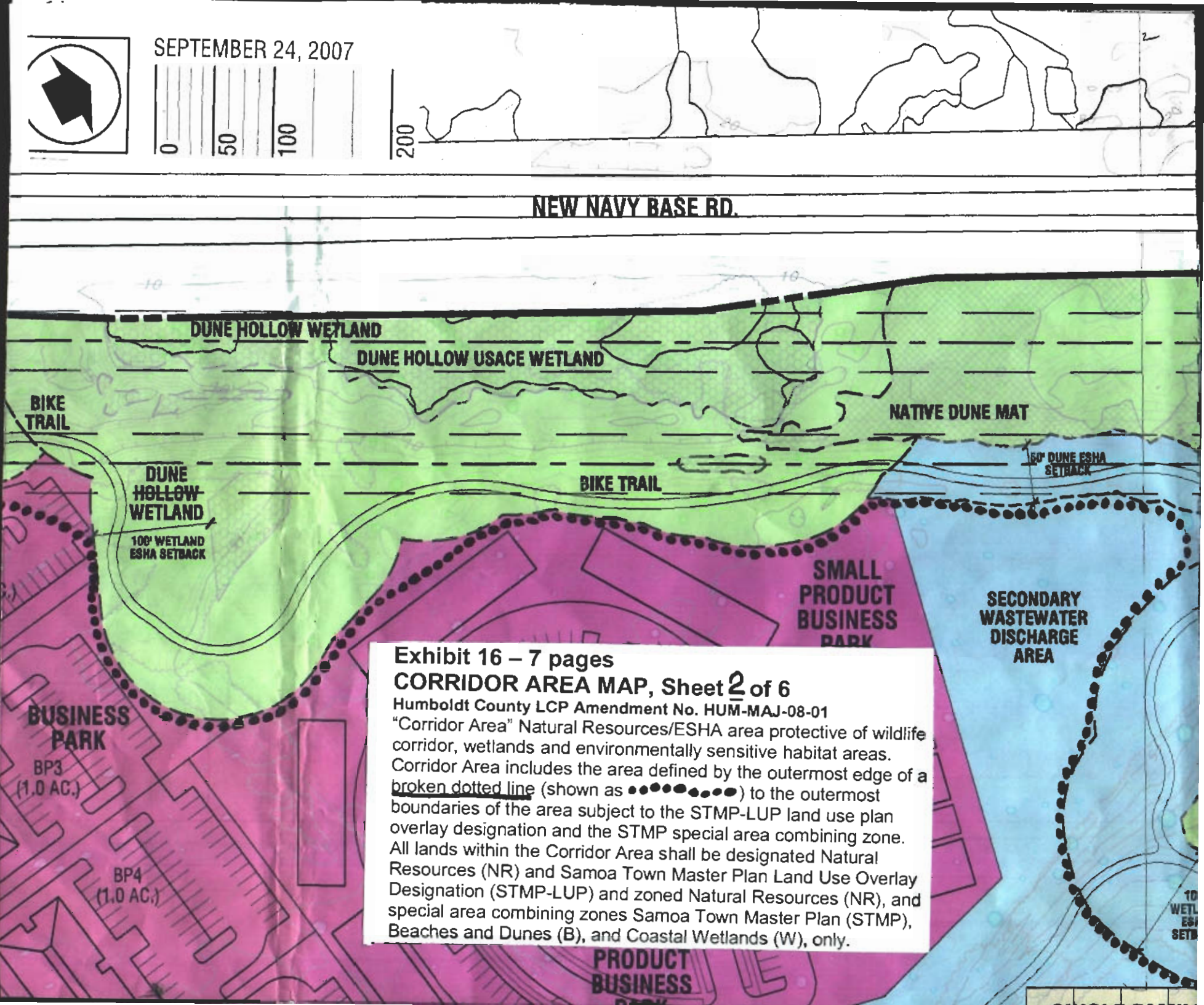


Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 2 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as ••••••••) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

SEPTEMBER 24, 2007

0 50 100 200

New Navy Base Road

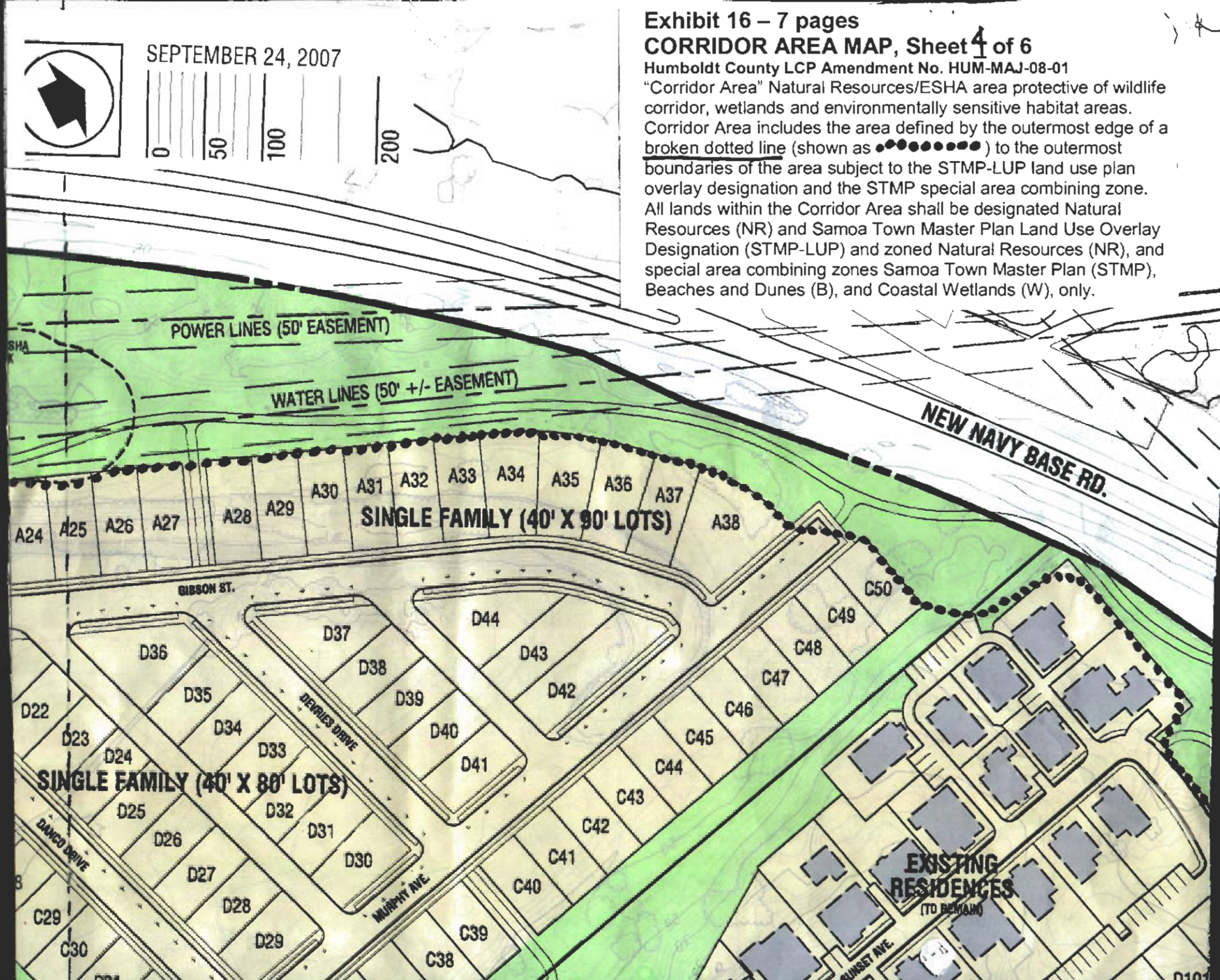
Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 3 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as ●●●●●●●●) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

NATIVE DUNE MAT
NATIVE DUNE MAT
50' DUNE ESHA SETBACK
BIKE TRAIL
DUNE HOLLOW WETLAND
DUNE HOLLOW USACE WETLAND
BIKE TRAIL
NATIVE COASTAL SCRUB
DUNE HOLLOW USACE WETLAND
DUNE HOLLOW WETLAND
50' DUNE ESHA SETBACK (TYP.)
50' DUNE ESHA SETBACK
A23
A22
A21
C23
C22
C21
D21
C24
C25
C26
C27
GIBSON ST.
C7 C8 C9 C10
C11 C20
C12 C19
C13 C18
C14 C17
C3 C6
SINGLE FAMILY (40' X 80' LOTS)
D17 D18 D19 D20
JOHNSON ST.
D51 D50 D49 D48 D47 D46 D45

Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 4 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as •••••••) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.



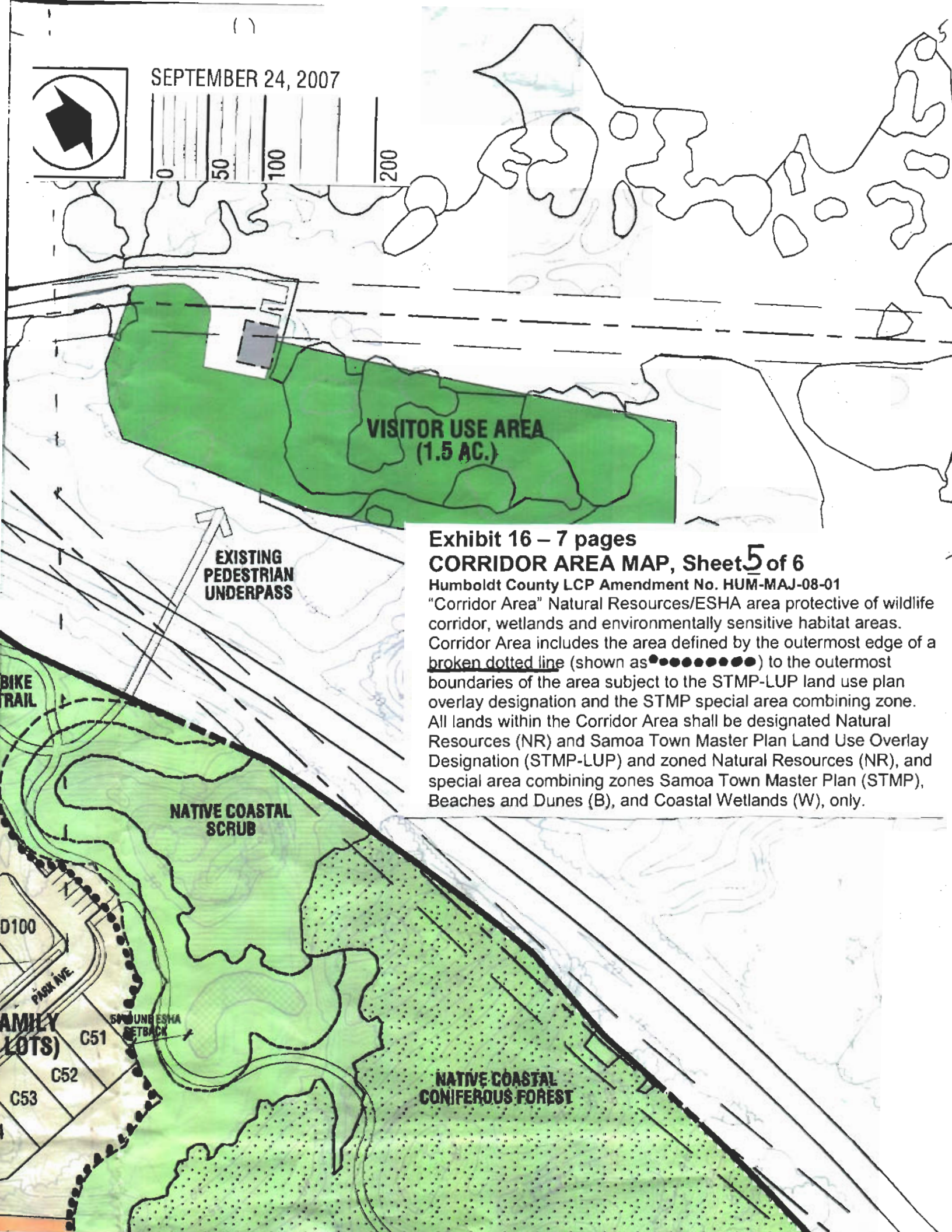


Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 5 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as •••••••••) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

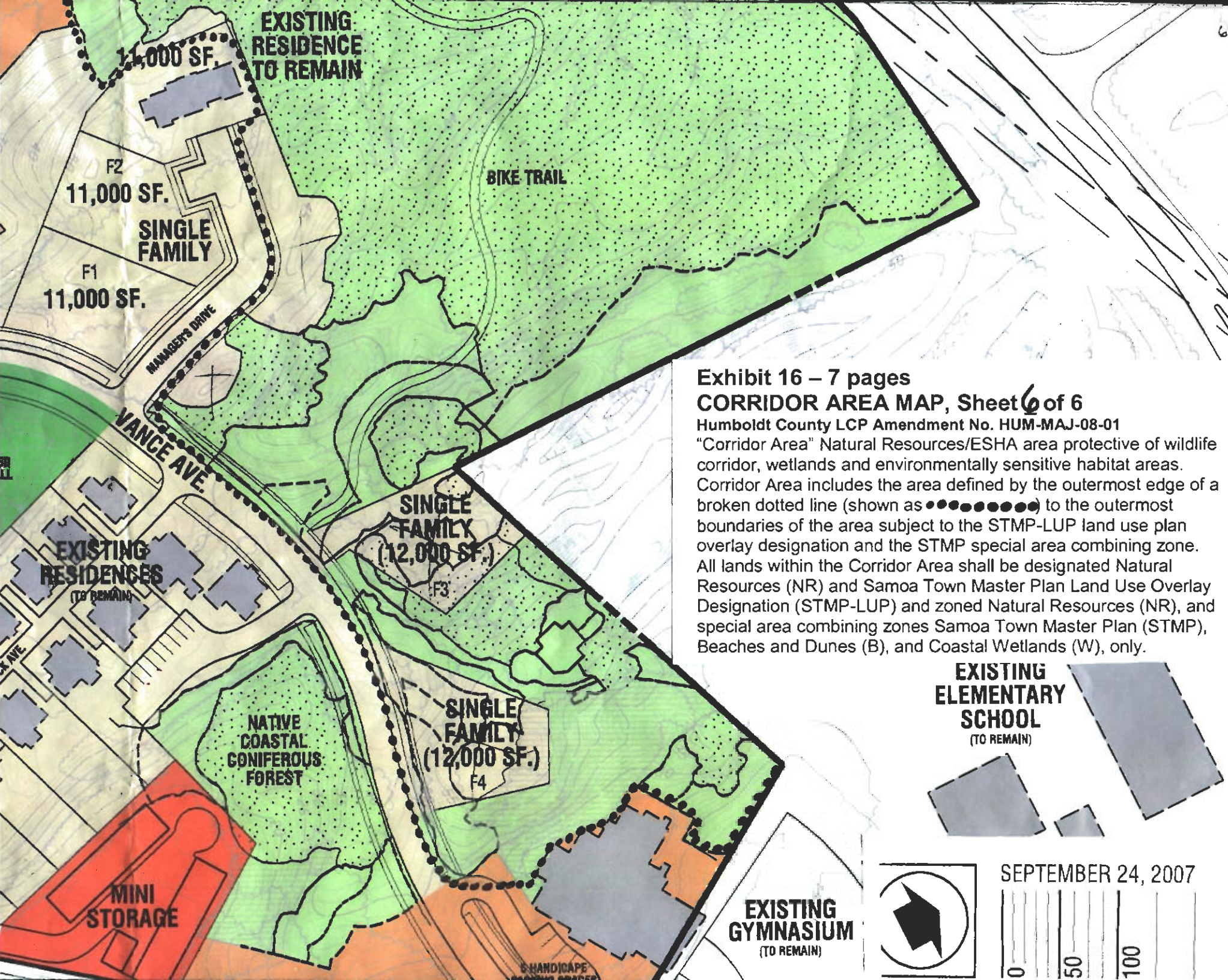


Exhibit 16 – 7 pages

CORRIDOR AREA MAP, Sheet 6 of 6

Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as ●●●●●●●●●) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

EXHIBIT NO. **15**

APPLICATION NO.

HUM-MAJ-1-08 – HUMBOLDT COUNTY LCP AMENDMENT (SAMOA TOWN PLAN)
"CERTIFICATE OF SUBDIVISION COMPLIANCE" WITH ANNOTATIONS, ISSUED BY HUMBOLDT COUNTY COMMUNITY DEVELOPMENT SERVICES ON 12/5/09 FOR 79 LOTS OWNED BY SIMPSON SAMOA COMPANY. RECORDED AS 2000-25874-10 HUMBOLDT COUNTY RECORDER, 12/7/00 (1 of 11)

Recording Requested By:

Simpson Samoa Company

Return To:
Humboldt County
Community Development Services
3015 H Street
Eureka, CA 95501-4484

2000-25874-10
Recorded — Official Records
Humboldt County, California
Carolyn Crnich, Recorder
Recorded by First American Title Ins Co
Exempt from payment of fees
Clerk: MM Total: 0.00
Dec 7, 2000 at 10:00
CONFORMED COPY

CERTIFICATE OF SUBDIVISION COMPLIANCE

ASSESSOR'S REFERENCE NUMBER(S):
401-031-28,-34,-37 LLA-99-23

NUMBER OF PARCELS CERTIFIED:
seventy nine

PROPERTY OWNER(S) OF RECORD:
Simpson Samoa Company

NOTICE IS HEREBY GIVEN pursuant to Section 66499.35 of the California Government Code that the Humboldt County Community Development Services has determined that the real property described in EXHIBIT "A" attached hereto complies with the provisions of the California Subdivision Map Act and Humboldt County Ordinances enacted pursuant thereto.

THIS CERTIFICATE relates only to issues of compliance or noncompliance with the Subdivision Map Act and local ordinances enacted pursuant thereto and no further compliance with the Subdivision Map Act is necessary once all conditions contained herein are satisfied. However, development of the parcel may require issuance of a permit or permits, or other grant or grants of approval.

THIS CERTIFICATE does not certify that the real property for which this certificate has been issued is suitable for development in accordance with existing or future regulations.

ISSUED ON 12/05/00 BY Kirk Girard
Kirk Girard, Director of Community Development Services, County of Humboldt

ACKNOWLEDGMENT

STATE OF CALIFORNIA
COUNTY OF HUMBOLDT

On Dec 6, 2000 before me, LESLIE M. RIECKE, Notary Public, personally appeared KIRK GIRARD, personally known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

Witness my hand and official seal.

Leslie M. Riecke
SIGNATURE OF NOTARY

LESLIE M. RIECKE
Comm. #1260749
NOTARY PUBLIC
HUMBOLDT COUNTY, CALIFORNIA
My commission expires May 12, 2004

Seal

(J:/planning/current/forms/notary/form7.pub/rev:06-27-00)

RE: Simpson Samoa Company H.C.P.D. File No. APN 401-031-28 et al

EXHIBIT A

PROPERTY DESCRIPTION

All that real property situated in the County of Humboldt, State of California, described as follows:

PARCEL ONE:
Lot Thirty-eight (38) in Block One (1) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWO:
Lots Thirty-six (36) and Thirty-seven (37) in Block One (1) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THREE:
Lot Forty (40) in Block Two (2) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FOUR:
Lot Thirty-nine (39) in Block Two (2) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIVE:
Lot Thirty-eight (38) in Block Two (2) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIX:
Lot Twenty-one (21) in Block Two (2) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SEVEN:
Lots Thirty-nine (39) and Forty (40) in Block Three (3) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL EIGHT:
Lot Thirty (30) in Block Three (3) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL NINE:
Lot Twenty-one (21) in Block Three (3) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TEN:

Lot Forty (40) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL ELEVEN:

Lot Thirty-nine (39) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWELVE:

Lots Thirty-four (34) and Thirty-five (35) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTEEN:

Lots Twenty-six (26), Twenty-seven (27), Twenty-eight (28), and Twenty-nine (29) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FOURTEEN:

Lot Twenty-five (25) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTEEN:

Lots Twenty-one (21) and Twenty-two (22) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTEEN:

Lot Forty (40) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SEVENTEEN:

Lots Thirty-eight (38) and Thirty-nine (39) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL EIGHTEEN:

Lots Thirty-six (36) and Thirty-seven (37) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL NINETEEN:

Lots Thirty-four (34) and Thirty-five (35) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY:

Lots Thirty (30) and Thirty-one (31) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-ONE:

Lots Twenty-eight (28) and Twenty-nine (29) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-TWO:

Lots Twenty-six (26) and Twenty-seven (27) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-THREE:

Lots Twenty-one (21) and Twenty-two (22) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-FOUR:

Lots Nineteen (19) and Twenty (20) in Block Two (2) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-FIVE:

Lot Sixteen (16) in Block Three (3) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-SIX:

Lot Five (5) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-SEVEN:

Lots Ten (10) and Eleven (11) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-EIGHT:

Lots Nineteen (19) and Twenty (20) in Block Four (4) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL TWENTY-NINE:

Lots One (1) and Two (2) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY:

Lot Nine (9) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-ONE:

Lots Ten (10) and Eleven (11) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-TWO:

Lot Twelve (12) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-THREE:

Lot Eighteen (18) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-FOUR:

Lots Nineteen (19) and Twenty (20) in Block Five (5) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-FIVE:

Lots Three (3), Four (4), Five (5), and Six (6) in Block Six (6) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

EXCEPTING THEREFROM that portion thereof conveyed to Northwestern Pacific Railroad Company by deed recorded February 2, 1925 in Book 171 Deeds, Page 186, Humboldt County Records.

PARCEL THIRTY-SIX:

Lots Thirty-six (36) and Thirty-seven (37) in Block Thirteen (13) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-SEVEN:

Lots Twenty-two (22) and Twenty-three (23) in Block Thirteen (13) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-EIGHT:

Lot Thirty-nine (39) in Block Twelve (12) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL THIRTY-NINE:
Lot Thirty-eight (38) in Block Twelve (12) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY:
Lot Two (2) in Block Thirteen (13) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-ONE:
Lot Seventeen (17) in Block Thirteen (13) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-TWO:
Lot Eighteen (18) in Block Thirteen (13) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-THREE:
Lot Forty (40) in Block Twenty-one (21) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-FOUR:
Lots Twenty-one (21) and Twenty-two (22) in Block Twenty-two (22) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-FIVE:
Lot Forty (40) in Block Twenty-three (23) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-SIX:
Lot Twenty-seven (27) in Block Thirty (30) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-SEVEN:
Lots Twenty-three (23) and Twenty-four (24) in Block Thirty (30) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-EIGHT:
Lots Twenty-one (21) and Twenty-two (22) in Block Thirty (30) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FORTY-NINE:
Lot Twenty-two (22) in Block Thirty-nine (39) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY:
Lots Thirty-eight (38), Thirty-nine (39), and Forty (40) in Block Thirteen (13) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-ONE:
Lot Thirty-eight (38) in Block Three (3) according to the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-TWO:
Lots Twenty-seven (27) and Twenty-eight (28) in Block Twelve (12) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-THREE:
Lots Twenty-five (25) and Twenty-six (26) in Block Twelve (12) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-FOUR:
Lots Twenty-three (23) and Twenty-four (24) in Block Twelve (12) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-FIVE:
Lots Twenty-one (21) and Twenty-two (22) in Block Twelve (12) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-SIX:
Lot Forty (40) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-SEVEN:
Lots Thirty-eight (38) and Thirty-nine (39) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-EIGHT:
Lot Thirty-seven (37) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL FIFTY-NINE:

Lot Thirty-six (36) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY:

Lots Thirty-four (34) and Thirty-five (35) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-ONE:

Lot Thirty-three (33) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-TWO:

Lot Thirty-two (32) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-THREE:

Lots Thirty (30) and Thirty-one (31) in Block Eleven (11) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-FOUR:

Lots Thirty-eight (38), Thirty-nine (39), and Forty (40) in Block Ten (10) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-FIVE:

Lots Thirty-three (33) and Thirty-four (34) in Block Ten (10) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-SIX:

Lots Thirty-one (31) and Thirty-two (32) in Block Ten (10) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-SEVEN:

Lots Twenty-eight (28), Twenty-nine (29), and Thirty (30) in Block Ten (10) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SIXTY-EIGHT:

Lot Five (5) in Block Seven (7) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

EXCEPTING THEREFROM that portion thereof conveyed to Northwestern Pacific Railroad Company by deed recorded June 20, 1911 in Book 116 Deeds, Page 9, Humboldt County Records.

PARCEL SIXTY-NINE:

Lots Six (6) and Seven (7) in Block Seven (7) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

EXCEPTING THEREFROM that portion thereof conveyed to Northwestern Pacific Railroad Company by deed recorded June 20, 1911 in Book 116 Deeds, Page 9, Humboldt County Records.

PARCEL SEVENTY:

Lot Eight (8) in Block Seven (7) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

EXCEPTING THEREFROM that portion thereof conveyed to Northwestern Pacific Railroad Company by deed recorded June 20, 1911 in Book 116 Deeds, Page 9, Humboldt County Records.

PARCEL SEVENTY-ONE:

Lot Nine (9) in Block Seven (7) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

EXCEPTING THEREFROM that portion thereof conveyed to Northwestern Pacific Railroad Company by deed recorded June 20, 1911 in Book 116 Deeds, Page 9, Humboldt County Records.

PARCEL SEVENTY-TWO:

Lots Twelve (12) and Thirteen (13) in Block Seven (7) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SEVENTY-THREE:

Lots Fourteen (14) and Fifteen (15) in Block Seven (7) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SEVENTY-FOUR:

Lots Sixteen (16) and Seventeen (17) in Block Seven (7) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SEVENTY-FIVE:

Lots One (1) and Two (2) in Block Eight (8) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SEVENTY-SIX:

Lot Twenty-seven (27) in Block Eight (8) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

EXCEPTING THEREFROM that portion thereof conveyed to Northwestern Pacific Railroad Company by deed recorded June 20, 1911 in Book 116 Deeds, Page 9, Humboldt County Records.

PARCEL SEVENTY-SEVEN:

Lot Twenty-six (26) in Block Eight (8) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

EXCEPTING THEREFROM that portion thereof conveyed to Northwestern Pacific Railroad Company by deed recorded June 20, 1911 in Book 116 Deeds, Page 9, Humboldt County Records.

PARCEL SEVENTY-EIGHT:

Lot Thirty-five (35) in Block Twenty-five (25) as shown on the Amended Map of Samoa or West Eureka, filed in Book 5 Maps, Page 74, Humboldt County Records.

PARCEL SEVENTY-NINE:

Beginning at the intersection of the east line of Murray Avenue and the north line of Hiller Street as shown on the official map of the Town of Samoa, County of Humboldt, State of California, as filed in the office of the County Recorder of said Humboldt County, in Book 5 Maps, Page 74, and marked on the ground by a two inch iron pipe set four feet in the ground;

thence N 25° E, 100 feet to stake for corner;

thence S 65° E, 110 feet to an iron pipe for corner;

thence S 25° W, 100 feet to an iron pipe for corner;

thence N 65° W, 110 feet along the north line of Hiller Street to the place of beginning.

END OF DESCRIPTION

Prepared by:

Michael J. O'Hern

Michael J. O'Hern
LS 4829 Exp. 9-30-04

Sheet 1

Sheet 2

Sheet 3

Sheet 4

Sheet 5

Sheet 6

Corridor Area

Certain Natural Resources with B zone

Legend

- RS Residential Single Family (53.3 ac.)
- RM Residential Multi Family (3.5 ac.)
- MC Industrial Coastal Dependent (33.5 ac.)
- CR Commercial Recreation (9.7 ac.)
- PF Public Facilities (10.1 ac.)
- CG Commercial General (4.6 ac.)
- MB Business Park (19.2 ac.)
- NR Natural Resources (34.9 ac.)
- PR Public Recreation (4.4 ac.)

NOTE:
1.5 ACRES OF PUBLIC RECREATION TOTAL IS FROM VISITOR USE AREA LOCATED OUTSIDE OF PROJECT AREA

HUMBOLDT BAY

NOTE:
Color copies of maps Are available at the Commission's website www.coastal.ca.gov - Public Meetings

Exhibit 16 (7 pages total) **HUM-MAJ-01-08**
CORRIDOR AREA ESHA: General Location
(Sheets 1-6 show the Corridor Area boundaries in more detail. Base Map for this page is the Samoa Town Master Plan Zoning Map submitted originally by Humboldt County on April 23, 2008 and is used here solely for the purpose of illustrating the Corridor Area that is shown more specifically on the following Sheets 1-6.

Corridor Area

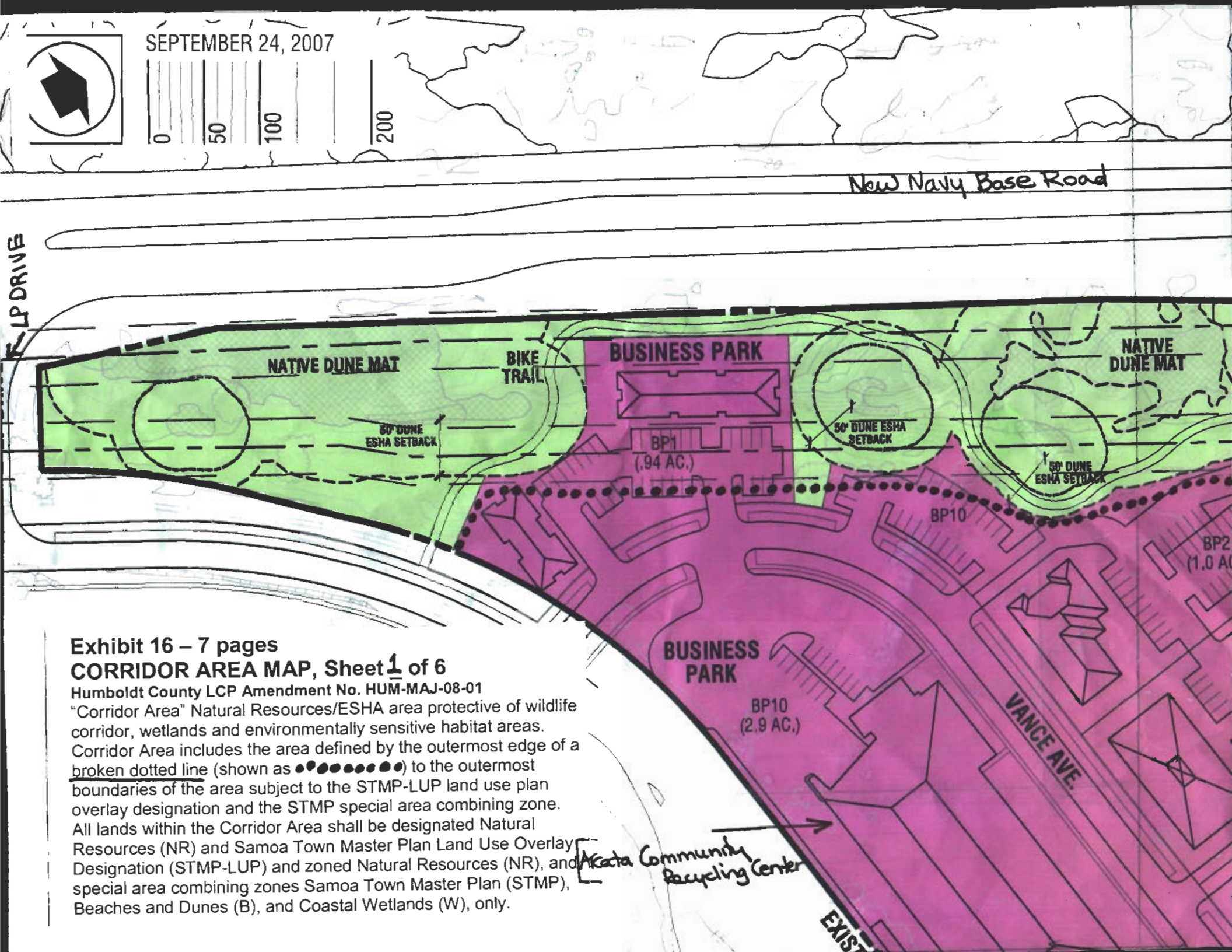


Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 1 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as ●●●●●●●●) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

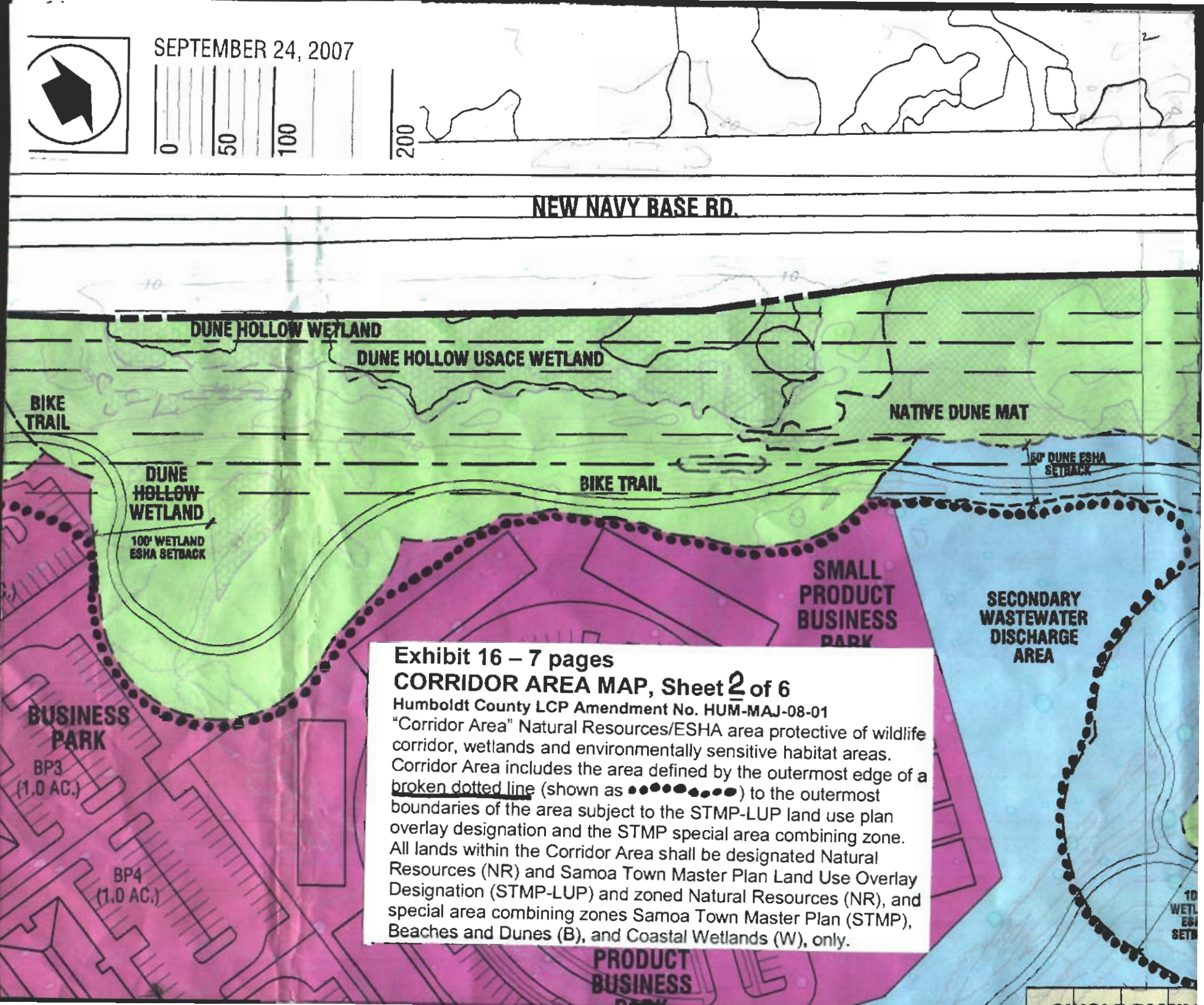


Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 2 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as ••••••••) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

SEPTEMBER 24, 2007

0 50 100 200

New Navy Base Road

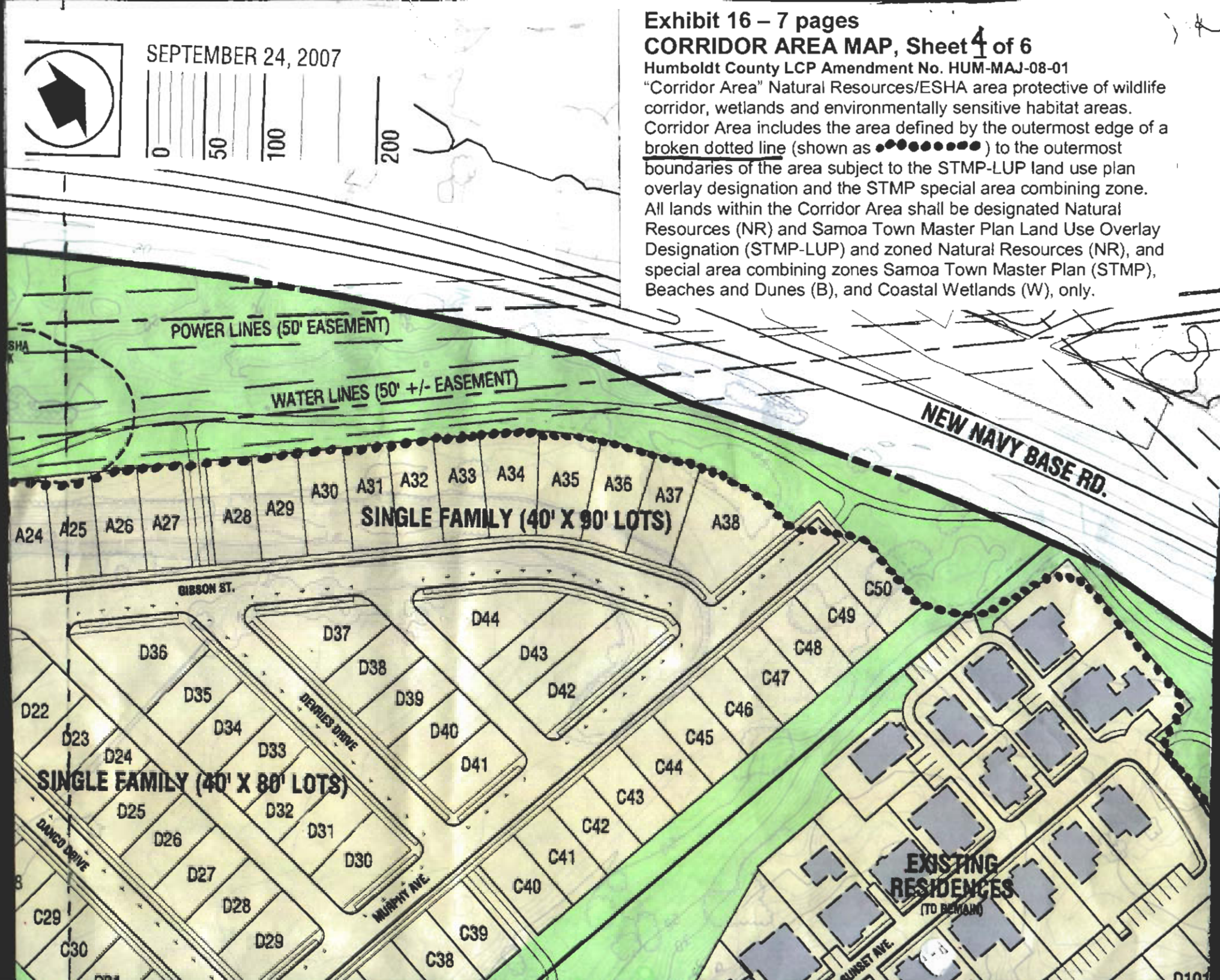
Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 3 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as ●●●●●●●●) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

NATIVE DUNE MAT
NATIVE DUNE MAT
50' DUNE ESHA SETBACK
BIKE TRAIL
DUNE HOLLOW WETLAND
DUNE HOLLOW USACE WETLAND
BIKE TRAIL
NATIVE COASTAL SCRUB
DUNE HOLLOW USACE WETLAND
DUNE HOLLOW WETLAND
50' DUNE ESHA SETBACK (TYP.)
50' DUNE ESHA SETBACK
A23
A22
A21
C23
C22
C21
D21
C24
C25
C26
C27
GIBSON ST.
C7 C8 C9 C10
C11 C20
C12 C19
C13 C18
C14 C17
C3 C6
SINGLE FAMILY (40' X 80' LOTS)
D17 D18 D19 D20
JOHNSON ST.
D51 D50 D49 D48 D47 D46 D45

Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 4 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as •••••••) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.



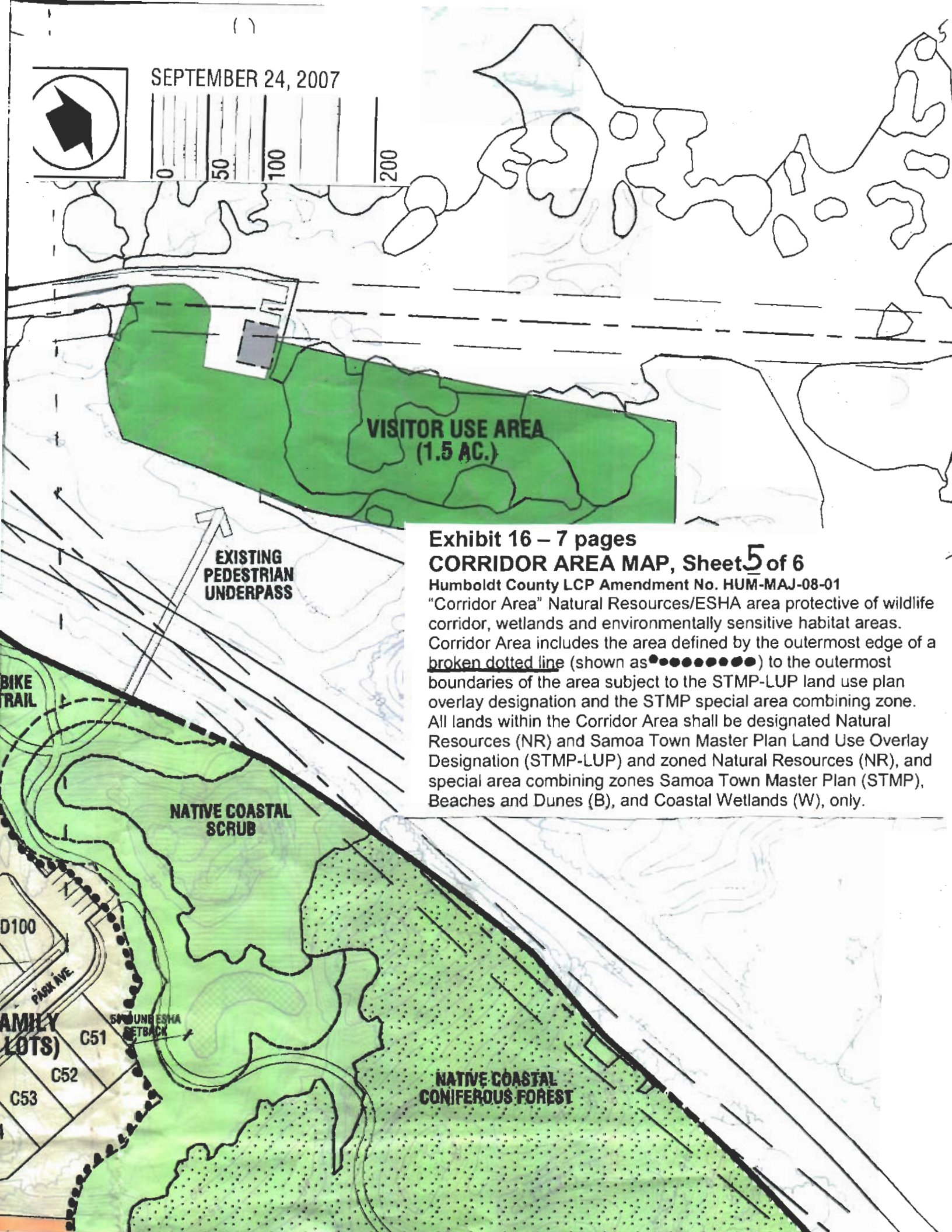


Exhibit 16 – 7 pages
CORRIDOR AREA MAP, Sheet 5 of 6
Humboldt County LCP Amendment No. HUM-MAJ-08-01

"Corridor Area" Natural Resources/ESHA area protective of wildlife corridor, wetlands and environmentally sensitive habitat areas. Corridor Area includes the area defined by the outermost edge of a broken dotted line (shown as •••••••••) to the outermost boundaries of the area subject to the STMP-LUP land use plan overlay designation and the STMP special area combining zone. All lands within the Corridor Area shall be designated Natural Resources (NR) and Samoa Town Master Plan Land Use Overlay Designation (STMP-LUP) and zoned Natural Resources (NR), and special area combining zones Samoa Town Master Plan (STMP), Beaches and Dunes (B), and Coastal Wetlands (W), only.

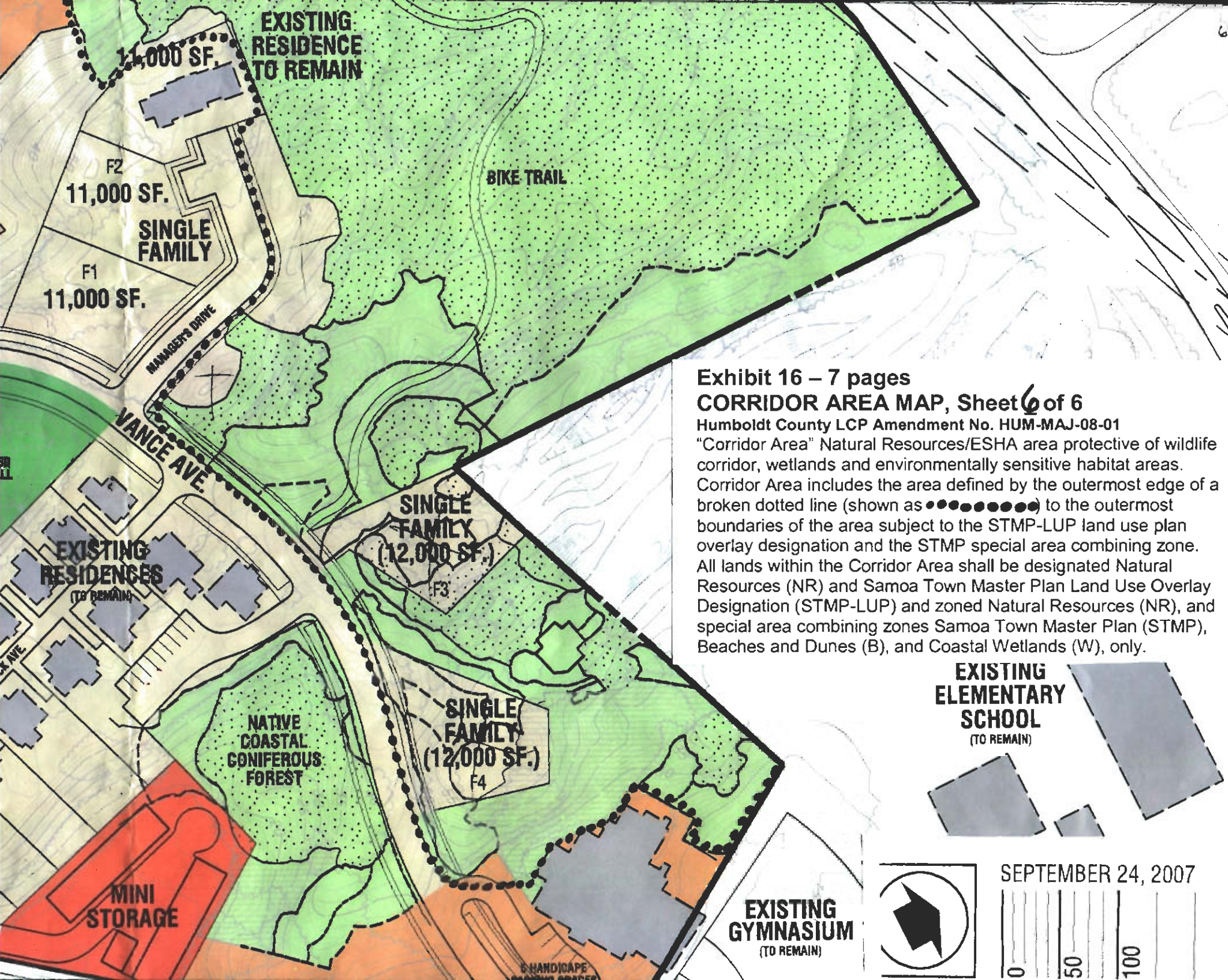


Exhibit 16 – 7 pages

CORRIDOR AREA MAP, Sheet 6 of 6

Humboldt County LCP Amendment No. HUM-MAJ-08-01

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