

GRANTS/CONTINGENT AWARD REQUEST



To: Grants and Loans Office

Date: 04 / 30 / 2012

Project Manager: Donald Coe Phone Number: (916) 654-3941 ext.
Office: Emerging Fuels and Technologies Division: Fuels and Transportation MS- 27
Project Title: Blythe LNG Public Access Infrastructure Project

Type of Request: (check one)

New Agreement: (include items A-F from below) Agreement Number: ARV-11-027
Program: Alternative and Renewable Fuels and Vehicle Technology Program
Solicitation Name and/or Number: ARV-11-602
Legal Name of Recipient: Blackhawk Logistics
Recipient's Full Mailing Address: 15500 South Commercial
Blythe CA 92225
Recipient's Project Officer: Greg Braun Phone Number: (760) 344-6700 ext.
Agreement Start Date: 6 / 13 / 2012 Agreement End Date: 03 / 30 / 2015

Amendment: (Check all that apply) Agreement Number: ARV-12-028
 Term Extension – New End Date: / /
 Work Statement Revision (include Item A from below)
 Budget Revision (include Item B from below)
 Change of Scope (include Items A – F as applicable from below)
 Other: (Specify)

ITEMS TO ATTACH WITH REQUEST:

- A. Work Statement
- B. Budget
- C. Recipient Resolution, if applicable. (Resolution may be requested in Special Conditions if not currently available.)
- D. Special Conditions, if applicable.
- E. CEQA Compliance Form
- F. Other Documents as applicable
 - Copy of Score Sheets
 - Copy of Pre-Award Correspondence
 - Copy of All Other Relevant Documents

California Environmental Quality Act (CEQA)

CEC finds, based on recipient's documentation in compliance with CEQA:
 Project exempt: Section 15301 NOE filed: / /
 Environmental Document prepared: Notice of Exemption NOD filed: / /
 Other: Explain
 CEC has made CEQA finding described in CEC-280, attached

Funding Information:

*Source #1: ARVFTP Amount: \$ 600,000.00 Statute: 2010 FY: FY 10 Budget List #: 601-
*Source #2: _____ Amount: \$ _____ Statute: _____ FY: _____ Budget List #: _____
*Source #3: _____ Amount: \$ 0.00 Statute: _____ FY: _____ Budget List #: _____

If federally funded, specify federal agreement number: _____
* Source Examples include ERPA, PIER-E, PIER-NG, FED, GRDA, ARFVT, OTHER.

Business Meeting Approval: (refer to Business Meeting Schedule)

Proposed Business Meeting Date: 01 / 09 / 2013 Consent Discussion
Business Meeting Participant: Donald Coe Time Needed: (5 minutes)

Agenda Notice Statement: (state purpose in layperson terms)

Possible approval of a Grant / Contingent Award to...
To provide \$600,000 to construct a publicly accessible liquefied natural gas station to fuel HayDay Farms fleet and goods movement vehicles in the Blythe region and along the I-10 connection between California and Arizona.

**ITEM #13(d)
January 9, 2013
Energy Commission Business Meeting**

**California Environmental Quality Act Review of Grant Agreement
ARV-12-028 with Blackhawk Logistics, Inc.**

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**Initial Study and Mitigated Negative Declaration
Recommendation for Blackhawk Logistics, Inc. Grant
for LCNG Fueling Facility in Blythe, California**

*Prepared by the California Energy Commission
October 2012*

BLACKHAWK LOGISTICS, LLC
GRANT FOR LCNG FUELING FACILITY
BLYTHE, CALIFORNIA

INITIAL STUDY AND MITIGATED NEGATIVE
DECLARATION RECOMMENDATION

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CALIFORNIA 95814

OCTOBER 2012

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1. Mitigation Monitoring and Reporting Program

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- A. Californian Emission Estimator Model (CalEEMod) Air Quality Calculations
- B. Geotechnical Engineering Report
- C. Drainage Study

INITIAL STUDY AND PROPOSED MITIGATED NEGATIVE DECLARATION

PROJECT: Blackhawk Logistics LCNG Fueling Facility
Blythe, California

LEAD AGENCY:

California Energy Commission,
1516 9th Street, Sacramento, California 95814

BRIEF PROJECT DESCRIPTION:

The project applicant, Blackhawk Logistics, LLC, a jointly held company of HayDay Farms, Inc. and Border Valley Trading, Ltd., is proposing to construct a Liquefied and Compressed Natural Gas (LCNG) fueling station in the City of Blythe, California. The fueling station would serve HayDay Farms' expanding fleet of natural gas powered trucks, and those of a short list of private operators with service agreements with Blackhawk Logistics. The station would also be available for use by the general public. The project would be constructed in two to three phases with the first phase consisting of the installation of LNG fueling facilities. The CNG fueling facilities would be added during the second and third phases of the project, which will be dictated by market demand.

EXECUTIVE SUMMARY

The proposed project involves the multi-phase development of a publicly accessible LCNG fueling station on a 1.73-acre site located on the east side of S. Willow Street between W. Wells Street and W. 14th Avenue in the Blythe, California. The property address is 450 S. Willow Street and the applicable Riverside County Assessor's Parcel Numbers are 848-110-010 and 848-110-011.

The existing land uses and General Plan/Zoning designations are shown on the following table.

**Table ES-1
Existing Use, General Plan, and Zoning Designations**

Location	Existing Use	General Plan Designation	Zoning Designation
Site	Vacant	General Commercial	CG
North	Truck/recreational vehicle parking area for a Super 8 Motel	General Commercial	CG
South	Vacant	General Commercial	CG
East	Public utility (SCE) service center	Public/Quasi-Public	P/Q-P
West	Vacant	General Commercial	CG

The project site is undeveloped, but has been entirely disturbed by prior human activity (i.e., graded/disked). The site is devoid of any significant types of vegetation. The sparse vegetative cover on the site is limited to common ruderal grasses and low growing scrub vegetation. The property does not contain any wetland or riparian features that would fall under the jurisdiction of the U.S. Army Corps of Engineers, the California Department of Fish and Game, or the Regional Water Quality Control Board.

The current General Plan and Zoning designations for the property are General Commercial (CG). The project site consists of two parcels that will be merged prior to the issuance of building/public improvement permits by the City of Blythe. The applicant, Blackhawk Logistics, LLC, proposes to construct an LCNG fueling station on the property in two to three phases with the first phase consisting of the installation of LNG fueling facilities. It is anticipated that the CNG fueling facilities would be added during the subsequent phases of development, which will be dictated by market conditions and demand. However, the site planning and engineering for the project provides for the accommodation of CNG fueling facilities during the initial phase of development, if the market conditions so warrant. The proposed station will close an existing "gap" in the regional clean fuel infrastructure and assist in reducing greenhouse

gas (GHG) emissions from currently diesel powered trucks transporting goods from the Ports of Long Beach and Los Angeles to Arizona, consistent with the goals of AB 32.

This Initial Study serves as the environmental review of the proposed project, as required by the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines. Although the City of Blythe has exempted the project as “ministerial,” the California Energy Commission cannot similarly make this determination, since its decision to approve \$600,000 in grant funding being requested by the project sponsor is wholly discretionary. Hence, the Energy Commission’s consideration of awarding grant funding to construct the proposed LCNG facility is not exempt from CEQA. As the only public agency having discretionary approval over the project, the Energy Commission is, by default, the “lead agency” for the purposes of CEQA and is responsible for preparing the appropriate environmental documents for the proposed project. As on-call planning staff to the City of Blythe, Willdan Engineering, in turn, was authorized by the City to assist the Energy Commission in determining the appropriate environmental documentation to be prepared for the project pursuant to CEQA, beginning with an Initial Study.

In accordance with Section 15063 of the State CEQA Guidelines, the Energy Commission is required to prepare an Initial Study to determine if the project may have a significant effect on the environment. This Initial Study is intended to be an informational document providing the Energy Commission, other public agencies, and the general public with an objective assessment of the potential environmental impacts that could result from implementation of the project. The results of the Initial Study show that there are potentially significant impacts to Cultural Resources (archaeological resources), Geology and Soils (liquefaction and soil corrosivity), Hydrology and Water Quality (possible construction dewatering), and Noise (construction), but that these potential impacts can be reduced to less than significant levels through the imposition of proposed mitigation measures.

Impacts to other environmental factors - Aesthetics, Agriculture and Forestry Resources, Air Quality, Biological Resources, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation/Traffic, and Utilities and Service Systems - are considered as having a less than significant impact or no impact on the environment.

1. INTRODUCTION

Blackhawk Logistics, LLC, a jointly held company of HayDay Farms, Inc. and Border Valley Trading, Ltd., proposes to construct a publicly accessible Liquefied and Compressed Natural Gas (LCNG) dispensing facility on vacant property located at 450 S. Willow Street in Blythe, California. Blackhawk Logistics applied for a grant award of \$600,000 from the California Energy Commission (Energy Commission) to financially assist with the construction of the facility and was proposed for an award on April 24, 2012.

The project is a principally permitted use (i.e., a use allowed by right) in the General Commercial (C-G) zoning district in which it is proposed to be constructed. The project will only require a parcel merger prior to the issuance of required building/public improvement permits by the City of Blythe, which are “ministerial” actions under the California Environmental Quality Act (CEQA). Since no discretionary actions are required on the part of the City of Blythe in order to allow the project to proceed, the City determined that the project was exempt from further CEQA review.

Under CEQA, “project” means “the whole of an action, which has the potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment,” and that is “an activity undertaken by a person which is supported in whole or in part through public agency contracts, grants, subsidies, loans, or other forms of assistance from one or more public agencies.” The proposed LCNG facility is an activity that has the potential to result in a direct physical change to the environment. Additionally, the project is proposed to be partially supported by a discretionary grant from the Energy Commission, which it could decide to approve or not to approve at a future business meeting. Therefore, the Energy Commission’s consideration of discretionary grant funding for the proposed Blackhawk Logistics LCNG facility is a “project” under CEQA.

Although the City of Blythe has exempted the project as “ministerial,” the Energy Commission cannot similarly make this determination, since its decision to approve the requested grant funding is wholly discretionary. Hence, the Energy Commission’s consideration of awarding grant funding to construct the proposed LCNG facility is not exempt from CEQA. As the only public agency having discretionary approval over the project, the Energy Commission is, by default, the “lead agency” for the purposes of CEQA and is responsible for preparing the appropriate environmental documents for the proposed project. As on-call planning staff to the City of Blythe, Willdan Engineering, in turn, was authorized by the City to assist the Energy Commission in determining the appropriate environmental documentation to be prepared for the project pursuant to CEQA, beginning with an Initial Study.

2. PROJECT DESCRIPTION

The project applicant, Blackhawk Logistics, LLC, a jointly held company of HayDay Farms, Inc. and Border Valley Trading, Ltd., is proposing to construct an LCNG fueling station in the City of Blythe, California. The fueling station would serve HayDay Farms' expanding fleet of natural gas powered trucks, and those of a short list of private operators with service agreements with Blackhawk Logistics. The station would also be available for use by the general public. The project would be constructed in two to three phases with the first phase consisting of the installation of LNG fueling facilities. It is anticipated that the CNG fueling facilities would be added during the subsequent phases of the project, which will be dictated by market demand. However, the site planning and engineering for the project provides for the accommodation of CNG fueling facilities during the initial phase of development, if the market conditions so warrant.

2.1 PROJECT LOCATION

The project is located in the City of Blythe, in the easternmost portion of Riverside County, California. The project site lies in the southwest portion of the City, south of Interstate 10 (I-10) and the City's downtown area (Figure 1). More specifically, the project site consists of two parcels located on the east side of S. Willow Street between W. Wells Street and W. 14th Avenue (Figure 2).

2.2 BACKGROUND AND PURPOSE

Blackhawk Logistics, LLC, a jointly held company of HayDay Farms, Inc. and Border Valley Trading Ltd., has requested grant funding support from the California Energy Commission in the amount of \$600,000 to develop a publicly accessible LNG station in Blythe, California to fuel HayDay Farms' expanding fleet of natural gas powered trucks. In conjunction with this Energy Commission supported LNG station project, HayDay Farms and Border Valley Trading plan to include LCNG fueling capacity at this facility.

The initial LNG station project will provide alternative fueling options for LNG and CNG vehicle users with routes along I-10 and that operate in the Imperial Valley. The primary objective of this project is to establish the LNG fueling infrastructure to support HayDay Farms' fleet and others operating along one of the busiest stretches of highway in the nation. This project will make natural gas fuel accessible to the HayDay Farms' fleet and the general retail market, predominantly goods movement trucks operating along the I-10 between Arizona and California, including Swift, Western Milling, Apex Bulk Commodities, and other retail users.

This project also will help regional goods movement and public agency fleets transition to clean natural gas, including Mallet and Sons, Coachella Valley Ice Company, the Palo Verde Irrigation District, and the City of Blythe. These entities are specifically examining natural gas fuel and are interested in using the Blythe station as they adopt LNG and CNG usage. This project will therefore assist the Energy Commission in reducing petroleum use and greenhouse gas emissions from the existing HayDay Farms LNG fleet, as well as numerous heavy-duty diesel trucks operated locally or traveling on I-10 between Los Angeles and Phoenix.

HayDay Farms and its partner, Border Valley Trading, are existing natural gas fleet users with an extremely high fuel demand from 40 LNG trucks (20 trucks per fleet). Both fleets transitioned to LNG in 2008 in response to the San Pedro Bay Ports Clean Air Action Plan and used the Sunline LNG station in Thousand Palms for refueling, until it went offline in late 2008. HayDay Farms and Border





Valley Trading remained committed to LNG fueling and have been working together to construct public-access stations for both their operations, plus other regional fleets. This partnership was formalized with the creation of Blackhawk Logistics, LLC, and led to an Energy Commission supported LNG/LCNG station in Palm Springs. Blackhawk Logistics is now seeking Energy Commission funding for this LNG station in Blythe to support HayDay Farms' LNG operations, although the fleet will continue to use the Palm Springs station for fueling redundancy and en-route fueling.

Once established, the Blythe station will close an existing "gap" in clean fuel infrastructure in this region. The closest public access fueling stations to Blythe are currently 100 miles away in El Centro, and 120 miles away in Palm Springs. Therefore, this public-access station will fill an important gap in natural gas availability for natural gas vehicle users looking to travel lengthy distances along the I-10 and or through the Imperial Valley. In addition to HayDay Farms's own fleet of vehicles, several regional heavy-duty fleet operators are also expected to utilize this planned facility as previously stated.

The proposed Blythe station will serve an important economic function for a region that has been negatively impacted by the recession by providing a more economical fueling option for local fleets. This station will also reduce greenhouse gas and criteria pollutant emissions in an area that is heavily impacted by emissions, geography and weather patterns. Lastly, this station will support businesses located in hard-hit communities, helping them to save money, displace large quantities of petroleum, and use entirely low-carbon fueling operations. This station will also enable goods movement fleets to reliably reach the Southern California ports and create the last needed link into LNG fueling markets 150 miles away in Phoenix, Arizona. This Blythe station will also connect with public retail stations in Palm Springs and in Ontario, creating a true interstate regional clean fuel corridor that will enable Inland Empire and Arizona goods movement fleets to fuel with LNG and CNG across the states of California and Arizona.

Hayday Farms and Border Valley Trading will jointly own the land. They have already contracted with GreenFIX to oversee project implementation, and are in the process of vendor selection for the station development. Permitting, site design, and vendor research is all currently underway in preparation for potential Energy Commission funding. Led by a prepared and seasoned team with a seasoned understanding of the technology, Hayday Farms, Border Valley Trading, and GreenFIX are fully prepared to immediately implement this highly beneficial project. The full cost of the proposed fueling station will be \$1,725,000, with Blackhawk Logistics requesting \$600,000 in Energy Commission funding to support a project that will achieve the following goals:

- Support and bolster the regional refueling infrastructure strategy being developed in Southern California and Arizona through the development of a new publicly accessible station along a key goods movement corridor;
- Promote regional growth in alternative fuel vehicle deployments and the replacement of heavy-duty diesel trucks;
- Provide natural gas refueling for HayDay Farms and other retail fleets;
- Eliminating 212,500 gallons of diesel usage by HayDay Farms in 2013;
- Replacing 758,275 gallons of annual diesel use with LNG from conservative estimates of HayDay Farms and other retail use in 2015;
- Reducing annual greenhouse gas (GHG) emissions by 638 metric tons in 2013;
- Further reducing annual GHG emissions by 2,486 metric tons in 2015;
- Reducing annual GHG emissions by 4,798 metric tons from 2013-2015;
- Achieving these goals at a cost-effectiveness as low as \$0.40 per gallon of diesel fuel use eliminated and \$125.00 per metric ton of GHGs reduced from 2013-2015.

3. ENVIRONMENTAL CHECKLIST

PROJECT INFORMATION
1. Project Title: LCNG Fueling Facility
2. Lead Agency Name and Address: California Energy Commission 1516 Ninth Street Sacramento, CA 95814
3. Contact Person and Phone Number: Donald Coe, (916) 654-3941
4. Project Location: 450 S. Willow Street, Blythe, California
5. Project Sponsor's Name and Address: Blackhawk Logistics, LLC, 44700 Village Court, Suite 100, Palm Desert, CA 92260
6. General Plan Designation: General Commercial (CG)
7. Zoning: General Commercial (CG)

8. Description of Project (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.): **The proposed project involves the multi-phase development of a publicly accessible LCNG fueling station on a 1.73-acre site, at 450 S. Willow Street in the Blythe, California (Figure 3). The project would be constructed in two to three phases with the first phase consisting of the installation of LNG fueling facilities.**

The first phase of development will include the installation of an up to 15,000 gallon storage tank and ancillary equipment for the pumping, vaporization and dispensing of LNG fuel. Site preparation will occur during this phase to accommodate expanded LNG storage and the addition of a CNG fueling facility in the future, during subsequent phases of development, as market conditions warrant. Phase 1 of the development will also include the installation of utilities, supporting safety equipment, and a portable toilet module, as well as the construction of driveways, concrete pads, a storm water retention basin and landscaping improvements. The site will be enclosed by a 6 to 8-foot high wall along the Willow Street frontage and by chain link fencing along the remaining perimeter of the site. Two access points will be provided on Willow Street; the southern access for ingress only and the northern access for egress only.

Subsequent phases of development, which shall be dictated by market conditions and demand, may include the expansion of LNG storage to 30,000 gallons with the addition of 1 or more fueling dispensers and the addition of a CNG fueling facility with 1 or more fueling dispensers. These phases of development would also include the construction of a restroom facility with connection to the existing sewer main located in S. Willow Street.

Access to the private portion of the LNG station will be controlled by perimeter fencing with lockable, automatic rolling driveway gates. This portion of the station would be restricted to HayDay Farms and a short list of private operators with service agreements with Blackhawk Logistics. The public portion of the station will include unrestricted public access for LNG dispensing and future CNG fueling.

Gas deliveries during Phase1 will be dictated by demand but are estimated to be approximately twice each week. When fully developed and operational, it is anticipated that a maximum of 150 LNG vehicles and 40-50 CNG vehicles will use the fueling station daily. Gas deliveries to the site will increase as public/private demand for fuel increases.

All proposed facilities will comply with the National Fire Protection Association 52 (NFPA 52) Vehicular Gaseous Fuel Systems Code and with the City of Blythe and state fire protection regulations. These are applicable to all aspects of the project, including the storage tanks' structural integrity and the safety mechanisms on auxiliary attachments and supporting equipment. The facility will also be equipped with programmable security and emergency measures. Additional safety procedures will be followed by trained fuelers and by qualified routine inspection and maintenance personnel.

Assuming that the Energy Commission approves the grant award in November 2012, the final engineering, preconstruction and permitting for Phase 1 of the development would be performed between November 2012 and April 2013. The LNG equipment required for the project would also be ordered during this period. Site preparation and improvements would be completed during May and June 2013, and the installation of the LNG equipment to occur between June and August 2013. Phase 1 of the fueling station would become fully operational, following startup and commissioning, by September 2013. As previously stated, the timing of the subsequent phases of the station development will be dictated by market demand and conditions. However, the subsequent phases of development would require less time to construct than Phase 1 of the development since the site preparation and improvements needed to accommodate future expansion of the LNG fueling facilities and the possible addition of CNG fueling facilities will have been completed during Phase 1.

The project site currently consists of two parcels: APN 848-110-010, which is .86 acres in size, and APN 848-110-011, which is .87 acres in size. Therefore, a parcel merger will be required prior to the issuance of building/public improvement permits by the City of Blythe, all of which are "ministerial" actions under CEQA. There are no discretionary actions required on the part of the City of Blythe since the project is a principally permitted use (i.e., permitted by right) in the General Commercial (CG) zone in which it is proposed to be constructed.

9. Surrounding Land Uses and Setting: The proposed project is located in the southwest portion of the City, which is an urbanized area consisting of commercial and other non-residential uses intermingled with undeveloped lots. The project site is bordered by a truck/recreational vehicle (RV) parking area for a Super 8 Motel on the north, a public utility (i.e., Southern California Edison) service center on the east, vacant land on the south, and Willow Street and vacant land beyond to the west.

10. Other Public Agencies Whose Approval is Required (e.g., permits, financing approval, or participation agreement): **City of Blythe (ministerial approval of a parcel merger and the issuance of building and public improvement permits)**

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED					
	Aesthetics		Agriculture and Forest Resources		Air Quality
	Biological Resources		Cultural Resources		Geology and Soils
	Greenhouse Gas Emissions		Hazards and Hazardous Materials		Hydrology and Water Quality
	Land Use and Planning		Mineral Resources		Noise
	Population and Housing		Public Services		Recreation
	Transportation / Traffic		Utilities and Service Systems		Mandatory Findings of Significance

DETERMINATION (To be completed by the Lead Agency)	
On the basis of this initial evaluation:	
<input type="checkbox"/>	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
<input checked="" type="checkbox"/>	I find that although the proposed project could have a significant effect on the environment, there WILL NOT be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
<input type="checkbox"/>	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
<input type="checkbox"/>	I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
<input type="checkbox"/>	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION , including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

Date

Printed Name

Title

Agency

EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
4. “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in (5) below, may be cross-referenced).
5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
 - a) Earlier Analysis Used. Identify and state where they are available for review.
 - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c) Mitigation Measures. For effects that are “Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project’s environmental effects in whatever format is selected.
9. The explanation of each issue should identify:
 - a) The significance criteria or threshold, if any, used to evaluate each question; and
 - b) The mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. Aesthetics.				
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ENVIRONMENTAL SETTING

The City of Blythe is located in eastern Riverside County, along the Colorado River and immediately west of the Arizona-California border. The City of Blythe is somewhat topographically uniform and has an average elevation of 270 feet above mean sea level. The elevation ranges from 430 feet on the Palo Verde Mesa to about 255 feet south of 18th Avenue. Development is generally focused along the main north-south and east-west arterial roadways in the City and along the I-10 corridor. The primary aesthetic and scenic resources in the City and surrounding area are the Colorado River and the views to the Palo Verde Mesa to the west and north, Big Maria Mountains to the north, Dome Rock, Trigo and Chocolate Mountains across the Colorado River in Arizona, and the McCoy and Chocolate Mountains to the northwest and southwest, respectively (*Final Program EIR, City of Blythe General Plan 2025*).

DISCUSSION

a) Have a substantial adverse effect on a scenic vista?

The project involves the construction of an LCNG fueling station in the southwestern portion of the City. The project area is urbanized and comprised of commercial and other non-residential uses interspersed with undeveloped properties. There are no scenic or aesthetic resources on or within the immediate vicinity of the project site. The project will involve the installation of up to two LNG storage tanks. The cylindrical-shaped structures will have a maximum height of 50 feet and a maximum diameter of 15 feet and will be visible from surrounding properties. However, given the location of the project and the fact that there are no scenic vistas in the immediate vicinity of the project site, the project has no potential to impact scenic vistas of the Colorado River or the surrounding mountains to the north, east, and south. Therefore, it is determined that the project will have no impact on scenic resources.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Interstate 10, which is located approximately 1,000 feet north of the site, is not listed as an "Officially Designated State Scenic Highway" or an "Eligible and Officially Designated Route" according to the California Department of Transportation's Scenic Highway Program. Therefore, the project would not substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

The project site is currently undeveloped. The immediately surrounding properties are developed with a motel parking lot for trucks/recreational vehicles and a public utility service center, or are otherwise undeveloped. The proposed project will convert the existing vacant land into an LCNG fueling facility. The project area is designated General Commercial in the Blythe General Plan and the project is consistent with this designation. Although the visual character of the project site will change, it will not impair the long-term future development pattern envisioned by the General Plan. Therefore, impacts to the visual character of the area will be less than significant.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The project will include outdoor illumination for nighttime safety and security. In compliance with Section 17.28.030 of the Blythe Municipal Code, which contains performance standards and general requirements that require lighting to be arranged so as to reflect away from adjoining property and to not cause a nuisance either to highway traffic or to the living environment, the lighting will consist of downward oriented luminaries with shielding to prevent light spillage on adjacent parcels.

The project will involve the installation of up to two cylindrical-shaped LNG storage tanks, with maximum heights of 50 feet and maximum diameters of 15 feet. Though the proposed LNG tanks will be visible from S. Lovekin Boulevard, W. 14th Avenue, and other nearby roadways, they are not expected to create glare that would adversely affect the day or nighttime views in the area since they will be painted with a matt-finish, natural light color that is complementary to the desert environment. Similarly, the other facilities proposed on the site will not contain reflective surfaces. Therefore, less than significant impacts are anticipated to result from the proposed project.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The project will have a less than significant impact on the visual character of the site and surrounding area.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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II. Agriculture and Forest Resources.

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state’s inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

The City of Blythe is located within the Palo Verde Valley. According to the *Final Program EIR, City of Blythe General Plan 2025*, the valley is known as one of the richest agricultural regions in California, having been created by the continuous flooding of the valley floor by the Colorado River, leaving deep, rich deposits of silt. The flat floor of the Palo Verde Valley is characterized by a constantly changing pattern of crops and

cultivation. Agricultural uses in the City include primarily alfalfa, cotton, hay, orchards, and field crops. Land to the north and south of I-10 and east of the Palo Verde Mesa are considered suitable for seasonal livestock (sheep) grazing. Prime agricultural soils are found east of the airport and used for orchards and field crops. Large areas with active Williamson Act contracts are located just north of the City boundaries between U.S. 95 and the Colorado River, and south of I-10 outside of the City boundaries. Being located in the Lower Mojave Desert region of Southern California, there is no timberland or forest land within the City or surrounding area.

DISCUSSION

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The project site is shown on the maps prepared pursuant to the Farmland mapping and Monitoring Program of the California Resources Agency as "Urban and Built-Up Land."

b) Conflict with existing zoning for agricultural use or a Williamson Act contract?

The project site is currently zoned General Commercial (CG). This zoning designation is not intended to facilitate agricultural production.

The surrounding zoning designations are General Commercial (CG) to the north; Public/Quasi-Public (P/Q-P) to the east; General Commercial (CG) to the west; and General Commercial (CG) to the south. Therefore, the project would not create conflicts between agriculture zoning and non-agriculture zoning.

In addition, according to the Riverside County Land Information System, the site is not covered by a Williamson Act Contract. Therefore, there are no impacts on existing agricultural zoning or a Williamson Act Contract.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

The current zoning designation on the site is General Commercial (CG). This zoning designation is not intended to accommodate forest land or timberland resources. There is no land on the site or in the vicinity of the site that is zoned as forest land or timberland. Therefore, the project would not conflict with existing zoning for forest land or timberland and it would not cause the rezoning of forest land or timberland.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

There is no forest land on or in the vicinity of the project site and, therefore, the project has no potential to result in the loss of forest land or the conversion of forest land to non-forest use.

- e) **Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?**

Since there is no Farmland or forest land on or in the vicinity of the project site, the project does not involve any changes in the existing environment that could result in the conversion of Farmland to non-agricultural use or the conversion of forest land to non-forest use.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The proposed project will have no impact on agriculture or forest resources.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. Air Quality.				
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make the following determinations.				
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ENVIRONMENTAL SETTING

The Mojave Desert Air Quality Management District (MDAQMD) has jurisdiction over air quality management for the project. According to the *Final Program EIR, City of Blythe General Plan 2025*, the MDAQMD has two plans in effect to address Ozone and Particulate Matter of 10 microns or less in size (PM₁₀): "MDAQMD 2004 Ozone Attainment Plan (State and Federal)" and "Final Mojave Desert Planning Area Federal Particulate Matter (PM₁₀) Attainment Plan." However, the PM₁₀ attainment plan does not apply to the Eastern Riverside County portion of the Mojave Desert Air Basin, because this area is in attainment for the federal PM₁₀.

The MDAQMD's primary means of implementing the above air quality plans is by adopting and enforcing rules and regulations. Stationary sources within the jurisdiction are regulated by the District's permit authority over such sources and through its review and planning activities.

In addition to various general MDAQMD rules concerning permits and fees, the following Prohibitory Rules are specifically applicable to the long-term development included in the *City of Blythe General Plan 2025* planning area: Rule 403 Fugitive Dust, Rule 1103 Cutback and Emulsified Asphalt, and Rule 1113 Architectural Coatings (during construction). Prohibitory rules must be complied with; violations are subject to fine. (Ref. General Plan EIR Pages 3.2-6 and 3.2-7).

DISCUSSION

a) Conflict with or obstruct implementation of the applicable air quality plan?

Project-generated emissions were modeled using the California Emissions Estimator Model (CalEEMod). Project-generated emissions were modeled based on project specific information and/or default information contained in CalEEMod, if project specific information was not available. Based on the CalEEMod computer program, the project's air pollutant emissions generated during all phases of the project will not exceed construction or operational emission thresholds. (See Tables 1 through 3). Therefore, the project's emissions are in compliance with the thresholds established by the Mojave Desert Air Quality Management District.

A project is considered to be compliant with the applicable air quality plans if it is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plans). Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast. An example of a non-conforming project would be one that increases the gross number of dwelling units, increases the number of trips, and/or increases the overall vehicle miles traveled in an affected area (relative to the applicable land use plan).

The City's General Plan was used to generate the growth forecast that is the underpinning of the applicable air quality plans. The proposed project, in turn, is consistent with the Blythe General Plan designation of the project site as General Commercial. Therefore, the project is in not in conflict with the Air Quality Plans of the Mojave Desert Air Quality Management District. Moreover, as discussed in the Background and Purpose section of this Initial Study, the project is expected to have a beneficial impact on regional air quality by providing low carbon fuels for goods movement vehicles operating between the Southern California ports and Arizona and thereby reducing annual GHG emissions from these vehicles by 4,798 metric tons from 2013-2015.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

The CEQA Guidelines indicate that a significant impact would occur if the proposed project would violate any air quality standard or contribute significantly to an existing or projected air quality violation.

The applicable thresholds of significance for air emissions generated by the Project are established by the Mojave Desert Air Quality Management District (MDAQMD) and are shown Table 1.

Table 1
MDAQMD Significant Emission Thresholds

Criteria Pollutant	Daily Threshold (pounds)
Carbon Monoxide (CO)	548
Oxides of Nitrogen (NOx)	137
Reactive Organic Matter (ROG) and Volatile Organic Compounds (VOC)	137
Oxides of Sulphur (SOx)	137
Particulate Matter (PM10)	82
Particulate Matter (PM2.5)	82

Source: Mojave Desert Air Quality Management District

Construction Emissions:

Construction emissions can be distinguished as either on-site or off-site. On-site emissions generated during construction principally consist of exhaust emissions (CO, ROG/VOC, NO_x, SO_x, PM₁₀, CO₂ and PM_{2.5}) from equipment use, and fugitive dust (PM₁₀, PM_{2.5}) from clearing/grubbing, on-site traffic, and ground disturbance. Off-site emissions during construction typically consist of exhaust emissions from truck traffic and worker commute trips; road dust associated with traffic to and from the construction site; and fugitive dust (PM₁₀ and PM_{2.5}) from trucks hauling materials and construction debris or excavated soils to/from the site.

The air quality calculations/analysis for the proposed project, which are presented in Appendix A, assumed a schedule for construction and estimated the project completion in 128-days. Table 2 shows the project's emissions for construction.

Table 2
Construction Emissions

Pollutant	Pounds (lbs/day)	Mojave AQMD Threshold	Exceeds Threshold?
CO	25.35	548	NO
NOx	33.67	137	NO
ROG/VOC	5.97	137	NO
PM 10	8.02	82	NO
PM 2.5	4.64	82	NO
SO2	0.04	137	NO

As shown in Table 2, construction emissions would be below the Mojave AQMD's significance thresholds for CO, ROG, NOx, PM₁₀, PM_{2.5} and SO₂. With no emissions exceeding the significance thresholds, predicted emissions would be considered to have a less than significant adverse impact during the construction phase of the project.

Operational Emissions:

Operational emissions were modeled using the California Emissions Estimator Model (CalEEMod) and the results of the modeling are presented in Appendix A. Project-generated emissions were modeled based on project specific information and/or default information contained in CalEEMod. The operational emissions were estimated on all three (3) phases of the project described as follows:

Phase 1:

- 15,000 gallon storage tank and ancillary equipment for the pumping, vaporization and dispensing of LNG fuel.

Phases 2 - 3

- Additional 15,000 gallon LNG storage tank and ancillary equipment for the pumping, vaporization and dispensing of LNG fuel.
- CNG fueling facilities.
- Restroom facility connected to the existing sewer main located in South Willow Street.

Table 3 shows the project's emissions for operations.

**Table 3
Operational Emissions**

Pollutant	Pounds (lbs/day)	Mojave AQMD Threshold	Exceeds Threshold?
CO	25.35	548	NO
NOx	33.67	137	NO
ROG/VOC	4.04	137	NO
PM 10	2.07	82	NO
PM 2.5	0.51	82	NO
SO ₂	0.02	137	NO

Conclusion

Both construction and operation emissions are below the thresholds established by the Mojave Desert Air Quality Management District. Nevertheless, the Mojave Desert Air Quality Management District enforces a series of rules and regulations that are intended to reduce air quality impacts to the maximum extent feasible and the project will be required to comply with all applicable rules and regulations. Moreover, as indicated earlier, the project will assist in reducing annual GHG emissions from goods movement vehicles operating along the I-10 between the Southern California ports and Arizona by 4,798 metric tons from 2013-2015. Therefore, it can be concluded that the project will not violate any air quality standard or contribute substantially to an existing or projected air quality violation.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

The project is located in a region that has been identified as being in Non-Attainment for Ozone and PM₁₀ (State) according to the California Air Resources Board Area Designation Maps. This means that the background concentration of these pollutants have historically been over the Federal and/or State Ambient Air Quality Standards. With respect to air quality, no individual project would by itself result in Non-Attainment of the Federal or State Ambient Air Quality Standards. However, a project's air pollution emissions although individually limited, may be cumulatively considerable when taken in combination with past, present, and future development projects. In order to be considered significant, a project's air pollutant emissions must exceed the emission thresholds established by the regional Air Quality Management District.

The results of the CalEEMod computer model prepared for the project determined that the thresholds for the above referenced criteria pollutants would not be exceeded by the project. (See Tables 2 and 3). Therefore, impacts from the project are not cumulatively considerable when included with other past, present, and future probable projects.

d) Expose sensitive receptors to substantial pollutant concentrations?

According to the Mojave Desert Air Quality Management Plan, CEQA Guidelines, February 9, 2009, the following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated:

- Any industrial project within 1000 feet;
- A distribution center (40 or more trucks per day) within 1000 feet;
- A major transportation project (50,000 or more vehicles per day) within 1000 feet;
- A dry cleaner using perchloroethylene within 500 feet;
- A gasoline dispensing facility within 300 feet.

The project involves the construction of a fuel dispensing facility, but a lower hydrocarbon vapor emitting facility than a traditional gasoline station. The potentially sensitive receptors in the project area are Miller Park, south of W. 14th Avenue, and several motels lying along the south side of W. Donlon Street, north of the project site. None of these potentially sensitive receptors are located within 300 feet of the project site. Moreover, because the project generates total emissions (direct and indirect) less than the thresholds established by the Mojave Desert AQMD, any impacts are considered to be less than significant.

e) Create objectionable odors affecting a substantial number of people?

Projects that typically emit odors include: Agriculture (farming and livestock); Chemical Plants; Composting Operations; Fiberglass Molding; Landfills; Refineries; Rendering Plants; Rail Yards; and Wastewater Treatment Plants. The proposed project is a dispensing facility for LNG and CNG, which are odorless substances.

The project does not propose any uses that will emit objectionable odors, therefore long-term impacts from odors are less than significant. During construction, odors from construction activities, such as laying asphalt will occur. Due to the short-term nature of the construction activities and the small scale of the project, short-term odor impacts will be less than significant.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The project will have a less than significant impact locally and a beneficial impact regionally, by aiding in the reduction of GHG emissions from diesel powered trucks transporting goods between the Ports of Long Beach and Los Angeles and Arizona.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. Biological Resources.				
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

The *City of Blythe General Plan 2025* planning area includes a rich and diverse range of biological resources. This can be attributed to the quality and quantity of natural habitats and to variations in topography, soil type and elevation. The most notable natural habitat types include lower desert, riparian woodland, and permanent wetland. These are sensitive habitats due to the presence of one or more rare, endangered or threatened species.

The Colorado River is the main aquatic habitat along the eastern edge of the planning area. Surface water is also channeled throughout the planning area in open and piped irrigation ditches which are operated and maintained by the Palo Verde Irrigation District. Riparian habitat and related vegetation occur along the Colorado River, agricultural drains and fringes of agricultural lands.

DISCUSSION

- a) **Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?**

The project site is undeveloped, but has been disturbed by human activity (i.e., graded/disked) and is considered to be “highly disturbed.” The site is devoid of any significant types of vegetation. The sparse vegetative cover on the site is limited to common ruderal grasses and low growing scrub vegetation. Because of the level of disturbance on the site, there is no habitat on the site that supports any species identified as candidate, sensitive or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

- b) **Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service?**

Section 404 of the Clean Water Act defines wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.” [Ref. EPA Regulations listed at 40 CFR 230.3(t)].

The California Department of Fish and Game found the U.S. Fish and Wildlife Service wetland definition (Section 404 definition above) and classification system to be the most biologically valid. The Department of Fish and Game staff uses this definition as a guide in identifying wetlands.

Based on a field review, the project site does not contain riparian habitat, sensitive natural communities, or wetlands that would fall under the jurisdiction of the U.S. Army Corps of Engineers, the California Department of Fish and Game, or the Regional Water Quality Control Board.

- c) **Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

See response to preceding question.

- d) **Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

Wildlife corridors link together areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human development. Corridors effectively act as links between different populations of a species. Interference with the movement of native resident migratory fish or wildlife

species occurs through the fragmentation of open space areas caused by urbanization.

Wildlife nursery sites are areas that provide valuable spawning and nursery habitat for fish and wildlife. Wildlife nursery sites occur in a variety of settings, such as trees, wetlands, rivers, lakes, forests, woodlands and grasslands to name a few. The use of a nursery site would be impeded if the use of the nursery site was interfered with directly or indirectly by a project's development or activities.

The site is located within an urbanized area and is bordered by a motel truck/RV parking area on the north, a public utility service facility on the east, vacant land on the south, and S. Willow Street and vacant land beyond on the west. The site is highly disturbed and is devoid of any significant types of vegetation. Consequently, the site does not serve as a wildlife movement corridor or wildlife nursery site.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Figure 6-2 of the *City of Blythe General Plan 2025* illustrates the applicability of policies for the protection of biological resources. The primary mechanisms are establishing Resource Conservation Areas or Resource Management Areas. Resource Conservation Areas contain the most sensitive and valuable habitat that requires protection and would be conserved. Resource Management Areas generally contain some resources that merit long-term preservation.

According to Figure 6-2 of the *City of Blythe General Plan 2025*, the project site is not located in either a Resource Conservation Area or a Resource Management Area. Additionally, the City of Blythe does not have a tree preservation ordinance. For these reasons, the project will not be in conflict with local policies or ordinances protecting biological resources, including tree preservation.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Lower Colorado River Multiple Species Conservation Program (LCR MSCP) is a coordinated, comprehensive conservation approach for the LCR basin for a period of 50 years. The LCR MSCP covers a portion of the area in the City of Blythe, but does not cover the project site. In addition, a review of the U.S. Fish and Wildlife Service Habitat Conservation Plan database indicated that there are no habitat conservation plans that cover the project site.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The proposed project will have no impact on biological resources.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. Cultural Resources.				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ENVIRONMENTAL SETTING

In March 2005, Senate Bill 18 (SB 18) went into effect requiring local governments to consult with Native American tribes prior to the adoption or amendment of a general plan or specific plan. The intent of SB 18 coordination is to obtain information regarding the presence of traditional lands, cultural places or sacred lands within a planning area. During the course of preparing the *City of Blythe General Plan 2025* the City initiated consultation with the Native American Heritage Commission (NAHC). The City formally requested from the NAHC a list of Native American groups and tribes that are on the "SB 18 Consultation List" so that any tribes with traditional lands or cultural places located within the City of Blythe's jurisdiction could be contacted.

The NAHC provided a formal response directing the City to contact three local Native American tribal representatives and also requested that the City contact the Imperial Valley College Desert Museum and the Eastern Information Center at U.C. Riverside. All groups were contacted and the results of the research are included in the *Final Program EIR, City of Blythe General Plan 2025*. A records search conducted in April 2006 by the Eastern Information Center (EIC) revealed that 17 cultural resources studies have been conducted and 78 cultural resources properties are recorded within the Blythe planning area. No properties within the planning area are listed in the National Register of Historic Places (NRHP). Three sites were listed in the Office of Historic Preservation's (OHP) Archaeological Determinations of Eligibility; however, none of them are eligible for listing on the NRHP. Forty-three properties, which are located in the older core area of the City, are listed in the OHP Directories of Properties in the Historic Property Data File (HPD). As shown on Exhibit 3.4-1 of the *Final Program EIR, City of Blythe General Plan 2025*, Areas of Archaeological Sensitivity are located west, southwest, and northwest of the City's corporate boundaries.

DISCUSSION

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Based on CEQA Guidelines Section 15064.5, "historical resources" include a resource that is eligible for listing in the California Register of Historical Resources or a resource listed in a local register of historical resources. There are no structures of any kind located on the project site. Therefore, the project will have no impact on a historical resource.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

The project site is located in an urbanized area and has been disturbed as a result of past human activities on the site. In addition, according to Figure 6-3 of the *Final Program EIR, City of Blythe General Plan 2025*, the site is not located within Areas of Archaeological Sensitivity. (Ref. General Plan EIR Page 3.4-4). However, it is always possible that cultural resources could be detected during site preparation and construction activities. The geotechnical report prepared for the project recommends over-excavation of the existing surface soils to a minimum of 7 feet below existing grade within the building pad and foundation areas of the site. The *Final Program EIR, City of Blythe General Plan 2025*, requires that the mitigation measure identified below be implemented as an environmental mitigation measure or condition of project approval. (Ref. General Plan EIR Page 3.4-3). To ensure potential impacts remain less than significant, the mitigation measure below is recommended.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The potential for paleontological resources to be present on a site is primarily based on the geologic conditions of an area. A formation or rock unit has paleontological sensitivity if it has previously produced, or has characteristics conducive to the preservation of paleontological resources. According to the Riverside County Land Information System, the site has a "Low Potential" for yielding paleontological resources and there are no unique geologic features on the site. Therefore, the project's potential impact on paleontological resources is considered to be less than significant.

d) Disturb any human remains, including those interred outside of formal cemeteries?

The project site has never been formally used as a cemetery and there is no record or known history of any human remains ever being interred on the site. Moreover, in the unlikely event of an accidental discovery or recognition of any human remains, California State Health and Safety Code Section 7050.5 dictates that no further disturbances shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to CEQA regulations and Public Resources Code Section 5097.98. With adherence to mandatory State Health and Safety Code Section 7050.5, which stipulates the process to be

followed when human remains are encountered, no mitigation measures are necessary.

PROPOSED MITIGATION MEASURES

Mitigation Measure CR-1: In the event that any cultural resources are discovered during clearing, grading or construction, project operations shall cease until a qualified archaeologist has evaluated the situation. Following the evaluation, the project sponsor shall implement recommendations provided by the archaeologist in consultation with the City and the California Energy Commission, which are consistent with State law. Any cultural resources found on the proposed project site will be recorded or described in a professional report and submitted to the University of California at Riverside.

CONCLUSION

With the imposition of the mitigation measure described above, any potential impacts associated with the project will be mitigated to a less than significant level.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. Geology and Soils.				
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

As discussed in the geotechnical engineering report prepared for the proposed project by Earth Systems Southwest, the project site lies within the Mojave Desert geomorphic province of California, an area of interspersed mountain ranges and broad desert plains. The predominant geologic feature in the project area is the Colorado River and associated floodplain of the Palo Verde Valley. Shallow sediments within the floodplain consist of fine- to medium-grained sands with imbedded clays and silts of alluvial origin. On-site soils consist of interbedded Holocene sediments of loosely consolidated fine-grained sands, silts, and clays.

There are no active faults in the immediate vicinity of the site. The site does not lie within a currently delineated Alquist-Priolo Earthquake Fault Zone. The San Andreas Fault is considered to be the primary source for seismic ground shaking and is approximately 65 miles southwest of the site.

DISCUSSION

The following responses are based in part on the document titled: Geotechnical Engineering Report, Proposed Willow Street LCNG Refueling Station, Blythe, Riverside County, California prepared by Earth Systems Southwest ("Earth Systems Report") dated June 21, 2012. This report is presented in its entirety in Appendix B.

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault?

The site is not located within an Alquist-Priolo Earthquake Fault Zone according to maps prepared by the State Geologist and information provided by the Riverside County Land Information System and the Earth Systems Report. According to the Earth Systems Report, there are no well-delineated active fault lines through the Palo Verde Valley shown on California Geological Survey maps and, based upon a review of Google Earth aerial photographs, no obvious air photograph lineaments were noted that would be suggestive of active fault rupture. Therefore, due to the lack of defined fault related photographic lineaments, the presence of a uniform floodplain surface, and the absence of previous mapped faults in the vicinity of the project site, the Earth Systems Report concludes that the potential for active faulting at the project site is very low.

ii) Strong seismic ground shaking?

Seismic ground shaking is influenced by the proximity of the site to an earthquake fault, the intensity of the seismic event, and the underlying soil composition. The Earth Systems Report indicates that the primary seismic hazard at the project site is weak to moderate ground shaking from earthquakes along the San Andreas Fault located approximately 65 miles southwest of the site. However, the design of the LCNG fueling facilities and restroom proposed on the site will at a minimum comply with the seismic design criteria of the California

Building Code. This will ensure that the proposed facilities will withstand the ground shaking associated with future seismic events on the San Andreas Fault, although they may experience some structural and non-structural damage.

iii) Seismic-related ground failure, including liquefaction?

According to the Riverside County Land Information System and the Earth Systems Report, the potential for liquefaction to occur on the site is considered “very high.” The Earth Systems Report concluded that the primary geotechnical constraint for development of the site is the potential for liquefaction induced ground settlement. In addressing this constraint, the report contains recommendations intended to reduce the potential distress to the facilities proposed on the site should liquefaction occur. Therefore, **Mitigation Measures GEO-1 through GEO-4** are recommended below.

iv) Landslides?

The potential for landslides to occur is not present because the site is generally flat with a gentle slope to the south with elevations on the order of 266 feet above mean sea level. There are no significant slopes on or adjacent to the project site.

b) Result in substantial soil erosion or the loss of topsoil?

Development of the site will require grading and excavation, which will result in the disturbance and possible loss of topsoil and the potential for soil erosion. The Earth Systems Report indicates that the project site lies within an area of moderate to high potential for wind and water erosion. However, watering disturbed surfaces to minimize fugitive dust during construction and installing landscaping and hardscape as elements of the project will render any potential erosion impacts less than significant.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Lateral spreading is a term referring to landslides that commonly form on gentle slopes and that have rapid fluid-like flow movement, like water. The Earth Systems Report indicates that the potential for liquefaction induced lateral spreading of the proposed fill pad slopes is considered low as no free-face or sloping ground conditions exist adjacent to the project site.

As noted in the response to Question VI(a)(iv), the site is not susceptible to landslides, since the site is relatively flat.

As noted in the response to Question VI(a)(iii), the potential for liquefaction to occur on the site is considered “very high,” and therefore Mitigation Measures GEO-1 through GEO-4 are required.

According to the Earth Systems Report, the project site is located in a geologic environment where the potential for collapsible soil exists. The results of collapse potential tests performed on selected soil samples from varying depths and

above the groundwater table indicated that the soils on the project site have a low potential for collapse as the majority of the soils are below the groundwater table and the soils which are above the groundwater table have a low collapse potential. Similarly, the potential for subsidence is low.

In conclusion, the risks associated with an unstable geologic unit are considered to have “no impact” or a “less than significant impact” except for liquefaction. With adherence to **Mitigation Measures GEO-1 through GEO-4**, impacts associated with liquefaction will be less than significant. The Earth Systems Report indicates that the recommended on-site soil improvement techniques and specialized foundation system that comprise **Mitigation Measures GEO-1 through GEO-4** will reduce the potential distress to the proposed fueling facility should liquefaction occur. These mitigation measures are intended to reduce the magnitude and severity of potential liquefaction induced differential settlement distress to the proposed restroom building, LCNG tank pad, and the above ground diesel tank pad, such that the estimated ground settlement can be accommodated in structural design.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Expansive soils are soils that swell and contract depending on the amount of water that is present. Depending on the extent and location below finished sub-grade, expansive soils can have a detrimental effect on structures. According to the Earth Systems Report, and based on laboratory testing, the expansion potential of the on-site soils is typically “low” as defined by the American Society of Testing and materials.

While this Initial Study Checklist does not identify soil corrosivity as an environmental issue to be addressed, corrosivity is a soil characteristics that can adversely affect a project. High chloride and sulfate content soils can be corrosive to concrete and buried metals. Although it was based on a single near surface soil sample, the Earth Systems Report indicates that corrosion values associated with that soil sample are normally considered as being very severely corrosive to buried metals and as possessing a “severe” exposure to sulfate attack for concrete. Therefore, the report recommends **Mitigation Measure GEO-5** below.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

The project will initially use a portable toilet module and will eventually be served by a permanent restroom facility connected to the sewer main located in S. Willow Street. Therefore, septic tanks will not be utilized by the project.

PROPOSED MITIGATION MEASURES

In addition to recommending adherence to numerous best soils engineering practices during site preparation and construction, the Earth Systems Report contains the

following recommendations to specifically mitigate potential seismic-related ground failure, including liquefaction:

Mitigation Measure GEO-1 (Soil Recomaction): Because of the relatively non-uniform and under-compacted nature of the site soils, as well as the liquefaction potential, the recompaction of soils in building areas is recommended. The over-excavation for the restroom building, LNG tank pad, and above ground diesel tank pad shall be performed as one excavation operation (if possible). The existing surface soils within the building pad and foundation areas shall be over-excavated a minimum of 7 feet below existing grade. The over-excavation shall extend for 7 feet beyond the outer edge of exterior footings or mat slab, where possible. The bottom of the sub-excavation shall be scarified, moisture conditioned, and recompacted to at least 90% relative compaction (ASTM D 1557) for an additional depth of one foot. Over-excavation of 7 feet will place the excavation bottom in the near vicinity of groundwater. Where compaction of the resultant excavation bottom is difficult or not achievable due the near vicinity of groundwater, this requirement may be reviewed and revised by the project geotechnical engineer. Alternative techniques to stabilize the bottom may be required (such as placing gravel and punching it into the soft soil surface prior to placement of geo-grid).

Auxiliary structures such as perimeter walls and retaining walls, shall be over-excavated a minimum of 2 feet below the bottom of the foundation or existing grade, whichever is lower. The over-excavation shall extend for 2 feet beyond the outer edge of exterior footings, where possible. The bottom of the sub-excavation shall be scarified, moisture conditioned, and recompacted to at least 90% relative compaction (ASTM D 1557) for an additional depth of one-foot.

Mitigation Measure GEO-2 (Soil Densification): Following soil recompaction as stipulated in **Mitigation Measure GEO-1**, three layers of tri-axial geo-grid (Tensar TX160 or equivalent) shall then be placed within the building pad remedial grading areas. One layer placed at the base of the over-excavation (after the sub-excavation has been moisture conditioned and compacted), and then at one-foot increments as the fill is placed at 7, 6, and 5 feet below grade. Each intervening foot of fill shall be compacted to at least 90% relative compaction (ASTM D 1557). The resultant excavation shall then be covered with a filter fabric (Mirafi 140N) overlain by 18 inches of 1 to 2-inch diameter crushed aggregate. The aggregate shall be lightly moistened and tamped with heavy vibratory equipment into place using 6-9 inch thick lifts to induce consolidation. The aggregate layer shall be enveloped on the top, sides and bottom with the filter fabric (i.e., burrito wrapped). The filter fabric shall be overlapped on top by at least 3 feet. At least one foot of fill shall then be placed to the mat foundation subgrade bottom elevation (see **Mitigation Measure GEO-3** for vent installation recommendations which shall partially occur prior to backfilling). The mat subgrade bottom elevation shall be designed such that this minimum thickness of fill can be accommodated, which may require designing the mat foundation finish surface elevation to be above grade. Placement of underground utilities shall take the geo-grid location into consideration, such that damage to the grid is not allowed during subsequent trench excavations and placement of piping.

Mitigation Measure GEO-3 (Installation of Hydrostatic Pressure Relief Vents): A minimum of 6 uniformly distributed vertical vent pipes consisting of 6-inch diameter Schedule 80 PVC pipe shall be placed around the tank and restroom mats and extend from the ground surface into the middle of the gravel layer. The vent piping shall be cutoff approximately 18 inches above the finished surface, covered with a top cap that is open to the atmosphere yet stops rainwater entry, and covered with a screen to prevent rodent entry. The vent piping shall be protected on all four sides with bollards or concrete encasement. If the pipes are concrete encased, the top of concrete shall be below the top of the pipe to limit water runoff entry. The vent piping is intended to relieve hydrostatic pressures in the event of liquefaction. In no event shall the pipes be capped or encased in boxes such that water outflow would be inhibited during a seismic event.

Mitigation Measure GEO-4 (Design of Tank, Restroom and Other Foundations): Foundations for the tank and restroom structures shall be supported on mat foundations bearing in properly prepared and compacted soils placed as required by **Mitigation Measures GEO-1 and GEO-2**. The requirements for the design of foundations that follow are based on "low" expansion category soils in the upper 7 feet of subgrade. During remedial grading of building pads, the soil expansion potential shall be verified and foundation recommendations confirmed or modified, based on the site specific expansion index at each building site.

Foundation design is the responsibility of the structural engineer, considering the structural loading and the geotechnical parameters identified in the Earth Systems Report. A geotechnical engineer/engineering geologist shall observe foundation excavations before placement of reinforcing steel or concrete. Loose soil or construction debris shall be removed from footing excavations before placement of concrete.

Bearing Capacity - Foundations for Buildings and Tank Pads: A minimum footing depth of 18 inches below lowest adjacent grade shall be maintained (lowest adjacent = lowest grade within 2 feet laterally). Allowable soil bearing pressures are given below for mat foundations bearing on recompacted soils as described in **Mitigation Measures GEO -1 and GEO-3**. Allowable bearing pressures are net (weight of footing and soil surcharge may be neglected). A factor-of-safety of 3.0 was used for determining allowable bearing values.

Mat foundations, 36-inch minimum thickness and 18-inch minimum below grade: 1,000 psf for dead plus design live loads.

Allowable increases of 500 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 2,500 psf.

Bearing Capacity - Foundations for Retaining Walls, Perimeter Walls and Isolated Pads: A minimum footing depth of 18 inches below lowest adjacent grade shall be maintained (lowest adjacent = lowest grade within 2 feet laterally). Allowable soil

bearing pressures are given below for foundations bearing on recompacted soils as described in **Mitigation Measure GEO-1**. Allowable bearing pressures are net (weight of footing and soil surcharge may be neglected). A factor-of-safety of 3.0 was used for determining allowable bearing values.

Continuous wall foundations, 12-inch minimum width and 18-inch minimum below grade: 1,500 psf for dead plus design live loads.

Allowable increases of 250 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 3,000 psf.

Isolated pad foundations, 2 x 2-foot minimum in plan and 18-inch minimum below grade: 1,500 psf for dead plus design live loads.

Allowable increases of 250 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 3,000 psf.

An average modulus of subgrade reaction, k , of 100 pounds per cubic inch (pci) can be used to design footings and slabs founded upon compacted fill. ACI Section 4.3, Table 4.3.1 should be followed for recommended cement type, water cement ratio, and compressive strength for severe exposure conditions.

Minimum Foundation Reinforcement: Minimum reinforcement for continuous footings shall be four No. 4 steel reinforcing bars, two placed near the top and two placed near the bottom of the footing. This reinforcing is not intended to supersede any additional structural requirements provided by the structural engineer.

The Earth Systems Report also contains the following recommendation to mitigate the potential impact that the corrosivity of the on-site soils could have on the project.

Mitigation Measure GEO-5: A soils/geotechnical engineer competent in corrosion mitigation shall review the results of the Earth Systems Report and more conclusively determine the corrosion potential of the on-site soils through a more extensive sampling of the on-site soils, and then appropriately design a corrosion protection plan for the proposed project. The plan shall identify the measures/techniques to be used (e.g., cathodic protection, impressed current, or soil modification) to adequately protect foundations and buried pipes and other metals from potential soil corrosion.

CONCLUSION

With adherence to the proposed mitigation measure described above, any potential impacts associated with the project will be mitigated to a less than significant level.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. Greenhouse Gas Emissions.				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

The primary regulatory mechanisms in place at the State level to address greenhouse gas emissions are Assembly Bill 32 and Senate Bill 375.

The plans required by Assembly Bill 32 and Senate Bill 375 would be considered an appropriate “applicable plan, policy, or regulation” in order to determine if a project was in conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Generally there are two primary criteria to consider when making this determination.

1. A project is consistent with a greenhouse gas emission plan, policy, or regulation if it will not result in an increase in the frequency or severity of greenhouse gas emissions or delay timely attainment of greenhouse emission reduction goals.
2. A project is consistent a greenhouse gas emission plan, policy, or regulation if it is not in conflict with the recommended actions contained in a plan or the provisions of a policy or regulation to reduce greenhouse gas emissions.

DISCUSSION

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

According to CEQA Guidelines Section 15064.4, when making a determination of the significance of greenhouse gas emissions, the “lead agency shall have discretion to determine, in the context of a particular project, whether to (1) use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use.” Moreover, CEQA Guidelines Section 15064.7(c) provides that “a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts...”

The *Riverside County Climate Action Plan* presents a comprehensive set of actions to reduce the County's internal and external GHG emissions consistent with the AB 32 Scoping Plan and is used in this analysis for purposes of complying with CEQA Guidelines Section 15064.7(c).

The following analysis is based on the *Governor's Office of Planning and Research, Technical Advisory on CEQA and Climate Change*.

Identify Greenhouse Gas Emissions:

Project-generated GHG emissions were modeled using the California Emissions Estimator Model (CalEEMod) and the results of the modeling are presented in Appendix A. Project-generated emissions were modeled based on project specific information and/or default information contained in CalEEMod, The project is estimated to generate 88.34 metric tons of carbon dioxide equivalent (MTCO₂e) per year during construction and 372.28 MTCO₂e during on-going operation of the project.

**Table 4
Greenhouse Gas Emissions (Annual)**

Project MTCO ₂ e Emissions	Riverside County Climate Action Plan Threshold MTCO ₂ e/Yr.	Mojave Desert Air Quality Management District Threshold MTCO ₂ e/Yr.	Exceeds Threshold?
Construction: 88.34	3,000	100,000	No
Operation: 372.28			

Determining Significance:

According to Riverside County's Greenhouse Gas Emissions CEQA Thresholds adopted in May, 2012, small projects that do not exceed 3,000 MTCO₂e per year will be considered to have a less than significant individual and cumulative impact for GHG emissions. As shown on Table 4, the project's emissions are 88.34 MTCO₂e per year during construction and 372.28 MTCO₂e during on-going operation of the project. These levels of GHG emissions do not exceed the 3,000 MTCO₂e threshold established by Riverside County.

In addition, the Mojave Desert Air Quality Management District has established a threshold of 100,000 tons of MTCO₂e per year. The project's emissions are 88.34 MTCO₂e per year during construction and 372.28 MTCO₂e during on-going operation of the project which does not exceed the 100,000 MTCO₂e threshold established by the Mojave Desert Air Quality Management District.

Therefore, the project's GHG emissions are not anticipated to exceed established GHG emissions thresholds and a less than significant impact is expected. However, recognizing that the project will facilitate the replacement of diesel fuel with LCNG in the operation of goods movement vehicles operating between the Southern California ports and Arizona, the project will have a beneficial impact on regional air quality by reducing annual GHG emissions from these vehicles by 4,798 metric tons from 2013-2015.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

As noted in the analysis under Question VII(a) above, the project was analyzed using the Governor's Office of Planning and Research, Technical Advisory on CEQA and Climate Change which is intended to address greenhouse gas emissions in a manner consistent with Assembly Bill 32 and Senate Bill 375. In addition, the project implements recommendations contained in the AB 32 Scoping Plan. Therefore, the project is not in conflict with any plans to regulate greenhouse gas emissions.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The project will have a less than significant impact locally and a beneficial impact regionally, by aiding in the reduction of GHG emissions from diesel powered trucks transporting goods between the Ports of Long Beach and Los Angeles and Arizona.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. Hazards and Hazardous Materials				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

The urban and natural environments of Blythe contain a number of public safety issues and public hazards which have been considered by the City during the course of the land use planning process. The primary goal of this process is to

protect the public's safety. The City is responsible for managing a broad range of issues related to public safety, public health and hazards including those mandated by State policies (such as seismic and building safety) and those associated with natural and man-made disasters including emergency response planning. Some of the potential public safety issues and hazards to the general public include flooding, unstable earth conditions, wildland and urban fires, crime, and exposure to hazardous materials.

DISCUSSION

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

According to Section 25371(a) of the California Health and Safety Code, the definition of "hazardous substance" does not include Liquefied Natural Gas (LNG). However, LNG can be considered hazardous under certain conditions due to its cryogenic temperatures, dispersion and flammability characteristics.

The California Energy Commission describes LNG as a clear, colorless, odorless liquid that is neither corrosive nor toxic (See <http://www.energy.ca.gov/lng/index.html>). The transport and dispensing of LNG operations are heavily regulated to ensure safety and security. According to the Energy Economics Research, under the Bureau of Economic Geology, the LNG industry has an "excellent safety record." Technical and operational practices have evolved to ensure safe and secure operations related to LNG.

The proposed project will be constructed in accordance with the applicable requirements of the National Fire Protection Association (NFPA) 52 Vehicular Gaseous Fuel System Codes (2010 Edition). In it, Chapter 12 of the NFPA 52 establishes a series of regulations related to LNG Fueling Facilities. The chapter applies to the design, siting, construction, installation, spill containment, and operation of containers, pressure vessels, pumps, vaporization equipment, buildings, structures, and associated equipment used for the storage and dispensing of LNG as engine fuel. Chapter 15 of the NFPA imposes requirements on LNG fire protection, personnel safety, security, training, and warning signs. Compliance with NFPA 52 will be determined by an engineered evaluation to ensure that facilities and fueling operations do not pose a hazard to the public.

The U.S. Department of Transportation (DOT) prescribes safety standards concerning the transport of LNG. As required, LNG will be delivered to the site utilizing a heavily insulated (double-walled) transport vessel at atmospheric pressure (LNG will not be under pressure). The tanker truck is anticipated to have a 10,000-gallon capacity.

The proposed project will be designed, constructed, operated, and maintained to ensure the safe use, dispensing, and storage of LNG in compliance with the applicable NFPA, Department of Transportation, and other safety standards. The project will also comply with Chapters 22, 27, 30, 32 and 34 of the California Fire

Code. On-site facilities will include accident prevention and mitigation plans and procedures. The applicability of these safety mechanisms will be determined and customized based on an engineering-level evaluation. Therefore, less than significant impacts are anticipated.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?

The practices of transport, storage and dispensing of LNG as engine fuel are regulated to reduce the potential risk of accidents or other abnormal operating conditions. The safety practices related to the handling of LNG are governed by: industry standards; regulations; industry experience and training; and design/technology. The integration of these factors and associated engineering-level requirements is inherent to the proposed project.

Two publications are used to determine risks associated with LNG fueling operations in respect to foreseeable accident conditions. One is "Qualitative Risk Assessment for an LNG Refueling Station and Review of Relevant Safety Issues," prepared by the Idaho National Engineering Laboratory (INEL). The second is "LNG Safety and Security," a report prepared by the Center for Energy Economics. According to these reports, Liquefied Natural Gas is handled at 260 degrees below zero and without pressurization. LNG is only flammable after it returns to a gaseous state and reaches a concentration range of 5% to 15% per volume. Furthermore, LNG is less subject to accidental fire than gasoline or diesel if vapors come into contact with a spark or flame.

The following incidents are individual scenarios leading to a potential on-site accident condition:

- LNG release due to construction accident
- LNG release due to external event
- Hose failure
- Drive-away
- Filling error
- LNG release due to maintenance error
- Pipe failure
- Seal failure
- Storage tank failure
- Truck fuel tank failure (on-site)
- LNG release due to vehicular accident
- Valve failure

In the event of equipment failure (hose, seal, pipe, etc.), any moderate amount of LNG (mostly methane) would evaporate rapidly. In this form, natural gas vapors are lighter than air, causing them to rise and dissipate. LNG vapors would not accumulate. A leak would be unlikely to reach a flame or spark due to industry-standard refueling station restrictions (e.g. smoking prohibition). In the event that evaporated LNG reached an ignition source, only a small percentage of the gas vapors would burn. Flammability would only be reached

with an LNG vapor concentration between 5% and 15% (percent per volume). Concentrations higher or lower than this limited range would not cause a fire. At project buildout, the facility does not include any buildings except for a single restroom located away from the dispensing stations. Consequently, there are few confined areas where accidental leaked vapors would be contained at the flammability-prone levels. In the event of accidental fire, methane vapors would burn along the flame rather than explode.

A larger volume of LNG would only be released by a catastrophic failure or accident, primarily associated with the storage tank or truck tank. In this scenario, LNG would retain its liquefied state for a short duration of time. LNG would reach the floor and begin draining to the on-site retention basin as it rapidly evaporates. If this material reached an ignition source, only the vapors within the limited gas concentration (5 – 15% per volume) would burn, but not explode due to the open environment nature of the proposed fueling facility.

LNG dispensing will only be performed by trained fuelers in a gate controlled facility. The fuel dispenser stations, supporting equipment and LNG tanks will be physically protected from vehicular accidents with the construction of strategically placed bollards. The project will also incorporate a series of safety measures to ensure that the public is not compromised from any foreseeable accident conditions due to fueling operations. A programmable logic controller (PCL) will be utilized to monitor and control all essential functions of the on-site system. This includes temperature, pressure, flow rates, emergency conditions, and others operating variables. The PCL will be connected by modem to operating personnel who can constantly check existing and historical operating conditions remotely. The PCL will adjust performance conditions and execute system-wide shut-down if deemed necessary. In accordance with NFPA 52, additional monitoring equipment and emergency stop devices will be installed as part of the project.

Taking into account the limited flammability characteristics of LNG and the industry-standard safety measures (structural and operational) to which the facility must adhere, a foreseeable accident condition caused by the project is not expected to create a significant hazard to the public or the environment. Therefore, less than significant impacts are anticipated.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

There are no existing or proposed schools located within one-quarter mile of the project site.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Neither the project site nor any surrounding properties are included on the Hazardous Waste and Substances Site List maintained by the State Department of Toxic Substances Control.

- e) **For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?**

According to the Riverside County Land Use Information System, the project site is not located within an Airport Influence Area or Airport Compatibility Zone. The project is located approximately 5 miles from Blythe Municipal Airport. Therefore, there will be no impact.

- f) **For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

A review of the area surrounding the project site revealed that there are no personal use airports (i.e., private airstrips) operating in the vicinity (i.e., area that could be impacted by aircraft take offs and landings) of the project site. Therefore, there will be no impact.

- g) **Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

Access to the site is provided from S. Lovekin Boulevard, via W. Wells Street, and from W. 14th Avenue via S. Willow Street. All of these streets will remain open during construction activities. Therefore, the project will not impair implementation of, or physically interfere with, an emergency evacuation or response plan.

- h) **Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?**

According to the Riverside County Land Information System, the project site is not located within a High Fire Hazard Area. The project site is not adjacent to or intermixed with wildlands. Therefore, no impacts are expected with regard to wildland fires.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The project will have less than significant impacts with regard to hazards and hazardous materials.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. Hydrology and Water Quality. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|
| b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Otherwise substantially degrade water quality? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| j) Inundation by seiche, tsunami, or mudflow? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
-

ENVIRONMENTAL SETTING

The following discussion of the environmental setting is taken from the *Final Program EIR, City of Blythe General Plan 2025*.

Surface Water Hydrology

The City of Blythe is located in the Colorado Desert (a subdivision of the Sonoran Desert) and the climate is characterized by low annual precipitation, low relative humidity and high summer temperatures. Mean annual rainfall at the Blythe Airport is 3.61 inches. Precipitation is typically concentrated in the summer period (July-October). Summer

storms originating in Baja California often release substantial amounts of rain in short periods.

The Blythe planning area is located on an alluvial terrace formed by deposition within the lower Colorado River basin. The Colorado River drainage basin includes portions of seven states, and a significant region of northern Mexico. A series of dams in both the Upper Colorado River Basin and the Lower Colorado River Basin control the Colorado River for the purposes of water supply, flood management, hydropower generation, recreation, and habitat uses. Water supply in the River is allocated by interstate compact and international treaty.

The Palo Verde Irrigation District (PVID) canals and drain system consists of about 244 miles of main and lateral canals that divert and route Colorado River water to a maximum of 120,500 acres of cultivated land in the Palo Verde Valley and adjacent Mesa. Another 141 miles of drainage system collect and return water to the River.

Groundwater Conditions and Quality

The Blythe area is underlain by the Palo Verde Valley Groundwater Basin that covers approximately 200 square-miles. Irrigated agriculture was first initiated in the Blythe area in the late 1800s. As a result of widespread irrigation, the groundwater table level also increased. Drainage networks were built to prevent groundwater levels from reaching the ground surface. Agricultural water supplies are primarily provided via surface canals from the Colorado River and are administered by the PVID.

The groundwater basin underlying Blythe supplies the majority of municipal water demands of the City and surrounding area. The groundwater system is sustained by applied irrigation water, infiltration from the Colorado River, and to a much lesser degree by direct infiltration of precipitation and recharge from local surface water drainage washes. There is no evidence of overdraft in the Blythe area. The Palo Verde groundwater basin ranges from the Colorado River on the east, the Palo Verde Diversion Dam and the Big Maria Mountains on the north, the Palo Verde Mesa on the west, and the Palo Verde Mountains to the south. The principal water-bearing deposits in the Palo Verde Valley Groundwater Basin are two units of Colorado River alluvium overlying the upper Bouse Formation limestone, and a conglomerate deposit of course older alluvium deposited under older (Miocene) high flow regimes. Groundwater aquifer levels in the Palo Verde Valley have been observed ranging from 3.9 to 22.6 feet below the surface.

Domestic water for the City of Blythe is obtained from 14 deep water wells and 5 storage tanks capable of storing 4.0 million gallons of water. The City supplies approximately 1.75 billion gallons of water per year to the City and surrounding area. The predominant chemical character of groundwater in the Colorado Desert is sodium sulfate or sodium chloride. Calcium and bicarbonate are also present in significant concentrations in some areas which is typical of the water chemistry of the Colorado River – Sonoran Desert area. With normal treatment, this water meets drinking water standards.

Extensive agricultural production offers the potential for high nitrate concentrations. However, this is not the case locally. Extensive testing of groundwater in the Blythe area by the Department of Environmental Health has not found nitrate levels that exceed the State's Maximum Contaminant Level (45 mg/l). This may be because the extensive irrigation system utilized in the Blythe area flushes the nitrates away. The eventual transition of residences from septic systems to wastewater treatment service and limitations on the issuance of new septic system permits may serve to further safeguard Blythe's groundwater from higher nitrate levels in the future.

Floodplains and Flooding Hazards

The Federal Emergency Management Agency (FEMA) has mapped special flood hazard areas, which includes lands subject to a 100-year flood, defined as an area that has a one percent (1%) chance of being flooded in any given year. According to the FEMA, the easternmost portion of the planning area, closest to the Colorado River, is located within a 100-year flood hazard zone.

DISCUSSION

The following responses are based in part on the documents titled: Blythe LCNG Site Drainage Study prepared by The Holt Group, Inc. ("Holt Group Report") dated July 16, 2012 and Geotechnical Engineering Report, Proposed Willow Street LCNG Refueling Station, Blythe, Riverside County, California prepared by Earth Systems Southwest ("Earth Systems Report") dated June 21, 2012.

a) Violate any water quality standards or waste discharge requirements?

According to the Earth Systems Report, groundwater was encountered during the geotechnical field investigation at a depth of approximately 8 feet below ground surface and dewatering may be required during excavation and construction. Water quality standards and waste discharge requirements could potentially be violated if any contaminated groundwater encountered during utility trenching and retention basin excavation is discharged on the surface during construction dewatering. Therefore, **Mitigation Measure HYD-1** below is recommended for dewatering during excavation and construction.

In addition, any construction on-site would be required to comply with the National Pollutant Discharge Elimination System (NPDES) and related implementing documents, which include the Water Quality Management Plan (WQMP) of the countywide Municipal Separate Storm Sewer System Permit (MS4 Permit) as issued by the Colorado River Regional Water Quality Control Board. The WQMP requires that construction projects must use Best Management Practices (BMPs).

Based on the above, the proposed project would not violate any water quality standards or waste discharge requirements.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a

lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

The restroom facility that is proposed to be constructed during Phase 2 of the project would utilize a minor amount of domestic water. The only other water usage that might occur on-site would be in conjunction with periodic maintenance activities and irrigation to assist with the initial establishment of drought tolerant landscaping. Runoff from the impervious surfaces to be constructed on the site will be collected and retained on-site for percolation and groundwater recharge.

The total storage capacity of the Palo Verde Valley Groundwater Basin is estimated at 4,960,000 acre feet. In addition, the Colorado River recharges the shallow aquifer by seepage in some reaches and by diversions from the Colorado River in the form of seepage from canals and irrigated land (Metzger 1973). The groundwater levels have tended to remain relatively stable in the basin (Owen- Joyce 1984). The City has not seen any reduction in the groundwater table. Bulletin 118 – Update 2003 does not indicate any potential overdraft of the Palo Verde Valley Groundwater Basin. (Ref. 2010 Urban Water Management Plan, Blythe 2010, March 2011).

Therefore, it is not anticipated that the project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

The conditions stipulated by the City of Blythe with regard to drainage are: *The applicant shall prepare a hydrology report addressing a 10 and 100-year storm event as per the City of Blythe Standard Drawings and Specifications and design a storm water retention basin capable of accommodating the proposed runoff from the project for a ten-year event and shall be dry within 72 hours. The retention basin shall have five feet of separation between the groundwater table and the invert elevation and shall be maintained by the owner and/or applicant. The basin shall not reside within city right-of-way.*

The proposed drainage system for the project is described as follows:

- On-Site Retention Basin – Based on the hydrology calculations for the site, The Holt Group is recommending a 3-foot deep basin that is 10'x150' at the bottom with 5:1 side slopes. The basin would be 40'x180' at the top. The basin would retain a maximum of 12,670 cubic feet of runoff.

Assuming a percolation rate of 1 inch per hour, per the Earth Systems Report, at a depth of 2.85 feet (34 inches), the basin would drain in 34 hours. This would meet the City's requirement of draining within 72 hours with a safety factor of almost 3.

The drainage system will be designed to manage soil erosion, siltation, and any sources of polluted runoff in accordance with the mandatory requirements of the Colorado River Water Quality Control Board. In addition, the project site does not contain any streams or rivers that would be altered by the construction of the drainage improvements described above. Therefore, impacts will be less than significant.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

As indicated in the preceding response, there are no streams or rivers on or in the vicinity of the project site. The development of the proposed LCNG fueling station will involve the construction of impervious surfaces on the currently undeveloped site and result in increased runoff from the site. However, the site will be graded so that all runoff from the site will be collected in an on-site retention basin for percolation and groundwater recharge. Therefore, impacts will be less than significant.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

There are no existing storm water drainage facilities on or in the vicinity of the site. However, a retention basin will be constructed on-site as a component of the project. The basin has been designed to accommodate anticipated runoff from the site in accordance with the requirements of the City of Blythe. Therefore, impacts will be less than significant.

f) Otherwise substantially degrade water quality?

As previously indicated, the drainage system for the proposed project will be designed to manage soil erosion, siltation, and any sources of polluted runoff in accordance with the mandatory requirements of the Colorado River Water Quality Control Board. Therefore, the project is not expected to substantially degrade water quality.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

The project does not involve the development of housing and according to Figure 7-1 of the *Safety Element of the City of Blythe General Plan 2025*, the project site is located significantly to the west of the FEMA designated 100-year flood hazard zone for the Blythe area.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

As indicated in the response to the preceding question, the project site is located significantly to the west of the FEMA designated 100-year flood hazard zone for the Blythe area.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

According to Figure 7-1 of the *Safety Element of the City of Blythe General Plan 2025*, the project site is located significantly to the west of the FEMA designated 100-year flood hazard zone for the Blythe area. However, Figure 7-1 does indicate that the project site is located within a “Dam Inundation Area” as is much of the City of Blythe.

Future development along the Colorado River is subject to the failure of numerous dams and water control facilities that exist upstream of the City of Blythe. The Colorado River is dammed approximately 60 miles upstream of the City at Parker Dam, and the Palo Verde Diversion Dam is located approximately 9 miles north of Blythe. It would take a catastrophic event such as a total dam failure to compromise the integrity of Parker Dam and the Palo Verde Diversion Dam. The likelihood of this event to occur is considered extremely remote according to the Bureau of Reclamation, (Ref. *Final Program EIR, City of Blythe General Plan 2025*, Page 3.6-13).

In the unlikely event of an upstream dam failure, there is an estimated minimum of 23 hours before the flood waters reach the Blythe area. The City of Blythe also has an Emergency Operations Plan in place which designates the proper procedures to follow in the case of a major emergency or disaster. (Ref. *Final Program EIR, City of Blythe General Plan 2025*, Page 3.6-14).

j) Inundation by seiche, tsunami, or mudflow?

Being located approximately 160 miles east of the Pacific Ocean, the project area is not identified on the Tsunami Inundation Maps prepared by the California Department of Conservation.

There are no bodies of water in the vicinity of the project site that are large enough to produce a seiche that could impact the project site.

Based on the responses to Questions VI (a) and VI(c) of this Initial Study Checklist, the project site is not located in an area prone to landslides, soil slips, or slumps. Therefore, there is no potential for the proposed project to be inundated by seiches, tsunamis, or mudflows.

PROPOSED MITIGATION MEASURES

HYD-1: If significant groundwater is encountered within utility trench or retention basin excavations, the applicant shall obtain permits from the City of Blythe Department of Public Works and Colorado River Regional Water Quality Control Board for the surface discharge of groundwater generated by construction dewatering. Permit regulations may require treatment of groundwater generated by construction dewatering activities prior to surface discharge.

CONCLUSION

With adherence to the proposed mitigation measure described above, the project will have a less than significant impact on hydrology and water quality.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. Land Use and Planning.				
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

The City of Blythe was incorporated in 1916, with the predominant land use being agriculture.

The City comprises approximately 16,400 acres (approximately 27 square-miles) of incorporated lands. The City's sphere of influence (SOI) surrounds the incorporated city limits and comprises approximately 12,800 acres (approximately 20 square miles). The SOI surrounds the incorporated City limits and extends from the Colorado River on the east, west to and including, the Blythe Airport, and from Second Avenue on the north to Eighteenth Avenue on the south although not all lands within these boundaries are included in the SOI.

As part of the City of Blythe General Plan 2025, the City has identified three Planning Areas that are relevant to the City's long term land use planning and policy efforts: Planning Area 1 is located north and west of the Blythe Municipal Golf Course; Planning Area 2 is located north of the existing city limits and/or SOI adjacent to the Colorado River; and Planning Area 3 is located south of the existing SOI boundary along the Colorado River.

The City has also prepared the Colorado River Corridor Plan. The Corridor Plan represents a comprehensive vision for growth of all lands along the Colorado River within the City of Blythe and its SOI. The Plan is intended to facilitate the implementation of the City of Blythe General Plan 2025 policies applicable to the Colorado River Corridor area and will guide the long-term evolution of this portion of the City with planning, policy and development implications for the entire City.

DISCUSSION

a) Physically divide an established community?

The site is bordered by vacant land on the north, a public utility (i.e., Southern California Edison) service facility on the east, vacant land on the south, and Willow Street and vacant land beyond to the west. The project is consistent with the existing and planned pattern of commercial and other non-residential uses in the surrounding area. Establishment of the project would not create physical barriers or impede vehicle or pedestrian access to the surrounding area. Therefore, a physical division of an established community will not occur.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The project is consistent with the City's General Plan and is a principally permitted use (i.e., permitted by right) in the C-G (General Commercial) Zoning District in which it is proposed. The project site does not lie within a Specific Plan area and is located well outside the California Coastal Zone. There are no regional, state or federal habitat conservation plans or programs that apply to the project site. Therefore, the proposed project does not conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

The Lower Colorado River Multiple Species Conservation Program (LCR MSCP) is a coordinated, comprehensive conservation approach for the LCR basin for a period of 50 years. The LCR MSCP covers a portion of the area in the City of Blythe but does not cover the project site. In addition, a review of the U.S. Fish and Wildlife Service Habitat Conservation Plan database indicated that there are no habitat conservation plans that cover the project site.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The proposed project will have no impact on existing land uses or the applicable planning programs of local, regional, state, or federal agencies.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. Mineral Resources.				
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

Urban preemption of prime mineral deposits and conflicts between mining and other uses throughout California led to passage of the Surface Mining and Reclamation Act of 1975 (SMARA), which establishes policies for conservation and development of mineral lands, and contains specific provisions for the classification of mineral lands by the State Geologist.

SMARA requires all cities and counties to incorporate in their general plans mapped designations approved by the state Division of Mines and Geology. These designations are to include lands categorized as Mineral Resource Zones, the most significant of which is a designation of mineral resources that are of regional or statewide significance.

According to the *Final Program EIR, City of Blythe General Plan 2025*, there are no active mines within the planning area for the *City of Blythe General Plan 2025*, although several areas along Midland Road were historically mined for gypsum and gravel. The majority of the closest mining operations are located north, outside of the planning area.

DISCUSSION

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

According to reports and maps prepared by the California Geological Survey, the site is not located in Mineral Resource Zone-2a or 2b (areas underlain by mineral deposits where geologic data show that significant measured or indicated resources are present or areas underlain by mineral deposits where geologic information indicates that significant inferred resources are present).

In addition, according to the California Geological Survey's Aggregate Availability Map, the project is not located within the vicinity of an aggregate production area. Therefore, the project has no potential to result in the loss of availability of a known mineral resource.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

The City's General Plan does not delineate any mineral resource recovery sites within the City limits. Therefore, the project would have no impact on mineral resources.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The proposed project will have no impact on mineral resources.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. Noise.				
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

According to the *Final Program EIR, City of Blythe General Plan 2025*, in most areas of Blythe, automobile and truck traffic is the major source of environmental noise. Traffic generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Generally, the federal government has established noise standards for transportation-related noise sources that are closely linked to interstate commerce, such as aircraft, locomotives, and trucks, and, for those noise sources, the state government is preempted from establishing more stringent standards. The state government sets noise standards for those transportation noise sources that are not preempted from regulation, such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through the City's noise ordinances and general plan policies.

DISCUSSION

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

The project involves the development of an LCNG fueling station. The applicable noise regulations are contained in the City of Blythe General Plan 2025 Noise Element. The General Plan establishes the following policy/standard with respect to noise:

"S-1 Policy: Areas shall be recognized as noise impacted if exposed to existing or projected future noise levels at the property line which exceed 65dBL_{dn} (CNEL)." (Ref. General Plan Page 8-3).

The predominant source of noise in the project area is traffic on I-10, which is located approximately 1,000 feet to the north of the site. Figure 8-2 of the City of Blythe General Plan 2025 Noise Element, Future Generalized Noise Contours indicates that the project site lies within the existing and future 60 dBL_{dn} (CNEL) noise contour for traffic on I-10. This is less than the 65 dBL_{dn} (CNEL) identified as the threshold of significance in General Plan Policy S-1 above. Table 3.8-2 of the City of Blythe General Plan 2025 Noise Element, Land Use Compatibility for Community Noise Environment, further indicates that the proposed fueling station is a land use that is "Normally Acceptable" within noise exposure areas of up to 70 dBL_{dn} (CNEL).

b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?

Some common sources of ground-borne vibration are trains, buses, large trucks, and construction activities such as blasting, pile-driving and operating heavy earth-moving equipment. Ground-borne noise is the result of the vibration and movement of a building, rattling of windows, and shaking of interior items such as dishes, wall pictures, etc. In essence, the room surfaces project the noise so it is perceptible to the ear.

Impacts are not anticipated to be significant because a substantial amount of grading and blasting or pile-driving are not required to construct the project. However, because the site is to be used as an LCNG fueling station for goods movement vehicles (i.e., heavy duty trucks) traveling on I-10 between Los Angeles and Phoenix, trucks refueling at the station could result in noise caused by ground-borne vibration or ground-borne noise. Truck traffic will access the site from I-10 via S. Lovekin Boulevard (a major arterial roadway). The S. Lovekin Boulevard interchange on I-10 is located approximately 1,000 feet to the north of the site, and much of the intervening area is developed with freeway oriented businesses and other non-residential uses. Therefore, it is not anticipated that noise generated by truck traffic using the LCNG station will cause a significant impact on the surrounding area.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

The ambient noise levels in the project vicinity are primarily attributable to traffic on I-10, which is located approximately 1,000 feet north of the project site. The fueling facilities proposed on the site will generate noise that will be undetectable beyond the project site and the trucks refueled at the site (estimated at up to 200 per day or an average of 8.3 per hour) will not appreciably contribute to an increase in ambient noise levels. The truck trips generated by the project will largely consist of a redistribution of existing trips within the City, away from other fueling facilities, or the capture of existing pass-by trips on I-10 and, as such, are already reflected in the current and projected ambient noise levels in the project vicinity.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Noise generated during the construction of the proposed project will likely exceed 65dB A threshold of significance for short durations. Therefore, as required by the City of Blythe General Plan 2025 Noise Element, **Mitigation Measure NOI-1** is recommended below.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

The Compatibility Plan for Blythe Airport is based upon the Airport Master Plan adopted by the Riverside County Board of Supervisors in 2001. According to Figure 8.5, Ultimate Noise Impacts, the project site is not located within an area impacted by noise from the Blythe Airport.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

A review of the area surrounding the project site revealed that there are no personal use airports (i.e., private airstrips) operating in the vicinity that would expose people using the project to excessive aircraft noise levels.

PROPOSED MITIGATION MEASURES

Mitigation Measure NOI-1: Construction hours shall be limited to the daytime hours of 7am to 5pm Monday through Saturday. No construction shall be allowed on Sundays or Holidays. (Ref. General Plan EIR page.3.8-20).

CONCLUSION

With adherence to the proposed mitigation measure described above, the project will not significantly impact noise levels in the project area. Conversely, the project will not be adversely affected by the existing or future noise levels in the project vicinity.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. Population and Housing.				
Would the project:				
(a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(b) Displace a substantial number of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

According to the 2010 U.S. Census, the City's population is 20,817. These persons reside in 5,473 housing units. The *City of Blythe General Plan 2025* envisions a planning area population of 24,563 by 2025 and 89,542 upon build out, which is expected to occur over a 40-50 year period. It should be noted that of the 20,817 existing residents, 12,972 live "in households" while 7,845 occupy group quarters.

DISCUSSION

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The project consists of the construction of an LCNG fueling facility and does not involve any residential dwelling units. All public infrastructure necessary to support the project is available at the project site and no extension of streets or other infrastructure is required. Therefore, the project will neither directly nor indirectly induce population growth in the Blythe area.

g) Displace a substantial number of existing housing, necessitating the construction of replacement housing elsewhere?

The project site is currently vacant and devoid of any structures. Therefore, the proposed project does not involve the demolition of any residences and there will be no displacement of housing.

h) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The proposed project does not involve the demolition of any housing units. Therefore, there will be no displacement of people.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The proposed project will have no impact on population and housing

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. Public Services.				
Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

Law enforcement within the City is performed by the City of Blythe Police Department, with secondary backup from the Riverside County Sheriff's Department. Fire protection services are provided by the City of Blythe Volunteer Fire Department and the Riverside County Fire Department/California Department of Forestry through an automatic aid agreement. The City of Blythe and surrounding area are served by the Palo Verde Unified School District. The District operates three elementary schools, one middle school, one high school, and one continuation high school for adult education in the City of Blythe. The City of Blythe's Parks Department currently operates eight (8) park sites encompassing approximately 74.01 acres.

Other recreational facilities in the City include Blythe Municipal Golf Course, the Colorado River, Desert Resource Areas, and campground facilities such as Mayflower Park, McIntyre Park, and the Blythe Marina.

DISCUSSION

- a) **Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:**

Fire Protection?

Fire protection services are provided by the City of Blythe Volunteer Fire Department and the Riverside County Fire Department/California Department of Forestry through an automatic aid agreement. The Blythe Volunteer Fire Department station is located at 201 North Commercial Street and is staffed with a full-time fire chief and paid volunteers. The Riverside County Fire Department station is located at 140 West Barnard Street and provides additional back up to the Blythe Volunteer Fire Department.

As discussed in the response to Question XIII(a), the project would not cause any additional permanent population growth. Therefore, while the project and the resulting project activities generate some additional demand for fire protection services, the project is not of the size and scale that would require the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, because adequate fire protection facilities and services exist to serve the project.

Police Protection?

The City of Blythe and the Riverside County Sheriff's Department provide police protection services to the City. The City of Blythe Police Department is located at 240 North Spring Street in Blythe and its service area covers all land in the City limits.

As discussed in the response to Question XIII(a), the project would not cause any additional permanent population growth. Therefore, while the project and the resulting project activities will generate some additional demand for police protection services, the project is not of the size and scale that would require the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, because adequate police protection facilities and services exist to serve the project.

Schools?

The project is located within the Palo Verde Unified School District. As discussed in the response to Question XIII(a), the project would not result in any permanent population growth. Therefore, the project would have no impact on schools/educational services.

Parks?

The proposed project involves the construction of a self-service LCNG fueling station. As discussed in the response to Question XIII(a), the project would not result in any additional permanent population growth. Therefore, the project

would have no impact on the need for new or expanded park and recreational facilities.

Other Public facilities?

The proposed project involves the construction of a self service LCNG fueling station. As discussed in the response to Question XIII(a), the project would not cause any additional permanent population growth. Therefore, the project would have no impact on other public services.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The project will have a less than significant effect on the provision of public services to residents and businesses within the City of Blythe.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. Recreation.				
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

The *Final Program EIR, City of Blythe General Plan 2025* indicates that the City of Blythe’s Parks Department currently operates eight (8) park sites encompassing approximately 74.01 acres. The City’s goal is a minimum level of park service of 4.5 acres of parkland per 1,000 residents. The City currently provides a level of service of 5.4 acres of existing park land per 1,000 residents (excluding the prison population).

Other recreational facilities in the City include Blythe Municipal Golf Course, the Colorado River, Desert Resource Areas, and campground facilities such as Mayflower Park, McIntyre Park, and the Blythe Marina. There are numerous existing public and private boat ramps and beach areas along the Colorado River that are used by local area residents and visitors for recreational purposes including boating, picnicking, canoeing, and fishing. The City of Blythe hosts periodic regional and recreational events

along the Colorado River that provide outdoor recreational activities for residents and visitors.

DISCUSSION

- a) **Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

The proposed project involves the construction of an LCNG fueling station. As discussed in the response to Question XIII(a), the project will neither directly nor indirectly cause any additional population growth. Therefore, construction of the project has no potential to lead to the substantial physical deterioration of any existing recreational facilities through the increased use of such facilities.

- b) **Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?**

The proposed project involves the construction of an LCNG fueling station and does not include any recreational facilities. Further, since the project will not contribute to population growth that could result in an increased demand for recreational facilities, it does not require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The proposed project will have no impact on recreational facilities.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. Transportation/Traffic.				
Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exceed, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a change in location that results in substantial safety risks?

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| d) Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Result in inadequate emergency access? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f) Result in inadequate parking capacity? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
-

ENVIRONMENTAL SETTING

As described in the *Final Program EIR, City of Blythe General Plan 2025*, the City's transportation network is characterized by I-10 running east-west, State Highway 78 and 95 running north-south, and a number of arterial streets providing regional and local access. The I-10 is a four-lane freeway (i.e., two lanes in each direction) and carries approximately 25,500 vehicles per day (Caltrans, 2004). State Highway 78 (SR78) links the Palo Verde Valley with Imperial Valley to the southwest. U.S. 95 links the Palo Verde Valley with communities along the Colorado River, including Laughlin, Nevada and Bullhead City, Arizona. There is currently no congestion on any of the City's major arterials and all intersections are operating within design capacities (Blythe, 2006).

DISCUSSION

- a) **Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?**

The arterial streets providing access to the project site are S. Lovekin Boulevard and W. 14th Avenue. According to the *Final Program EIR, City of Blythe General Plan 2025*, S. Lovekin Boulevard between I-10 and W. 14th Avenue is currently operating at a Level of Service (LOS) A. Similarly, the unsignalized intersection of S. Lovekin Boulevard at 14th Avenue and the signalized intersection of the I-10 freeway ramps at S. Lovekin Boulevard are also operating at an LOS A. By comparison, the City has established a target (threshold of significance) LOS B for roadway segments and LOS D for intersections.

The project is expected to ultimately generate 200 truck trips per day, or an average of 8.3 per hour over a 24-hour business day. When added to the existing

traffic volumes on the street network serving the project, this will result in a minor incremental deterioration in the level of service. Moreover, the truck trips generated by the project will largely consist of a redistribution of existing trips within the City, away from other fueling facilities, or the capture of existing pass-by trips on I-10 and, as such, are already reflected in the existing traffic volumes on the I-10 and the local street network providing access to the project site.

b) Exceed, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways?

The 2010 Riverside County Congestion Management Program adopted on March 10, 2010 is the applicable Congestion Management Program for the project area. Neither S. Lovekin Boulevard nor W. 14th Avenue are identified as a Congestion Management Program roadway. The nearest Congestion Management Program roadway is I-10, which is located at the intersection of S. Lovekin Boulevard and I-10, approximately 1,000 feet north of the project site.

Based on the current levels of service on these roadways and the 200 trips per day that could ultimately be generated by the proposed project, the project will not have a significant impact on the Congestion Management Program roadway system.

In addition, the project is not anticipated to have an adverse impact on the other components of the Congestion Management Program, such as the frequency and routing of public transit, jobs-housing balance, or the measures to improve air quality (e.g., use of carpools, vanpools, public transit, bicycles, etc.) because it does not impede the use of these forms of transportation.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

According to the Riverside County Land Use Information System, the project site is not located within an Airport Influence Area or Airport Compatibility Zone. The project is located approximately 5 miles from Blythe Municipal Airport. Therefore, the project will have no impact on air traffic patterns for aircraft operations at Blythe Municipal Airport.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The proposed project can be adequately served by the existing street system and does not involve the construction of any new streets or modifications to existing streets. The project will not increase traffic hazards through the introduction of street design features or incompatible uses.

e) Result in inadequate emergency access?

As indicated in the preceding response, the project does not involve any modifications to the existing street system in the project area. The project will in no way hinder or impede emergency access in the surrounding area.

f) Result in inadequate parking capacity?

The proposed project involves the construction of a self-service LCNG fueling facility. Trucks will be refueled by drivers properly trained in the use of the facility while the operations are monitored remotely. Therefore, there is no need for on-site employee or customer parking and the project will not affect availability of parking in the surrounding area.

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

As a fueling facility for heavy duty trucks largely transporting goods within the region and between Arizona and California, the project does not include any specific improvements in support of alternative transportation modes. However, full street improvements (i.e., curb, gutter and sidewalk) already exist on S. Willow Street at the project site and the project does not include any features that would conflict with adopted policies, plans, or programs supporting alternative transportation.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The project will have a less than significant impact on transportation and traffic in the project area.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. Utilities and Service Systems.				
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ENVIRONMENTAL SETTING

Water, wastewater and storm water services within the Blythe city limits are provided by the City of Blythe. Solid waste collection is performed by the Palo Verde Valley Disposal Company, with solid waste being transported to the Quartzite Transfer Station, which is located in Arizona on Highway 95 approximately two and a half miles north of Interstate 10, and eventually disposed of at the La Paz County Municipal Solid Waste Landfill located on Highway 95 approximately 10 miles south of Parker, Arizona. Gas and electric services are provided to residents and businesses within the City by The Gas Company and Southern California Edison, respectively.

DISCUSSION

a) **Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB)?**

The project involves the construction of an LCNG fueling station on a currently undeveloped site. The site will be graded in a manner so that all storm and nuisance runoff from the site will be retained on-site. The project will eventually involve the construction of a restroom facility, which is the only improvement proposed on the site that will generate domestic wastewater, and it will be connected to the existing sewer main located in S. Willow Street adjacent to the site. Therefore, the project has no potential to exceed the wastewater treatment requirements of the Colorado River Regional Water Quality Control Board.

b) **Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

As indicated in the response to the preceding question, the project will generate a minor amount of wastewater upon the construction of a proposed restroom facility. Water and wastewater facilities are available adjacent to the project site in S. Willow Street. The only water and wastewater improvements required for the project are on-site pipelines and unit connections to the infrastructure systems, which are subject to connection fees. Therefore, the proposed project would not require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities off-site, and the project would therefore have less than significant impacts.

c) **Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

The storm drainage improvements required for the project consist of an on-site retention basin. [Please see responses to Questions IX(c-e) for additional details]. The construction of the storm water retention basin has been addressed as part of this Initial Study and impacts were found to be less than significant. Therefore, the project would not require or result in the construction or expansion of new regional or off-site storm drain facilities which could cause significant environmental effects.

d) **Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

The restroom facility that is proposed to be constructed during Phase 2 of the project would utilize a minor amount of domestic water. The only other water usage that might occur on-site would be in conjunction with periodic maintenance activities and irrigation to assist with the initial establishment of drought tolerant landscaping. Based on the water supply information contained

in the *Final Program EIR, City of Blythe General Plan 2025*, the project's water demands can readily be served from existing entitlements and resources.

e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?

According to the *Final Program EIR, City of Blythe General Plan 2025*, the minor amount of wastewater eventually generated by the project can readily be accommodated by the City's existing wastewater treatment facilities without requiring the construction of new facilities or the expansion of existing facilities.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

The project will generate a minor amount of solid waste, primarily in conjunction with the restroom facility proposed to be constructed during Phase 2 of the project. The La Paz County Municipal Solid Waste Landfill, which will serve the project site, has adequate capacity to accommodate the minor amount of solid waste that could be generated by the project.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

The California Integrated Waste Management Act requires that jurisdictions maintain a 50% or better diversion rate for solid waste. The City implements this requirement through Chapter 8.24 of the City's Municipal Code, which establishes regulations for the collection of solid waste between the City and waste disposal contractors. This section requires agreements between the City and the contracted waste disposal companies to establish procedures for complying with all state and federal laws, rules and regulations pertaining to solid waste handling services, and for implementing state-mandated programs.

The City of Blythe has a contract with Palo Verde Valley Disposal for trash pickup and recycling. The City of Blythe in partnership with Palo Verde Valley Disposal Service sponsors several diversion programs within the City, including: school recycling programs, Colorado River clean-up, and recycling bins located throughout the community. All waste generated through these programs is taken to a materials recycling facility to sort and capture recyclables. Therefore, the project would be in compliance with statutes or regulations related to solid waste.

PROPOSED MITIGATION MEASURES

No mitigation measures are proposed or required.

CONCLUSION

The project will have a less than significant impact on utilities and service systems.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. Mandatory Findings of Significance.				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DISCUSSION

- a) **Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?**

Based on the analysis contained in this Initial Study, impacts to Aesthetics, Agriculture and Forestry Resources, Air Quality, Biological Resources, Hazards and Hazardous Materials, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation and Traffic, and Utilities and Service Systems are considered as having a less than significant or no impact on the environment.

The results of the Initial Study show that there are potentially significant impacts to Cultural Resources (archaeological resources), Geology and Soils (liquefaction

and soil corrosivity), Hydrology and Water Quality (possible construction dewatering), and Noise (construction noise). These impacts will be reduced to less than significant with the implementation of the proposed mitigation measures.

Therefore the project will not degrade the quality of the environment and no habitat, wildlife populations, or plant and animal communities or examples of the major periods of California history or prehistory would be impacted.

b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

The analysis in this Initial Study demonstrated that the project is consistent with the growth projections and land use and other policies of the City’s General Plan, which serves as the basis for all applicable regional and state mitigation plans. Therefore, the project is in compliance with all such plans including but not limited to: water quality control plan; air quality maintenance plan; integrated waste management plan; and plans or regulations for the reduction of greenhouse gas emissions such as AB 32 and SB 375.

In addition, the project would not produce impacts that, when considered with the effects of other past, present, and probable future projects, would be cumulatively considerable because potential adverse environmental impacts were determined to be less than significant with the implementation of mitigation measures identified in this Initial Study.

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

As discussed in this Initial Study, the project would not expose persons to adverse impacts related to Air Quality, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, or Transportation/Traffic hazards. These impacts were identified as less than significant or non-existent.

Impacts from Cultural Resources (archaeological resources), Geology and Soils (liquefaction and soil corrosivity), Noise (construction noise), and Hydrology and Water Quality (potential construction dewatering) would be potentially significant unless mitigated.

The implementation of the mitigation measures identified in this Initial Study would result in a less than significant impact and there would be no substantial adverse effects on human beings, either directly or indirectly

MITIGATION MEASURES

See Mitigation Monitoring and Reporting Program (Attachment 1).

4. MITIGATION MONITORING & REPORTING PROGRAM

The mitigation measures listed on Attachment 1 shall be incorporated into the project and the California Energy Commission shall ensure that the mitigation measures have been properly implemented. This verification shall be maintained as part of the project record to demonstrate that the Mitigation Monitoring and Reporting Program required pursuant to Public Resources Code Section 21081.6 was implemented.

5. INCORPORATION BY REFERENCE

This Initial Study is based in part on the information and analysis contained in the documents listed below. These documents are hereby incorporated by reference in their entirety into this Initial Study. Copies of documents incorporated herein are available for review at the California Energy Commission Library, 1516 Ninth Street, Sacramento, CA 95814, in the City of Blythe Planning Department, 235 N. Broadway, Blythe, California, 92225 or on the internet at [http:// www.energy.ca.gov/altfuels](http://www.energy.ca.gov/altfuels).

A. City of Blythe General Plan 2025

This document provides a vision for the future development of the community. It is the official policy statement of the City Council intended to guide the private and public development of the City.

B. Final Program EIR, City of Blythe General Plan 2025

The document serves as the first tier analysis of the potential environmental impacts that could result from land uses and development described in *General Plan 2025*.

C. Title 17 of the Blythe Municipal Code (Zoning, Land Use and Development Regulations).

This document contains the zoning regulations and development standards that govern the use and development of properties within the City.

6. LIST OF PREPARERS

Listed below are the persons who prepared or participated in the preparation of the Initial Study:

Project Manager:

Al Warot, Director of Planning, Willdan Engineering

Technical Support Staff:

Ernest Perea, Contract Senior Planner, Willdan Engineering

**Mitigation Monitoring and Reporting
Program for Blackhawk Logistics, Inc.
LCNG Fueling Facility**

**ATTACHMENT 1
MITIGATION MONITORING and REPORTING PROGRAM**

CULTURAL RESOURCES			
MITIGATION MEASURE	TIMING	DEPARTMENT	SIGNATURE
<p>Mitigation Measure CR-1: In the event that any cultural resources are discovered during clearing, grading or construction, project operations shall cease until a qualified archaeologist has evaluated the situation. Following the evaluation, the project sponsor shall implement recommendations provided by the archaeologist in consultation with the City, which are consistent with State law. Any cultural resources found on the proposed project site will be recorded or described in a professional report and submitted to the University of California at Riverside.</p>	During grading	Public Works and Building & Safety	
GEOLOGY AND SOILS			
<p>Mitigation Measure GEO-1 (Soil Recompaction): Because of the relatively non-uniform and under-compacted nature of the site soils, as well as the liquefaction potential, the soils in building areas shall be recompacted. The over-excavation for the restroom building, LNG tank pad, and above ground diesel tank pad shall be performed as one excavation operation (if possible). The existing surface soils within the building pad and foundation areas shall be over-excavated a minimum of 7 feet below existing grade. The over-excavation shall extend for 7 feet beyond the outer edge of exterior footings or mat slab, where possible. The bottom of the sub-excavation shall be scarified, moisture conditioned, and recompacted to at least 90% relative compaction (ASTM D 1557) for an additional</p>	During grading and construction	Public Works	

<p>depth of one foot. Over-excavation of 7 feet will place the excavation bottom in the near vicinity of groundwater. Where compaction of the resultant excavation bottom is difficult or not achievable due the near vicinity of groundwater, this requirement may be reviewed and revised by the project geotechnical engineer. Alternative techniques to stabilize the bottom may be required (such as placing gravel and punching it into the soft soil surface prior to placement of geo-grid).</p> <p>Auxiliary structures such as perimeter walls and retaining walls, shall be over-excavated a minimum of 2 feet below the bottom of the foundation or existing grade, whichever is lower. The over-excavation shall extend for 2 feet beyond the outer edge of exterior footings, where possible. The bottom of the sub-excavation should be scarified, moisture conditioned, and recompacted to at least 90% relative compaction (ASTM D 1557) for an additional depth of one-foot.</p>			
<p>Mitigation Measure GEO-2 (Soil Densification): Following soil recompaction as stipulated in Mitigation Measure GEO-1, three layers of tri-axial geo-grid (Tensar TX160 or equivalent) shall then be placed within the building pad remedial grading areas. One layer placed at the base of the over-excavation (after the sub-excavation has been moisture conditioned and compacted), and then at one-foot increments as the fill is placed at 7, 6, and 5 feet below grade. Each intervening foot of fill should be compacted to at least 90% relative compaction (ASTM D 1557). The resultant excavation shall then be covered with a filter fabric (Mirafi 140N) overlain by 18 inches of 1 to 2-inch diameter crushed aggregate. The aggregate shall be lightly moistened and tamped with heavy</p>	<p>During grading</p>	<p>Public Works</p>	

<p>vibratory equipment into place using 6-9 inch thick lifts to induce consolidation. The aggregate layer shall be enveloped on the top, sides and bottom with the filter fabric (i.e., burrito wrapped). The filter fabric shall be overlapped on top by at least 3 feet. At least one foot of fill shall then be placed to the mat foundation subgrade bottom elevation (see Mitigation Measure GEO-3 for vent installation requirements which shall partially occur prior to backfilling). The mat subgrade bottom elevation shall be designed such that this minimum thickness of fill can be accommodated, which may require designing the mat foundation finish surface elevation to be above grade. Placement of underground utilities shall take the geo-grid location into consideration, such that damage to the grid is not allowed during subsequent trench excavations and placement of piping.</p>			
<p>Mitigation Measure GEO-3 (Installation of Hydrostatic Pressure Relief Vents): A minimum of 6 uniformly distributed vertical vent pipes consisting of 6-inch diameter Schedule 80 PVC pipe shall be placed around the tank and restroom mats and extend from the ground surface into the middle of the gravel layer. The vent piping shall be cutoff approximately 18 inches above the finished surface, covered with a top cap that is open to the atmosphere yet stops rainwater entry, and covered with a screen to prevent rodent entry. The vent piping shall be protected on all four sides with bollards or concrete encasement. If the pipes are concrete encased, the top of concrete shall be below the top of the pipe to limit water runoff entry. The vent piping is intended to relieve hydrostatic pressures in the event of liquefaction. In no event shall the pipes be capped or encased in boxes such that water outflow would be inhibited during a seismic event.</p>	<p>During grading</p>	<p>Public Works</p>	

<p>Mitigation Measure GEO-4 (Design of Tank, Restroom and Other Foundations): Foundations for the tank and restroom structures should be supported on mat foundations bearing in properly prepared and compacted soils placed as required by Mitigation Measures GEO-1 and GEO-2. The requirements for the design of foundations that follow are based on “low” expansion category soils in the upper 7 feet of subgrade. During remedial grading of building pads, the soil expansion potential shall be verified and foundation requirements confirmed or modified, based on the site specific expansion index at each building site.</p> <p>Foundation design is the responsibility of the structural engineer, considering the structural loading and the geotechnical parameters identified in the Earth Systems Report. A geotechnical engineer/engineering geologist shall observe foundation excavations before placement of reinforcing steel or concrete. Loose soil or construction debris shall be removed from footing excavations before placement of concrete.</p> <p>Bearing Capacity - Foundations for Buildings and Tank Pads: A minimum footing depth of 18 inches below lowest adjacent grade shall be maintained (lowest adjacent = lowest grade within 2 feet laterally). Allowable soil bearing pressures are given below for mat foundations bearing on recompacted soils as described in Mitigation Measures GEO -1 and GEO-3. Allowable bearing pressures are net (weight of footing and soil surcharge may be neglected). A factor-of-safety of 3.0 was used for determining allowable bearing values.</p> <p>Mat foundations, 36-inch minimum thickness and 18-inch minimum below grade: 1,000 psf for dead plus design live loads.</p>	<p>Prior to issuance of grading permit</p>	<p>Building and Safety</p>	
---	--	----------------------------	--

Allowable increases of 500 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 2,500 psf.

Bearing Capacity - Foundations for Retaining Walls, Perimeter Walls and Isolated Pads:

A minimum footing depth of 18 inches below lowest adjacent grade shall be maintained (lowest adjacent = lowest grade within 2 feet laterally). Allowable soil bearing pressures are given below for foundations bearing on recompacted soils as described in **Mitigation Measure GEO-1**. Allowable bearing pressures are net (weight of footing and soil surcharge may be neglected). A factor-of-safety of 3.0 was used for determining allowable bearing values.

Continuous wall foundations, 12-inch minimum width and 18-inch minimum below grade: 1,500 psf for dead plus design live loads.

Allowable increases of 250 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 3,000 psf.

Isolated pad foundations, 2 x 2-foot minimum in plan and 18-inch minimum below grade: 1,500 psf for dead plus design live loads.

Allowable increases of 250 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 3,000 psf.

An average modulus of subgrade reaction, k , of 100 pounds per cubic inch (pci) can be used to design footings and slabs founded upon compacted fill. ACI Section 4.3, Table 4.3.1 shall be followed for recommended cement type, water cement ratio, and compressive strength for severe exposure conditions.

<p>Minimum Foundation Reinforcement: Minimum reinforcement for continuous footings shall be four No. 4 steel reinforcing bars, two placed near the top and two placed near the bottom of the footing. This reinforcing is not intended to supersede any additional structural requirements provided by the structural engineer.</p>			
<p>Mitigation Measure GEO-5: A soils/geotechnical engineer competent in corrosion mitigation shall review the results of the Earth Systems Report and more conclusively determine the corrosion potential of the on-site soils through a more extensive sampling of the on-site soils, and then appropriately design a corrosion protection plan for the proposed project. The plan shall identify the measures/techniques (e.g., cathodic protection, impressed current, or soil modification) to be used to adequately protect foundations and buried pipes and other metals from soil corrosion.</p>	<p>Prior to issuance of grading permit</p>	<p>Building and Safety</p>	

HYDROLOGY AND WATER QUALITY			
MITIGATION MEASURE	TIMING	DEPARTMENT	SIGNATURE
<p>HYD-1: If significant groundwater is encountered within utility trench or retention basin excavations, the applicant shall obtain permits from the City of Blythe Department of Public Works and Colorado River Regional Water Quality Control Board for the surface discharge of groundwater generated by construction dewatering. Permit regulations may require treatment of groundwater generated by construction dewatering activities prior to surface discharge.</p>	<p>During utility trench and retention basin excavations</p>	<p>Public Works</p>	
NOISE			
<p>Mitigation Measure NOI-1: Construction hours shall be limited to the daytime hours of 7am to 5pm Monday through Saturday. No construction shall be allowed on Sundays or Holidays. (Ref. General Plan EIR page.3.8-20).</p>	<p>During construction</p>	<p>Public Works and Building & Safety</p>	

APPENDIX A
Californian Emission Estimator Model (CalEEMod)
Air Quality Calculations

Construction Emissions:

125 total days for construction.

- Site Prep – 2 days
- Grading & Retention Basin - 28 days
- Facility Construction - 80 days
- Paving (concrete drives and pads) – 15 days

Equipment: (CalEEMod Default Equipment used to model project)

Site Prep: 1 Grader (8-hrs/day), 1 Rubber Tire Dozer (7-hrs/day), 1 Tractor/Loader/Backhoe (8-hrs/day)

Grading & Retention Basin: 1 Grader (6-hrs/day), 1 Rubber Tire Dozer (6-hrs/day), 2 Scrapers (7-hrs/day)

Facility Construction: 1 Crane (6-hrs/day), 1 Forklift (6-hrs/day), 1 Gen Set (8-hrs/day), 1 Tractor/Loader/Backhoe (6-hours/day), 3 Welders (8-hrs/day).

Paving (concrete work): 1 Cement/Mortar Mixer (6-hrs/day), 5 Dumpers/Tenders (represents concrete trucks) (8-hrs/day), 1 Other Construction Equipment (7-hrs/day), 1 Tractor/Loader/Backhoe (8-hrs/day).

Emissions Source	ROG	Nox	CO	Sox	PM10 Total	PM2.5 Total	CH4	CO2e	MTCO2e /year
Unmitigated Construction	5.97	33.67	25.35	0.04	8.02	4.64	0.54	3,902.32	88.34
Total Emissions lbs/day	5.97	33.67	25.35	0.04	8.02	4.64	0.54	3,902.32	
MDAQMD Thresholds	137	137	548	137	82	82			
Significant	No	No	No	No	No	No			No

Mitigation for construction includes watering 3-times per day.

Emissions Source	ROG	Nox	CO	Sox	PM10 Total	PM2.5 Total	CH4	CO2e	MTCO2e /year
Mitigated Construction	5.97	33.67	25.35	0.04	4.25	2.92	0.54	3,902.32	88.34
Total Emissions lbs/day	5.97	33.67	25.35	0.04	4.25	2.92	0.54	3,902.32	
MDAQMD Thresholds	137	137	548	137	82	82			
Significant	No	No	No	No	No	No			No

Project Area and Operations Emissions

Emissions Source	ROG	Nox	CO	Sox	PM10 Total	PM2.5 Total	CH4	CO2e	MTCO2e /year
Mobile Sources	4.00	18.89	30.86	0.02	2.07	0.51	0.29	2,506.45	366.12
Area	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.18
Waste									0.98
Water									0.00
Total Emissions lbs/day	4.04	18.89	30.86	0.02	2.07	0.51	0.29	2,506.45	
Total Emissions MT/yr									372.28
MDAQMD Thresholds	137	137	548	137	82	82			100.000
Significant	No	No	No	No	No	No			No

APPENDIX B
Geotechnical Engineering Report

HAY DAY FARMS
15500 SOUTH COMMERCIAL DRIVE
BLYTHE, CA 92225

**GEOTECHNICAL ENGINEERING REPORT
PROPOSED WILLOW STREET LCNG REFUELING STATION
BLYTHE, RIVERSIDE COUNTY, CALIFORNIA**

June 21, 2012

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File No.: 12068-01
Doc. No.: 12-06-724



June 21, 2012

File No.: 12068-01
Document No.: 12-06-724

Hay Day Farms
% Mr. Ulrich Sauerbrey
15500 South Commercial Drive
Blythe CA 92225

Attention: Mr. Dale Tyson

Subject: **Geotechnical Engineering Report**

Project: **Proposed Willow Street Liquefied Compressed Natural Gas (LCNG) Refueling Station**
Blythe, Riverside County, California

Earth Systems Southwest [Earth Systems] is pleased to submit this geotechnical report for the project referenced above. The proposed project site is located at the northeast corner of 14th Avenue and Willow Street in Blythe, Riverside County, California. This report presents our findings and recommendations for site grading, foundation design, and on-site water detention incorporating the information provided to our office. The site is suitable for the proposed development, provided the recommendations in this report are followed in design and construction. This report should stand as a whole and no part of the report should be excerpted or used to the exclusion of any other part. This report completes our scope of services in accordance with our proposal SWP-12-062, dated April 30, 2012.

Other services that may be required, such as plan review and grading observation, are additional services and will be billed according to our Fee Schedule in effect at the time services are provided. Unless requested in writing, the client is responsible for distributing this report to the appropriate governing agency or other members of the design team.

We appreciate the opportunity to provide our professional services. Please contact our office if there are any questions or comments concerning this report or its recommendations.

Respectfully submitted,

EARTH SYSTEMS SOUTHWEST

Kevin L. Paul, PE, GE
Senior Engineer

SER/klp/mss/cen



Mark S. Spykerman PG, EG
Senior Engineering Geologist



Distribution: 5/Hay Day Farms
1/BD File

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APPENDIX A

Plate 1 – Site Location

Plate 2– Boring and Test Location Map

Plates 3 through 6 – Willow and West Wells Street Photos

Terms and Symbols Used on Boring Logs

Soil Classification System

Boring and Trench Logs

Site Class (2)

Seismic Settlement Calculation (2)

Table 1 – Fault Parameters

Table 2 – Historic Earthquakes

APPENDIX B

Laboratory Results

**GEOTECHNICAL ENGINEERING REPORT
PROPOSED WILLOW STREET LCNG REFUELING STATION
BLYTHE, RIVERSIDE COUNTY, CALIFORNIA**

**Section 1
INTRODUCTION**

1.1 Project Description

We understand that proposed development to the site consists of the construction of a Liquefied, Compressed Natural Gas [LCNG] refueling facility consisting of an above ground compressed natural gas tank(s) mounted lengthwise (approximately 50 feet vertical height), an approximate 4,000 square foot restroom building, paved asphalt concrete and Portland Cement concrete driveways, and an onsite retention basin.

We assume the restroom building will be of single story wood framed or masonry construction founded upon shallow foundations with a slab-on-grade floor and will have no below-grade basement levels. We have assumed the LCNG tanks will be founded upon mat-type foundations. We understand Willow Street (bounded by 14th Avenue) and West Wells Street (bounded by South Lovekin Boulevard) will be used for access to the LCNG site by heavy 18-wheel type truck traffic. We also understand that storm water will be managed using an onsite retention basin. The proposed retention basin location is shown on Plate 1; however, the exact and final location and elevation of this system is not yet determined. Based on existing site topography and ground conditions, we anticipate site grading may consist of fills not exceeding 5 feet.

1.2 Site Description

The proposed facility is to be constructed on approximately 2 acres located at the northeast corner of 14th Avenue and Willow Street in Blythe, Riverside County, California. Coordinates near the center of site are 33.6039°N latitude and 114.6033°W longitude. Access to the site is via Willow Street, a paved street. The approximate site location is shown on Plate 1 in Appendix A.

Topographically, the site is generally flat with a gentle slope to the south with elevations on the order of 266 feet above mean sea level. The site currently has no existing buildings, but appears to have been graded or previously disturbed. Drainage is predominantly by sheet flow to the south.

Although not specifically located as a part of this study, undocumented fill and buried utilities may be located in the vicinity of the existing surrounding offsite structures adjacent to the project site.

1.3 Purpose and Scope of Services

The purpose for our services was to evaluate the site soil conditions and to provide professional opinions and recommendations regarding the proposed development. The scope of services for this report included:

1. Surface conditions were visually observed and select available published reports for the site and vicinity were reviewed for significant conditions that may affect the proposed development.
2. Boring locations were pre-marked and Underground Service Alert was contacted to mark the location of underground utilities in the work area. An encroachment permit (city of Blythe, No. BL205-007) was obtained in order to drill within the public roadway.
3. Onsite subsurface soil conditions were explored using a truck-mounted hollow-stem-auger drilling rig. One boring was advanced to approximately 50 feet at the proposed location of the tank and one boring to approximately 30 feet at the proposed location of the restroom. Two borings to approximately 7-½ feet were advanced in the driveway areas to evaluate pavement support characteristics and the potential for poor subgrade support soils. Soil samples were collected during drilling, examined in the field for soil type, and described on a log of the boring. Selected samples were retained and returned to our laboratory. The borings were abandoned by backfilling with cuttings.
4. Offsite subsurface soil conditions beneath Willow Street and West Wells Street were explored using a truck-mounted hollow-stem-auger drilling rig. Three borings to 5 feet along Willow Street and three borings to 5 feet along West Wells Street were advanced to evaluate the existing pavement section and to evaluate pavement support characteristics of the underlying soil. Borings were placed near the site entry and exit approaches to evaluate soil conditions at the points of highest loading (truck turning areas), and along the roadway centerline and roadway margins to evaluate if differing pavement section thicknesses exist across the roadway width which may limit potential repair options. Soil samples were collected during drilling, examined in the field for soil type, and described on a log of the boring. Selected samples were retained and returned to our laboratory. The borings were abandoned by backfilling with cuttings and capping with black dyed quickset concrete.
5. A visual site reconnaissance of Willow Street (bounded by 14th Avenue) and West Wells Street (bounded by South Lovekin Boulevard) was performed in order to visually observe the overall pavement condition and presence and severity of cracking.
6. Infiltration testing was performed in the proposed retention basin location using a double-ring infiltrometer system in general accordance with ASTM D 3385 criteria. Double ring test procedures simulate the low water head conditions typically present in shallow infiltration basins. A backhoe was used to excavate two test pits to the assumed depth of the proposed basin (3 to 5 feet). We understand a minimum of 5 feet buffer between the bottom of the basin and groundwater may be required.

The infiltration rate at each of the two locations was monitored for 6 hours, per ASTM guidelines. A logging trench was excavated next to the infiltration test pits to look for adverse impermeable strata below the depth of the test pits. The logging trench was excavated to a depth of approximately 12 feet below the existing site grade.

7. Laboratory testing was performed on selected soil samples obtained from the exploratory borings. Testing included unit densities, moisture content, particle size analysis, consolidation, shear strength, moisture-density relationship, R-Value, Expansion Index and soil chemical analyses. These test results aided in the classification and evaluation of the pertinent engineering properties of the various soils encountered at the site.
8. An engineering analysis of the data generated from the testing was performed. This report presents our findings and recommendations related to the following:
 - A description of the proposed project including a site plan showing the approximate boring locations. The proposed boring locations were located in the field by hand measuring devices such as tape or a wheel, based on the control provided.
 - A description of the subsurface site conditions encountered during our field exploration including groundwater conditions, as encountered.
 - A description of the site geologic setting and possible associated geology-related hazards, including liquefaction, hydro-collapse potential, subsidence, and seismic settlement analysis.
 - A discussion of regional geology and site seismicity.
 - A description of local and regional active faults, their distances from the site, and their potential for future earthquakes.
 - A discussion of other geologic hazards such as ground shaking, flooding, and tsunamis.
 - A discussion of site conditions, including the excavation characteristics and geotechnical suitability of the site for the general type of construction proposed.
 - 2010 California Building Code seismic design values.
 - Corrosion potential of the site soils tested (Soluble sulfate, chlorides, pH, resistivity).
 - Recommendations for imported fill (if required) for use in compacted fills.
 - Recommendations for site grading and earthwork, including requirements for site preparation, shoring and specifications for placement of fill and utility trench backfill.
 - General design criteria for the foundations of the proposed structures, including bearing capacity, anticipated building settlement due to static foundation loading, and lateral resistance.
 - Recommendations for concrete slabs-on-grade as related to moisture vapor protection, modulus of subgrade reaction, and soil corrosivity.

- Asphalt concrete and Portland cement concrete pavement structural sections for associated drive areas.
- Infiltration capacity of the soil at the retention basin area.
- Presentation of the pavement section thicknesses observed in our borings on Willow Street and West Wells Street and discussion on the suitability of the existing section to support the anticipated truck loading (truck type/loading and number of truck trips supplied to Earth Systems by the client).

Section 2

METHODS OF EXPLORATION AND TESTING

2.1 Field Exploration

The subsurface exploration program included advancing ten exploratory borings and three test pits between May 15 and May 17, 2012. The borings were drilled to depths ranging from approximately 6½ to 51½ feet BGS using mud-rotary techniques with 8-inch outside diameter hollow-stem augers (4 inch inside diameter) powered by a Mobile B-61 truck mounted drill rig, provided by Whitcomb Drilling and WDC Drilling, respectively. The borings were drilled to observe soil profiles and obtain samples for laboratory testing. The site is generally flat and borings were excavated at the existing ground surface (elevation on the order of 266 feet above mean sea level).

Three exploratory backhoe trenches were excavated to depths of approximately 3 to 12 feet BGS to observe soil profiles adjacent to the infiltration testing performed within the proposed retention basin area. The pits were excavated using a rubber tire backhoe with a 24-inch bucket. Each pit was visually logged by our representative and samples collected and returned to the laboratory. The boring and trench locations are shown on the Boring and Trench, Location map, Plate 2, in Appendix A. The locations shown are approximate, established by consumer grade Global Positioning System [GPS] accurate to approximately 15 feet in conjunction with pacing from local site features.

A representative from Earth Systems maintained a log of the subsurface conditions encountered and obtained samples for visual observation, classification and laboratory testing. Subsurface conditions encountered in the borings were categorized and logged in general accordance with the Unified Soil Classification System and ASTM D 2487 and 2488 (current edition). Our typical sampling interval within the borings was approximately every 2½ to 5 feet to the full depth explored; however, sampling intervals were adjusted depending on the materials encountered onsite. Samples were obtained within the test borings using a Standard Penetration [SPT] sampler (ASTM D 1586) and a Modified California [MC] ring sampler (ASTM D 3550 with those similar to ASTM D 1586). The SPT sampler has a 2-inch outside diameter and a 1.38-inch inside diameter. The MC sampler has a 3-inch outside diameter and a 2.4-inch inside diameter.

In the small diameter borings, both ring and SPT samplers were mounted on drill rod and driven using a 140-pound automatic hammer falling for a height of 30 inches. The number of blows necessary to drive either a SPT sampler or a MC type ring sampler within the borings was recorded.

Design parameters provided by Earth Systems in this report have considered an estimated 70% hammer efficiency. The number of blows necessary to drive either a SPT sampler or a MC type ring sampler within the borings was recorded. Since the MC sampler was used in our field exploration to collect ring samples, the N-values using the California sampler can be roughly correlated to SPT N-values using a conversion factor that may vary from about 0.5 to 0.7. In general, a conversion factor of approximately 0.63 from the recent study at the Port of Los Angeles (Zueger and McNeilan, 1998) is considered satisfactory. A value of 0.63 was applied in our calculations for this project.

Bulk samples of the soil materials were obtained from the drill auger cuttings, representing a mixture of soils encountered at the depths noted. Following drilling, sampling, and logging the borings and test pits were backfilled with native cuttings and tamped upon completion. Borings performed within asphalt concrete paved areas were patched at the surface with black dyed quickset concrete. Our field exploration was provided under the direction of a registered Geotechnical Engineer from our firm.

The final logs of the borings and test pits represent our interpretation of the contents of the field logs and the results of laboratory testing performed on the samples obtained during the subsurface exploration. The final logs are included in Appendix A of this report. The stratification lines represent the approximate boundaries between soil types, although the transitions may be gradational. In reviewing the boring logs and legend, the reader should recognize that the legend is intended as a guideline only, and there are a number of conditions that may influence the soil characteristics as observed during drilling. These include, but are not limited to, the presence of cobbles or boulders, cementation, variations in soil moisture, presence of groundwater, and other factors. The logs present field blowcounts per 6 inches of driven embedment (or portion thereof) for a total driven depth attempted of 18 inches. The blowcounts are uncorrected (i.e. not corrected for overburden, sampling, etc.). Consequently, the user must correct the blowcounts per standard methodology if they are to be used for design and exercise judgment in interpreting soil characteristics, possibly resulting in soil descriptions that vary somewhat from the legend.

2.2 Retention Basin Infiltration Testing

The site soils at the test locations consisted of interbedded silty sand (SM), Silty Clay (CL) and Sandy Silt (ML) soils. Typically, the sandy soils which may have an increased potential to infiltrate water were observed at depths of approximately 2 to 4½ feet below the existing grades. Above these depths soils were clayey and not suitable to infiltrate water. Below these approximate depths, soils were silty and clayey to a depth of approximately 9½ feet where sandy (SP) soils were encountered. At a depth of 8 feet, groundwater was encountered. As such, there appears to be a very narrow range of depth where water in a retention basin could infiltrate (laterally in the SM type soils), see the *Double Ring Infiltration Test Exploratory Log* in Appendix A for a depiction of the soil strata at the test location. To evaluate the soils encountered two infiltration tests were performed. One test was performed in the silt type soils, and one test in the silty sand type soils. The infiltration testing was performed with double-ring infiltrometers, following the general guidelines contained in ASTM D3385, *Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer*. Tests were performed at two locations, as indicated on Plate 2.

For each test location, an approximately 4-inch deep circular concentric trench was excavated by hand and the inner and outer rings driven with a sledgehammer into the ground an additional 2 inches. As necessary, powdered bentonite was placed around the edges of the rings in order to create a watertight seal. Care was taken to not alter the structure of the soil during hand excavation. Per ASTM test procedure, potable water was used to evaluate the basic infiltration rate. The tests were performed for a period of 6 hours. Test results are summarized below.

Table 1
Retention Basin Infiltration Results

Test Pit	Test Description	Soil Condition	USCS Soil Description in Test Zone	Test Zone Below Existing Grade (feet)	Estimated Basic Infiltration Rate*
P-1	Double Ring Infiltrometer (12" and 24" Rings)	Alluvium (Native Soil Surface)	Silty Sand (SM)	3	15.9 in/hr
P-2	Double Ring Infiltrometer (12" and 24" Rings)	Alluvium (Native Soil Surface)	Sandy Silt (ML)	4.5	0.2 in/hr

*Field Values, No factor of safety applied. Typical factors of safety range from 3 to 12 depending on the type of system which will be designed using the field values and depending on the level of pre-treatment and influent which will be discharged into the basins. See Section 5.10.

Logs of the exploratory test pits are presented in Appendix B. Please refer to Section 5.10 for design and maintenance recommendations. We understand a minimum of 5 feet buffer between the bottom of the basin and groundwater may be required.

2.3 Laboratory Testing

Samples were reviewed along with field logs to select those that would be analyzed further. Those selected for laboratory testing include, but were not limited to, soils that would be exposed and those deemed to be within the influence of the proposed structures. Test results are presented in graphic and tabular form in Appendix B of this report. Testing was performed in general accordance with American Society for Testing and Materials (ASTM) or other appropriate test procedure. Selected samples were also tested for a screening level of corrosion potential (pH, electrical resistivity, water-soluble sulfates, and water-soluble chlorides). Earth Systems does not practice corrosion engineering; however, these test results may be used by a qualified corrosion engineer in designing an appropriate corrosion control plan for the project.

Our testing program consisted of the following:

- Density and Moisture Content of select samples of the site soils collected (ASTM D 2937 & 2216).
- Maximum density tests to evaluate the moisture-density relationship of typical soils encountered (ASTM D 1557).
- Particle Size Analysis to classify and evaluate soil composition. The gradation characteristics of selected samples were made by hydrometer and sieve analysis procedures (ASTM D 422).
- Plasticity evaluation to classify and evaluate soil composition. (ASTM D 4318).
- Consolidation (Collapse Potential) to evaluate the compressibility and hydroconsolidation (collapse) potential of the soil upon wetting (ASTM D 5333).

- Direct Shear to evaluate the relative frictional strength of the soils. Specimens were placed in contact with water before testing and were then sheared under normal loads ranging from 0.5 to 4.0 kips per square foot (ASTM D 3080).
- Expansion index test to evaluate the expansive nature of the soil. The sample was surcharged under 144 pounds per square foot at moisture content of near 50% saturation. The sample was then submerged in water for 24 hours and the amount of expansion was recorded with a dial indicator (ASTM D 4829).
- Chemical Analyses (Soluble Sulfates and Chlorides (ASTM D 4327), pH (ASTM D 1293), and Electrical Resistivity/Conductivity (ASTM D 1125) to evaluate the potential for adverse effects of the soil on concrete and steel.
- R-Value testing to evaluate pavement support characteristics (CTM 301).

Section 3 DISCUSSION

3.1 Geologic Setting

Regional Geology: The site lies within the Mojave Desert geomorphic province of California, an area of interspersed mountain ranges and broad desert plains. The predominant geologic feature in the site area is the Colorado River and associated flood plain of Palo Verde Valley. In this area, deep profiles of Quaternary sediments exist.

Regionally, no major active faults are in the immediate vicinity of the site. The San Andreas fault is considered the primary source for seismic ground shaking and is approximately 65 miles southwest of the site.

Local Geology: The project site is located within Palo Verde Valley, adjacent to the Colorado River, and is situated upon the associated flood plain. Shallow sediments within the flood plain consist of fine- to medium-grained sands with interbedded clays and silts of fluvial origin. On-site shallow soils consist of interbedded Holocene sediments composed of loosely consolidated fine-grained sands, silts and clays.

No active faults are in the vicinity of the project. The site is not zoned within a currently delineated Alquist-Priolo Earthquake Fault Zone.

3.2 Soil Conditions

Holocene fluvial soils are present and consist predominantly of interbedded sand with varying amounts of silt, and silts and clays with varying amounts of sand (Unified Soils Classification System symbols of, SM, SP-SM, SP, CL, and ML). Appendix A presents the Logs of the Borings which present greater detail. Samples as depth in the deeper borings advanced at the site were logged as having a hydrocarbon odor. It is our understanding that an environmental assessment will be performed to evaluate these conditions.

The site lies within an area of moderate to high potential for wind and water erosion. Fine particulate matter (PM₁₀) can create an air quality hazard if dust is blowing. Watering the surface, planting grass or landscaping, or placing hardscape normally mitigates this hazard.

3.3 Groundwater

Free groundwater was encountered in the deep borings during exploration at an approximate depth of 8 feet below the ground surface. Readily available data obtained from the California Department of Water Resources database indicates multiple wells in the site vicinity. Historically, one well, located approximately 1,000 feet southwest of the site and at an elevation of 262 feet (msl) (Well 07S23E06A0015) indicated a static water level of 8 feet in 1971. Another well, located approximately 1,200 feet south of the site and at an elevation of 265 feet (msl) (Well 07S23E05D0015) indicated a static water level of 8 feet in 1972.

Due to the recorded depths of historical and present groundwater depths, it is our opinion that a groundwater depth of 8 feet below existing grades may be considered for design and construction. Fluctuations of the groundwater level, localized zones of perched water, and soil moisture content should be anticipated during and following the rainy season or from irrigation. Additionally, if excavation is performed in the near vicinity of the groundwater (i.e. soils above, but near the groundwater elevation), increased moisture content and unstable soils should be anticipated.

3.4 Collapse Potential

Collapsible soil deposits generally exist in regions of moisture deficiency. Collapsible soils are generally defined as soils that have potential to suddenly decrease in volume upon increase in moisture content even without an increase in external loads. Soils susceptible to collapse include loess, weakly cemented sands and silts where the cementing agent is soluble (e.g. soluble gypsum, halite), valley alluvial deposits within semi-arid to arid climate, and certain granite residual soils.

In arid climatic regions, granular soils may have a potential to collapse upon wetting. Collapse (hydroconsolidation) may occur when the soluble cements (carbonates) in the soil matrix dissolve, causing the soil to densify from its loose configuration from deposition.

The degree of collapse of a soil can be defined by the Collapse Potential [CP] value, which is expressed as a percent of collapse of the total sample using the Collapse Potential Test (ASTM Standard Test Method D 5333). Based on the Naval Facilities Engineering Command (NAVFAC) Design Manual 7.1, the severity of collapse potential is commonly evaluated by the following Table 2, Collapse Potential Values.

Table 2
Collapse Potential Values

Collapse Potential Value	Severity of Problem
0-1%	No Problem
1-5%	Moderate Problem
5-10%	Trouble
10-20%	Severe Trouble
> 20%	Very Severe Trouble

Table 2 can be combined with other factors such as the probability of ground wetting to occur on-site and the extent or depth of potential collapsible soil zone to evaluate the potential hazard by collapsible soil at a specific site. A hazard ranking system associated with collapsible soil as developed by Hunt (1984) is presented in Table 3, Collapsible Soil Hazard Ranking System.

Table 3
Collapsible Soil Hazard Ranking System

Degree of Hazard	Definition of Hazard
No Hazard	No hazard exists where the potential collapse magnitudes are non-existent under any condition of ground wetting.
Low Hazard	Low hazards exist where the potential collapse magnitudes are small (CP values 0-1%) and tolerable or the probability of significant ground wetting is low.
Moderate Hazard	Moderate hazards exist where the potential collapse magnitudes are undesirable (CP values 1-5%) or the probability of substantial ground wetting is low, or the occurrence of the collapsible unit is limited.
High Hazard	High hazard exist where potential collapse magnitudes are undesirably high (CP values 5-20%) and the probability of occurrence is high.

The project site is located in a geologic environment where the potential for collapsible soil exists. The results of collapse potential tests performed on three selected samples from different depths throughout the project site and above the groundwater table indicated a range of collapse potential on the order of 0 to 1 percent at applied vertical stresses of 1,000 to 2,000 psf. It is our opinion that the site soils have a low potential for collapse as the majority of site soils are below the groundwater table and testing indicates soils which are above the groundwater table have a low collapse potential.

3.5 Expansive Soils

Expansive soils are characterized by their ability to undergo significant volume change (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from rainfall, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors, and may cause unacceptable settlement or heave of structures, concrete slabs supported-on-grade, or pavements supported over these materials. Depending on the extent and location below finished subgrade, expansive soils can have a detrimental effect on structures. Based on our laboratory testing, the expansion potential of the onsite soils is typically “low” as defined by ASTM D 4829.

3.6 Corrosivity

One sample of the near-surface soil within the proposed site area was tested for potential to corrosion of concrete and ferrous metals. The tests were conducted in general accordance with the ASTM test methods to evaluate pH, resistivity, and water-soluble sulfate and chloride content. The test results are presented in Appendix B. These tests should be considered as only an indicator of corrosivity for the sample tested. Other earth materials found on site may be more, less, or of a similar corrosive nature. Water-soluble sulfates in soil can react adversely with concrete. ACI 318 provides the relationship between corrosivity to concrete and sulfate concentration, presented in the table below:

Table 4
Sulfate Corrosion Correlations

Water-Soluble Sulfate in Soil (ppm)	Corrosivity to Concrete
0-1,000	Negligible
1,000 – 2,000	Moderate
2,000 – 20,000	Severe
Over 20,000	Very Severe

In general, the lower the pH (the more acidic the environment), the higher the soil corrosivity will be with respect to ferrous structures and utilities. As soil pH increases above 7 (the neutral value), the soil is increasingly more alkaline and less corrosive to buried steel structures, due to protective surface films, which form on steel in high pH environments. A pH between 5 and 8.5 is generally considered relatively passive from a corrosion standpoint. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried steel or reinforced concrete structures. Soil resistivity is a measure of how easily electrical current flows through soils and is the most influential factor. Based on the findings of studies presented in ASTM STP 1013 titled “Effects of Soil Characteristics on Corrosion” (February, 1989), the approximate relationship between soil resistivity and soil corrosivity was developed as shown in Table 5.

Table 5
Resistivity Corrosion Correlations

Soil Resistivity (Ohm-cm)	Corrosivity to Ferrous Metals
0 to 900	Very Severely Corrosive
900 to 2,300	Severely Corrosive
2,300 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
10,000 to >100,000	Very Mildly Corrosive

Test results (presented in Appendix B) show a pH value of 8.1, chloride content of 2,360 ppm, sulfate content of 2,740 ppm, and minimum resistivity of 178 Ohm-cm. Additionally, evidence of sulfate attack was seen in the surrounding sidewalks adjacent to the site. Although Earth Systems does not practice corrosion engineering, the corrosion values from the soil tested are normally considered as being very severely corrosive to buried metals and as possessing a “severe” exposure to sulfate attack for concrete as defined in American Concrete Institute (ACI) 318, Section 4.3. The above values can potentially change based on several factors, such as importing soil from another job site and the quality of construction water used during grading and subsequent landscape irrigation. As such, we recommend an engineer competent in corrosion mitigation review these results and design corrosion protection appropriately.

3.7 Geologic Hazards

Geologic hazards that may affect the region include primary seismic hazards (ground shaking and surface fault rupture), secondary seismic hazards (soil liquefaction, ground subsidence, tsunamis, and seiches), and other hazards (slope instability, erosion potential, and flooding). A discussion follows on the hazards specific to this site.

3.7.1 Primary Seismic Hazards

Seismic Sources: Several active faults or seismic zones lie within 132 miles of the project site as shown on Table 1 in Appendix A. The primary seismic hazard to the site is weak to moderate ground shaking from earthquakes along the San Andreas fault located southwest of the project. The Mean Magnitude Earthquake listed is from published geologic information available for each fault (CGS, 2008).

Surface Fault Rupture: The project site does not lie within a currently delineated State of California, *Alquist-Priolo* Earthquake Fault Zone (Bryant and Hart, 2007) or Riverside County designated fault zone. There are no well-delineated active fault lines through the Palo Verde Valley region as shown on California Geological Survey [CGS] maps (Jennings, 1994). No active faults are mapped within the project limits. Based upon a review of Google Earth aerial photographs, no obvious air photograph lineaments were noted that would be suggestive of active fault rupture.

On-site reconnaissance revealed a level disturbed surface. Much of the site area has been modified by agricultural activities. An aerial photograph review was performed to further review the potential of active faulting in the site vicinity. Using Google Earth web photographic resources (1994-2011), the sites appear to be extremely uniform with no obvious natural topographic features suggestive of active faulting. Some remnants of meandering river patterns are present east of the site. Anthropogenic lineaments pertain to plow patterns, roadways, and power lines.

Therefore, due to the lack of defined fault related photographic lineaments, the presence of a uniform flood plain surface, and absence of previous mapped faults in the site vicinity, it is our professional opinion that the potential for active faulting at this project site is very low.

Known active and potentially active faults in the site vicinity are listed in Table 1 of Appendix A. The San Andreas fault has the lowest return interval and highest slip rate of proximal faults. Thus, it is our professional opinion that the San Andreas is the closest significant fault

Historic Seismicity: The project site is in an area of relatively low historic seismic activity. Approximately 35 magnitude 5.5 or greater earthquakes have occurred within 100 miles of the project since 1872. Most of the historic earthquake epicenters are greater than 50 miles from the project site. Table 2 in Appendix A present's historical earthquake information.

Seismic Risk: While accurate earthquake predictions are not possible, various agencies have conducted statistical risk analyses. In 2002 and 2008, the California Geological Survey [CGS] and the United States Geological Survey [USGS] completed of probabilistic seismic hazard maps. We have used these maps in our evaluation of the seismic risk at the site. The recent Working Group of California Earthquake Probabilities (WGCEP, 2008) estimated a 59% conditional probability that a magnitude 6.7 or greater earthquake may occur between 2008 and 2038 along the southern segment of the San Andreas fault.

The primary seismic risk at the site is a potential earthquake along segments of the San Andreas fault zone that are approximately 65 miles southwest of the site and are considered as fault Type A per the CGS. Geologists believe that the San Andreas fault has characteristic earthquakes that result from rupture of each fault segment. The estimated characteristic earthquake is magnitude 7.7 for the Southern Segment of the fault (USGS, 2002). This segment has the longest elapsed time since rupture of any part of the San Andreas fault. The last rupture occurred about 1680 AD, based on dating by the USGS near Indio (WGCEP, 2008). This segment has also ruptured on about 1020, 1300, and 1450 AD, with an average recurrence interval of about 220 years. The San Andreas fault may rupture in multiple segments, producing a higher magnitude earthquake. Recent paleoseismic studies suggest that the San Bernardino Mountain Segment to the north and the Coachella Segment may have ruptured together in 1450 and 1690 AD (WGCEP, 1995).

3.7.2 Secondary Hazards

Secondary seismic hazards related to ground shaking include soil liquefaction, seismic settlement, tsunamis, and seiches.

Soil Liquefaction and Lateral Spreading: The site is within a “very high” liquefaction zone as identified by Riverside County. Liquefaction is the loss of soil strength from sudden shock (usually earthquake shaking), causing the soil to become a fluid mass. Lateral spreading is the movement of a soil on a liquefied or seismically softened zone of soil. In general, for the effects of liquefaction to be manifested at the surface, groundwater levels must be within 50 feet of the ground surface and the soils within the saturated zone must also be susceptible to liquefaction. Current groundwater conditions are shallow in the site area currently and historically at approximately 8 feet below the existing ground surface. Based on the soil conditions observed and anticipated seismic shaking, we believe that the potential for liquefaction of the underlying soils at the site is considered very high. The potential for liquefaction induced lateral spreading of the proposed fill pad slopes is considered low as no free-face or sloping ground conditions exist adjacent to the proposed site.

Dry seismic (dynamic) settlement is often caused by loose to medium dense granular soils above the water table being consolidated due to soil particle redistribution into a more compact state during ground shaking. Due to the loose, unconsolidated nature of the soils above the groundwater table, the potential for dry seismic settlement exists at the site.

We have used the data obtained from our borings to evaluate the potential for dry seismic settlement and liquefaction induced settlement at the site. We estimated seismically induced settlements in general accordance with methods developed by Tokimatsu and Seed (1987), the 1996 NCEER and 1998 NCEER/NSF workshops on liquefaction, and considered information provided in *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California*, published by Southern California Earthquake Center (SCEC), dated March 1999 and *Guidelines for Analyzing and Mitigating Seismic Hazards in California*, Special Publication 117A, published by California Geological Society (CGS), 2008. Our analysis incorporated multi-directional shaking and used a Design Earthquake ground motion of 0.13g ($S_{DS}/2.5$ ground acceleration) associated with a magnitude 8.2 earthquake. We used a groundwater depth of 8 feet.

We evaluated our deep borings at the site (borings B-7 and B-8). The results of our analyses indicate that isolated layers of soil liquefaction will occur within the observed alluvial soils at depths on the order of 12 to 28 feet and 37 to 50 feet below the ground surface within Boring B-7 and depths on the order of 17 to 28 feet and 37 to 50 feet below the ground surface within boring B-8. Total estimated liquefaction-induced settlement of the total soil columns is on the order of 1.7 to 4.8 inches. The potential for differential settlement is estimated to be on the order of 3 inches over a distance of 40 feet (typical foundation distance, SP117A). The potential for seismically induced dry settlement of soils above the groundwater table was calculated to be negligible. Due to the depth of the liquefiable soils below the proposed finish grades, it is our opinion that the potential for complete loss of foundation bearing support from liquefied soils is low; however, it is also our opinion that the potential for sand boil formation to relieve subsurface pore-water pressures generated during a seismic event is moderate. Tanks or buoyant structures founded below grade may be subject to hydrostatic forces during a seismic event. The recommended remedial grading presented in subsequent sections of this report has been provided to reduce potential for structure distress should liquefaction of these soils occur.

The total seismically induced settlement is exclusive and independent of any static settlement that may occur from foundation loads. The potential for total and differential settlements is addressed in a later Section of this report. The potential for static differential settlements of native soils and fill placed during the anticipated grading is addressed in a later section of this report.

Tsunamis and Seiches: The site is far inland, and there are no water storage reservoirs on or near the site, so the hazards from tsunamis and seiches are nil.

3.7.3 Other Geologic Hazards

Slope Instability: The site is relatively level and there are no significant slopes on or adjacent to the site. Therefore, the potential for slope instability, landslides or debris flows is considered nil for permanent slope conditions.

Erosion Potential: The project is located in an area where seasonal rainfall and runoff can be intense. Shallow exposed soils are moderately to highly susceptible to erosion.

Flooding: The project site is within an “undetermined” FEMA flood risk zone. The project site is in an area where sheet flooding and erosion could occur. Appropriate project design, construction, and maintenance can minimize the sheet flooding potential.

Section 4 CONCLUSIONS

The following is a summary of our conclusions and professional opinions based on the data obtained from a review of selected technical literature and the site evaluation.

General:

- From a geotechnical perspective, the site is suitable for the proposed development, provided the recommendations in this report are followed in the design and construction of this project
- The primary geologic hazard relative to site development is moderate ground shaking and associated liquefaction from earthquakes originating on local faults. In our opinion, a major seismic event originating on regional segments of the San Andreas fault zones will be the most likely cause of significant earthquake activity at the site within the estimated design life of the proposed facility.
- We consider the primary geotechnical constraint for development of this site, as identified by our study, to be the potential for liquefaction induced ground settlement. It is our opinion that to construct the proposed facility, site soil improvement techniques and a specialized foundation system will be required to reduce the potential distress to the proposed structure should liquefaction occur. The recommendations presented are intended to reduce the magnitude and severity of potential liquefaction induced differential settlement distress to the proposed restroom building, LCNG tank pad, and above ground diesel tank pad, such that the estimated ground settlement presented within can be accommodated in structural design.
- The recommendations presented within do not address post-earthquake performance in regard to flatwork, site perimeter walls, basins, utilities, etc. It is our opinion that it is not practically feasible to mitigate or reduce the potential for the occurrence of liquefaction across the whole site due to the shallow nature of the groundwater and the susceptible nature of the site soils. The manifestation and effect of liquefaction may generally affect the flatwork, site perimeter walls, basin, utilities, etc. through differential settlement of the liquefied soils after seismic shaking and/or through buoyant forces due to the release of pore water pressure (manifested on the surface as sand boils). These effects may cause localized distress to the portions of the site where liquefaction occurs. It is our opinion that it may not be economically feasible or cost effective to implement engineering measures to attempt to reduce the potential effects of liquefaction. It is our opinion that the effects of liquefaction and related distress will most likely require repair to portions of the site after a major seismic event. The extent of liquefaction induced distress is difficult to quantify based upon the limits of this study, but may require replacement or re-leveling. If the site is designated as part of an essential service, consideration should be given to performing further study to estimate potential impacts to the proposed site and the possibility to reduce the impact of liquefaction. Other measures may include performing the indicated structure overexcavation for the tank and restroom pads across the whole site.

- The underlying geologic condition for seismic design is Site Class F due to liquefaction potentials. A qualified professional should design any permanent structure constructed on the site. The *minimum* seismic design should comply with the 2010 edition of the California Building Code.
- Based upon criteria presented in *SP117A, 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California*, the foundations at the site are not considered susceptible to loss of bearing support due to the depth of liquefaction below the proposed finished grades.
- The upper soils were found to be relatively non-uniform silty sands, clays, and silts which are unsuitable in their present condition to support structures, fill, and hardscape. The soils within the building and structural areas will require moisture conditioning, over-excavation, and recompaction to improve bearing capacity and reduce the potential for differential settlement. Soils can be readily cut by normal grading equipment.
- Other geologic hazard potentials, including fault rupture, tsunamis, seiches and slope instability are considered low to nil on this site.
- Site soils should be reviewed by a corrosion engineer, see Section 3.6.
- Tanks or buoyant structures founded below grade may be subject to hydrostatic forces during a seismic event.

Section 5 RECOMMENDATIONS

5.1 Site Development – Grading for Building Structures

A representative of Earth Systems should observe site clearing, grading, and the bottoms of excavations before placing fill. Local variations in soil conditions may warrant increasing the depth of recompaction and over-excavation.

Clearing and Grubbing: At the start of site grading, existing vegetation, trees, large roots, pavement, foundations, irrigation systems, non-engineered fill, construction debris, trash, and underground utilities should be removed from the proposed building pad and improvement areas. Areas disturbed during demolition and clearing should be properly backfilled and compacted as described below.

Septic systems, leach fields, drywells, undocumented fill, and buried utilities may be located in the vicinity of the proposed structures and within other areas of the project site. As part of the demolition plan for the project, it is recommended these structures be located and identified for proper abandonment. All buried structures which are removed should have the resultant excavation backfilled with soil compacted as engineered fill described herein or with a minimum 2-sack sand slurry approved by the project geotechnical engineer. Abandoned utilities should be removed entirely, or pressure-filled with concrete or grout and be capped. Buried utilities should not extend through building lines.

Subsequent to stripping and grubbing operations, areas to receive fill should be stripped of loose or soft earth materials until a uniform, firm subgrade is exposed, as evaluated by the geotechnical engineer or geologist. Prior to the placement of fill or subsequent to cut, the existing surface soils within the building pads and improvement areas should be over-excavated as follows:

Building and Tank Pad Preparation: Because of the relatively non-uniform and under-compacted nature of the site soils as well as the liquefaction potential, we recommend recompaction of soils in building areas. We have combined three accepted methods of reducing localized differential settlement (reinforced foundation and soil densification, and gravel bed with vent pipes to reduce hydrostatic pressure) which are recommended in SP117A and *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California*, Martin and Lew, 1999. The mat slab and geogrid reinforced soil mat (densification) system presented in the project soils report for this site are recommended as measures to increase the soil bridging (membrane effect) such that point differential settlement which may occur at depth due to liquefaction is further distributed and attenuated within the foundation and slab area. The gravel and vent pipes are recommended to reduce the potential for the formation of sand boils.

We recommend the overexcavation for the restroom and tank pad, and above ground diesel tank pad be performed as one excavation operation (if possible). The existing surface soils within the building pad and foundation areas should be over-excavated a minimum of 7 feet below existing grade. The over-excavation should extend for 7 feet beyond the outer edge of exterior footings or mat slab, where possible. The bottom of the sub-excavation should be scarified, moisture conditioned, and recompacted to at least 90% relative compaction (ASTM D 1557) for an additional depth of one foot. Overexcavation of 7 feet will place the excavation bottom in the near vicinity of groundwater.

Where compaction of the resultant excavation bottom is difficult or not achievable due the near vicinity of groundwater, this recommendation may be reviewed and revised by the project geotechnical engineer. Alternative techniques to stabilize the bottom may be required (such as placing gravel and punching it into the soft soil surface prior to placement of geogrid).

Three layers of tri-axial geo-grid (Tensar TX160 or equivalent) should then be placed within the building pad remedial grading. One layer placed at the base of the over-excavation (after the sub excavation has been moisture conditioned and compacted), and then at one-foot increments as the fill is placed (i.e. at 7, 6, and 5 feet below grade), i.e. one layer of Tensar tri-axial geogrid should then be placed on the excavation bottom, then one foot of fill should then be placed and compacted to at least 90% relative compaction (ASTM D 1557), then one layer of Tensar tri-axial geogrid should then be placed, then one foot of fill should then be placed and compacted to at least 90% relative compaction (ASTM D 1557), then the final layer of Tensar tri-axial geogrid should then be placed, then one foot of fill should then be placed and compacted to at least 90% relative compaction (ASTM D 1557). The resultant excavation should then be covered with a filter fabric (Mirafi 140N) overlain by 18 inches of 1 to 2-inch diameter crushed aggregate. The aggregate should be lightly moistened and tamped with heavy vibratory equipment into place using 6-9 inch thick lifts to induce consolidation. The aggregate layer should be enveloped on the top, sides and bottom with the filter fabric (i.e. burrito wrapped). The filter fabric should be overlapped on top by at least 3 feet. At least 1-foot of fill should then be placed to the mat foundation subgrade bottom elevation (see the following paragraph for vent installation recommendations which should partially occur prior to backfilling). The mat subgrade bottom elevation should be designed such that this minimum thickness of fill can be accommodated, which may require designing the mat foundation finish surface elevation to be above grade. Placement of underground utilities should take the geogrid location into consideration, such that damage to the grid is not allowed during subsequent trench excavations and placement of piping.

A minimum of 6 uniformly distributed vertical vent pipes consisting of 6-inch diameter Schedule 80 PVC pipe should be placed around the tank and restroom mat and extend from the ground surface into the middle of the gravel layer. The vent piping should be cutoff approximately 18 inches above the finished surface, covered with a top cap that is open to the atmosphere yet stops rainwater entry, and covered with a screen to prevent rodent entry. The vent piping should be protected on all four sides with bollards or concrete encasement. If the pipes are concrete encased, the top of concrete should be below the top of the pipe to limit water runoff entry. The vent piping is intended to relieve hydrostatic pressures in the event of liquefaction. In no event should the pipes be capped or encased in boxes such that water outflow would be inhibited during a seismic event.

Auxiliary Structures Subgrade Preparation: Auxiliary structures such as perimeter walls and retaining walls, should be over-excavated a minimum of 2 feet below the bottom of the foundation or existing grade, whichever is lower. The over-excavation should extend for 2 feet beyond the outer edge of exterior footings, where possible. The bottom of the sub-excavation should be scarified, moisture conditioned, and recompacted to at least 90% relative compaction (ASTM D 1557) for an additional depth of one-foot.

Lightly Loaded Flatwork, Such As Sidewalks, Trash Enclosure Pads, etc.: These areas should be over-excavated to a minimum depth of 2 feet below existing grade or finish grade (whichever is lower). The over-excavation should extend horizontally for 2 feet beyond the outer pad edges, where possible. Fill compacted to a minimum 90% compaction relative to ASTM D 1557 should be placed to finished grade.

Pavement Area Preparation: In street, drive, and permanent parking areas, the subgrade should be over-excavated, scarified, moisture conditioned, and compacted to at least 90% relative compaction (ASTM D 1557) for a depth of three feet below existing grade or finish grade (whichever is deeper), with the upper 1 foot compacted to at least 95% relative compaction. Compacted fill should be placed to finish subgrade elevation. Compaction should be verified by testing.

All over-excavations should extend to a depth where the project geologist, engineer or his representative has deemed the exposed soils as being suitable for receiving compacted fill. The materials exposed at the bottom of excavations should be observed by a geotechnical engineer or geologist from our office prior to the placement of any compacted fill soils. Additional removals may be required as a result of observation and/or testing of the exposed subgrade subsequent to the required over-excavation.

If excavation is performed in the near vicinity of the groundwater (i.e. soils above, but near the groundwater elevation), increased moisture content and unstable soils should be anticipated.

Engineered Fill Soils: The native soil is suitable for use as engineered fill and utility trench backfill provided it is free of significant organic or deleterious matter, and oversize rock. Within areas to receive foundations and slabs-on-grade the fill should be “very low” to “low” in expansion potential.

All fill should be placed in maximum 8-inch lifts (loose thickness) and compacted to at least 90 percent relative compaction in general accordance with ASTM D 1557 (current edition). In parking and drive areas the upper one foot of subgrade and aggregate base should be compacted to a minimum of 95 percent relative compaction. Compaction should be verified by testing. In general, rocks larger than 6 inches in greatest dimension should be removed from fill or backfill material.

All soils should be moisture conditioned prior to application of compactive effort. Moisture conditioning of soils refers to adjusting the soil moisture to or just above optimum moisture content. If the soils are overly moist so that instability occurs, or if the minimum recommended compaction cannot be readily achieved, it may be necessary to aerate to dry the soil to optimum moisture content or use other means to address soft soils.

A program of compaction testing, including frequency and method of test, should be developed by the project geotechnical engineer at the time of grading. Acceptable methods of test may include Nuclear methods such as those outlined in ASTM D 6938 (Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods) or correlated hand-probing.

Shrinkage: The shrinkage factor for earthwork is expected to range from -6 to 27 percent for the upper excavated or scarified *site* soils (negative shrinkage is bulking). This estimate is based on compactive effort to achieve an average relative compaction of about 92 percent.

Based upon 29 in-place densities evaluated, the average computed shrinkage is 15% with a standard deviation of 7%. Subsidence is estimated to be less than 0.2 feet. Shrinkage and subsidence are highly dependent on and may vary with contractor methods for compaction. Losses from site clearing, oversize material, and removal of existing site improvements may affect earthwork quantity calculations and should be considered.

5.2 Excavations, and Utilities

Excavations should be made in accordance with OSHA requirements. Using the OSHA standards and general soil information obtained from the field exploration, classification of the near surface on-site soils will likely be characterized as Type C. Actual classification of site specific soil type per OSHA specifications as they pertain to trench safety should be based on real-time observations and determinations of exposed soils by the contractors *Competent Person* (as defined by OSHA) during grading and trenching operations. Due to the cohesionless site soil encountered to depth and shallow groundwater, caving and running surficial soils should be anticipated.

Our site exploration and knowledge of the general area indicates there is a moderate potential for caving and slaking of site excavations (overexcavation areas, utilities, footings, etc.). Where excavations over 4 feet deep are planned lateral bracing or appropriate cut slopes of 1½:1 (horizontal/vertical) should be provided. No surcharge loads from stockpiled soils or construction materials should be allowed within a horizontal distance measured from the top of the excavation slope and equal to the depth of the excavation. Soils are susceptible to caving such that shallower excavated slopes may be required for site safety. Based upon the currently proposed elevations and the groundwater levels encountered during our field exploration, groundwater may be encountered during construction above or in the near vicinity excavations for the site. As such, soils in the vicinity of groundwater may have increased moisture content and be unstable.

Excavations which parallel structures, pavements, or other flatwork, should be planned so that they do not extend into a plane having a downward slope of 1.5:1 (horizontal: vertical) from the bottom edge of the footings, pavements, or flatwork. Shoring or other excavation techniques may be required where these recommendations cannot be satisfied due to space limitations or foundation layout. Where overexcavation will be performed adjacent to existing structures, ABC slot cutting techniques may be used. The width of the slot cuts will depend on the soils encountered at the point of excavation (slot cut widths are generally no greater than 5 to 8 feet).

Shoring: Shoring may be required where soil conditions, space or other restrictions do not allow a sloped excavation. A braced or cantilevered shoring system may be used.

A temporary cantilevered shoring system should be designed to resist an active earth pressure equivalent to a fluid weighing 45 pounds per cubic foot (pcf). Shoring below the groundwater table should be designed to resist an active earth pressure equivalent to a fluid weighing 25 pounds per cubic foot (pcf) and should include water pressure. Braced or restrained excavations above the groundwater table should be designed to resist a uniform horizontal equivalent soil pressure of 65 pounds per cubic foot (pcf). Braced or restrained shoring below the groundwater table should be designed to resist an active earth pressure equivalent to a fluid weighing 35 pounds per cubic foot (pcf) and should include water pressure. The values provided above assume a level ground surface adjacent to the top of the shoring and do not include a factor of safety.

Fifty percent of an aerial surcharge placed adjacent to the shoring may be assumed to act as a uniform horizontal pressure against the shoring. Special cases such as combinations of slopes and shoring or other surcharge loads may require an increase in the design values recommended above. These conditions should be evaluated by the project geotechnical engineer on a case-by-case basis. The wall pressures above the groundwater do not include hydrostatic pressures; it is assumed that drainage will be provided. If drainage is not provided, shoring extending below the groundwater level should be evaluated on a case-by-case basis.

Cantilevered shoring must extend to a sufficient depth below the excavation bottom to provide the required lateral resistance. We recommend required embedment depths be determined using methods for evaluating sheet pile walls and based on the principles of force and moment equilibrium. For this method, the allowable passive pressure against shoring, which extends below the level of excavation may be assumed to be equivalent to a fluid weighing 250 pcf. Additionally, we recommend a factor of safety of at least 1.2 be applied to the calculated embedment depth and that passive pressure be limited to 2,000 psf.

The contractor should be responsible for the structural design and safety of all temporary shoring systems. The contractor should carefully review the boring and test pits logs in this report, and perform their own assessment of potential construction difficulties, and methods should be selected accordingly. Shoring should be sealed to prevent the piping of soil material and potential soil loss conditions which can cause settlement. The method of excavation and support is ultimately left to the contractor with guidance and restrictions provided by the designer and owner. We recommend that existing structures be monitored for both vertical and horizontal movement, especially if vibratory compaction techniques are utilized.

A representative from our firm should be present during all site demolition, and clearing and grading operations to monitor site conditions; substantiate proper use of materials; evaluate compaction operations; and verify that the recommendations contained herein are met.

Utility Trenches: Backfill of utilities within roads or public right-of-ways should be placed in conformance with the requirements of the governing agency (water district, public works department, etc.). Utility trench backfill within private property should be placed in conformance with the provisions of this report. In general, service lines extending inside of property may be backfilled with native soils compacted to a minimum of 90% relative compaction per ASTM D 1557. Backfill operations should be observed and tested to monitor compliance with these recommendations. The trench bottom should be in a firm condition prior to placing pipe, bedding, or fill.

Under pavement sections, the upper 12 inches of trench backfill soil below the pavement section should be compacted to at least 95 percent relative compaction (ASTM D 1557). Backfill materials should be brought up at substantially the same rate on both sides of the pipe or conduit. Reduction of the lift thickness may be necessary to achieve the above recommended compaction. Mechanical compaction is recommended; ponding or jetting should be avoided, especially in areas supporting structural loads or beneath concrete slabs supported on-grade, pavements, or other improvements.

In general, coarse-grained sand and/or gap graded gravel (i.e. ¾-inch rock or pea-gravel, etc.) should not be used for pipe/conduit or trench zone backfill due to the potential for soil migration into the relatively large void spaces present in this type of material and water seepage along trenches backfilled with coarse-grained sand and/or gravel. Loss of soil may cause damaging settlement. NOTE: Rocks greater than 3 inches in diameter should not be incorporated within utility trench backfill.

Utilities connections which tie into the tank pads or restroom structure should be flexible and designed to accommodate at least 3 inches of vertical offset at the transition from the overexcavated and remediated pads to other areas of the site.

5.3 Temporary Dewatering

Based upon the currently proposed elevations and the groundwater levels encountered during our field exploration, groundwater may be encountered during construction above or in the near vicinity excavations for the site.

The contractor may require a dewatering plan for excavation and construction in the event that dewatering is required. The goal of the plan should be to identify an effective means of temporarily removing water from the trench excavation. As such, the plan should include identifying groundwater elevations relative to excavation or construction elevations, the horizontal and vertical permeability of soils needing to be dewatered, the area and volume of material needing to be dewatered, and the appropriate means to do so. Since temporary dewatering will impact and be dependent on construction methods and scheduling, we recommend the contractor be solely responsible for the design, installation, maintenance and performance of all temporary dewatering systems. The following suggestions are designed to aid the contractor in preparing an acceptable dewatering plan.

Prior to initiating any dewatering operations, the contractor should conduct at least the following assessments.

- Groundwater levels can fluctuate depending on rainfall, runoff conditions, or other factors. Therefore, water levels presented in this report may not be representative of those encountered at the time of construction.
- Identify specific soil types and their associated vertical and horizontal permeability.
- Identify depth of dewatering based on soil types and depth of construction.
- Identify dewatering methods suitable to soil types and excavation type and depth.

Given the type and setting of the project, the contractor may also need to accommodate for the following logistical issues.

- Discharge: Water removed from the excavations needs to be discharged remotely to avoid reinfiltration into the excavation. Water discharge should follow all local, state, and federal regulatory laws.
- Operations: Active construction and excavation sites often damage dewatering well heads, power lines, discharge lines and collection lines. As such, the final dewatering system needs to be designed and operated for this type of environment.
- Settlement: Dewatering may cause settlement of surrounding structures in the near vicinity of groundwater drawdown. We recommend structures be monitored for potential movement and the contractor have a plan for minimizing settlement occurrence.

Depending on the depth of excavation below groundwater, soil conditions encountered along the excavation face and slope inclination, caving or sloughing of excavation slopes is possible within the vicinity of a dewatering system.

Sloughing or caving of excavation slopes could endanger personnel working within or adjacent to the excavation as well as nearby equipment, structures, or other existing improvements. The contractor should be aware of the potential for caving and take appropriate precautions to ensure the safety of site personnel as well as the integrity of the excavation slopes and any existing nearby structures or other improvements.

5.4 Foundations

In our professional opinion, foundations for the tank and restroom structures proposed (as presented within) should be supported on mat foundations bearing in properly prepared and compacted soils placed as recommended in Section 5.1. The recommendations that follow are based on "low" expansion category soils in the upper 7 feet of subgrade. During remedial grading of building pads, the soil expansion potential should be verified and foundation recommendations confirmed or modified, based on the site specific expansion index at each building site.

Foundation design is the responsibility of the Structural Engineer, considering the structural loading and the geotechnical parameters given in this report. A representative of Earth Systems should observe foundation excavations before placement of reinforcing steel or concrete. Loose soil or construction debris should be removed from footing excavations before placement of concrete.

Bearing Capacity - Foundations for Buildings and Tank Pads: A minimum footing depth of 18 inches below lowest adjacent grade should be maintained (lowest adjacent = lowest grade within 2 feet laterally). Allowable soil bearing pressures are given below for mat foundations bearing on recompacted soils as described in Section 5.1. Allowable bearing pressures are net (weight of footing and soil surcharge may be neglected). We utilized a factor-of-safety of 3.0 for determining allowable bearing values.

- Mat foundations, 36-inch minimum thickness and 18-inch minimum below grade:

1,000 psf for dead plus design live loads.

Allowable increases of 500 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 2,500 psf.

Bearing Capacity – Retaining Walls and Perimeter Walls: A minimum footing depth of 18 inches below lowest adjacent grade should be maintained (lowest adjacent = lowest grade within 2 feet laterally). Allowable soil bearing pressures are given below for foundations bearing on recompacted soils as described in Section 5.1. Allowable bearing pressures are net (weight of footing and soil surcharge may be neglected). We utilized a factor-of-safety of 3.0 for determining allowable bearing values.

- Continuous wall foundations, 12-inch minimum width and 18-inch minimum below grade:

1,500 psf for dead plus design live loads.

Allowable increases of 250 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 3,000 psf.

- Isolated pad foundations, 2 x 2-foot minimum in plan and 18-inch minimum below grade:

1,500 psf for dead plus design live loads.

Allowable increases of 250 psf for each additional 0.5-foot of footing depth may be used up to a maximum value of 3,000 psf.

An average modulus of subgrade reaction, k , of 100 pounds per cubic inch (pci) can be used to design footings and slabs founded upon compacted fill. ACI Section 4.3, Table 4.3.1 should be followed for recommended cement type, water cement ratio, and compressive strength for severe exposure conditions.

Minimum Foundation Reinforcement: Minimum reinforcement for continuous footings should be four No. 4 steel reinforcing bars, two placed near the top and two placed near the bottom of the footing. This reinforcing is not intended to supersede any additional structural requirements provided by the structural engineer.

Bearing Capacity and Passive Pressure – Wind and Seismic Increases: A one-third ($\frac{1}{3}$) increase in the bearing and passive pressures may be used when calculating resistance to wind or seismic loads. The allowable bearing values indicated are based on the structure types described in this report. If the structures are different from that described, the geotechnical engineer must reevaluate the allowable bearing values and the grading requirements.

5.4.1 Estimated Settlements

Total static settlement of the foundation will vary depending on the plan dimensions of the foundation and the actual load supported. Based upon the foundation dimensions presented within, the assumed maximum bearing pressures provided, and assuming the site is prepared as recommended within this report, it is our opinion that estimated total static settlement of the proposed foundations should be less than 1 inch.

Differential mat settlement (expressed as mat rotation) should be less than $\frac{1}{2}$ inch, expressed in a post-construction angular distortion ratio of 1:480 or less. Differential static settlement of retaining wall and perimeter wall foundations should be less than $\frac{3}{4}$ inch, expressed in a post-construction angular distortion ratio of 1:480 or less. Outside of tank slab and restroom mat slab areas, the total estimated seismic-induced settlement of the total soil columns is on the order of 1.7 to 4.8 inches. The potential for differential settlement is estimated to be on the order of 3 inches over a distance of 40 feet (typical foundation distance, SP117A). Due to the granular nature of the site soils, the total static settlement is expected to occur during and shortly after construction.

5.5 Slabs-on-Grade

Subgrade: Concrete slabs-on-grade and flatwork should be supported by compacted soil placed in accordance with Section 5.1 of this report.

Vapor Retarder: In areas of moisture-sensitive floor coverings or exposed interior slabs, an appropriate vapor retarder should be installed to reduce moisture transmission from the subgrade soil to the slab. For these areas, a vapor retarder (minimum 10-mil thickness) should underlie the floor slabs. If a Class A vapor retarder (ASTM E 1745) is specified, the retarder can be placed directly on non expansive soil and the retarder should be covered with a minimum of 2 inches of *clean* sand.

If a less durable vapor retarder is specified (i.e. ASTM E 1745, Class B or C), a minimum of 4 inches of clean sand should be provided, and the retarder should be placed in the center of the clean sand layer. Clean sand is defined as well or poorly-graded sand (ASTM D 2488) of which less than 3% passes the No. 200 sieve. The site soils do not fulfill the criteria to be considered clean sand. The sand should be lightly moistened just prior to placing the concrete. Low-slump concrete should be used to help reduce the potential for concrete shrinkage. The effectiveness of the membrane is dependent upon its quality, the method of overlapping, its protection during construction, and the successful sealing of the membrane around utility lines and at joints. Capillary breaks (if any) should consist of a minimum of 4 inches of open/gap-graded gravel.

The following minimum slab recommendations are intended to address geotechnical concerns such as potential variations of the subgrade and are not to be construed as superseding any structural design. The design engineer and/or project architect should ensure compliance with SB800 with regards to moisture and moisture vapor.

Slab Thickness and Reinforcement: Slab thickness and reinforcement of slabs-on-grade are contingent on the recommendations of the structural engineer or architect and the expansion index of the supporting soil. Based upon our findings, a modulus of subgrade reaction of approximately 100 pounds per cubic inch can be used in concrete slab design for the expected compacted subgrade. ACI Section 4.3, Table 4.3.1 should be followed for recommended cement type, water cement ratio, and compressive strength for severe exposure conditions.

Concrete slabs and flatwork should be a minimum of 4 inches thick (actual, not nominal). We suggest that the concrete slabs be reinforced with a minimum of No. 3 rebar at 18-inch centers, both horizontal directions, placed on positive spacers at slab mid-height to resist potential shrinkage cracking. Concrete floor slabs may either be monolithically placed with the foundations or doweled after footing placement.

The thickness and reinforcing given are not intended to supersede any structural requirements provided by the structural engineer. The project architect or geotechnical engineer should continually observe all reinforcing steel in slabs during placement of concrete to check for proper location within the slab.

Control Joints: Control joints should be provided in all concrete slabs-on-grade at a maximum spacing of 36 times the slab thickness (12 feet maximum on-center, each way) as recommended by American Concrete Institute [ACI] guidelines. All joints should form approximately square patterns to reduce the potential for randomly oriented shrinkage cracks. Control joints in the slabs should be tooled at the time of the concrete placement or saw cut ($\frac{1}{4}$ of slab depth) as soon as practical but not more than 8 hours from concrete placement.

Construction (cold) joints should consist of thickened butt joints with $\frac{1}{2}$ -inch dowels at 18 inches on center or a thickened keyed-joint to resist vertical deflection at the joint. All control joints in exterior flatwork should be sealed to reduce the potential of moisture or foreign material intrusion. These procedures will reduce the potential for randomly oriented cracks, but may not prevent them from occurring.

Curing and Quality Control: The contractor should take precautions to reduce the potential of curling of slabs in this arid desert region using proper batching, placement, and curing methods. Curing is highly affected by temperature, wind, and humidity.

Quality control procedures *may* be used, including trial batch mix designs, batch plant inspection, and on-site special inspection and testing. Curing should be in accordance with ACI recommendations contained in ACI 211, 304, 305, 308, 309, and 318.

5.6 Retaining Walls and Lateral Earth Pressures

Retaining Walls:

- Retaining walls should be designed for an active soil pressure equivalent to a fluid density of 40 pcf. The active lateral earth pressures are for horizontal (level) backfills using the on-site native soils on walls that are free to rotate at least 0.1% of the wall height. Walls, which are restrained against movement or rotation at the top, should be designed for an at-rest equivalent fluid pressure of 60 pcf. The lateral earth pressure values for level backfill are provided for walls backfilled with drainage materials and existing on-site soils which are above the groundwater table. The geotechnical engineer should be consulted on a case-by-case basis for walls designed to be below the groundwater table.
- In addition to the active or at rest soil pressure, the proposed wall structures may be designed to include forces from dynamic (seismic) earth pressure. Dynamic earth pressures should be estimated by the structural engineer using methods such as the Mononobe-Okabe method (Mononobe and Matsuo, 1929), Seed and Whitman (1970), or other suitable technique. Dynamic pressures are additive to active earth pressure. Walls retaining less than 12 feet of soil or walls designed using at-rest pressures need not consider this increased pressure (reference: *Seismic Earth Pressures on Deep Building Basements*, M. Lew, et al, 2010 Structural Engineers Association of California Convention proceedings).
- Retaining wall foundations should be placed upon compacted fill described in Section 5.1.
- A backdrain or an equivalent system of backfill drainage should be incorporated into the retaining wall design, whereby the collected water is conveyed to an approved point of discharge. Design should be in accordance with Section 1805.4.2 and 1805.4.3 of the 2010 California Building Code. Drain rock should be wrapped in filter fabric such as Mirafi 140N as a minimum. Backfill immediately behind the retaining structure should be a free-draining granular. Waterproofing should be according to the designer's specifications. Water should not be allowed to pond or infiltrate near the top of the wall. To accomplish this, the final backfill grade should be such that water is diverted away from the retaining wall.
- Compaction on the retained side of the wall within a horizontal distance equal to one wall height (to a maximum of 6 feet) should be performed by hand-operated or other lightweight compaction equipment (90% compaction relative to ASTM D 1557 at near optimum moisture content). This is intended to reduce potential locked-in lateral pressures caused by compaction with heavy grading equipment or dislodging modular block type walls.

- The above recommended values do not include compaction or truck-induced wall pressures. Care must be taken during the compaction operation not to overstress the wall. Heavy construction equipment should be maintained a distance of at least 3 feet away from the walls while the backfill soils are placed. Upward sloping backfill or rock, or surcharge loads from nearby footings can create larger lateral pressures. Should any walls be considered for retaining sloped backfill (or rock) or placed next to foundations, our office should be contacted for recommended design parameters. Surcharge loads should be considered if they exist within a zone between the face of the wall and a plane projected 45 degrees upward from the base of the wall. The increase in lateral earth pressure should be taken as 35% of the surcharge load within this zone and applied to the backside of the wall as a distributed load. Retaining walls subjected to traffic loads should include a uniform surcharge load equivalent to at least 2 feet of native soil (130 pcf unit weight). Retaining walls should be designed with a minimum factor of safety of 1.5.

Frictional and Lateral Coefficients:

- Resistance to lateral loads (including those due to wind or seismic forces) may be provided by frictional resistance between the bottom of concrete foundations and the underlying soil, and by passive soil pressure against the foundations. An allowable coefficient of friction of 0.30 may be used between cast-in-place concrete foundations and slabs and the underlying soil. An allowable coefficient of friction of 0.25 may be used between pre-cast or formed concrete foundations and slabs and the underlying soil
- Allowable passive pressure may be taken as equivalent to the pressure exerted by a fluid weighing 250 pounds per cubic foot (pcf). Vertical uplift resistance may consider a soil unit weight of 105 pounds per cubic foot. The upper 1 foot of soil should not be considered when calculating passive pressure unless confined by overlying asphalt concrete pavement or Portland cement concrete slab. The soils pressures presented have considered onsite fill soils. Testing or observation should be performed during grading by the soils engineer or his representative to confirm or revise the presented values.
- Passive resistance for thrust blocks bearing against firm natural soil or properly compacted backfill can be calculated using an equivalent fluid pressure of 250 pcf. The maximum passive resistance should not exceed 1,500 psf.
- Friction and soil pressure values (resistance) presented above are considered to have a factor of safety of 1.5 in relation to ultimate values (factor of safety = 1). The above values are not permitted to be increased by 1/3 due to short term loads such as wind or seismic forces.
- Construction employing poles or posts (i.e. lamp posts) may utilize design methods presented in Section 1807.3 of the CBC for sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM, and GC) material class. Groundwater at 8 feet should be considered in the design.

- The passive resistance of the subsurface soils will diminish or be non-existent if trench sidewalls slough, cave, or are over widened during or following excavations. If this condition is encountered, our firm should be notified to review the condition and provide remedial recommendations, if warranted.

5.7 Slope Construction

Onsite slope construction is anticipated to be minimal (less than 5 feet in height, if any). Slopes should be constructed such that fully compacted soil is exposed at the surface. Such methods may include overfilling during construction and cutting back to expose a fully compacted soil, or track-walking or grid-rolling. Compacted fill should be placed at near optimum moisture content and compacted to a minimum 90% of the maximum dry unit weight, as measured in relation to ASTM D 1557 test procedures. The exposed face of any cut or fill slope (upper 12 inches) should have a minimum relative density of 90 percent of the maximum dry unit weight, as measured in relation to ASTM D 1557 test procedures, and be compacted at near optimum moisture content. Basin slopes should be constructed no steeper than 3:1 (horizontal:vertical). We recommend that basin bottom soils be left in a natural, un-worked, uncompacted state subsequent to construction to allow for infiltration. Compacted soils significantly reduce infiltration rates.

5.7.1 Surficial Slope Failures

All slopes will be exposed to weathering, resulting in decomposition of surficial earth materials, thus potentially reducing shear strength properties of the surficial soils. In addition, these slopes become increasingly susceptible to rodent burrowing. As these slopes deteriorate, they can be expected to become susceptible to surficial instability such as soil slumps, erosion, soil creep, and debris flows. Development areas immediately adjacent to ascending or descending slopes should address future surficial sloughing of soil material. Such measures may include debris fences, catchment areas or walls, ditches, soil planting or other techniques to contain soil material away from developed areas.

Operation and maintenance inspections should be done after a significant rainfall event and on a time-based criteria (annually or less) to evaluate distress such as erosion, slope condition, rodent infestation burrows, etc. Inspections should be recorded and photographs taken to document current conditions. The repair procedure should outline a plan for fixing and maintaining surficial slope failures, erosional areas, gullies, animal burrows, etc. Repair methods could consist of excavating and infilling with compacted soil erosional features, track walking the slope faces with heavy equipment, as determined by the type and size of repair. These repairs should be performed in a prompt manner after their occurrence. Existing slope inclinations should be maintained and a maintenance program should include identifying areas where slopes begin to steepen.

5.8 Seismic Design Criteria

This site maybe subject to moderate ground shaking due to potential fault movements along regional faults. *A site response analysis is typically required for liquefiable sites meeting the definition of site class F;* however, we have classified this site as Site Class D as allowed in ASCE 7-05 Section 11.4.7.

This section permits the determination of a site class in accordance with Section 20.3, with the corresponding values of F_a and F_v determined from Tables 11.4-1 and 11.4.2, such that a site-response analysis is not required to determine the spectral accelerations for liquefiable soils if the structure being designed has a fundamental period of vibration equal to or less than 0.5 seconds and the foundation soils are not subject to bearing failure from liquefaction. The site soils in the tank and restroom areas are not subject to liquefaction induced bearing failure if the grading recommendations presented within are adhered to. Additionally, we understand based upon discussion with the structural engineer (Tom Mitchell, June 14, 2012) that the tank structure period is less than 0.5 seconds. As such, the *minimum* seismic design should comply with the 2010 edition of the CBC using the seismic coefficients given in the table below.

2010 CBC (ASCE 7-05) Seismic Parameters

Site Class:	D
Maximum Considered Earthquake [MCE] Ground Motion	
Short Period Spectral Response S_s :	0.314 g
1 second Spectral Response, S_1 :	0.190 g
Site Coefficient, F_a :	1.549
Site Coefficient, F_v :	2.039
Design Earthquake Ground Motion	
Short Period Spectral Response, S_{DS}	0.324 g
1 second Spectral Response, S_{D1}	0.258 g

The intent of the CBC lateral force requirements is to provide a structural design that will resist collapse to provide reasonable life safety from a major earthquake, but may experience some structural and nonstructural damage.

A fundamental tenet of seismic design is that inelastic yielding is allowed to adapt to the seismic demand on the structure. In other words, *damage is allowed*. The CBC lateral force requirements should be considered a *minimum* design. The owner and the designer may evaluate the level of risk and performance that is acceptable. Performance based criteria could be set in the design. The design engineer should exercise special care so that all components of the design are fully met with attention to providing a continuous load path. An adequate quality assurance and control program is urged during project construction to verify that the design plans and good construction practices are followed.

5.9 Streets and Driveways

Pavement structural sections for associated parking and drive areas including recommendations for standard and heavy duty asphalt concrete and Portland cement concrete are provided below.

Pavement Area Preparation: In onsite drive, and parking areas, the subgrade should be overexcavated as recommended in Section 5.1 and below, moisture conditioned, and compacted. Compaction should be verified by testing.

Truck Driveways

The pavement section presented in the following Table 6 is for 18-wheel semi-trailer type traffic which is expected to enter and exit the site, and is based on R-value testing and current Caltrans design procedures.

Site soils in the influence zone for paving and flatwork are clayey in nature and provide minimal pavement support based upon R-Value testing conditions. Truck traffic information provided by Mr. Ulrich Sauerbrey on June 19, 2012, estimated that the peak daily truck traffic over the design life of the station will be 200 vehicles. As such, considering a typical 80,000 lb truck load, 18-wheel configuration, and a design life of 20 years (servicing traffic over 7 days per week, 52 weeks per year), we estimate an Equivalent Single Axle Load (ESAL) for the site of 3,400,000 which correlates to a Traffic Index (TI) of 10.5, which was used to facilitate the design of asphalt concrete pavements for drive areas and offsite street improvements. The TI's assumed below should be reviewed by the project Civil Engineer to evaluate the suitability for this project. All design should be based upon an appropriately selected traffic index. Changes in the traffic indices will affect the corresponding pavement section.

Table 6
Preliminary Flexible Pavement Section Recommendations

R-Value Subgrade Soils - 10 (tested)		Design Method – CALTRANS	
Traffic Index (Assumed)	Pavement Use	Flexible Pavements	
		Asphaltic Concrete Thickness (inches)	Aggregate Base Thickness (inches)
10.5	Semi-Trailer Drives	8.5	19

Conventional, rigid pavements, i.e. Portland cement concrete (PCC) pavements, are recommended in areas that will be subject to relatively high static wheel loads and/or heavy vehicle loading and unloading and turning areas (i.e. truck/bus lanes). The pavement section below is based upon the *Guide for Construction of Concrete Parking Lots, ACI 330R*, and the assumptions outlined below.

Table 7
Preliminary Portland Cement Concrete Pavement Sections

Area	Minimum Pavement PCC Thickness (inches)	Minimum Aggregate Base Thickness (inches)	Minimum 28 Day Flexural Strength (psi)	Concrete Compressive Strength (psi)
Truck Access Areas (Traffic Category D, ADTT =200)	8.0	4.0	575	3,750

Modulus of Subgrade Reaction drive area fill, k = 100 pci

Should the actual traffic category vary from those assumed and listed above, these sections should be modified. All above recommended preliminary pavement sections are contingent on the following recommendations being implemented during construction:

- The upper 12 inches of subgrade soils beneath the asphalt concrete and conventional PCC pavement section should be compacted to a minimum of 95% relative compaction (ASTM D 1557).
- Subgrade soils and aggregate base should be in a stable, non-pumping condition at the time of placement and compaction. Exposed subgrades should be proof-rolled to verify the absence of soft or unstable zones.
- Subgrade soils should be compacted at or slightly over optimum moisture content.
- Aggregate base materials should be compacted at near optimum moisture content to at least 95% relative compaction (ASTM D 1557) and should conform to Caltrans Class II criteria.
- All concrete curbs separating pavement from landscaped areas should extend at least 6 inches into the subgrade soils to reduce the potential for movement of moisture into the aggregate base layer (this reduces the risk of pavement failures due to subsurface water originating from landscaped areas). The curbing acts as a moisture cut-off barrier.
- Concrete pavements should be constructed with transverse joints at maximum spacing of 12 feet. A thickened edge should be used where possible and, as a minimum, where concrete pavements abut asphalt pavements. The thickened edge should be 1.2 times the thickness of the pavement (10 inches for an 8-inch pavement), and should taper back to the pavement thickness over a horizontal distance on the order of 3 feet.
- All longitudinal or transverse control joints should be constructed by hand forming or placing a pre-molded filler such as "zip strips." Expansion joints should be used to isolate fixed objects abutting or within the pavement area. The expansion joint should extend the full depth of the pavement. Joints should run continuously and extend through integral curbs and thickened edges. We recommend that joint layout be adjusted to coincide with the corners of objects and structures. In addition, the following is recommended for concrete pavements:
 1. Slope pavement at least ½ percent to provide drainage;
 2. Provide rough surface texture for traction;
 3. Cure concrete with curing compound or keep continuously moist for a minimum of seven days;
 4. Keep all traffic off concrete until compressive strength exceeds 2,000 pounds per square inch (truck traffic should be limited until the concrete meets the design strength (3,750 psi); and
 5. Due to potential low expansive soils, all construction joints should be keyed or slip dowels should be used on 24-inch centers to strengthen control and construction joints. Dowels placed within dowel baskets should be incorporated into the concrete at each saw-cut control joint (i.e. dowel baskets and dowels are set in place prior to placement of concrete).
- Subgrade soils and base materials should be in a stable, non-pumping condition at the time of placement and compaction.

- Asphalt concrete paving and placement methods should conform to the Caltrans or the Standard Specification for Public Works referred to in the (“Green Book”).
- Concrete placement and curing should, at a minimum, be in accordance with the American Concrete Institute (ACI) recommendations contained in ACI 211, 304, 305, 308, 309, and 318.
- Within the structural pavement section areas, positive drainage (both surface and subsurface) should be provided. In no instance should water be allowed to pond on the pavement. Roadway performance depends greatly on how well runoff water drains from the site. This drainage should be maintained both during construction and over the entire life of the project.
- Proper methods, such as hot-sealing or caulking, should be employed to limit water infiltration into the pavement base course and/or subgrade at construction/expansion joints and/or between existing and reconstructed asphalt concrete sections (if any). Water infiltration could lead to premature pavement failure.
- To reduce the potential for detrimental settlement, excess soil material, and/or fill material removed during any footing or utility trench excavation, should not be spread or placed over compacted finished grade soils unless subsequently compacted to at least 95% of the maximum dry unit weight, as evaluated by ASTM D 1557 test procedure, at near optimum moisture content, if placed under areas designated for pavement.
- Asphaltic concrete should be Caltrans, ½-in. or ¾-in. maximum-medium grading or as dictated by Riverside County guidelines and compacted to a minimum of 95% of the 75-blow Marshall density (ASTM D 1559) or equivalent.
- Where new roadways will be installed against existing roadways, the repaired asphalt concrete pavement section should be designed and constructed to have at least the pavement and aggregate base section as the original pavement section thickness (for both AC and base) or upon the newly calculated pavement sections presented within, whichever is greater.

The appropriate pavement design section depends primarily on the shear strength of the subgrade soil exposed after grading and anticipated traffic over the useful life of the pavement. R-value testing should be performed during grading to verify and/or modify the preliminary pavement sections presented within this report. Pavement designs assume that heavy construction traffic will not be allowed on base cap or finished pavement sections.

Existing Asphalt Concrete: Our borings placed within the existing Willow and West Wells Street measured the existing asphalt concrete and aggregate base thickness. Additionally, we performed a visual evaluation of the existing asphalt concrete. Table 8 below presents the measured thickness and location.

Table 8
Existing Pavement Section at Exploration Location

Boring	Roadway Location	Measured Asphalt Concrete Thickness (in)	Measured Aggregate Base Thickness (in)
B-1	West Edge of Willow Street	4½	5
B-2	East Edge of Willow Street at Turning Radius	4½	4½
B-3	East Edge of Willow Street at Turn Radius off W. 14 th Avenue	4½	4½
B-4	South Edge of West Wells Street at Existing Arco Facility	4½	20
B-5	North Edge of West Wells Street at Turning Radius Exit	4½	5
B-6	Center of West Wells Street	4½	4½

Our evaluation considered that Willow Street (bounded by 14th Avenue) and West Wells Street (bounded by South Lovekin Boulevard) will be used for access to the LCNG site by heavy 18-wheel type truck traffic. Truck traffic information provided by Mr. Ulrich Sauerbrey on June 19, 2012, estimated that the peak daily truck traffic over the design life of the station will be 200 vehicles; however, for the first couple years, truck traffic is projected to be 50 to 100 vehicles per day.

In general, the asphalt concrete between the boundaries mentioned above is moderately to severely degraded. Some rutting is present indicating forms of subgrade failure; however, due to the lack of water infiltration (lack of rainfall or runoff) the rutted areas are minor. Typically within the travelled way, the asphalt concrete exhibits “alligator” hexagonal type cracking which has well defined blocks and spalling at the edges. In general, the blocks are 3 to 6 inches in width. There is significant soil and debris intrusion into the separations between the spalled edges (most likely from windblown sand). At minor locations, separation between asphalt lifts has occurred. In less travelled areas, the cracking is less pronounced; however, the asphalt exhibits moderate to severe oil loss and hardening. These types of failures are generally caused by high temperature, intense sun which causes oxidation and oil loss which leads to hardening and embrittlement. Plates 3 through 6 present example roadway pictures.

It is our opinion that roadway repair options are limited, short of removal and replacement. We have been requested to provide discussion on the suitability of the existing section to support the anticipated truck loading (truck type/loading and number of truck trips as discussed above). We understand that Willow Street and West Wells Streets are not proposed to be rehabilitated or reconstructed until 1 or 2 years after construction of the LCNG facility. In general, it is our opinion that the roadway will continue to deteriorate in its present form. The alligator cracking is severe; however, loss of subgrade support was minor. As roadways near these life stages, deterioration increases at a more pronounced rate, especially with increased traffic and load, such that cracking of brittle asphalt is increased. Typically, with the introduction of water, this allows water intrusion, which then causes subgrade and aggregate base failure and rutting, potholes, and roadway asphalt block loss. Blythe, however, is a desert climate with intense sun and high average temperatures throughout a majority of the year. Rainfall averages 4 inches, typically spread equally throughout each month, and occurring in short sporadic events (www.cityofblythe.ca.gov). As such, this type of failure is less likely, as evidenced by the general lack of rutting in the roadway, despite ongoing traffic loading and moderate to severe cracking.

In regard to pavement section to resist deterioration from traffic loads, Willow Street and West Wells do not have an adequate section to provide long term support for the anticipated Traffic Index. Due to the possible time delay between constructing the LCNG facility and reconstructing/rehabilitating the roadways, we recommend West Wells and Willow Streets be monitored for further degradation. For the current roadway condition and lack of water intrusion, roadways typically do not fail catastrophically, especially on low speed roadways such as Willow Street and West Wells. Due to an inadequate pavement section and clayey subgrade soils, the roadway may experience depressions and distortions. Where ruts, potholes, depressions, and distortions begin to develop, they should be promptly repaired such that accelerated roadway distress is limited until the roadway is replaced.

5.10 Site Drainage and Maintenance

Positive drainage in native soils should be maintained away from the structures (5% for 5 feet minimum) to prevent ponding and subsequent saturation of the foundation soils. Gutters and downspouts in conjunction with a 2% paved or hardscape grade should be considered as a means to convey water away from foundations if increased fall is not provided.

Drainage should be maintained for paved areas. Water should not pond on or near paved areas or foundations. The following recommendations are provided in regard to site drainage and structure performance:

- In no instance should water be allowed to flow or pond against structures, slabs or foundations or flow over unprotected slope faces. Adequate provisions should be employed to control and limit moisture changes in the subgrade beneath foundations or structures to reduce the potential for soil saturation. Landscape borders should not act as traps for water within landscape areas. Potential sources of water such as piping, drains, broken sprinklers, etc, should be frequently examined for leakage or plugging. Any such leakage or plugging should be immediately repaired.

- It is highly recommended that landscape irrigation or other sources of water be collected and conducted to an approved drainage device. Landscaping and drainage grades should be lowered and sloped such that water drains to appropriate collection and disposal areas. All runoff water should be controlled, collected, and drained into proper drain outlets. Control methods may include curbing, ribbon gutters, 'V' ditches, or other suitable containment and redirection devices.
- The proposed retention/infiltration pond should not be based in fine grained soils. Excavation should extend through any fine grained soils encountered and extend into the site sandy soils. The site soils within the proposed retention basin area consisted of interbedded silty sand (SM), Silty Clay (CL) and Sandy Silt (ML) soils. Typically, the sandy soils (SM) which may have the potential to infiltrate water were observed at depths of approximately 2 to 4½ feet below the existing grades. Above these depths soils were clayey and not suitable to infiltrate water. Below these approximate depths, soils were silty and clayey (not suitable to infiltrate water) to a depth of approximately 9½ feet where sandy (SP) soils were encountered. At a depth of 8 feet, groundwater was encountered. As such, there appears to be a very narrow range of depth where water in a retention basin could infiltrate (laterally in the SM type soils as water may perch on the lower silt and clay layers), see the *Double Ring Infiltration Test Exploratory Log* in Appendix A for a depiction of the soil strata at the test location. The subgrade soils should be evaluated by the project geotechnical engineer or his representative to confirm or modify the basin recommendations provided.
- Maintenance of drainage systems and infiltration structures can be the most critical element in determining the success of a design. They must be protected and maintained from sediment-laden water both during and after construction to prevent clogging of the surficial soils any filter medium. The potential for clogging can be reduced by pre-treating structure inflow through the installation of maintainable forebays, biofilters, or sedimentation chambers. In addition, sediment, leaves, and debris must be removed from inlets and traps on a regular basis. Since these and other factors (such as varying soil conditions) may affect the rate of water infiltration, it is imperative to apply a conservative factor of safety [FOS] to the unfactored Basic Percolation/Infiltration Rates presented within to provide a reliable basis for design. In order to account not only for the unknown factors above but also for changes of conditions during the use of the structures such as potential clogging effects due to washing in of soil fines, a FOS between 3 and 12 should be applied to lower the presented infiltration rates.

We suggest a FOS of at least 5 be applied for design due to the potential for soil clogging, soil variation, and dirty water effects; however, the factor of safety should be selected by the project drainage engineer and may be dependent on agency guidelines and the presence of filters and sedimentation structures. If these measures are provided, the factor of safety can be reduced.

- The drainage pattern should be established at the time of final grading and maintained throughout the life of the project. Additionally, drainage structures should be maintained (including the de-clogging of piping, basin bottom scarification, etc.) throughout their design life.

Maintenance of these structures should be incorporated into the facility operation and maintenance manual. Structural performance is dependent on many drainage-related factors such as landscaping, irrigation, lateral drainage patterns and other improvements.

- It is expected that basin soils will be graded with heavy, construction grade earth moving equipment which can compact soils during grading. Compacted soils have a reduced inability to infiltrate water. As such, we recommend leaving basin bottom soils in a native, undisturbed or scarified condition to maintain infiltration rates.

Section 6**LIMITATIONS AND ADDITIONAL SERVICES****6.1 Uniformity of Conditions and Limitations**

Our findings and recommendations in this report are based on selected points of field exploration, laboratory testing, and our understanding of the proposed project. Furthermore, our findings and recommendations are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil or groundwater conditions could exist between and beyond the exploration points. The nature and extent of these variations may not become evident until construction. Variations in soil or groundwater may require additional studies, consultation, and possible revisions to our recommendations.

The planning and construction process is an integral design component with respect to the geotechnical aspects of this project. Because geotechnical engineering is an inexact science due to the variability of natural processes and because we sample only a small portion of the soil and material affecting the performance of the proposed structure, unanticipated or changed conditions can be disclosed during demolition and construction. Proper geotechnical observation and testing during construction is imperative to allow the geotechnical engineer the opportunity to verify assumptions made during the design process and to verify that our geotechnical recommendations have been properly interpreted and implemented during construction. Therefore, we recommend that Earth Systems be retained during the construction of the proposed improvements to observe compliance with the design concepts and geotechnical recommendations, and to allow design changes in the event that subsurface conditions or methods of construction differ from those assumed while completing this commission. If we are not accorded the privilege of performing this review, we can assume no responsibility for misinterpretation of our recommendations. The above services can be provided in accordance with our current Fee Schedule.

Our evaluation of subsurface conditions at the site has considered subgrade soil and groundwater conditions present at the time of our study. The influence(s) of post-construction changes to these conditions such as introduction or removal of water into or from the subsurface will likely influence future performance of the proposed project. It should be recognized that definition and evaluation of subsurface conditions are difficult. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions due to the limitation of data from field studies. The availability and broadening of knowledge and professional standards applicable to engineering services are continually evolving. As such, our services are intended to provide the Client with a source of professional advice, opinions and recommendations based on the information available as applicable to the project location, time of our services, and scope. If the scope of the proposed construction changes from that described in this report, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions of this report are modified or approved in writing by Earth Systems.

Findings of this report are valid as of the issued date of the report. However, changes in conditions of a property can occur with passage of time, whether they are from natural processes or works of man, on this or adjoining properties. In addition, changes in applicable standards occur, whether they result from legislation or broadening of knowledge. Accordingly, findings of this report may be invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and should not be relied upon after a period of one year.

This report is issued with the understanding that the owner or the owner's representative has the responsibility to bring the information and recommendations contained herein to the attention of the architect and engineers for the project so that they are incorporated into the plans and specifications for the project. The owner or the owner's representative also has the responsibility to verify that the general contractor and all subcontractors follow such recommendations. It is further understood that the owner or the owner's representative is responsible for submittal of this report to the appropriate governing agencies.

As the Geotechnical Engineer of Record for this project, Earth Systems has striven to provide our services in accordance with generally accepted geotechnical engineering practices in this locality at this time. No warranty or guarantee, express or implied, is made. This report was prepared for the exclusive use of the Client and the Client's authorized agents.

Earth Systems should be provided the opportunity for a general review of final design and specifications in order that earthwork and foundation recommendations may be properly interpreted and implemented in the design and specifications. If Earth Systems is not accorded the privilege of making this recommended review, we can assume no responsibility for misinterpretation of our recommendations. The owner or the owner's representative has the responsibility to provide the final plans requiring review to Earth Systems' attention so that we may perform our review.

Any party other than the client who wishes to use this report shall notify Earth Systems of such intended use. Based on the intended use of the report, Earth Systems may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Earth Systems from any liability resulting from the use of this report by any unauthorized party.

Although available through Earth Systems, the current scope of our services does not include an environmental assessment or an investigation for the presence or absence of wetlands, hazardous or toxic materials in the soil, surface water, groundwater, or air on, below, or adjacent to the subject property.

6.2 Additional Services

This report is based on the assumption that a program of client consultation, construction monitoring, and testing will be performed during the final design and construction phases to check compliance with these recommendations. Maintaining Earth Systems as the geotechnical consultant from beginning to end of the project will provide continuity of services. *The geotechnical engineering firm providing tests and observations shall assume the responsibility of Geotechnical Engineer of Record.*

Construction monitoring and testing would be additional services provided by our firm. The costs of these services are not included in our present fee arrangements, but can be obtained from our office. The recommended review, tests, and observations include, but are not necessarily limited to the following:

- Consultation during the final design stages of the project.
- A review of the building and grading plans to observe that recommendations of our report have been properly implemented into the design.
- Observation and testing during site preparation, grading, and placement of engineered fill.
- Special Inspection for concrete, masonry, steel during construction.
- Consultation as needed during construction.

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Aerial Photographs:

Google Earth

1994-2011

APPENDIX A

Plate 1 – Site Location
Plate 2– Boring and Test Location Map
Plates 3 through 6 – Willow and West Wells Street Photos
Terms and Symbols Used on Boring Logs
Soil Classification System
Boring and Trench Logs
Site Class (2)
Seismic Settlement Calculation (2)
Table 1 – Fault Parameters
Table 2 – Historic Earthquakes



Reference: USGS Blythe, CA-AZ Quadrangle, 2012

LEGEND

Approximate Scale: 1" = 3,450'



**Plate 1
Site Location**

Proposed Willow Street LCNG Refueling Station
 NEC 14th Avenue & Willow Street
 Blythe, Riverside County, California



**Earth Systems
Southwest**

06/21/2012

File No.: 12068-01



Reference: GoogleEarth Satellite Image, 11/29/2004.

 <p style="text-align: center;">LEGEND</p> <ul style="list-style-type: none">  B-10 Approximate Boring Locations  P-2 Approximate Percolation Test Location  T-1 Approximate Trench Location <p>Approximate Scale: 1" = 170'</p> 	<p>Plate 2 Boring and Test Locations</p>
	<p>Proposed Willow Street LCNG Refueling Station NEC 14th Avenue & Willow Street Blythe, Riverside County, California</p>
	 <p>Earth Systems Southwest</p>
	<p>06/21/2012</p>



West Wells Street looking west

**Plate 3
West Wells Street Photo**

Proposed Willow Street LCNG Refueling Station
NEC 14th Avenue & Willow Street
Blythe, Riverside County, California



**Earth Systems
Southwest**

06/21/2012

File No.: 12068-01



West Wells Street looking east

**Plate 4
West Wells Street Photo**

Proposed Willow Street LCNG Refueling Station
NEC 14th Avenue & Willow Street
Blythe, Riverside County, California



**Earth Systems
Southwest**

06/21/2012

File No.: 12068-01



West Wells Street looking east

**Plate 5
West Wells Street Photo**

Proposed Willow Street LCNG Refueling Station
NEC 14th Avenue & Willow Street
Blythe, Riverside County, California



**Earth Systems
Southwest**

06/21/2012

File No.: 12068-01



Willow Street looking north

**Plate 6
Willow Street Photo**

Proposed Willow Street LCNG Refueling Station
NEC 14th Avenue & Willow Street
Blythe, Riverside County, California



**Earth Systems
Southwest**

06/21/2012

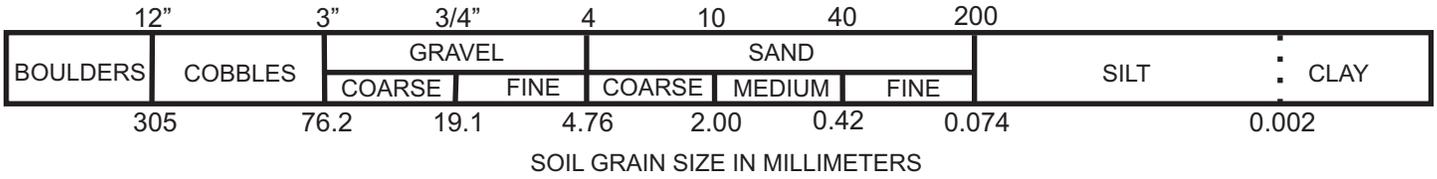
File No.: 12068-01

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on ASTM Designations D 2487 and D 2488 (Unified Soil Classification System). Information on each boring log is a compilation of subsurface conditions obtained from the field as well as from laboratory testing of selected samples. The indicated boundaries between strata on the boring logs are approximate only and may be transitional.

SOIL GRAIN SIZE

U.S. STANDARD SIEVE



RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, AND NON-PLASTIC SILTS)

Very Loose	*N=0-4	RD=0-30	Easily push a 1/2-inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a 1/2-inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a 1/2-inch reinforcing rod with hammer
Dense	N=31-50	RD=70-90	Drive a 1/2-inch reinforcing rod 1 foot with difficulty by a hammer
Very Dense	N>50	RD=90-100	Drive a 1/2-inch reinforcing rod a few inches with hammer

*N=Blows per foot in the Standard Penetration Test at 60% theoretical energy. For the 3-inch diameter Modified California sampler, 140-pound weight, multiply the blow count by 0.63 (about 2/3) to estimate N. If automatic hammer is used, multiply a factor of 1.3 to 1.5 to estimate N. RD=Relative Density (%). C=Undrained shear strength (cohesion).

CONSISTENCY OF COHESIVE SOILS (CLAY OR CLAYEY SOILS)

Very Soft	*N=0-1	*C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium Stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very Stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000	Dented slightly by a pencil point or thumbnail

MOISTURE DENSITY

Moisture Condition:	An observational term; dry, damp, moist, wet, saturated.
Moisture Content:	The weight of water in a sample divided by the weight of dry soil in the soil sample expressed as a percentage.
Dry Density:	The pounds of dry soil in a cubic foot.

MOISTURE CONDITION

Dry.....	Absence of moisture, dusty, dry to the touch
Damp.....	Slight indication of moisture
Moist.....	Color change with short period of air exposure (granular soil) Below optimum moisture content (cohesive soil)
Wet.....	High degree of saturation by visual and touch (granular soil) Above optimum moisture content (cohesive soil)
Saturated.....	Free surface water

RELATIVE PROPORTIONS

Trace.....	minor amount (<5%)
with/some.....	significant amount
modifier/and...	sufficient amount to influence material behavior (Typically >30%)

PLASTICITY

DESCRIPTION	FIELD TEST
Nonplastic	A 1/8 in. (3-mm) thread cannot be rolled at any moisture content.
Low	The thread can barely be rolled.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit.
High	The thread can be rerolled several times after reaching the plastic limit.

LOG KEY SYMBOLS

	Bulk, Bag or Grab Sample
	Standard Penetration Split Spoon Sampler (2" outside diameter)
	Modified California Sampler (3" outside diameter)
	No Recovery

GROUNDWATER LEVEL

	Water Level (measured or after drilling)
	Water Level (during drilling)

Terms and Symbols used on Logs



Earth Systems
Southwest

MAJOR DIVISIONS			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS		
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS < 5% FINES		GW	Well-graded gravels, gravel-sand mixtures, little or no fines		
				GP	Poorly-graded gravels, gravel-sand mixtures. Little or no fines		
		GRAVELS WITH FINES > 12% FINES		GM	Silty gravels, gravel-sand-silt mixtures		
				GC	Clayey gravels, gravel-sand-clay mixtures		
	SAND AND SANDY SOILS	CLEAN SAND (Little or no fines) < 5%		SW	Well-graded sands, gravelly sands, little or no fines		
				SP	Poorly-graded sands, gravelly sands, little or no fines		
		SAND WITH FINES (appreciable amount of fines) > 12%		SM	Silty sands, sand-silt mixtures		
				SC	Clayey sands, sand-clay mixtures		
			FINE-GRAINED SOILS	LIQUID LIMIT <u>LESS</u> THAN 50		ML	Inorganic silts and very fine sands, rock flour, silty low clayey fine sands or clayey silts with slight plasticity
						CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity					
	MH	Inorganic silty, micaceous, or diatomaceous fine sand or silty soils					
LIQUID LIMIT <u>GREATER</u> THAN 50		CH		Inorganic clays of high plasticity, fat clays			
		OH		Organic clays of medium to high plasticity, organic silts			
HIGHLY ORGANIC SOILS				PT	Peat, humus, swamp soils with high organic contents		
VARIOUS SOILS AND MAN MADE MATERIALS					Fill Materials		
MAN MADE MATERIALS					Asphalt and concrete		
			Soil Classification System				
			 Earth Systems Southwest				



Boring No. B-1

Project Name: Willow Street LCNG Refueling Station

Project Number: 12068-01

Boring Location: See Plate 2

Drilling Date: May 16, 2012

Drilling Method: 8" HSA

Drill Type: B61 w/autohammer

Logged By: Rich Howe

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units	
							Blow Count	Dry Density
0				AC			ASPHALT CONCRETE (AC): 4 1/2 inches	
		4,4,4		BASE			AGGREGATE BASE (BASE): 5 inches	
				CL			SILTY CLAY: brown, firm, moist, low to medium plasticity	
		7,9,14		SM	100	14	SILTY SAND: reddish brown, medium dense, moist, fine grained sand	
5		4,7,11			95	19		
10								
15								
20								
25								
30								

Graphic Trend

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Total Depth 6 1/2 feet
No Refusal
No groundwater encountered
Backfilled with native, AC patched with commercial grade concrete mix with black dye



Boring No. B-2

Project Name: Willow Street LCNG Refueling Station

Project Number: 12068-01

Boring Location: See Plate 2

Drilling Date: May 16, 2012

Drilling Method: 8" HSA

Drill Type: B61 w/autohammer

Logged By: Rich Howe

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units		Graphic Trend Blow Count Dry Density
							Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.		
0				AC			ASPHALT CONCRETE (AC): 4 1/2 inches		
		5,10,11		BASE	110	19	AGGREGATE BASE (BASE): 4 1/2 inches		
				CL			SILTY CLAY: dark brown, stiff, moist, medium plasticity		
		5,6,7		SM	93	8	SILTY SAND: yellow brown, loose, moist, fine grained sand		
5		5,5,9		ML	96	24	SANDY SILT: brown, stiff, moist, slightly cohesive, non plastic, fine grained sand		
10									
15									
20									
25									
30							Total Depth 6 1/2 feet No Refusal No groundwater encountered Backfilled with native, AC patched with commercial grade concrete mix with black dye		



Boring No. B-3

Project Name: Willow Street LCNG Refueling Station

Project Number: 12068-01

Boring Location: See Plate 2

Drilling Date: May 16, 2012

Drilling Method: 8" HSA

Drill Type: B61 w/autohammer

Logged By: Rich Howe

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units	
							Blow Count	Dry Density
0				AC			ASPHALT CONCRETE (AC): 4 1/2 inches	
		5,5,6		BASE	122	17	AGGREGATE BASE (BASE): 4 1/2 inches	
			ML				SANDY SILT: red brown, firm, moist, fine grained sand, low plasticity	
		5,7,9		CL	109	12	SILTY CLAY: brown, stiff, moist, with fine grained sand	
5		6,9,14		SP-SM	93	9	POORLY GRADED SAND WITH SILT: reddish brown, medium dense, moist, fine grained sand	
10								
15								
20								
25								
30								

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend

Blow Count Dry Density

Total Depth 6 1/2 feet
No Refusal
No groundwater encountered
Backfilled with native, AC patched with commercial grade concrete mix with black dye

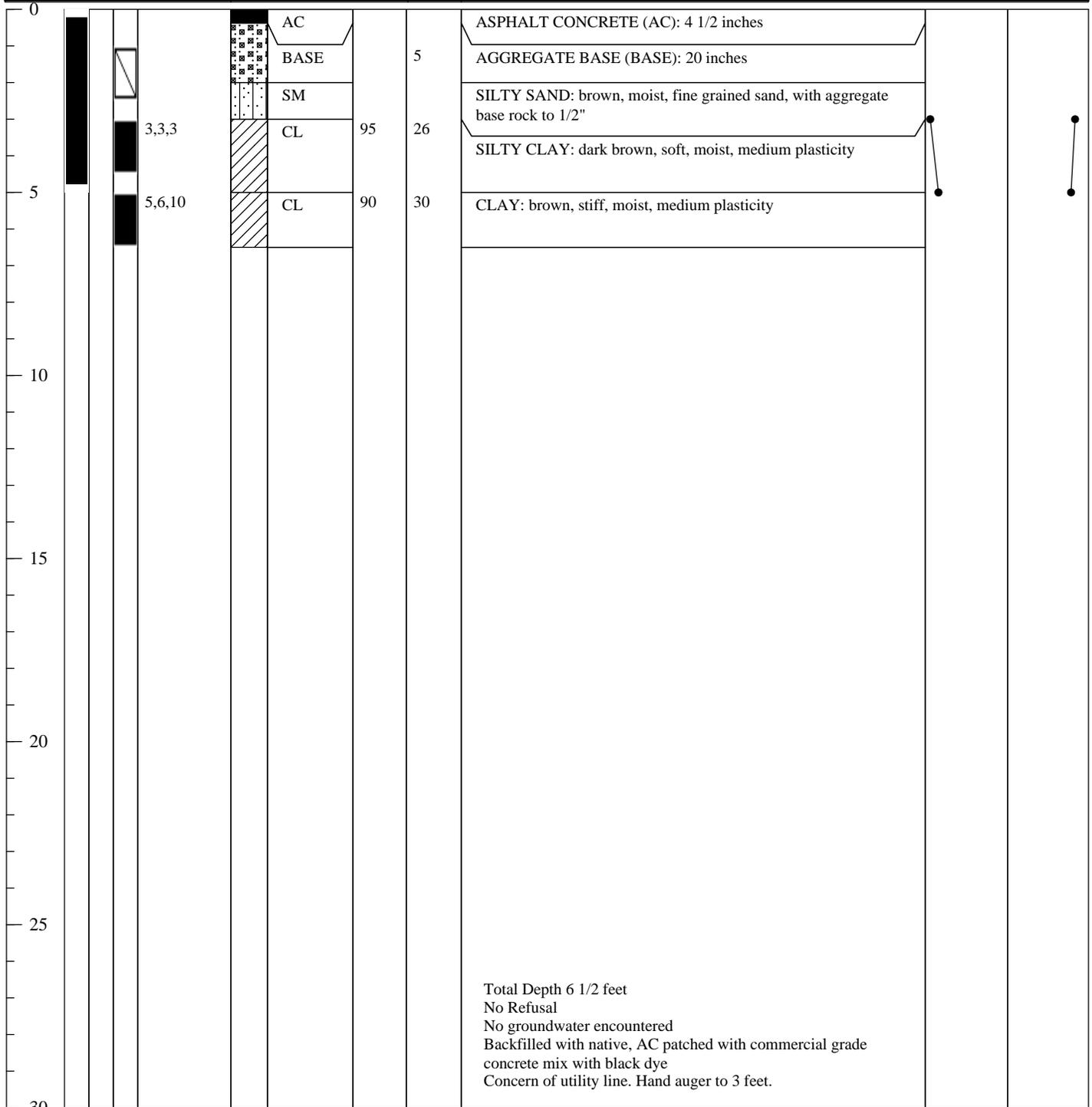


Boring No. B-4 Project Name: Willow Street LCNG Refueling Station Project Number: 12068-01 Boring Location: See Plate 2	Drilling Date: May 16, 2012 Drilling Method: 8" HSA Drill Type: B61 w/autohammer Logged By: Rich Howe
---	--

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units	
							Graphic Trend	Blow Count Dry Density

Page 1 of 1

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.





Boring No. B-5

Project Name: Willow Street LCNG Refueling Station

Project Number: 12068-01

Boring Location: See Plate 2

Drilling Date: May 16, 2012

Drilling Method: 8" HSA

Drill Type: B61 w/autohammer

Logged By: Rich Howe

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units	
							Blow Count	Dry Density
0				AC			ASPHALT CONCRETE (AC): 4 1/2 inches	
4.7, 6		4,7,6		BASE	103	23	AGGREGATE BASE (BASE): 5 inches	
				CL			SILTY CLAY: dark brown, firm, moist, low to medium plasticity	
7, 10, 13		7,10,13		ML/SM	97	5	SANDY SILT to SILTY SAND: brown, stiff (medium dense), slightly moist, fine grained sand	
				SM			SILTY SAND: reddish brown, loose, moist, fine grained sand	
6, 7, 9		6,7,9			102	11		
<p>Total Depth 6 1/2 feet No Refusal No groundwater encountered Backfilled with native, AC patched with commercial grade concrete mix with black dye</p>								

Graphic Trend

Blow Count Dry Density



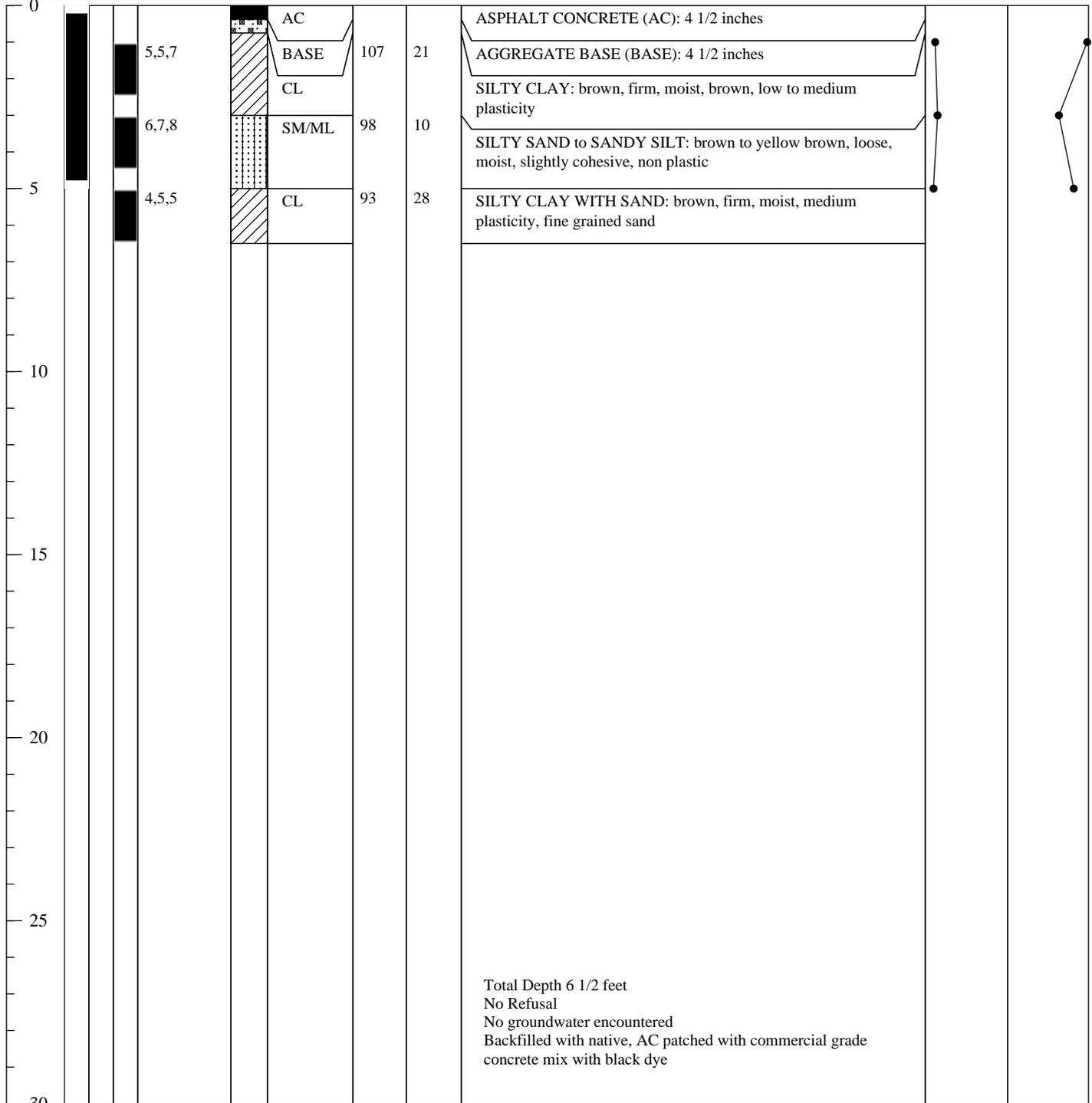
Boring No. B-6 Project Name: Willow Street LCNG Refueling Station Project Number: 12068-01 Boring Location: See Plate 2	Drilling Date: May 16, 2012 Drilling Method: 8" HSA Drill Type: B61 w/autohammer Logged By: Rich Howe
---	--

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units	
							Blow Count	Dry Density

Page 1 of 1

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

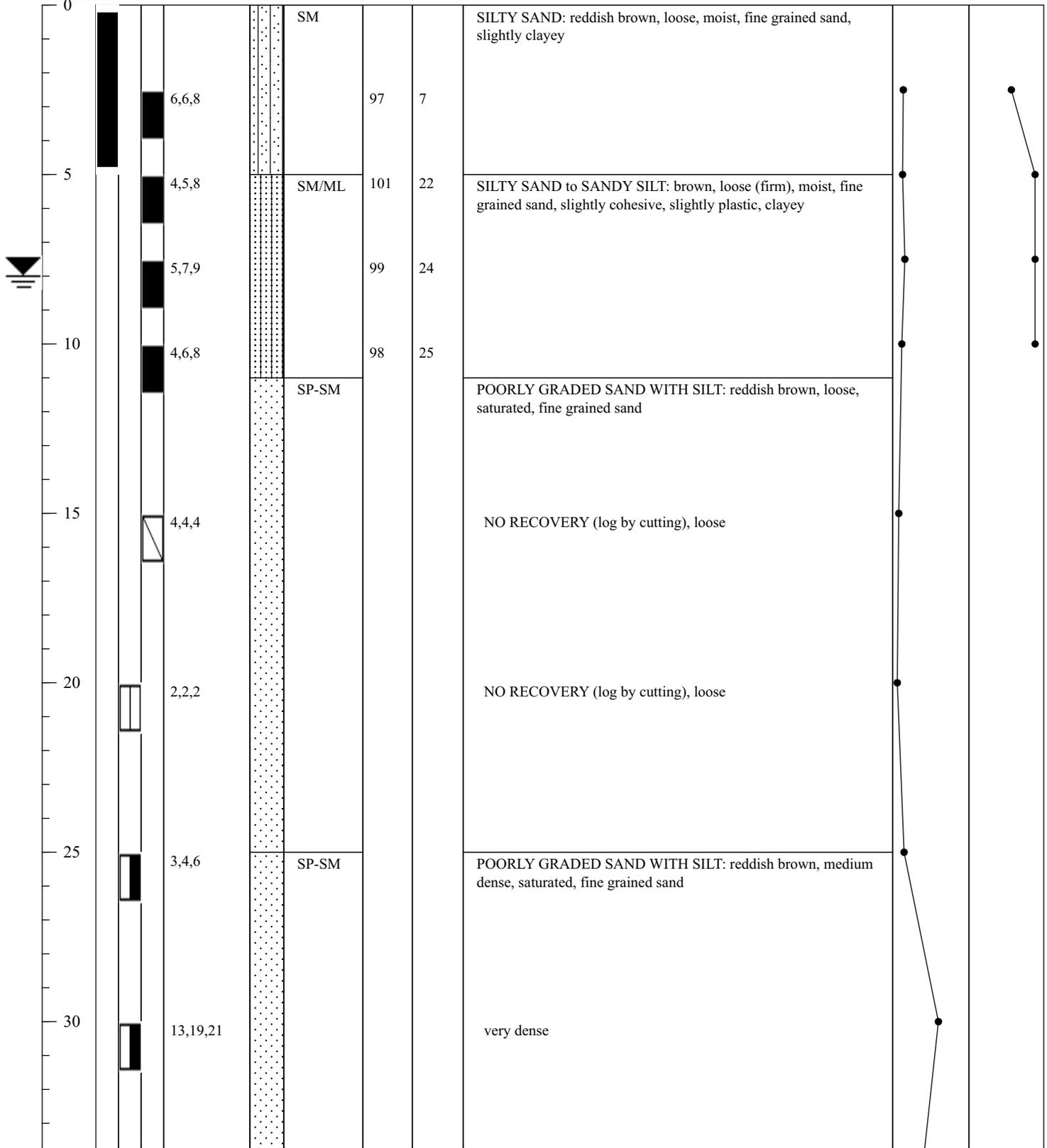
Graphic Trend





Boring No. B-7 Project Name: Willow Street LCNG Refueling Station Project Number: 12068-01 Boring Location: See Plate 2				Drilling Date: May 16, 2012 Drilling Method: 8" HSA Drill Type: B61 w/autohammer Logged By: Rich Howe			
---	--	--	--	--	--	--	--

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units		Graphic Trend Blow Count Dry Density
							Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.		



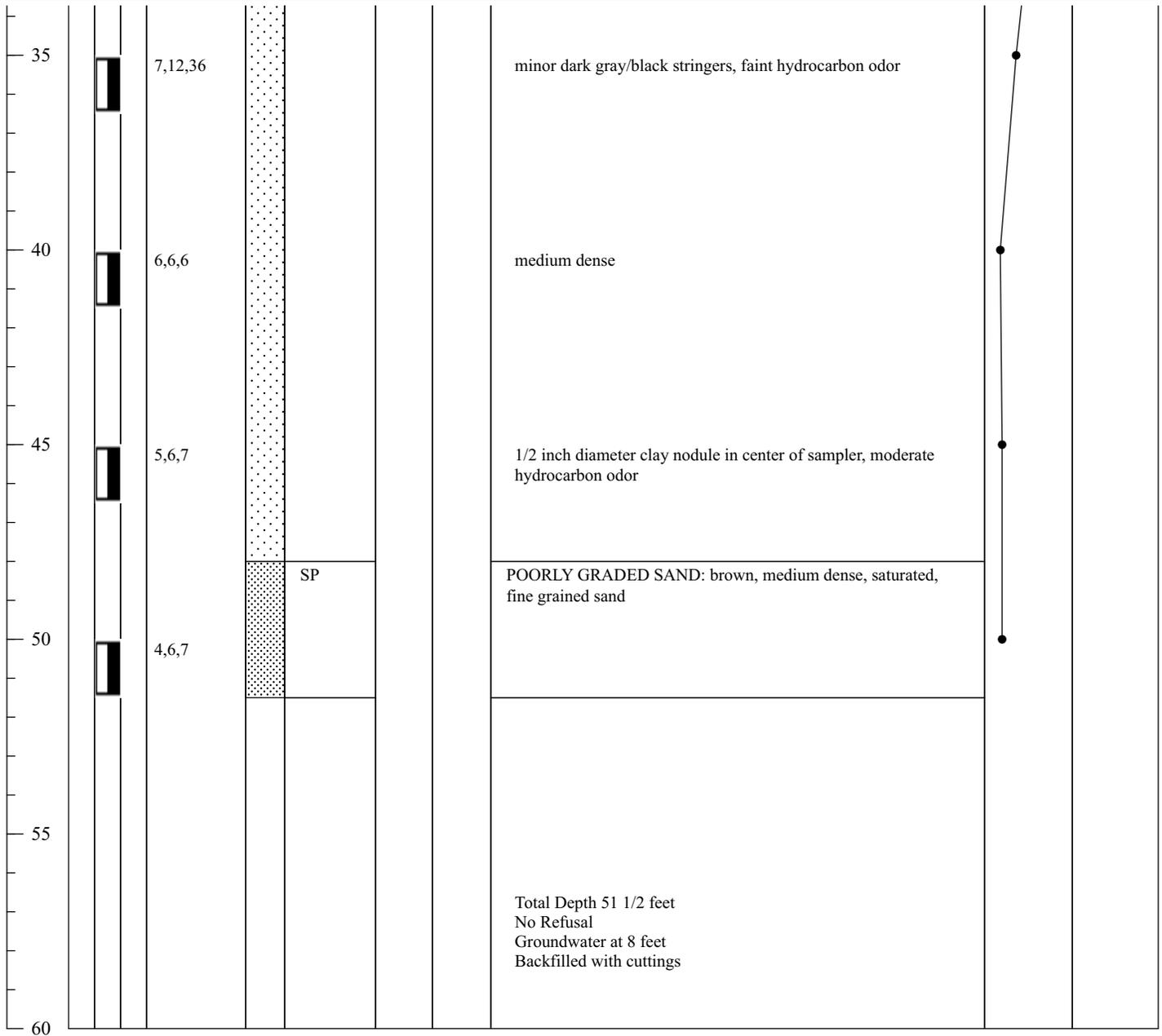


Boring No. B-7 Project Name: Willow Street LCNG Refueling Station Project Number: 12068-01 Boring Location: See Plate 2	Drilling Date: May 16, 2012 Drilling Method: 8" HSA Drill Type: B61 w/autohammer Logged By: Rich Howe
---	--

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units	
							Blow Count	Dry Density

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

Graphic Trend



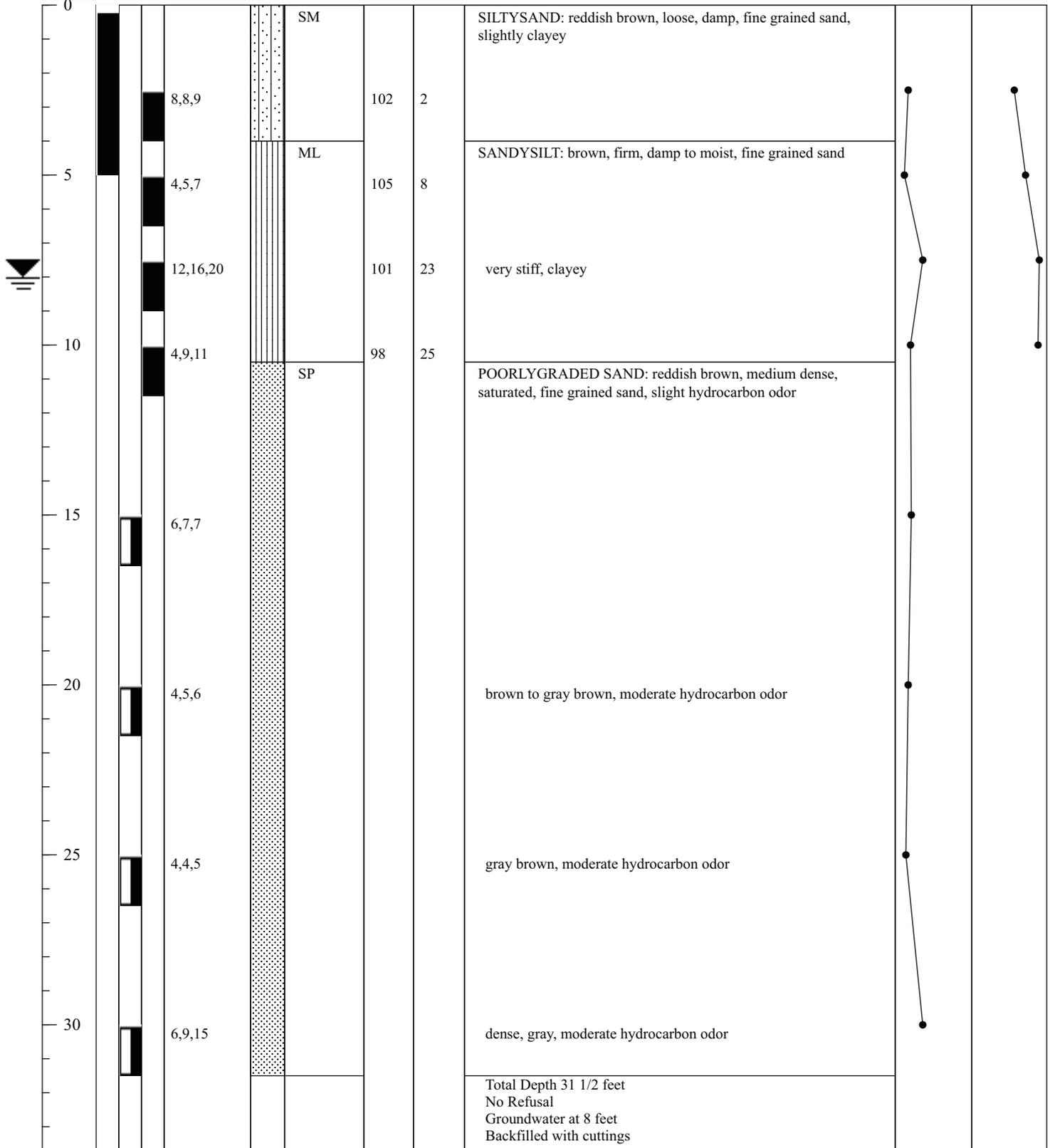


Boring No. B-8 Project Name: Willow Street LCNG Refueling Station Project Number: 12068-01 Boring Location: See Plate 2				Drilling Date: May 16, 2012 Drilling Method: 8" HSA DrillType: B61 w/autohammer Logged By: Rich Howe			
---	--	--	--	---	--	--	--

Depth (Ft.)	Sample Type	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	DryDensity (pcf)	Moisture Content (%)	Description of Units	Page 1 of 1	
-------------	-------------	-----------------------------------	--------	--------------	------------------	----------------------	----------------------	-------------	--

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

GraphicTrend
Blow Count Dry Density





Boring No. B-9 Project Name: Willow Street LCNG Refueling Station Project Number: 12068-01 Boring Location: See Plate 2	Drilling Date: May 16, 2012 Drilling Method: 8" HSA Drill Type: B61 w/autohammer Logged By: Rich Howe
---	--

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units	
							Graphic Trend	Blow Count Dry Density

Page 1 of 1

Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.

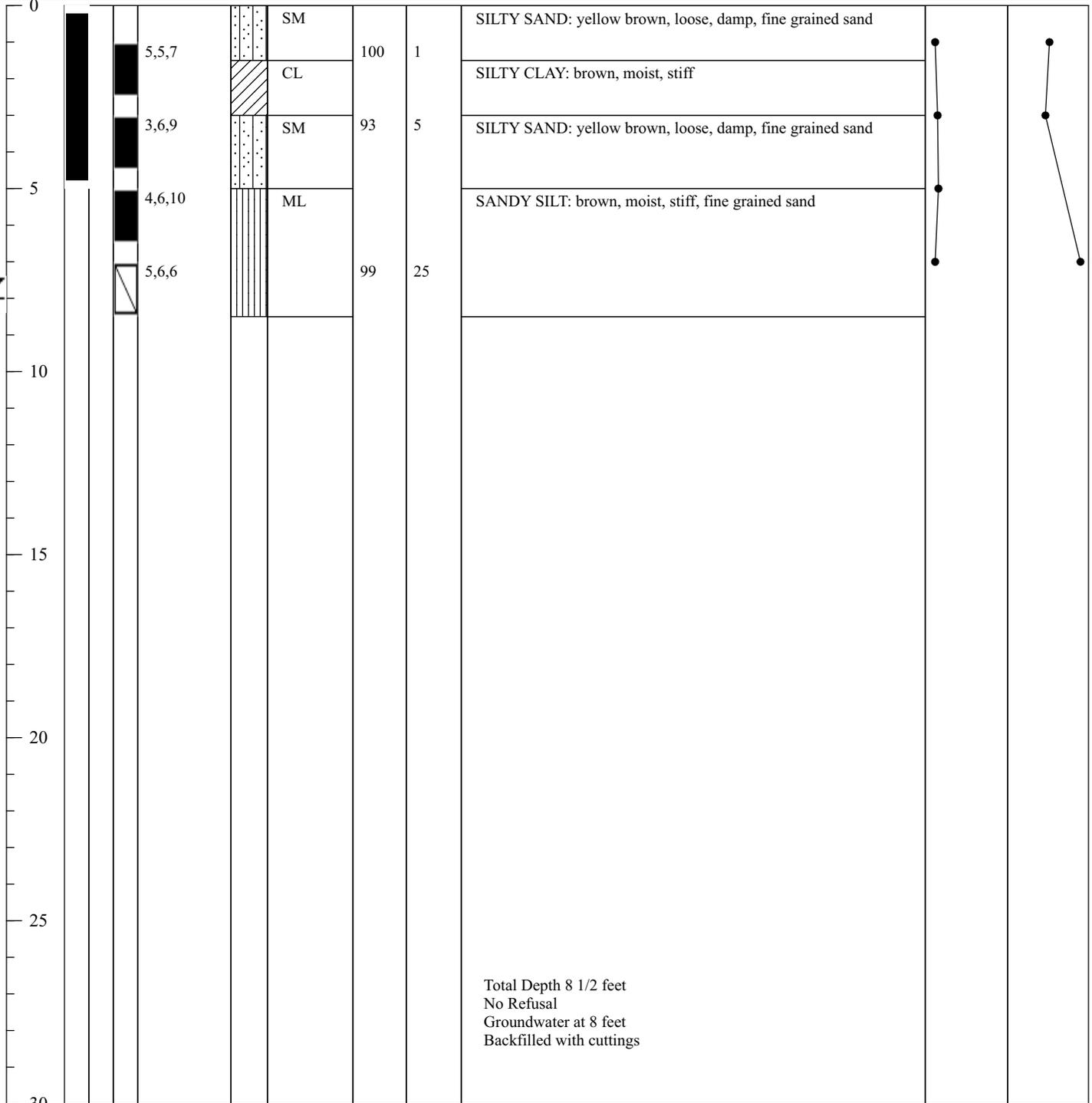
0		7,9,14		SM	97	4	SILTY SAND: reddish brown, medium dense, slightly moist, fine grained sand, slightly clayey		
		7,12,17		SM/ML	108	11	SILTY SAND to SANDY SILT: yellow brown, medium dense/stiff, moist, fine grained sand, clayey		
5		10,16,18		SM	98	13	SILTY SAND: reddish brown, medium dense, moist, fine grained sand		
		8,9,10					NO RECOVERY		
10									
15									
20									
25									
30									

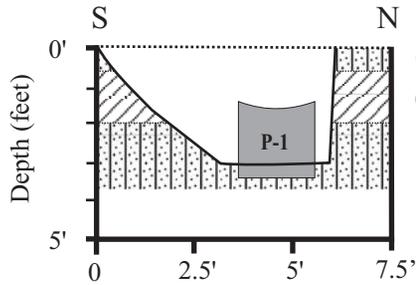
Total Depth 8 feet
No Refusal
Groundwater at 8 feet
Backfilled with cuttings



Boring No. B-10 Project Name: Willow Street LCNG Refueling Station Project Number: 12068-01 Boring Location: See Plate 2	Drilling Date: May 16, 2012 Drilling Method: 8" HSA Drill Type: B61 w/autohammer Logged By: Rich Howe
--	--

Depth (Ft.)	Sample Type Bulk SPT MOD Calif.	Penetration Resistance (Blows/6")	Symbol	USCS/Bedrock	Dry Density (pcf)	Moisture Content (%)	Description of Units		Page 1 of 1
							Note: The stratification lines shown represent the approximate boundary between soil and/or rock types and the transition may be gradational.		Graphic Trend Blow Count Dry Density





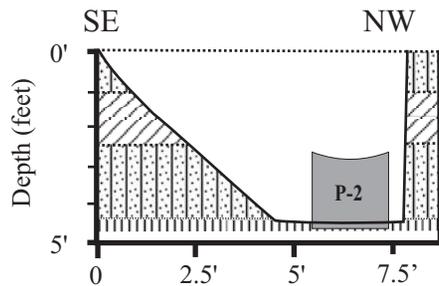
P-1

- 0-0.5' SM: SILTY SAND, reddish brown, slightly moist, fine grained sand
- 0.5-2' CL: SILTY CLAY, brown, moist, low to moderate plasticity
- 2-3' SM: SILTY SAND, light reddish brown, slightly moist, fine grained sand

Double Ring Infiltration Test P-1 at 3'

Total Trench Depth 3 Feet

No groundwater encountered



P-2

- 0-1' SM: SILTY SAND, reddish brown, slightly moist, fine grained sand
- 1-2.5' CL: SILTY CLAY, brown, moist, low to moderate plasticity
- 2.5-4.5' SM: SILTY SAND, light reddish brown, slightly moist, fine grained sand
- 4.5' ML: SANDY SILT, brown, slightly moist, fine grained sand

Double Ring Infiltration Test P-2 at 4.5'

Total Trench Depth 4.5 Feet

No groundwater encountered

Horizontal and Vertical
Scale: 1" = 5'



Reference: Field Sketch, ESSW (2012)

Double Ring Infiltration Test Trench Logs

Willow Street CLNG Refueling Station
Blythe, Riverside County, California

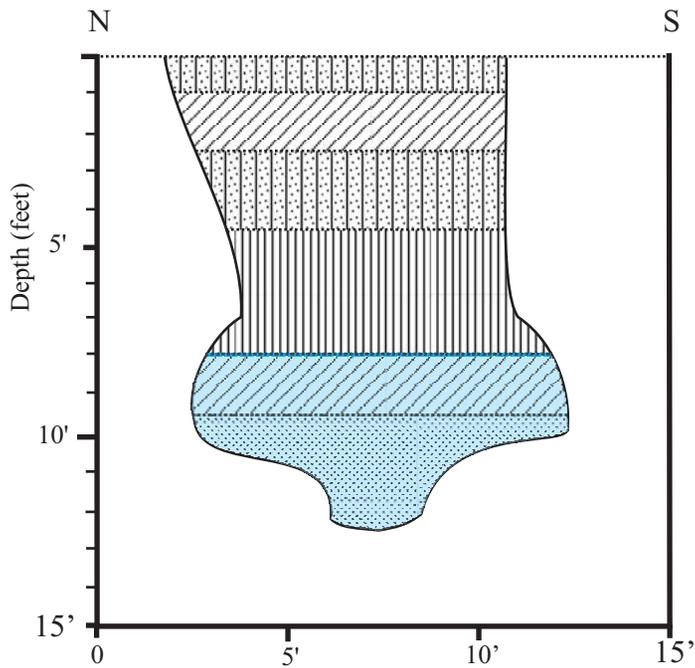


Earth Systems
Southwest

06-15-2012

File No.: 12068-01

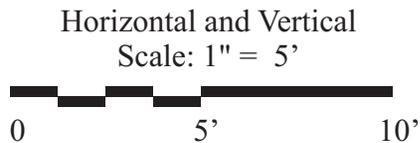
T-1



- 0-1' SM: SILTY SAND, reddish brown, slightly moist, fine grained sand
- 1-2.5' CL: SILTY CLAY, brown, moist, low to moderate plasticity
- 2.5-4.5' SM: SILTY SAND, reddish brown, slightly moist, fine grained sand
- 4.5-8' ML: SILT TO SANDY SILT, reddish brown to brown, fine grained sand, some 1-2'' interbedded silty sand (SM) layers
- 8-9.5' CL: SILTY CLAY, brown, wet, moderate plasticity
Groundwater at 8'
- 9.5-12' SP: SAND, reddish brown, wet, fine grained sand

Caving below 9.5'

Total Trench Depth 12 feet



Reference: Field Sketch, ESSW (2012)

Double Ring Infiltration Test Exploratory Trench Log

Willow Street CLNG Refueling Station
Blythe, Riverside County, California



Earth Systems
Southwest

05-xx-2012

File No.: 12068-01

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

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Project: LCNG Blythe
 Job No: 12068-01
 Date: 6/15/2012
 Boring: B-7

Methods: Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)
 Journal of Geotechnical and Environmental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
 Settlement Analysis from Tokimatsu and Seed (1987), JGEE, Vol 113 No 8 ASCE
 Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: 9.2 7.5
 PGA, g: 0.13 0.16
 MSF: 0.80
 GWT: 8.0 feet
 Calc GWT: 8.0 feet
 Remediate to: 7.0 feet

SPT N VALUE CORRECTIONS:

Energy Correction to N60 (C_E): 1.16
 Drive Rod Corr. (C_R): 1 Default
 Rod Length above ground (feet): 5.0
 Borehole Dia. Corr. (C_B): 1.00
 Sampler Liner Correction for SPT?: 1 Yes
 Cal Mod/ SPT Ratio: 0.63

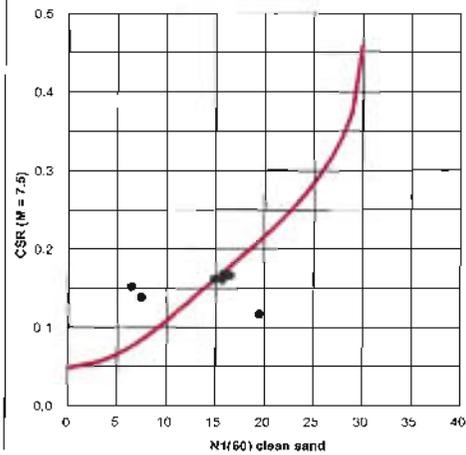
Total (ft)
 Liquefied
 Thickness:
 27.5

Total (in.)
 Induced
 Subsidence
 4.8
 upper 50 ft

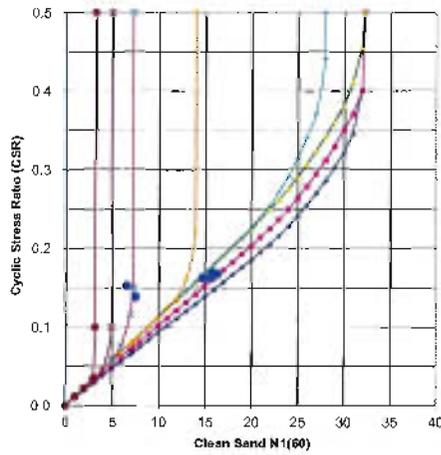
SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Base Depth (feet)	Cal Mod N	Liquef. Suscept. (0 or 1)	Total Unit Wt. (pcf)	Fines Content (%)	Depth (feet)	Rod Length (feet)	Tot. Stress at SPT po (tsf)	Eff. Stress p'o (tsf)	rd	C _N	C _R	C _B	N ₁₍₆₀₎	Rel. Density Dr (%)	Trigger FC Adj	Eqv Sand N _{1(60)CS}	K _σ	M = 7.5	M = 7.5	Liquefac. Safety Factor	FC Adj ΔN _{1(60)CS}	Volumetric Strain (%)	Induced Subsidence (in.)	ρ (tsf)	G _{max} (tsf)	τ _{av} (tsf)	Shear Strain γ	Strain E _s	Strain Enc	Dry Sand Subsidence (in.)	
5.0	14	90	1	105	15	7.5	0.131	0.131	1.00	1.70	0.75	1.00	74.0	100	6.1	80.0	1.00	1.200	0.106	Non-Liq.	6.1	80.0	0.00	0.00	0.088	571	0.011	2.1E-05	4.0E-06	4.7E-06	0.00
8.0	13	8	1	120	50	10.0	0.263	0.263	0.99	1.70	0.75	1.00	12.1	42	7.4	19.5	1.00	0.211	0.105	Non-Liq.	7.4	19.5	0.01	0.00	0.176	505	0.022	5.0E-05	5.1E-05	6.1E-05	0.00
11.0	16	10	1	120	50	12.5	0.413	0.413	0.98	1.60	0.75	1.00	14.0	45	7.8	21.9	1.00	0.238	0.105	Non-Liq.	7.8	21.9	0.00	0.00	0.276	657	0.034	5.9E-05			
12.5	14	9	1	120	50	15.0	0.583	0.500	0.98	1.45	0.81	1.00	12.0	41	7.4	19.4	1.00	0.210	0.117	1.79	7.4	19.4	0.00	0.00	0.377	737	0.047	7.1E-05			
17.5	5	5	1	110	9	20.0	0.850	0.632	0.97	1.29	0.89	1.00	6.8	31	0.7	7.4	1.00	0.084	0.138	0.60	0.8	7.6	2.92	1.75	0.570	659	0.070	1.3E-04			
25.0	4	1	1	110	9	25.0	1.125	0.751	0.96	1.19	0.96	1.00	5.8	29	0.7	6.4	1.00	0.075	0.152	0.49	0.8	6.6	3.31	2.98	0.754	722	0.091	1.5E-04			
27.5	10	1	1	110	9	30.0	1.400	0.870	0.94	1.10	1.00	1.15	14.8	46	0.8	15.6	1.00	0.168	0.161	1.04	0.8	15.6	0.28	0.08	0.938	1,081	0.111	1.2E-04			
32.5	40	1	1	110	9	35.0	1.675	0.989	0.92	1.03	1.00	1.30	62.4	94	1.6	64.0	1.00	1.200	0.166	7.24	1.6	64.0	0.00	0.00	1.122	1,894	0.130	7.4E-05			
37.5	48	1	1	110	9	40.0	1.950	1.108	0.89	0.98	1.00	1.30	70.7	100	1.8	72.5	0.98	1.200	0.170	7.07	1.8	72.5	0.00	0.00	1.307	2,131	0.147	7.4E-05			
42.5	12	1	1	110	9	45.0	2.225	1.227	0.85	0.93	1.00	1.16	14.9	46	0.8	15.7	0.97	0.170	0.169	1.01	0.8	15.7	0.66	0.39	1.491	1,388	0.160	1.3E-04			
47.5	13	1	1	110	9	50.0	2.500	1.346	0.80	0.89	1.00	1.16	15.5	47	0.8	16.3	0.95	0.176	0.166	1.06	0.8	16.3	0.23	0.14	1.675	1,468	0.170	1.3E-04			
50.0	13	1	1	110	2	55.0	2.775	1.465	0.75	0.85	1.00	1.15	14.8	46	0.0	14.8	0.94	0.160	0.162	0.99	0.0	14.8	0.75	0.22	1.859	1,496	0.177	1.3E-04			

NCEER (1997) Curve of Liquefaction Resistance



Post-Liquefaction Volumetric Strain Ref: Tokimatsu & Seed (1987)



$$N_{1(60)} = C_N \cdot C_E \cdot C_a \cdot C_R \cdot C_S \cdot N$$

$$C_R = 0.75 \text{ for Rod lengths } < 3m, 1.0 \text{ for } > 10m$$

$$C_R = \min(1, \max(0.75, 1.4666 \cdot 2.556 / (z(ft))^{0.5}))$$

$$C_N = (1 \text{ atm} / p'o)^{0.5}, \text{ max } 1.7$$

$$C_S = \max(1.1, \min(1.3, 1 + N_{1(60)} / 100)) \text{ for SPT without liners}$$

$$MSF = 10^{2.4 \cdot CSR} / M^{0.5}$$

$$z = \text{Depth (m)}$$

$$p_a = 1 \text{ atm} = 101 \text{ KPa} = 1.058 \text{ tsf}$$

$$rd = (1 - 0.41 \cdot 13 \cdot z^{0.5} + 0.04052 \cdot z + 0.001753 \cdot z^2 + 1.5) / (1 - 0.4177 \cdot z^{0.5} + 0.05729 \cdot z - 0.009205 \cdot z^2 + 1.5 + 0.00121 \cdot z^2)$$

$$\Delta N_{1(60)} = \min(10, \text{IF}(FC < 35, \exp(1.76 \cdot (160/FC)^2), 5) + \text{IF}(FC < 5, \text{IF}(FC < 35, 0.99 \cdot (FC^{1.5}/1000), 1.2)) \cdot N_{1(60)} - N_{1(60)})$$

$$N_{1(60)CS} = N_{1(60)CS} + \Delta N_{1(60)}$$

$$K_\sigma = \min \text{ of } 1.0 \text{ or } (p'o / 1.058)^{0.5} \text{ (IF}(Dr > 0, 0.6, \text{IF}(Dr < 0.5, 0.8, 0.7)) - 1)$$

$$Dr = (N_{1(60)} / 70)^{0.5}$$

$$CSR_{req} = 0.65 \cdot PGA \cdot (p'o / p'o) \cdot rd$$

$$CSR^* = CSR_{req} / MSF / K_\sigma$$

$$CRR_{7.5} = (0.048 - 0.004721 \cdot N + 0.0008136 \cdot N^2 - 0.00001673 \cdot N^3) / (1 - 0.1248 \cdot N + 0.009578 \cdot N^2 - 0.0003285 \cdot N^3 + 0.000003714 \cdot N^4)$$

$$N = N_{1(60)CS}$$

$$SF = CRR / 5.1487 / CSR^*$$

$$\rho = 0.67 \cdot p'o$$

$$N_c = (MAG - 4)^{-1.17}$$

$$\tau_{av} = 0.65 \cdot PGA \cdot p'o \cdot rd$$

$$G_{max} = 447 \cdot N_{1(60)CS}^{-1.13} \cdot p'o^{0.5}$$

$$a = 0.0389 \cdot (p'/1) + 0.124$$

$$b = 6400 \cdot (p'/1)^{1.001}$$

$$\gamma = [1 + a \cdot \text{EXP}(b \cdot \tau_{av} / G_{max})] / [(1 + a) \cdot \tau_{av} / G_{max}]$$

$$E_{15} = \gamma \cdot (N_{1(60)CS} / 20)^{-1.2}$$

$$E_{inc} = (N_c / 15)^{0.45} \cdot E_{15}$$

$$S = 2 \cdot H \cdot E_{inc}$$

LIQUEFY-v 2.3.XLS - A SPREADSHEET FOR EMPIRICAL ANALYSIS OF LIQUEFACTION POTENTIAL AND INDUCED GROUND SUBSIDENCE

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Project: **LCNG Blythe**
 Job No: **12068-01**
 Date: **6/15/2012**
 Boring: **B-8** Data Set: **2**

Methods: **Liquefaction Analysis using 1996 & 1998 NCEER workshop method (Youd & Idriss, editors)**
 Journal of Geotechnical and Environmental Engineering (JGEE), October 2001, Vol 127, No. 10, ASCE
 Settlement Analysis from Tokimatsu and Seed (1987), JGEE, Vol 113, No.8, ASCE
 Modified by Pradel, JGEE, Vol 124, No. 4, ASCE

EARTHQUAKE INFORMATION:

Magnitude: **0.2** 7.5
 PGA, g: **0.13** 0.16
 MSF: **0.80**
 GWT: **6.8** feet
 Calc GWT: **6.8** feet
 Remediate to: **7.0** feet

SPT N VALUE CORRECTIONS:

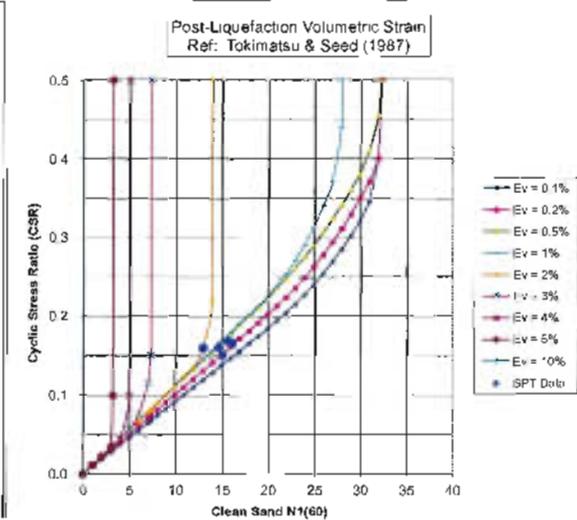
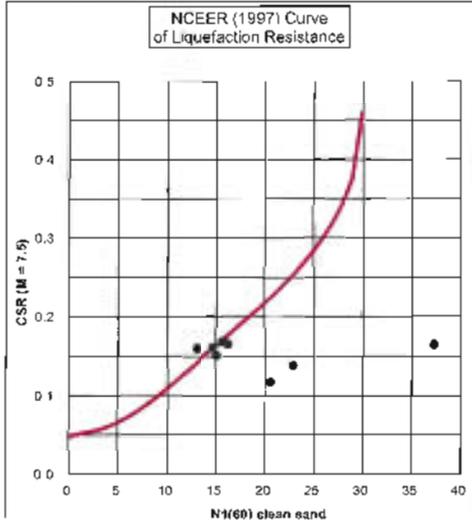
Energy Correction to N60 (C_E): **1.16**
 Drive Rod Corr. (C₃): **1** Default
 Rod Length above ground (feet): **5.0**
 Borehole Dia. Corr. (C_B): **1.00**
 Sampler Liner Correction for SPT?: **1** Yes
 Cal Mod: SPT Ratio: **0.63**

Total (ft)
 Liquefied
 Thickness
22.5

Total (in.)
 Induced
 Subsidence
1.7
 upper 50 ft

SETTLEMENT (SUBSIDENCE) OF DRY SANDS

Base Cal	Liquef.	Total	Fines	Depth	Rod	Tot.Stress	Eff.Stress	rd	C _N	C _R	C _S	N ₁₍₆₀₎	Dens	Rel. Dr (%)	Trigger	Equiv	M = 7.5	M = 7.5	Liquefac.	Post	Volumetric	Induced	p	G _{max}	τ _{av}	Shear	Strain	Strain	Strain	Dry Sand			
Depth	Mod	SPT	Suscept.	Unit Wt	Content	of SPT	Length	at SPT	at SPT						FC Adj	Sand	κ _σ	Available	Induced	Safety	FC Adj.	Strain	Subsidence	(tsf)	(tsf)	(tsf)	γ	E ₁₅	Enc	Subsidence			
(feet)	N	N	(0 or 1)	(pcf)	(%)	(feet)	(feet)	po (tsf)	p'o (tsf)									CRR	CSR*	Factor	ΔN _{1(60)CS}	N _{1(60)CS}	(in.)							(in.)			
4.0	17	50	1	105	15	2.5	7.5	0.131	0.131	1.00	1.70	0.75	100	74.0	100	6.1	80.0	1.00	1.200	0.106	Non-Liq.	6.1	80.0	0.00	0.00	0.088	571	0.011	2.1E-05	4.0E-06	4.7E-06	0.00	
8.0	12	8	1	115	50	5.0	10.0	0.268	0.268	0.99	1.70	0.75	100	11.2	40	7.2	18.4	1.00	0.199	0.105	Non-Liq.	7.2	18.4	0.01	0.01	0.179	500	0.022	5.1E-05	5.7E-05	6.8E-05	0.01	
10.0	36	23	1	120	50	7.5	12.5	0.410	0.410	0.98	1.61	0.75	100	31.7	67	10.0	41.7	1.00	1.200	0.105	Non-Liq.	10.0	41.7	0.00	0.00	0.275	812	0.034	4.6E-05				
15.0	20	13	1	120	15	10.0	15.0	0.560	0.498	0.98	1.46	0.81	100	17.2	50	3.3	20.5	1.00	0.222	0.117	1.90	3.3	20.5	0.00	0.00	0.375	750	0.046	7.0E-05				
17.5	14	1	1	110	3	15.0	20.0	0.860	0.642	0.97	1.28	0.89	1.22	22.8	57	0.0	22.8	1.00	0.251	0.138	1.82	0.0	22.8	0.00	0.00	0.576	963	0.070	8.2E-05				
22.5	10	1	1	110	3	20.0	25.0	1.135	0.781	0.96	1.18	0.96	1.16	15.1	46	0.0	15.1	1.00	0.163	0.152	1.08	0.0	15.1	0.18	0.11	0.760	964	0.092	1.1E-04				
27.5	9	1	1	110	3	25.0	30.0	1.410	0.880	0.94	1.10	1.00	1.14	13.0	43	0.0	13.0	1.00	0.141	0.160	0.88	0.0	13.0	2.00	1.20	0.945	1,022	0.112	1.3E-04				
37.5	24	1	1	110	3	30.0	35.0	1.685	0.999	0.92	1.03	1.00	1.30	37.3	73	0.0	37.3	1.00	1.200	0.165	7.27	0.0	37.3	0.00	0.00	1.129	1,586	0.131	9.0E-05				
42.5	12	1	1	110	8	40.0	45.0	2.235	1.237	0.85	0.92	1.00	1.15	14.9	46	0.8	15.7	0.97	0.169	0.169	1.00	0.8	15.7	0.67	0.40	1.497	1,369	0.161	1.3E-04				
47.5	13	1	1	110	5	45.0	50.0	2.510	1.356	0.80	0.88	1.00	1.16	15.5	47	0.8	16.3	0.95	0.176	0.166	1.06	0.8	16.3	0.24	0.14	1.682	1,469	0.170	1.3E-04				
50.0	13	1	1	110	2	50.0	55.0	2.785	1.475	0.75	0.85	1.00	1.15	14.7	46	0.0	14.7	0.94	0.159	0.161	0.99	0.0	14.7	0.77	0.23	1.866	1,497	0.177	1.3E-04				



$$N_{1(60)} = C_v \cdot C_E \cdot C_S \cdot C_R \cdot C_B \cdot N$$

$$C_R = 0.75 \text{ for Rod lengths } < 3\text{m}, 1.0 \text{ for } > 10\text{m}$$

$$= \min(1, \max(0.75, 1.4666 - 2.556/(z(ft))^{0.5}))$$

$$C_N = (1 \text{ atm}/p'o)^{1.5}, \text{ max } 1.7$$

$$C_S = \max(1.1, \min(1.3, 1 + N_{1(60)}/100)) \text{ for SPT without liners}$$

$$MSF = 10^{-0.4M/2.0}$$

$$z = \text{Depth (m)}$$

$$p_a = 1 \text{ atm} = 101 \text{ kPa} = 1.058 \text{ tsf}$$

$$rd = (1 - 0.4113z^{*0.5} + 0.04052z^{*2} + 0.001753z^{*4} + 5)(1 - 0.4177z^{*0.5} + 0.05729z^{*2} - 0.00205z^{*4} + 0.00121z^{*2})$$

$$\Delta N_{1(60)} = \min(10, IF(FC < 35, \exp(1.76 - (190/FC^2)), 5) + IF(FC < 5, 1, IF(FC < 35, 0.99 + (FC^4/1.5/1000), 1.2)) / (N_{1(60)} - N_{1(60)})$$

$$N_{1(60)CS} = N_{1(60)CS} + \Delta N_{1(60)}$$

$$\kappa_{\sigma} = \min \text{ of } 1.0 \text{ or } (p'o/1.058)^{IF(Dr > 0.7, 0.8; FC > 10, 0.5; 0.8; 0.7; 1)}$$

$$Dr = (N_{1(60)}/70)^{1.5}$$

$$CSR_{req} = 0.65 \cdot PGA^4 \cdot (p'o/p'o)^{rd}$$

$$CSR^* = CSR_{req} / MSF / \kappa_{\sigma}$$

$$CHR_{7.5} = (0.048 - 0.004721N + 0.0006136N^2 - 0.00001673N^3) / (1 - 0.1248N + 0.009578N^2 - 0.0003985N^3 + 0.000003714N^4)$$

$$N = N_{1(60)CS}$$

$$SF = CRR_{7.5} / CSR^*$$

$$p = 0.67 \cdot p_o$$

$$N_c = (MAG - 4)^{1.7}$$

$$\tau_{av} = 0.65 \cdot PGA \cdot p_o \cdot rd$$

$$G_{max} = 447 \cdot N_{1(60)CS}^{(103)/0.5} \cdot p^{0.5}$$

$$a = 0.0389 \cdot (p/1) + 0.124$$

$$b = 6400 \cdot (p/1)^{0.61}$$

$$\gamma = [1 + a \cdot \exp(b \cdot \tau_{av} / G_{max})] / [(1 + a) \cdot \tau_{av} / G_{max}]$$

$$E_{15} = \gamma^4 \cdot (N_{1(60)CS} / 20)^{-1.2}$$

$$E_{nc} = (Nc/15)^{2.132} \cdot E_{15}$$

$$S = 2 \cdot H \cdot E_{nc}$$

Table 1
Fault Parameters

Fault Section Name	Distance		Avg Dip Angle	Avg Dip Direction	Avg Rake	Trace Length	Fault Type	Mean Mag	Mean Return Interval	Slip Rate
	(miles)	(km)	(deg.)	(deg.)	(deg.)	(km)			(years)	(mm/yr)
Blue Cut	51.8	83.3	90	177	na	79	B'	7.1		
Brawley (Seismic Zone), alt 2	65.8	105.9	90	250	na	61	B'	7.0		
Elmore Ranch	65.9	106.0	90	310	0	29	B	6.6		1
San Andreas (Coachella) rev	66.2	106.6	90	224	180	69	A	7.2	69	20
Brawley (Seismic Zone), alt 1	68.9	111.0	90	250	na	60	B'	7.0		
Imperial	72.1	116.0	82	55	180	46	A	6.8	89	20
Superstition Hills	78.2	125.8	90	220	180	36	A	7.4	199	4
San Jacinto (Superstition Mtn)	80.4	129.4	90	210	180	26	B'	6.6		
Superstition Mountain	80.4	129.4	37	37	37	37	B	7.0		0.1
Pinto Mtn	84.3	135.7	90	175	0	74	B	7.2		2.5
San Jacinto (Borrego)	87.8	141.3	90	223	180	34	A	7.0	146	4
Pisgah-Bullion Mtn-Mesquite Lk	88.4	142.2	90	60	180	88	B	7.3		0.8
Cerro Prieto	89.2	143.6	90	221	na	84	B'	7.2		
San Jacinto (Clark) rev	89.5	144.0	90	214	180	47	A	7.6	211	14
Ludlow	93.0	149.6	90	239	na	70	B'	7.0		
San Andreas (San Gorgonio Pass-Garnet Hill)	95.2	153.3	58	20	180	56	A	7.6	219	10
San Andreas, (North Branch, Mill Creek)	95.2	153.3	76	204	180	106	A	7.5	110	17
Laguna Salada	95.6	153.8	90	41	180	99	A	6.8	89	3.5
San Jacinto (Coyote Creek)	96.3	155.0	90	223	180	43	A	7.3	259	4
Calico-Hidalgo	97.1	156.3	90	52	180	117	B	7.4		1.8
So Emerson-Copper Mtn	98.1	157.9	90	51	180	54	B	7.0		0.6
Elsinore (Coyote Mountain)	99.1	159.4	82	35	180	39	A	7.1	322	3
Joshua Tree (Seismicity)	100.0	160.9	90	271	na	17	B'	6.5		
Canada David (Detachment)	100.7	162.1	37	255	na	37	B'	7.1		
Eureka Peak	102.8	165.4	90	75	180	19	B	6.6		0.6
Burnt Mtn	105.1	169.1	67	265	180	21	B	6.7		0.6
Earthquake Valley (So Extension)	106.5	171.5	90	204	180	9	B'	6.3		
San Jacinto (Anza) rev	110.2	177.3	90	216	180	46	A	7.6	151	18
Earthquake Valley	110.6	178.0	90	217	180	20	B	6.7		2
Elsinore (Julian)	110.8	178.3	84	36	180	75	A	7.6	725	3
Landers	111.2	179.0	90	60	180	95	B	7.4		0.6
Hector Mine	112.7	181.4	90	246	na	28	B'	6.7		
Mission Creek	116.3	187.2	65	5	180	31	B'	6.9		
Johnson Valley (No)	117.0	188.3	90	51	180	35	B	6.8		0.6
Earthquake Valley (No Extension)	118.0	189.9	90	221	180	33	B'	6.9		
North Frontal (East)	120.4	193.8	41	187	90	27	B	6.9		0.5
San Gorgonio Pass	127.1	204.5	60	11	na	29	B'	6.9		
Lenwood-Lockhart-Old Woman Springs	127.6	205.4	90	43	180	145	B	7.5		0.9
San Andreas (San Bernardino S)	129.5	208.5	90	210	180	43	A	7.6	150	16
San Jacinto (San Jacinto Valley, stepover)	132.5	213.3	90	224	180	24	A	7.4	199	9

Reference: USGS OFR 2007-1437 (CGS SP 203)

Mean Magnitude for Type A Faults based on 0.1 weight for unsegmented section, 0.9 weight for segmented model (weighted by probability of each scenario with section listed as given on Table 3 of Appendix G in OFR 2007-1437). Mean magnitude is average of Ellsworths-B and Hanks & Bakun moment area relationship.

Site Coordinates: 33.604 N 114.603 W

Table 2
Historic Earthquakes in Vicinity of Project Site, M > 5.5

Event Name	Day	Year	Epicenter		Distance from Site (mi)	Reported Magnitudes				Estimated Site PGA (g)
			Latitude (Degrees)	Longitude (Degrees)		M _w	M _s	M _L	M _i	
	05/03	1872	33.00	115.00	48				5.8	0.02
	07/29	1950	33.12	115.57	65			5.5		0.01
<i>Pinto Mountain</i>	05/02	1949	34.02	115.68	68	5.9		5.9		0.02
	05/28	1917	32.80	115.30	69				5.5	0.01
<i>Westmorland</i>	04/26	1981	33.10	115.63	69	5.9	6.0	5.6		0.02
	10/22	1942	33.23	115.72	69			5.5		0.01
<i>Brawley Aftershock</i>	10/15	1979	32.98	115.55	70			5.8		0.02
<i>Imperial Valley</i>	04/19	1906	32.90	115.50	71	6.2	6.2		5.8	0.02
<i>Imperial Valley</i>	06/23	1915	32.80	115.50	76		5.9		5.6	0.02
<i>Imperial Valley</i>	06/23	1915	32.80	115.50	76	6.0	6.0		5.6	0.02
<i>Elmore Ranch</i>	11/23	1987	33.08	115.78	77	5.9	6.2	5.8		0.02
	01/24	1951	32.98	115.73	78			5.6		0.01
	06/14	1953	32.95	115.72	79			5.5		0.01
<i>El Centro</i>	05/19	1940	32.73	115.50	80	7.0	7.2	6.2	7.0	0.03
<i>Fort Yuma</i>	11/29	1852	32.50	115.00	80	7.0			7.0	0.03
<i>Imperial Valley</i>	10/15	1979	32.61	115.32	80	6.5	6.8	6.6	6.0	0.02
<i>Superstition Hills</i>	11/24	1987	33.01	115.84	82	6.5	6.6	6.0		0.02
	08/15	1945	33.22	116.13	92			5.7		0.01
	11/15	1875	32.50	115.50	92	6.2			6.2	0.01
<i>North San Jacinto</i>	11/07	1923	32.50	115.50	92				5.5	0.01
	01/01	1927	32.50	115.50	92			5.5		0.01
	01/01	1927	32.50	115.50	92			5.8		0.01
<i>Borrego Mountain</i>	04/09	1968	33.19	116.13	92	6.5	6.8	6.8	6.3	0.02
<i>Fish Creek Mountain</i>	10/21	1942	33.05	116.08	94	6.6		6.5	6.3	0.02
<i>Arroyo Salada</i>	03/19	1954	33.28	116.18	94	6.4		6.2	6.2	0.02
<i>Laguna Salada</i>	02/24	1892	32.55	115.63	94	7.0			7.0	0.02
	05/28	1892	33.20	116.20	96	6.5			6.3	0.02
	02/01	1954	32.30	115.30	99			5.6		0.01
	02/09	1890	33.40	116.30	99	6.5			6.3	0.02
<i>Victoria</i>	06/09	1980	32.20	115.08	101	6.4	6.4	6.1		0.02
<i>Joshua Tree</i>	04/22	1992	33.96	116.32	102	6.1		6.1		0.01

Notes:

- 1.) Earthquake information primarily from Ellsworth (1990) in USGS Professional Paper 1515
- 2.) Magnitude Scales: M_w - moment magnitude, M_L - Local (Richter) magnitude, M_s - surface wave magnitude, M_i - estimated from felt area intensity.
- 3.) Before 1932, Epicenters of earthquakes are approximate, indicated to nearest 0.5 to 0.1 degree.

APPENDIX B

Laboratory Results

UNIT DENSITIES AND MOISTURE CONTENT ASTM D2937-04 & D2216-05

Job Name: Willow St. LCNG Refueling Station.

Sample Location	Depth (feet)	Unit Dry Density (pcf)	Moisture Content (%)	USCS Group Symbol
B1	0-5	---	14	CL-SM
B1	3	100	6	SM
B1	5	95	7	SM
B2	1	110	19	CL
B2	3	93	8	SM
B2	5	96	24	ML
B3	1	122	17	ML
B3	3	109	12	CL
B3	5	93	9	SP-SM
B4	1	---	5	SM
B4	3	95	26	CL
B4	5	90	30	CL
B5	1	103	23	CL
B5	3	97	5	SM/ML
B5	5	102	11	SM
B6	1	107	21	CL
B6	3	98	10	SM/ML
B6	5	93	28	CL
B7	2.5	97	7	SM
B7	5	101	22	SM/ML
B7	7.5	99	24	SM/ML
B7	10	98	25	SM/ML

UNIT DENSITIES AND MOISTURE CONTENT ASTM D2937-04 & D2216-05

Job Name: Willow St. LCNG Refueling Station.

Sample Location	Depth (feet)	Unit Dry Density (pcf)	Moisture Content (%)	USCS Group Symbol
B8	2.5	102	2	SM
B8	5	105	8	ML
B8	7.5	101	23	ML
B8	10	98	25	ML
B9	1	97	4	SM
B9	3	108	11	SM/ML
B9	5	98	13	SM
B10	1	100	1	SM
B10	3	93	5	SM
B10	7	99	25	ML

File No.: 12068-01

June 21, 2012

Job Name: Willow St. LCNG Refueling Station.

Lab Number: 12-0077

AMOUNT PASSING NO. 200 SIEVE

ASTM D 1140-03a

Sample Location	Depth (feet)	Fines Content (%)	USCS Group Symbol
B4	3	99	CL
B5	1	94	CL
B5	3	53	SM/ML
B5	5	24	SM
B7	5	95	ML
B7	35	9	SP-SM
B7	50	2	SP
B8	20	3	SP
B9	3	76	ML

PLASTICITY INDEX

Job Name: 12068-01

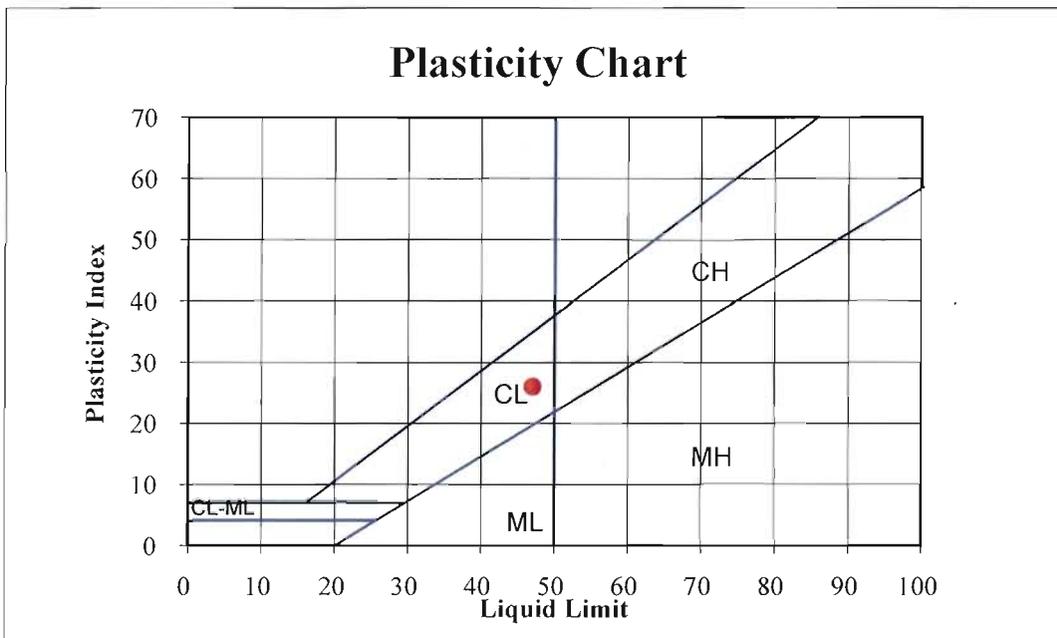
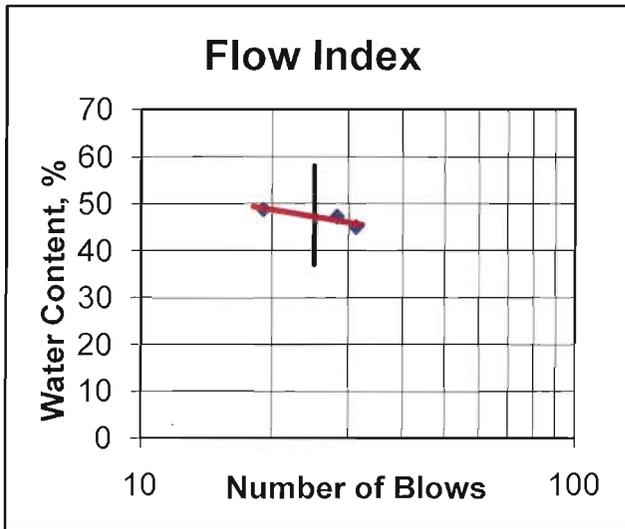
Sample ID: B4 @ 3 feet

Soil Description: Silty Clay (CL)

DATA SUMMARY

TEST RESULTS

Number of Blows:	31	28	19	LIQUID LIMIT	48
Water Content, %	45.1	47.2	48.8	PLASTIC LIMIT	21
				PLASTICITY INDEX	26



PLASTICITY INDEX

Job Name: 12068-01

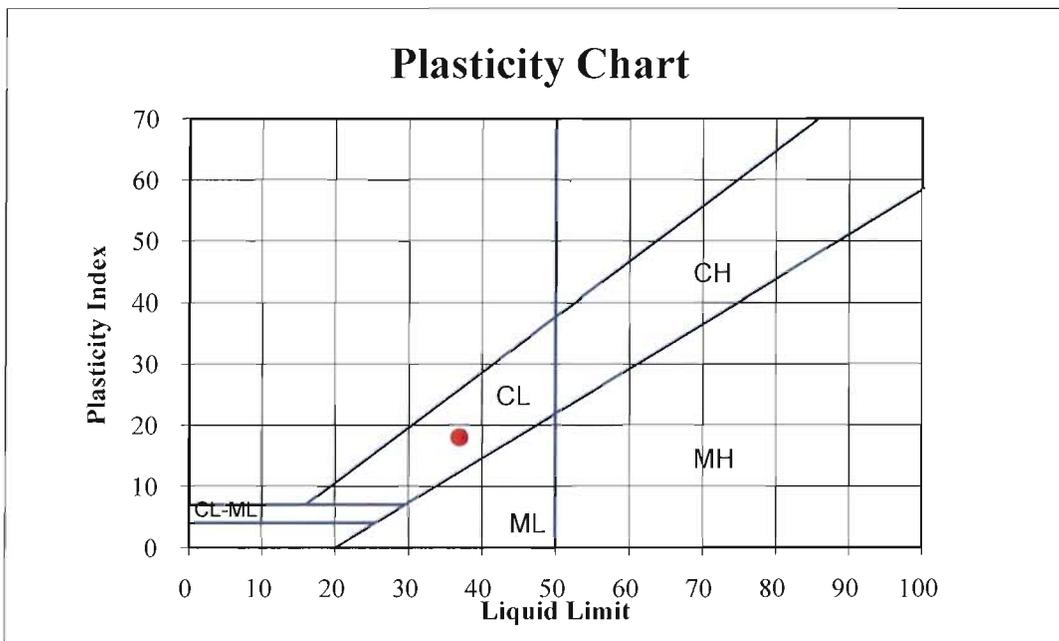
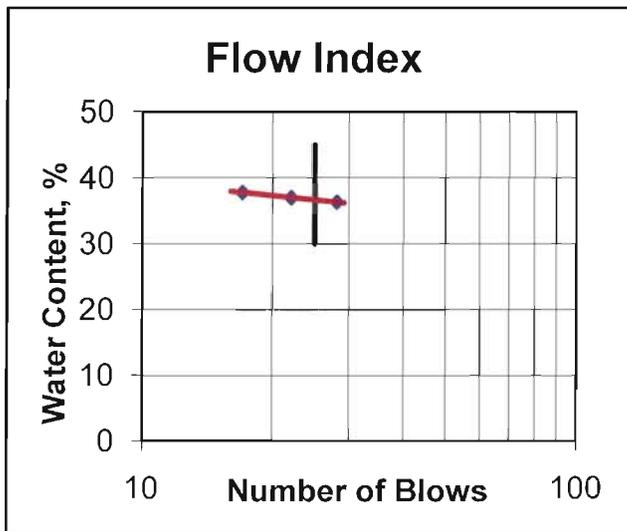
Sample ID: B5 @ 1 feet

Soil Description: Silty Clay (CL)

DATA SUMMARY

TEST RESULTS

Number of Blows:	28	22	17	LIQUID LIMIT	36
Water Content, %	36.4	37.0	37.8	PLASTIC LIMIT	19
				PLASTICITY INDEX	18



CONSOLIDATION TEST

ASTM D 2435-04 & D 5333

Willow St. LCNG Refueling Station.

Initial Dry Density: 95.1 pcf

B-7 @ 5 feet

Initial Moisture, %: 22.0%

Sandy Silt (ML)

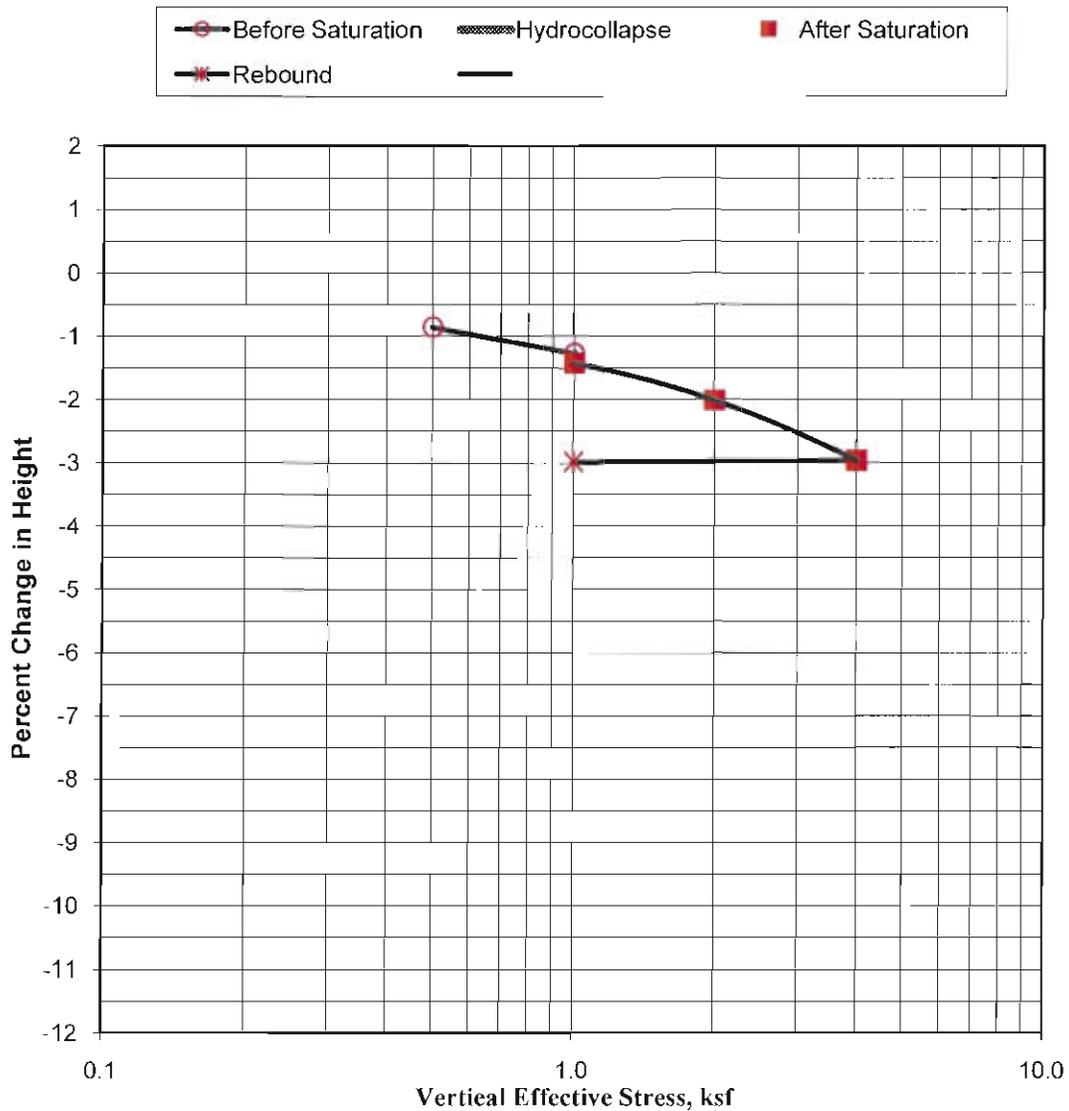
Specific Gravity (assumed): 2.67

Initial Void Ratio: 0.753

Ring Sample

Hydrocollapse: 0.2% @ 1.0 ksf

% Change in Height vs Normal Pressure Diagram



CONSOLIDATION TEST

ASTM D 2435-04

Willow St. LCNG Refueling Station.

Initial Dry Density: 97.8 pcf

B-7 @ 7.5 feet

Initial Moisture, %: 23.8%

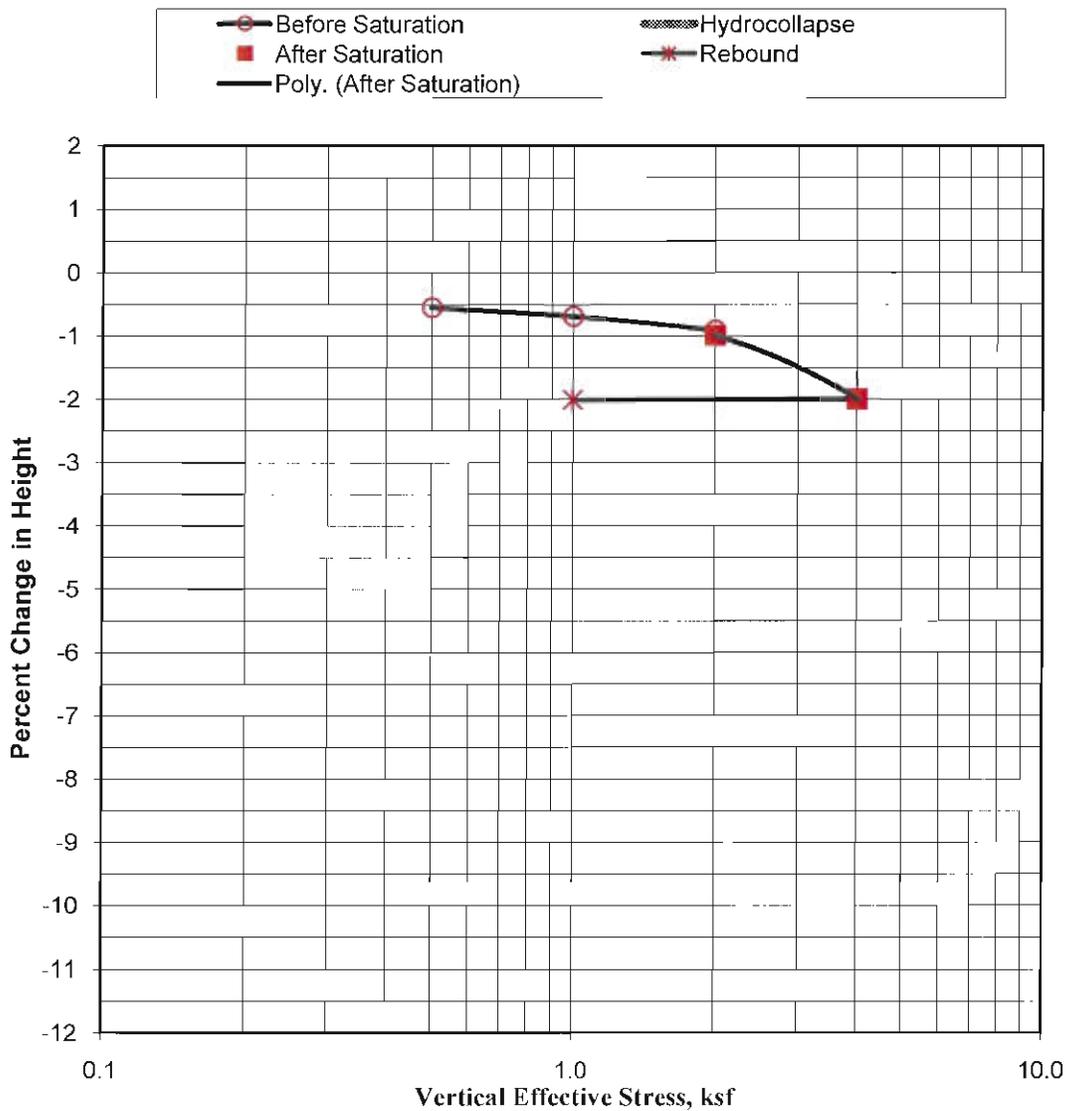
Silty Sand (SM)

Specific Gravity (assumed): 2.67

Initial Void Ratio: 0.704

Ring Sample

% Change in Height vs Normal Pressure Diagram



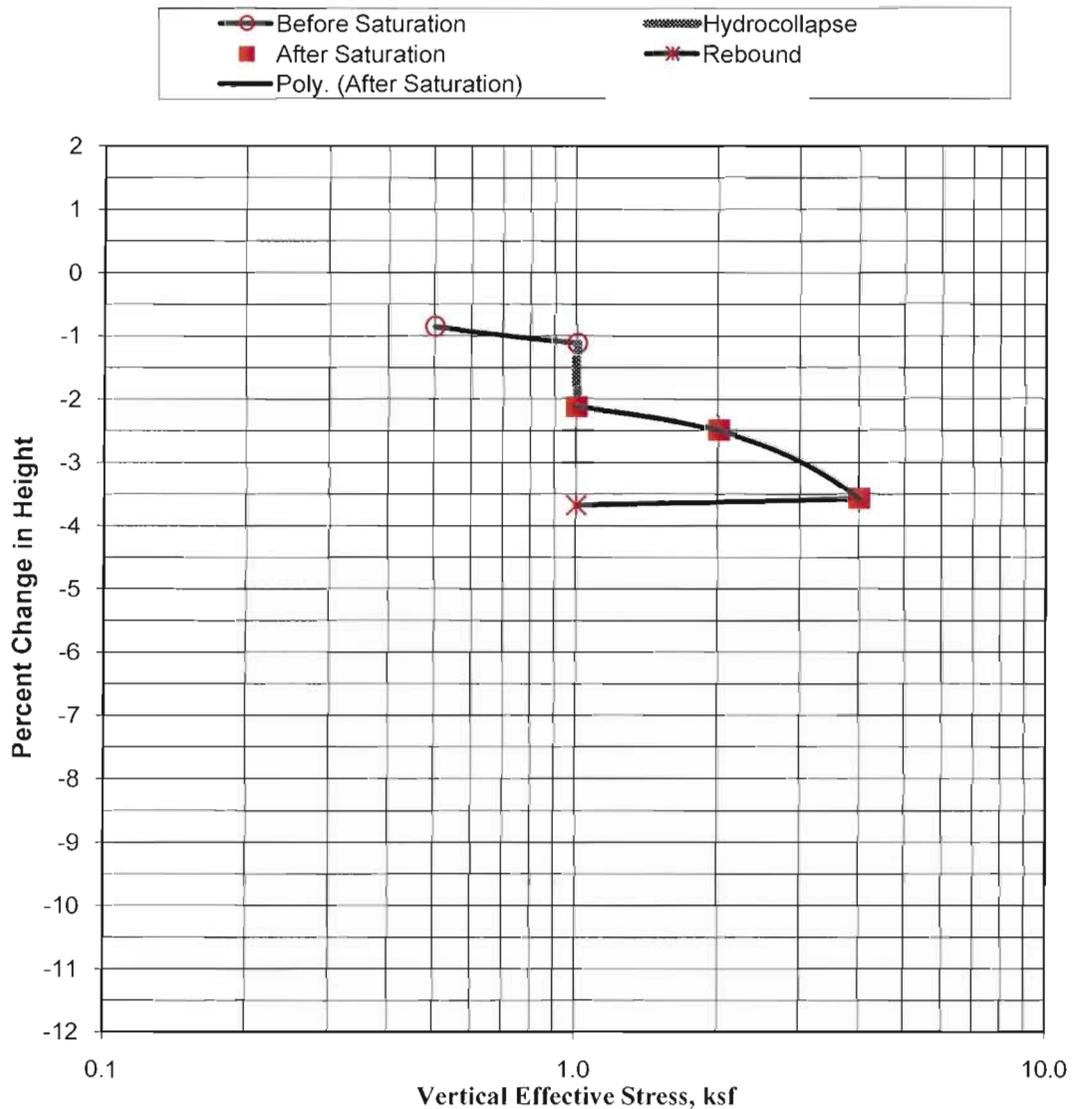
CONSOLIDATION TEST

ASTM D 2435-04 & D 5333

Willow St. LCNG Refueling Station.
B-8 @ 2.5 feet
Silty Sand (SM)
Ring Sample

Initial Dry Density: 96.7 pcf
Initial Moisture, %: 2.3%
Specific Gravity (assumed): 2.67
Initial Void Ratio: 0.724
Hydrocollapse: 1.0% @ 1.0 ksf

% Change in Height vs Normal Pressure Diagram



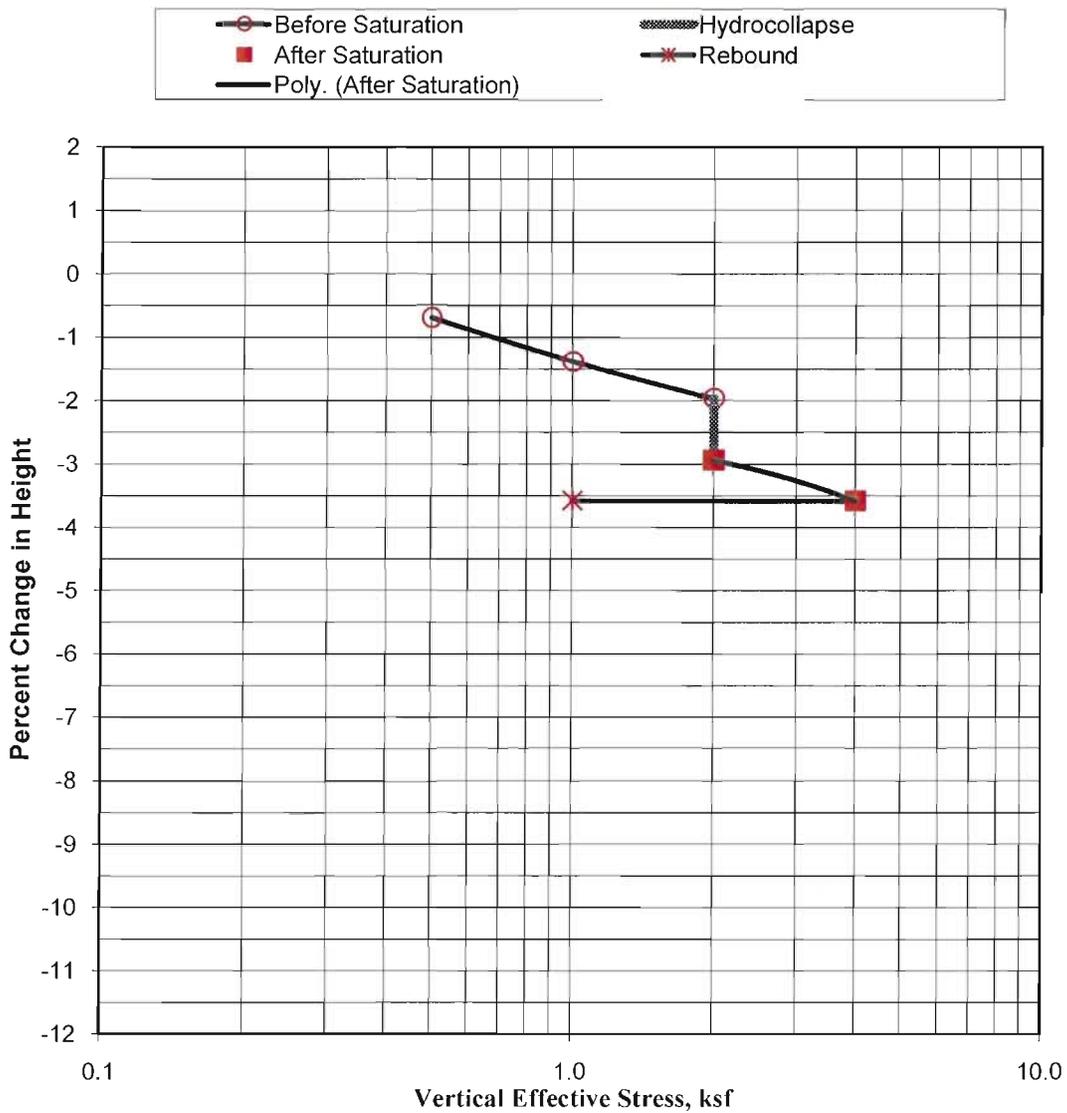
CONSOLIDATION TEST

ASTM D 2435-04 & D 5333

Willow St. LCNG Refueling Station.
B-8 @ 10 feet
Sandy Silt (ML)
Ring Sample

Initial Dry Density: 94.4 pcf
Initial Moisture, %: 24.8%
Specific Gravity (assumed): 2.67
Initial Void Ratio: 0.765
Hydrocollapse: 1.0% @ 2.0 ksf

% Change in Height vs Normal Pressure Diagram



File No.: 12068-01

June 21, 2012

Lab No.: 12-0077

EXPANSION INDEX

ASTM D-4829-08a, UBC 18-2

Job Name: Willow St. LCNG Refueling Station.
Sample ID: B7 @ 0-5 feet
Soil Description: Silty Sand, Slightly Clayey (SM)

Initial Moisture, %: 10.6
Initial Compacted Dry Density, pcf: 106.9
Initial Saturation, %: 50
Final Moisture, %: 21.0
Volumetric Swell, %: 3.7

Expansion Index, EI: 37 Low

EI measured at 50 +/- 1% saturation

EI	UBC Classification
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

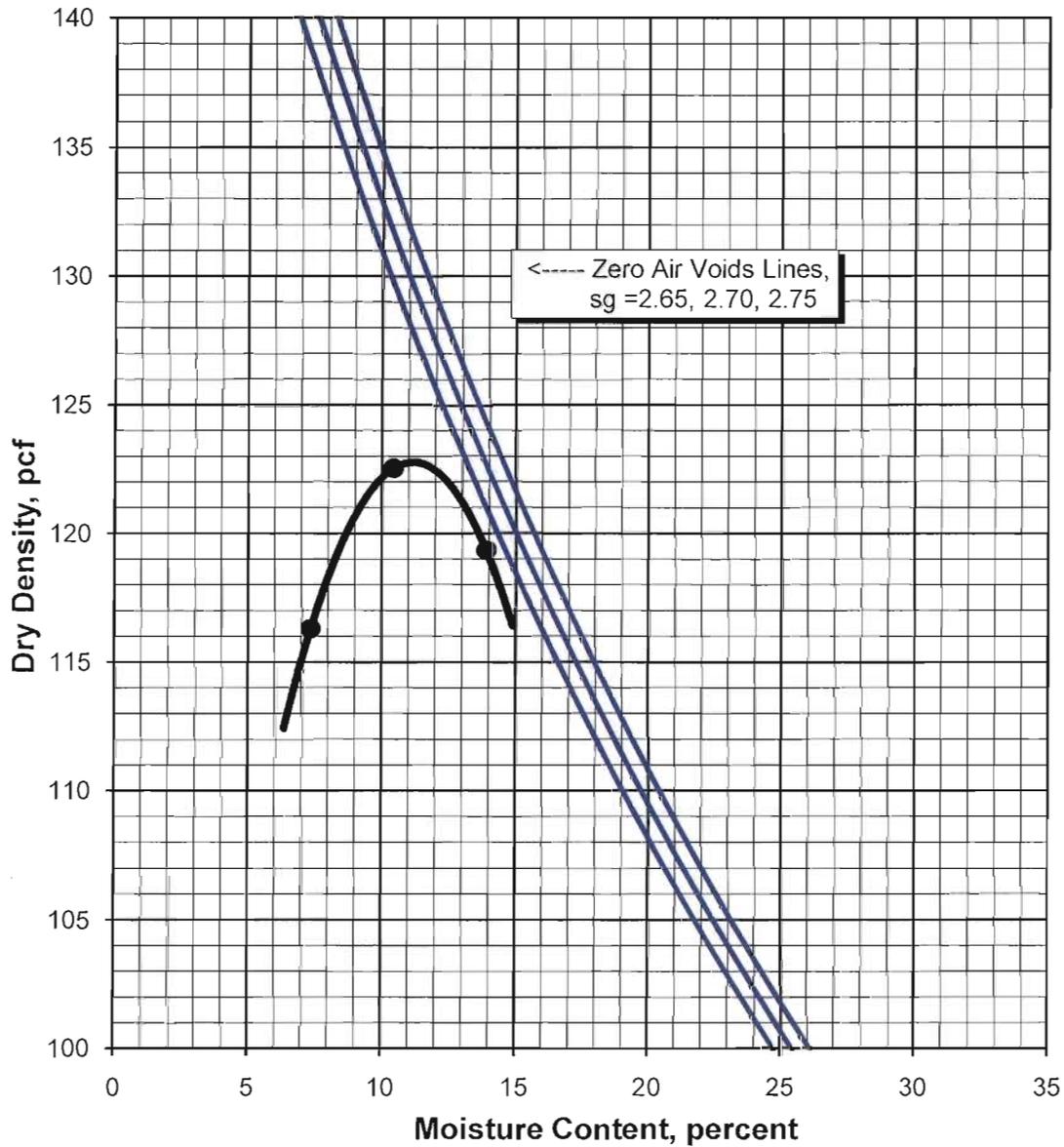
MAXIMUM DENSITY / OPTIMUM MOISTURE

ASTM D 1557-09 (Modified)

Job Name: Willow St. LCNG Refueling Station.
Sample ID: 1
Location: B6 @ 0-5 feet
Description: Clayey Silt w/Sand (ML/CL)

Procedure Used: A
Preparation Method: Moist
Rammer Type: Mechanical
Lab Number: 12-0077

		Sieve Size	% Retained (Cumulative)
Maximum Density:	122.8 pcf	3/4"	0.0
Optimum Moisture:	11.2%	3/8"	0.8
		#4	4.6



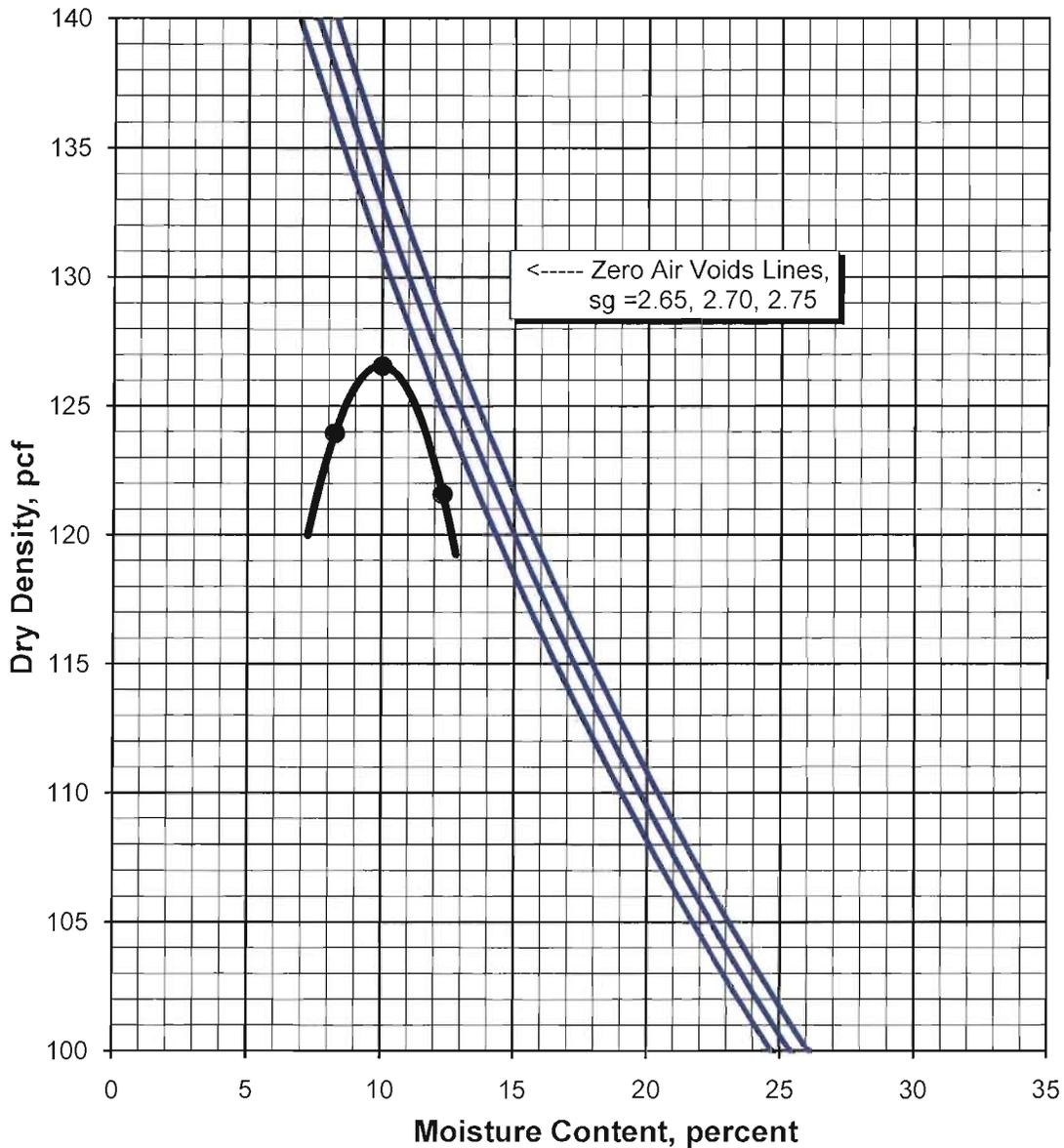
MAXIMUM DENSITY / OPTIMUM MOISTURE

ASTM D 1557-09 (Modified)

Job Name: Willow St. LCNG Refueling Station.
Sample ID: 2
Location: B7 @ 0-5 feet
Description: Clayey Silty Sand (SM)

Procedure Used: A
Preparation Method: Moist
Rammer Type: Mechanical
Lab Number: 12-0077

		Sieve Size	% Retained (Cumulative)
Maximum Density:	126.5 pcf	3/4"	0.0
Optimum Moisture:	10%	3/8"	0.0
		#4	0.0



SOIL CHEMICAL ANALYSES

Job Name: Willow St. LCNG Refueling Station.

Job No.: 12068-01

Sample ID:	B7		
Sample Depth, feet:	0-5	DF	RL
Sulfate, mg/Kg (ppm): (ASTM D 4327)	2,740	20	10.00
Chloride, mg/Kg (ppm): (ASTM D 4327)	2,360	20	4.00
pH, (pH Units): (ASTM D 1293)	8.10	1	---
Resistivity, (ohm-cm):	178	---	---
Conductivity, (μ mhos-cm): (ASTM D 1125)	5,620	1	2.00

Note: Tests performed by Subcontract Laboratory:

Truesdail Laboratories, Inc.

14201 Franklin Avenue

Tustin, California 92780-7008 Tel: (714) 730-6462

DF: Dilution Factor

RL: Reporting Limit

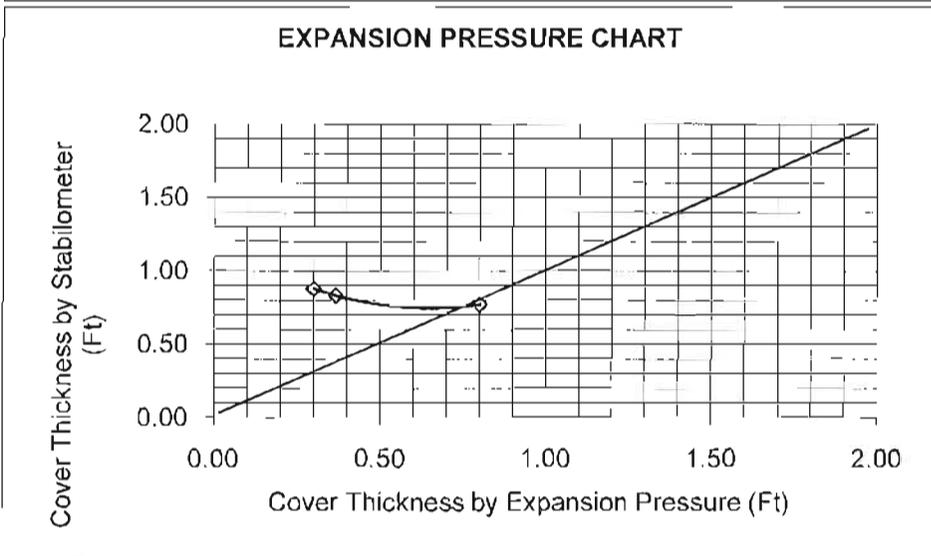
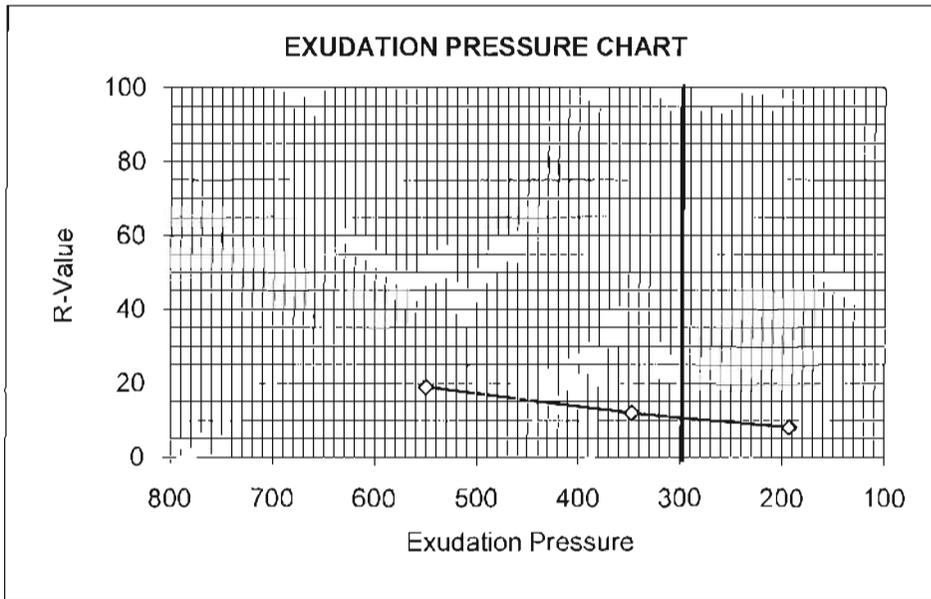
N.D.: Not Detectable

General Guidelines for Soil Corrosivity

Chemical Agent	Amount in Soil	Degree of Corrosivity
Soluble Sulfates ¹	0 -1,000 mg/Kg (ppm) [0-.1%]	Low
	1,000 - 2,000 mg/Kg (ppm) [0.1-0.2%]	Moderate
	2,000 - 20,000 mg/Kg (ppm) [0.2-2.0%]	Severe
	> 20,000 mg/Kg (ppm) [>2.0%]	Very Severe
Resistivity ²	0- 900 ohm-cm	Very Severely Corrosive
	900 to 2,300 ohm-cm	Severely Corrosive
	2,300 to 5,000 ohm-cm	Moderately Corrosive
	5,000-10,000 ohm-cm	Mildly Corrosive
	10,000+ ohm-cm	Progressively Less Corrosive

1 - Water Soluble Sulfate in Soil by Weight, ACI 318, Tables 4.2.1 - Exposure Categories and Classes and Table 4.3.1 - Requirements for Concrete By Exposure Class."

2 - Although no standard has been developed and accepted by corrosion engineering organizations, it is generally agreed that the classification shown above, or other similar classifications, reflect soil corrosivity. Source: Corrosionsource.com. The classification presented is excerpted from ASTM STP 1013 titled "Effects of Soil Characteristics on Corrosion" (February, 1989)

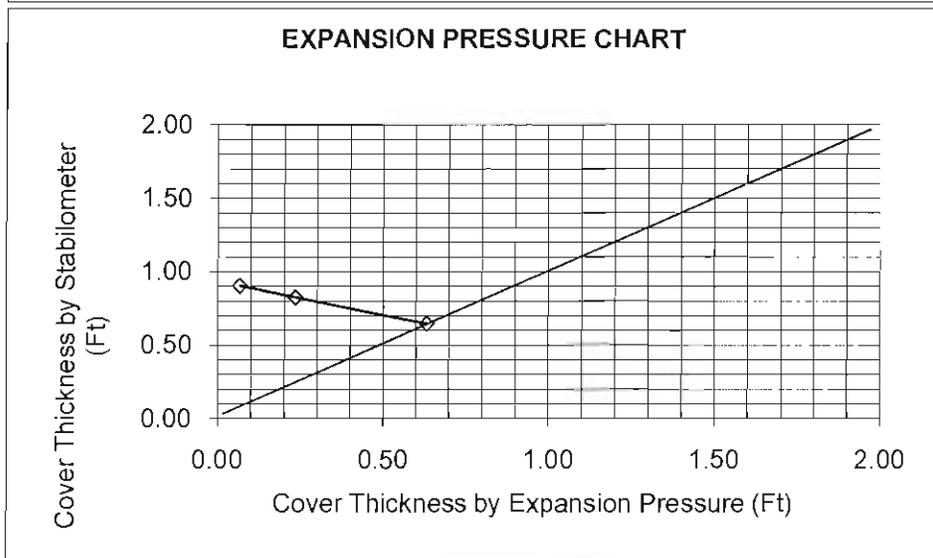
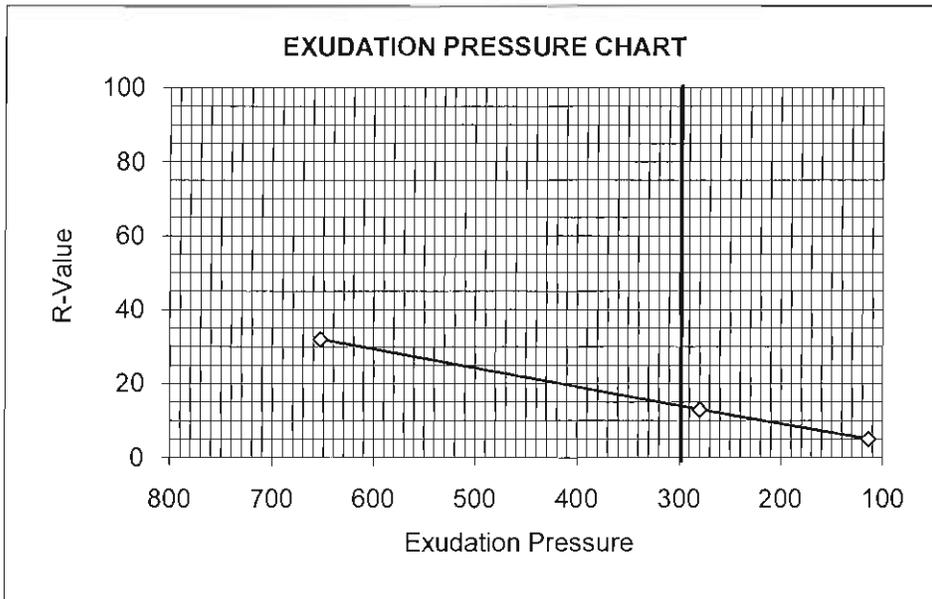


JOB NAME: Willow Street LNG Fuel Station
 SAMPLE I. D.: Boring B3@0-5'
 SOIL DESCRIPTION: Clayey Silt with Fine Sand (ML)

SPECIMEN NUMBER	A	B	C
EXUDATION PRESSURE	550	347	193
RESISTANCE VALUE	19	12	8
EXPANSION DIAL(0.0001")	24	11	9
EXPANSION PRESSURE (PSF)	103.9	47.6	39.0
% MOISTURE AT TEST	11.5	12.6	14.7
DRY DENSITY AT TEST	120.9	119.3	117.4

R-VALUE @ 300 PSI EXUDATION	10
R-VALUE by Expansion Pressure*	21

*Based on a Traffic Index of 5.0 and a Gravel Factor of 1.70

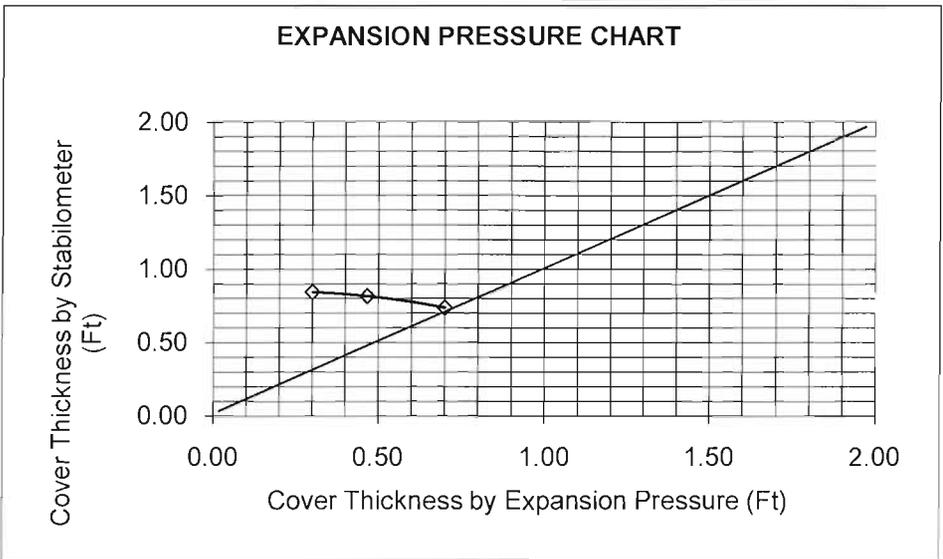
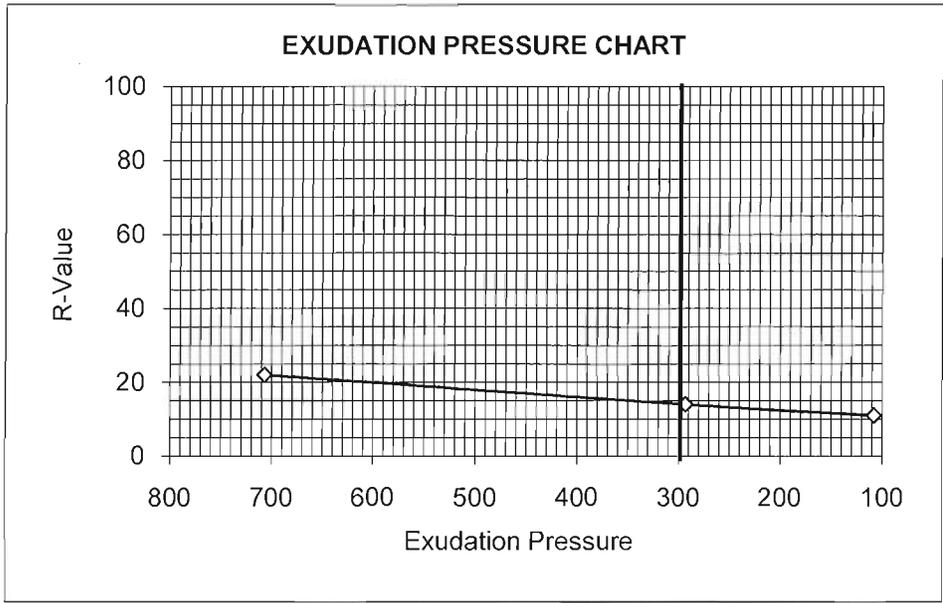


JOB NAME: Willow Street LNG Fuel Station
 SAMPLE I. D.: Boring B6@0-5'
 SOIL DESCRIPTION: Clayey Silt with Fine Sand (ML)

SPECIMEN NUMBER	A	B	C
EXUDATION PRESSURE	653	280	114
RESISTANCE VALUE	32	13	5
EXPANSION DIAL(0.0001")	19	7	2
EXPANSION PRESSURE (PSF)	82.3	30.3	8.7
% MOISTURE AT TEST	12.9	15.2	17.9
DRY DENSITY AT TEST	113.1	112.8	112.6

R-VALUE @ 300 PSI EXUDATION	14
R-VALUE by Expansion Pressure*	35

*Based on a Traffic Index of 5.0 and a Gravel Factor of 1.70

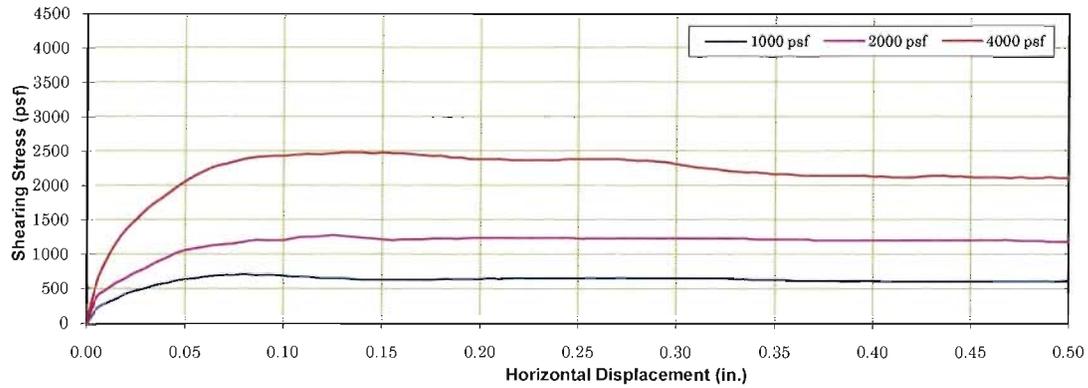
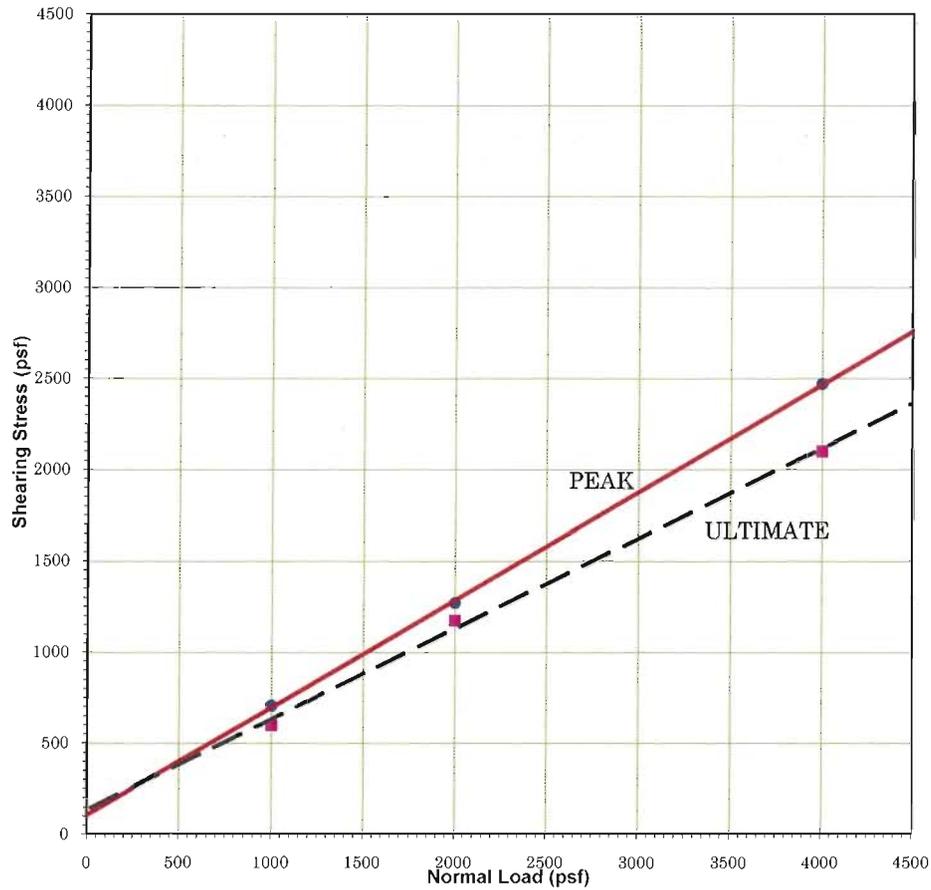


JOB NAME: Willow Street LNG Fuel Station
 SAMPLE I. D.: Boring B9@0-5'
 SOIL DESCRIPTION: Clayey Silt with Fine Sand (ML)

SPECIMEN NUMBER	A	B	C
EXUDATION PRESSURE	707	293	108
RESISTANCE VALUE	22	14	11
EXPANSION DIAL(0.0001")	21	14	9
EXPANSION PRESSURE (PSF)	90.9	60.6	39.0
% MOISTURE AT TEST	12.2	20.4	23.1
DRY DENSITY AT TEST	114.4	112.2	110.7

R-VALUE @ 300 PSI EXUDATION	14
R-VALUE by Expansion Pressure*	26

*Based on a Traffic Index of 5.0 and a Gravel Factor of 1.70



DIRECT SHEAR DATA*

Sample Location: B8 at 5 feet
 Material: Sandy Silt (ML)
 Dry Density (pcf): 104.9

	Initial	Final
Moisture Content (%):	7.8	20.6
Saturation (%):	35	100
	Peak	Ultimate
φ Angle of Friction (degrees):	31	26
c Cohesive Strength (psf):	100	130

Test Type: Peak and Ultimate
 Shear Rate (in/min): 0.01

* Test Method: ASTM D-3080

DIRECT SHEAR TEST	
Willow St. LCNG Fueling Station	
Blythe, California	
	Earth Systems Southwest
6/21/2012	12068-01

APPENDIX C
Drainage Study

**BLYTHE LCNG SITE
DRAINAGE STUDY**

July 16, 2012

THG Project No.
1130.006

The Holt Group
1601 N. Imperial Ave.
El Centro, CA 92243

INDEX

SECTION 1		DRAINAGE STUDY
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EXHIBIT C	100 YR. 6 HR. RAINFALL	
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EXHIBIT L	10 YR. 1 HR. RAINFALL DETAIL	
EXHIBIT M	3-HR. RAINFALL DETERMINATION	
SECTION 3		HYDROLOGY CALCULATIONS
10-year storm	On-site Developed Conditions	
100-year storm	On-site Developed Conditions	

SECTION 1
DRAINAGE STUDY

Purpose

The purpose of this drainage study is to determine the retention requirements for the Willow Street LCNG (Liquefied and Compressed Natural Gas) Fueling Facility.

The conditions from the City of Blythe are:

The applicant shall prepare a hydrology report addressing a 10 and 100-year storm event as per the City of Blythe Standard Drawing and Specifications and design a storm water retention basin capable of accommodating the proposed run-off from the project for a ten-year event and shall be dry within 72 hours. The retention basin shall have five feet of separation between the groundwater table and the invert elevation and shall be maintained by the owner and/or applicant. The basin shall not reside within city right-of-way.

This study will determine the runoff generated from both the 10 and 100-year storms for the site as well as determining an approximate size for the required retention basins.

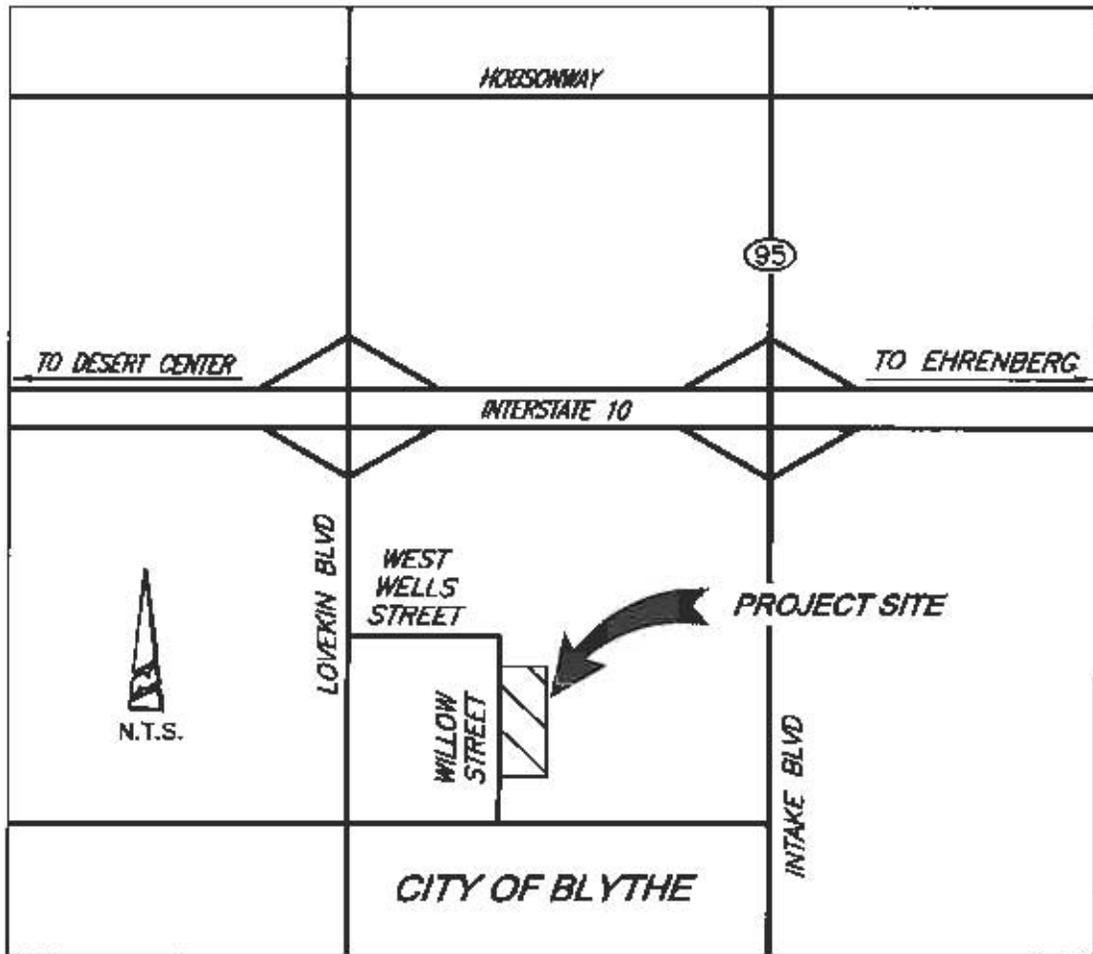
Location

The Willow Street Liquefied and Compressed Natural Gas Fueling Facility (LCNG) is comprised of approximately 1.73 acres located at 450 South Willow Street, in the City of Blythe, California. The project site is located near the northeast corner of the intersection of South Willow Street and 14th Avenue. The project is located at 33.6039 degree North latitude, 114.6031 degree West longitude and is identified on the Figure 1 – Project Location Map below.

The project site is bound to the north by the existing Super 8 motel truck/RV parking lot; to the east by the Southern California Edison Blythe Service Center; a vacant commercial parcel to the south; and South Willow Street frontage on the west. The project site is vacant with sparse vegetation. The proposed project site is relatively flat with a slight slope to the east. There are no storm drainage facilities within the project site or vicinity.

The proposed improvements include site grading activities; construction of a retention basin; construction of Portland Cement Concrete (P.C.C.) foundations; curb and gutter, sidewalk, pavements, and driveways; installation of above ground LCNG tanks and ancillary infrastructure; and a rest room facility.

Figure 1 – Project Location Map



Site Characteristics

As noted above the site is currently undeveloped and flat with a slight slope to the east. The soils report for the site indicated that the soils are mostly fill sand and alluvial soils underlain by a clay/silt layer. Groundwater was encountered at a depth of approximately 8 feet below the existing ground surface.

Based on information from the National Oceanographic and Atmospheric Administration the following are the rainfall amounts anticipated for the 10 and 100-year storm events (see also Exhibits A – M).

	10-year storm	100-year storm
1-hour storm	1.1 in.	2.2 in.
3-hours storm	1.3 in.	2.5 in.
6-hours storm	1.6 in.	3.0 in.
24-hour storm	2.2 in.	3.5 in.

Results

The following are the results from the **on-site** hydrologic analysis. The chart shows the flood volumes generated on-site from the 10 and 100 year storm events. The amounts shown are the net storm volumes and do not include infiltration occurring during the storm event. Actual calculations are included in Section 3.

Table 1 – On-Site Hydrology Analysis

	Flood Volume 10-year storm (cubic ft.)	Flood Volume 100-year storm (cubic ft.)
1 hr.	3,505	11,701
3 hr.	2,714	9,917
6 hr.	2,250	9,963
24 hr.	794	8,017

As shown, the largest storm volume occurs with the 100-year 1 hour storm event. Therefore, the basin for the site will be designed to retain a minimum of 11,701 cubic feet.

Recommendations

Retention Basin - Site

Based on the hydrology calculations for the site we are recommending a 3 foot deep basin that is 10'x150' at the bottom with 5:1 side slopes. The basin would be 40'x180' at the top. The basin would retain a maximum of 12,670 cubic feet of runoff.

Assuming a percolation rate of 1 inch per hour¹ at a depth of 2.85 feet (34 inches) the basin would drain within 34 hours. This would meet the City's requirements of draining within 72 hours with a factor of safety of almost 3.

¹ A soils report prepared by Earth Systems Engineering in June 2012 had percolation rates ranging from 15.9 in/hr at a depth of 3 feet to 0.2 inches per hour a depth of 4.5 feet. An assumed infiltration rate of 1 inch per hour gives a reasonable factor of safety and still provides a reasonable basin size.

RAINFALL INTENSITY

BLYTHE AIRPORT

10-YEAR STORM

Duration	Rainfall
1 hr.	1.0"
3 hr. *	1.2"
6 hr.	1.5"
24 hr.	2.0"

100-YEAR STORM

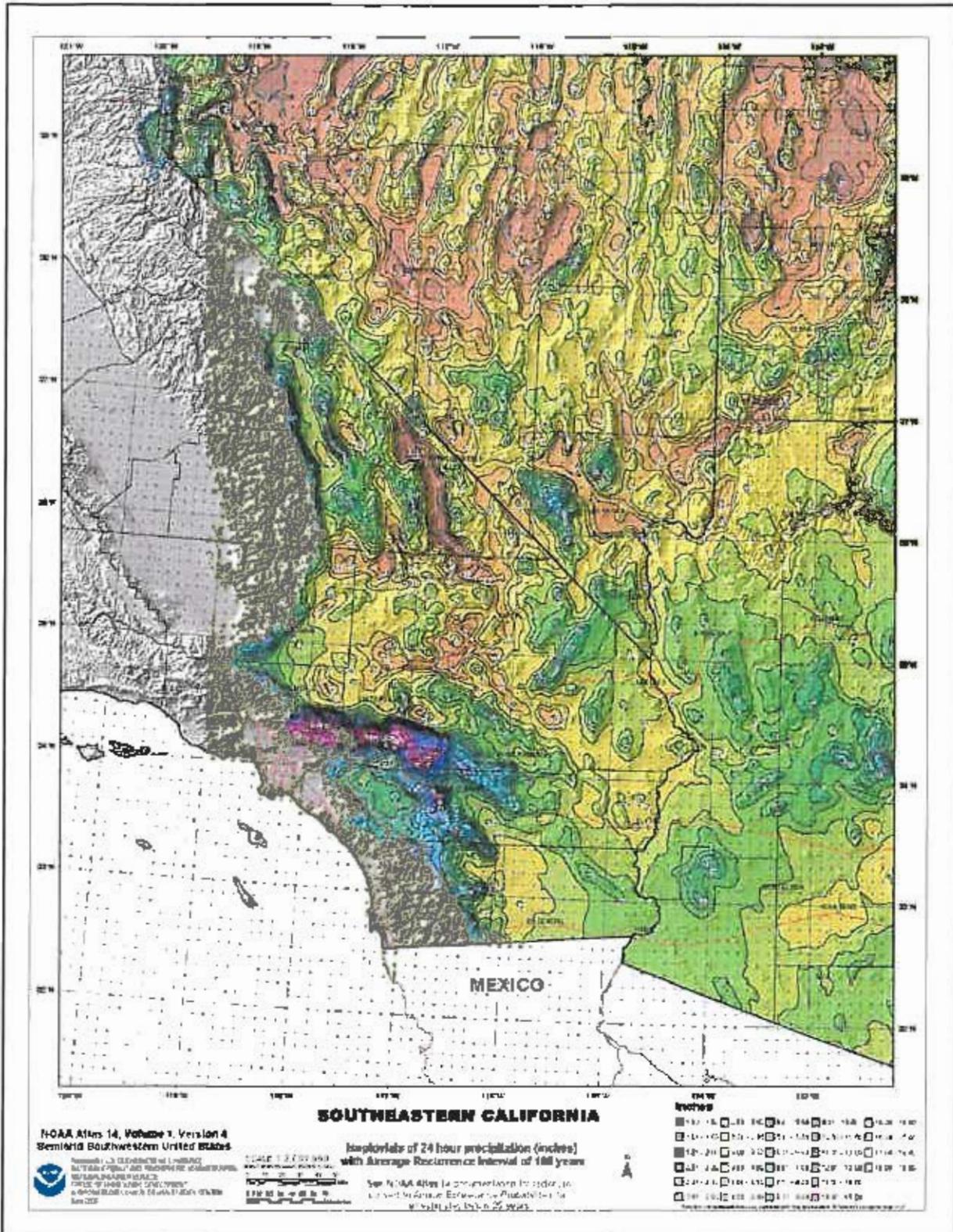
Duration	Rainfall
1 hr.	2.2"
3 hr. *	2.4"
6 hr.	2.9"
24 hr.	3.5"

* Calculated, see Exhibit M.

SECTION 2
RAINFALL DATA

EXHIBIT A

100 YR. - 24 HR. RAINFALL

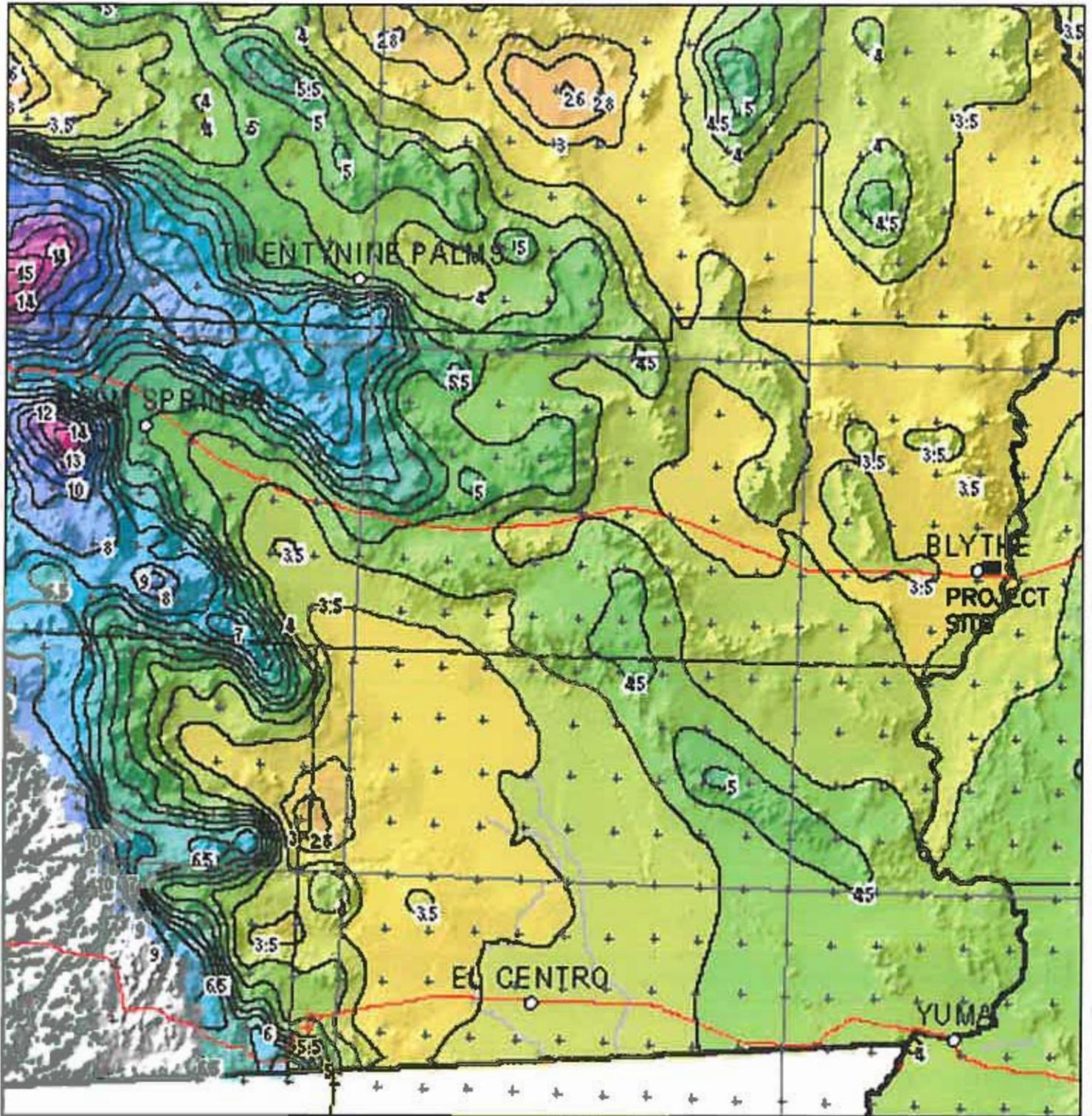


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(760) 337-3883					
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EXHIBIT B
100 YR. - 24 HR. RAINFALL
DETAIL



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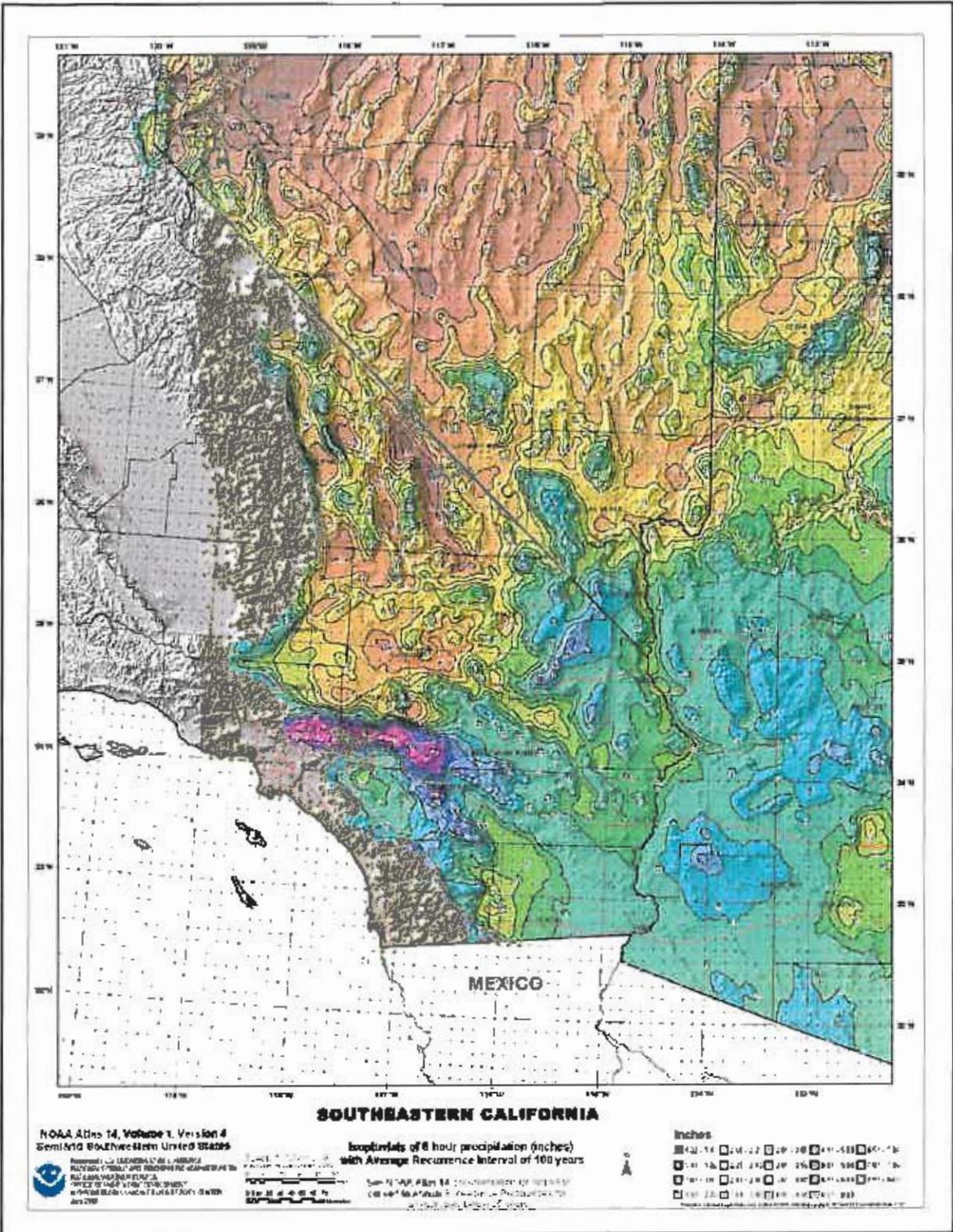
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EXHIBIT C

100 YR. - 6 HR. RAINFALL

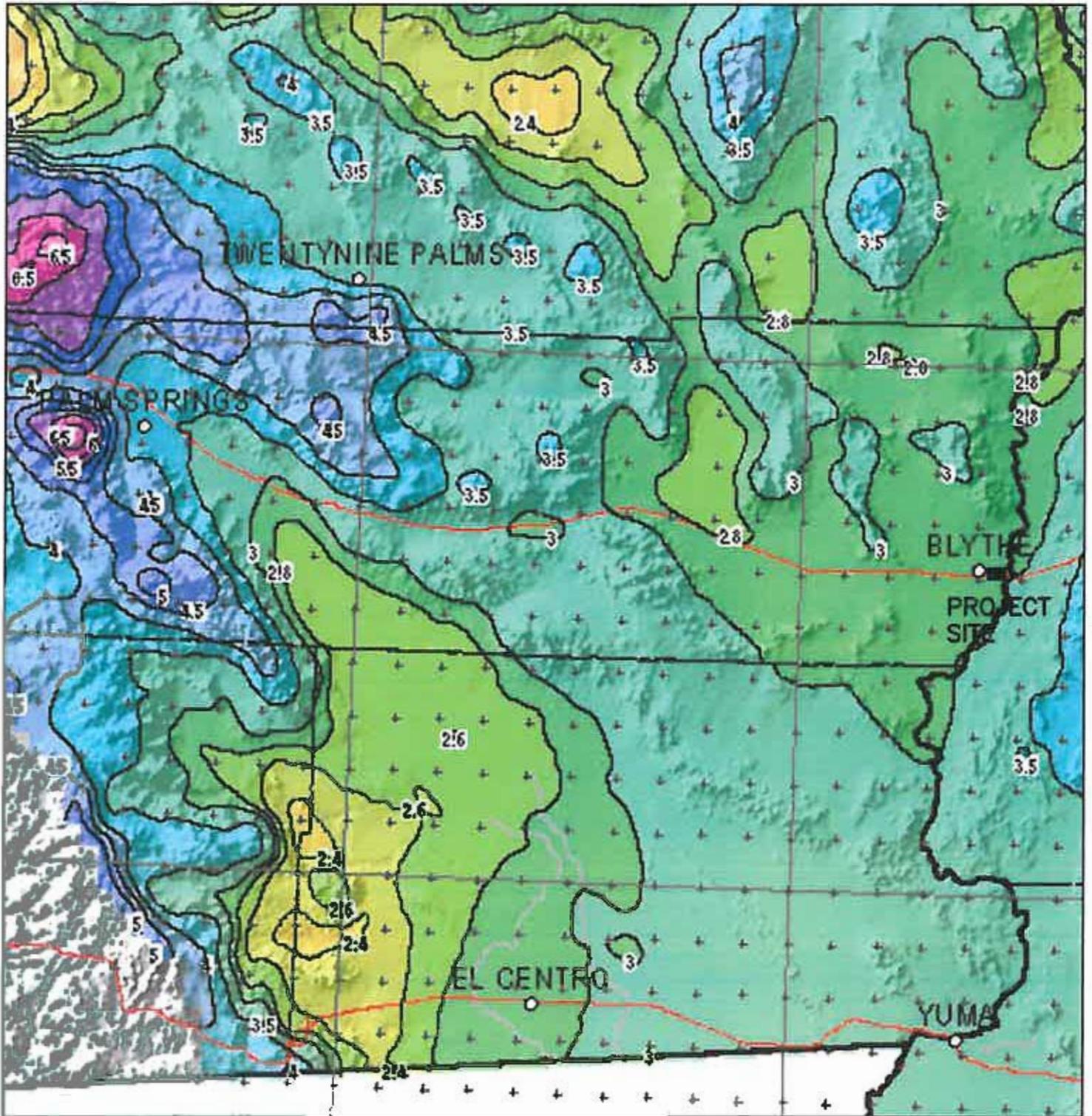


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EXHIBIT D
 100 YR. - 6 HR. RAINFALL
 DETAIL



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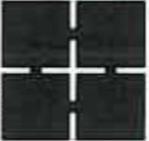
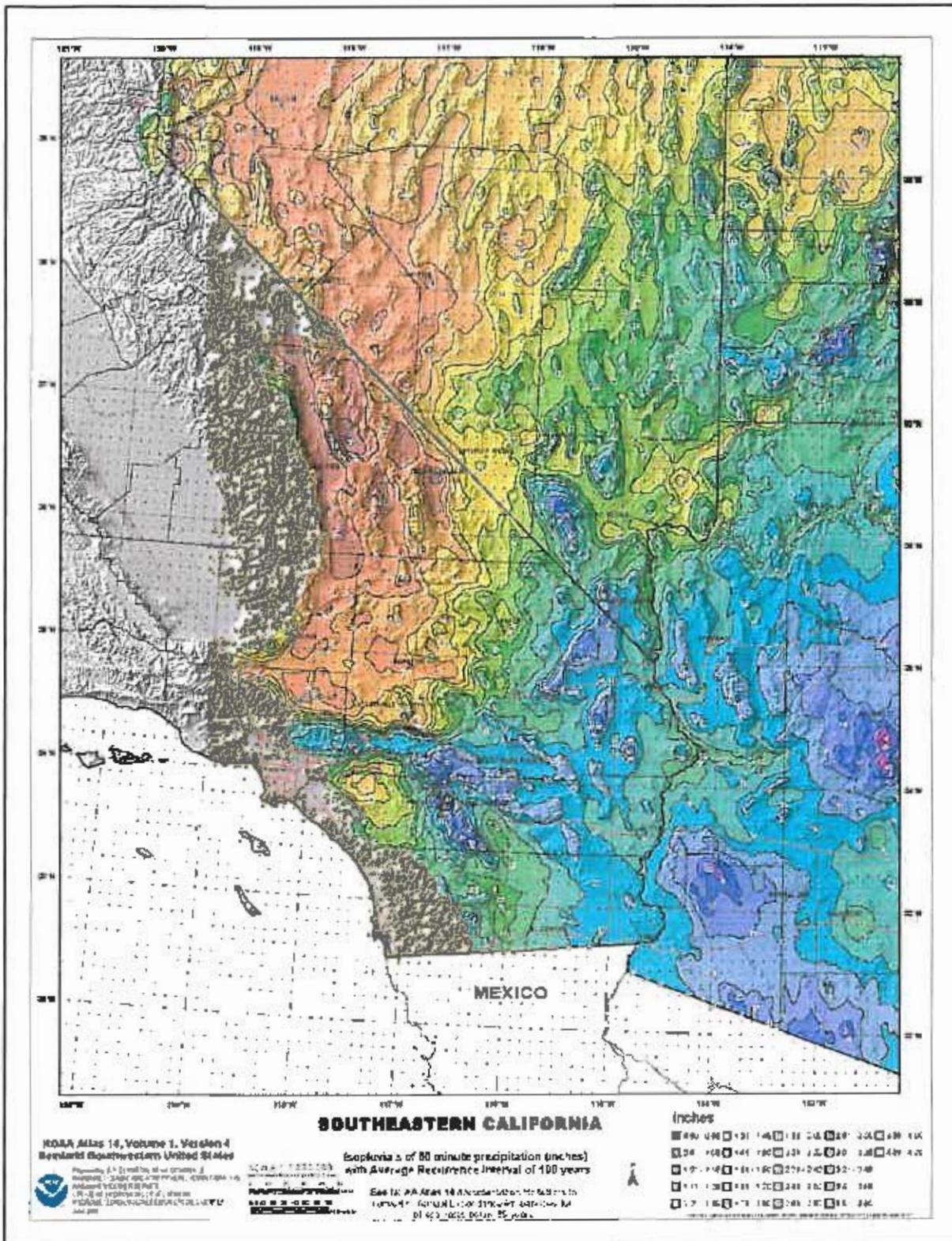


EXHIBIT E

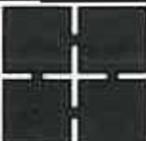
100 YR. - 1 HR. RAINFALL



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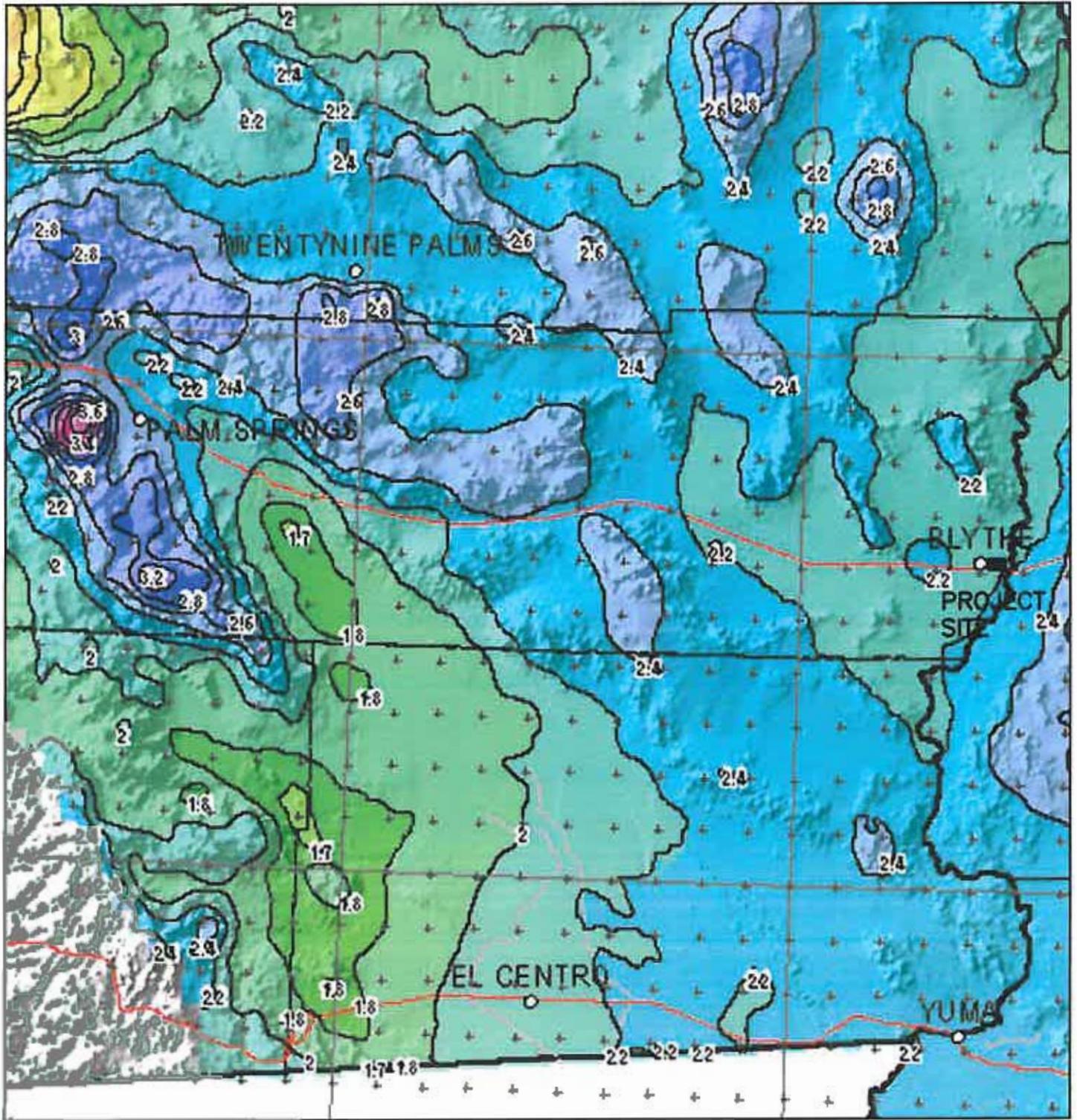
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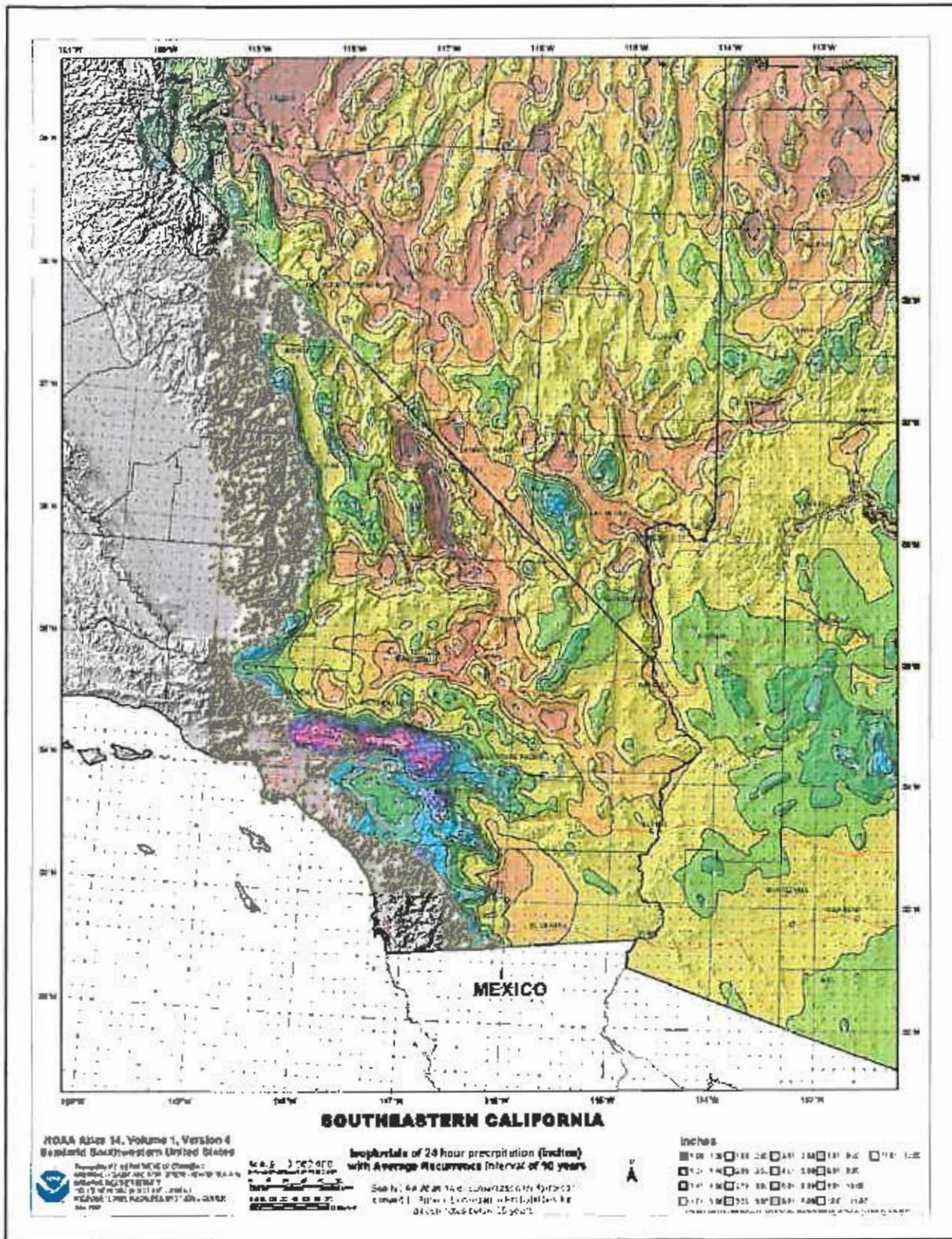
EXHIBIT F
 100 YR. - 1 HR. RAINFALL
 DETAIL



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EXHIBIT G

10 YR. — 24 HR. RAINFALL

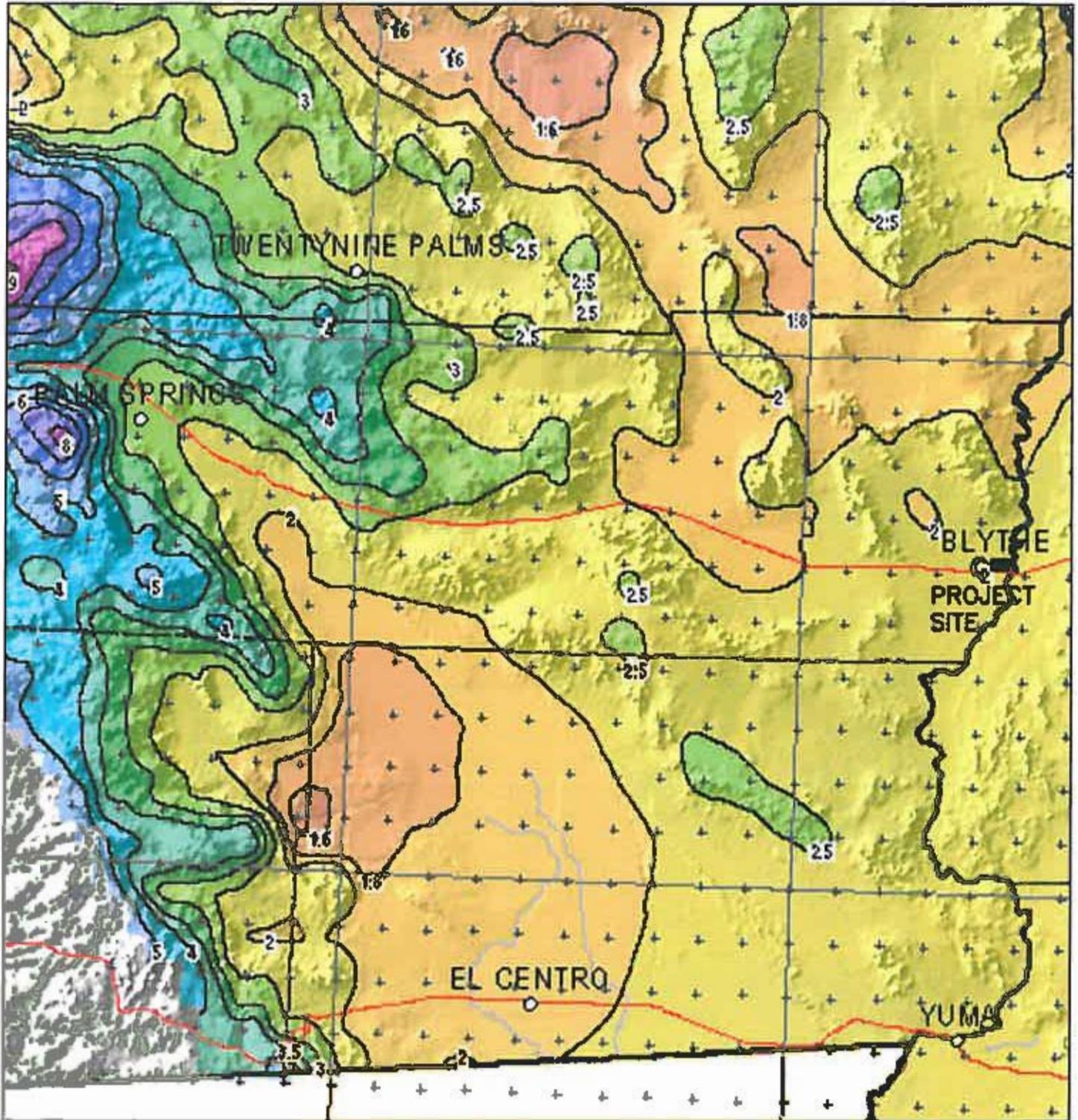


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EXHIBIT H
10 YR. - 24 HR. RAINFALL
DETAIL



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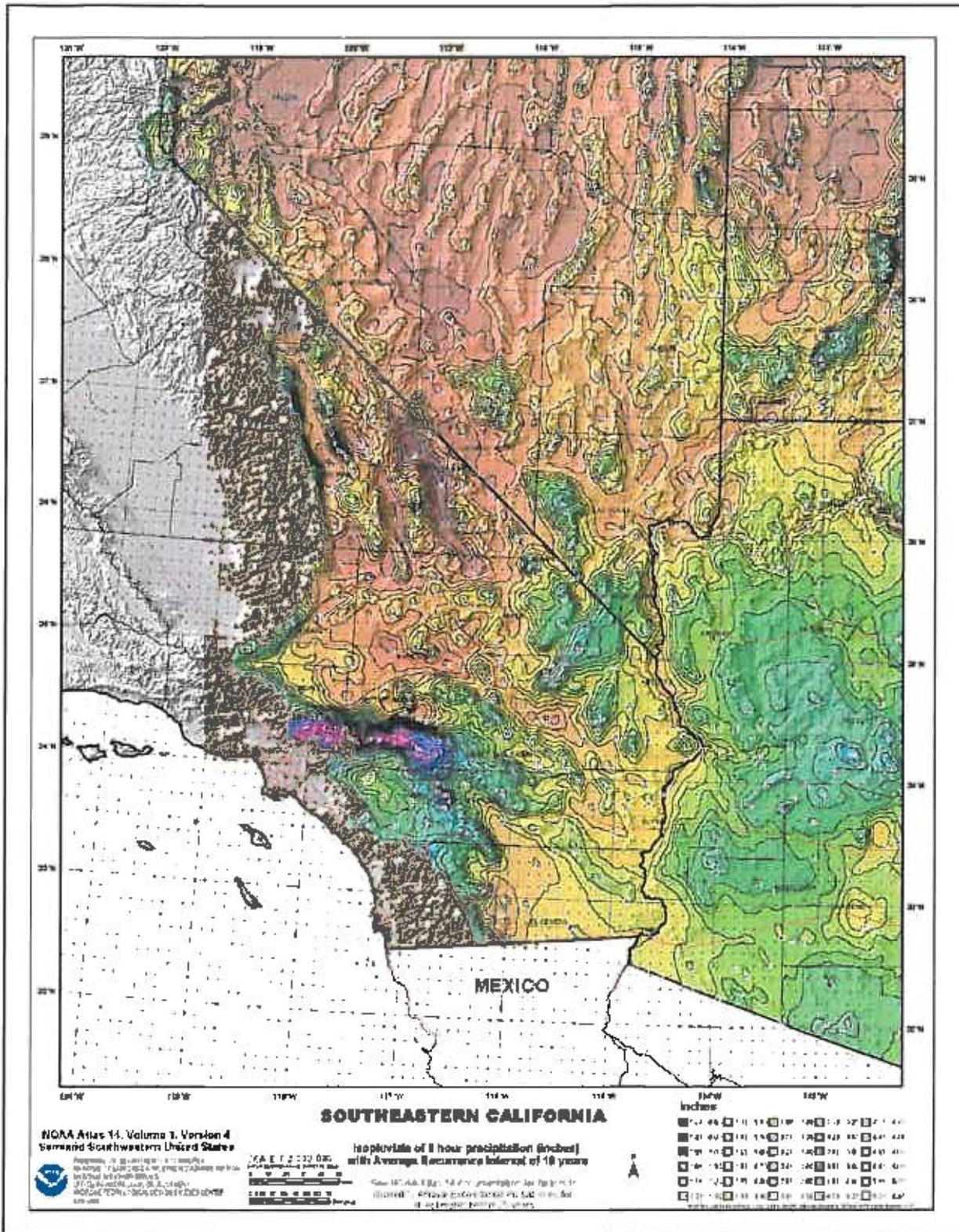
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EXHIBIT I 10 YR. - 6 HR. RAINFALL



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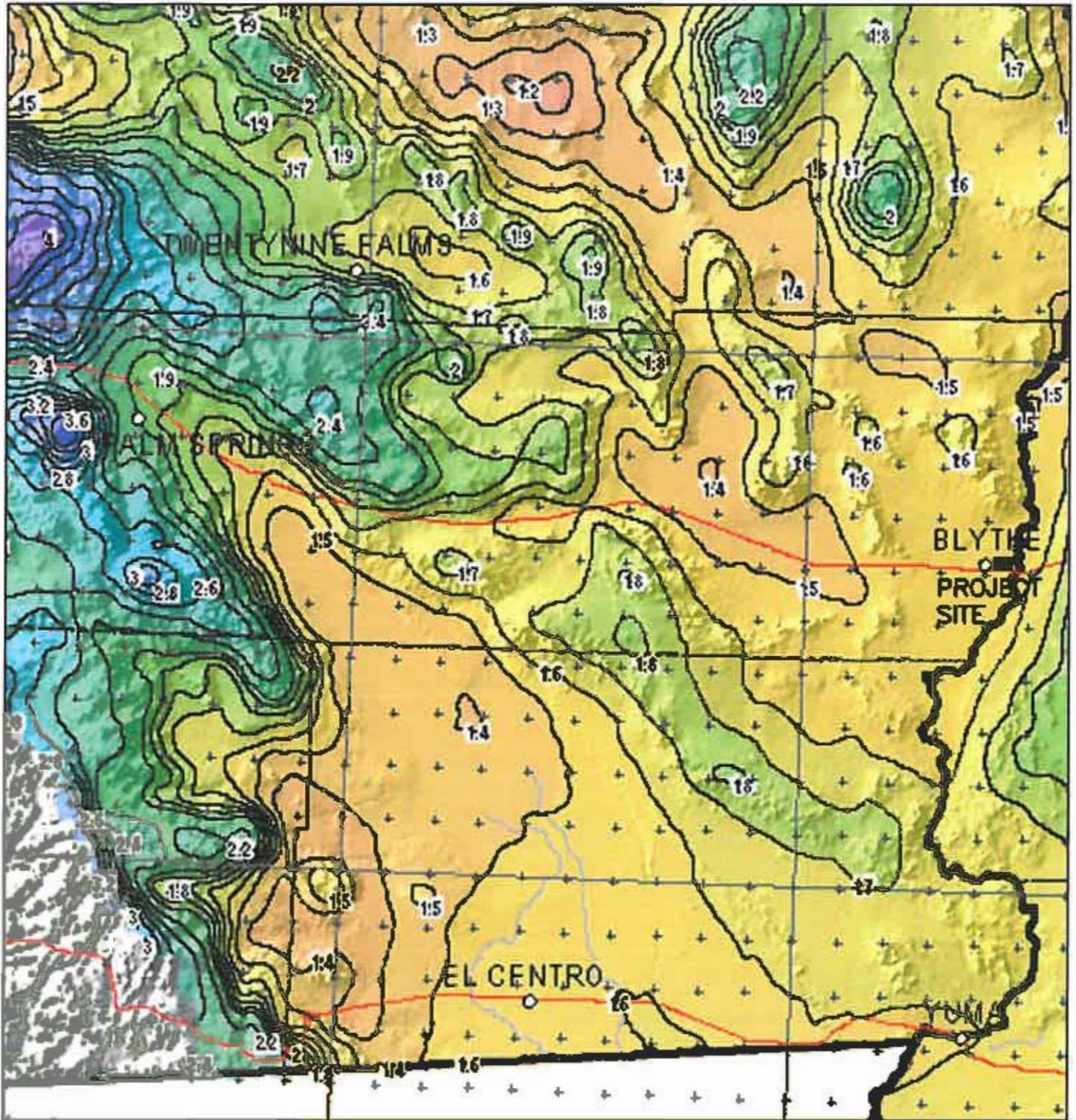
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EXHIBIT J
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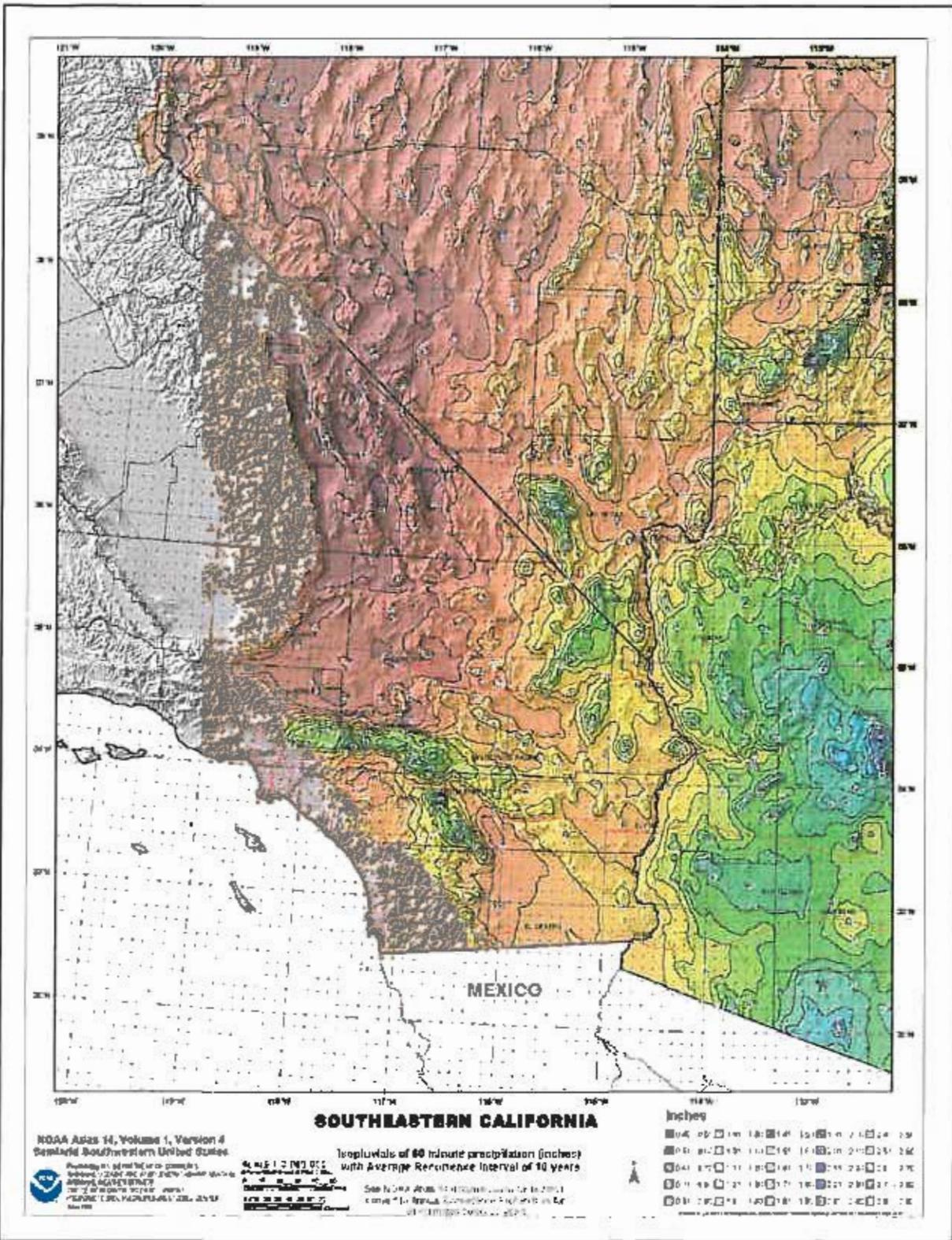
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EXHIBIT K

10 YR. - 1 HR. RAINFALL



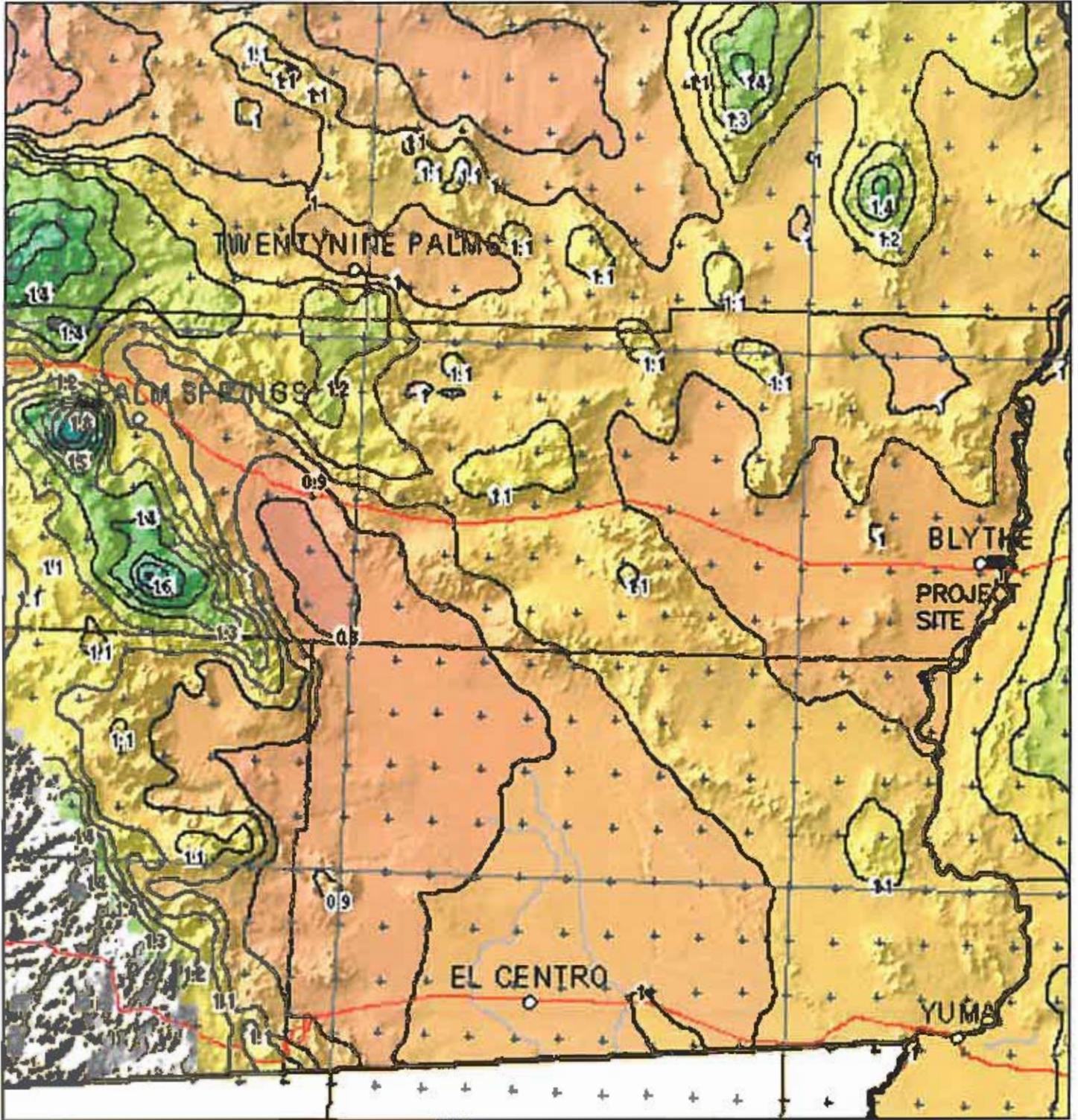
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EXHIBIT L
10 YR. - 1 HR. RAINFALL
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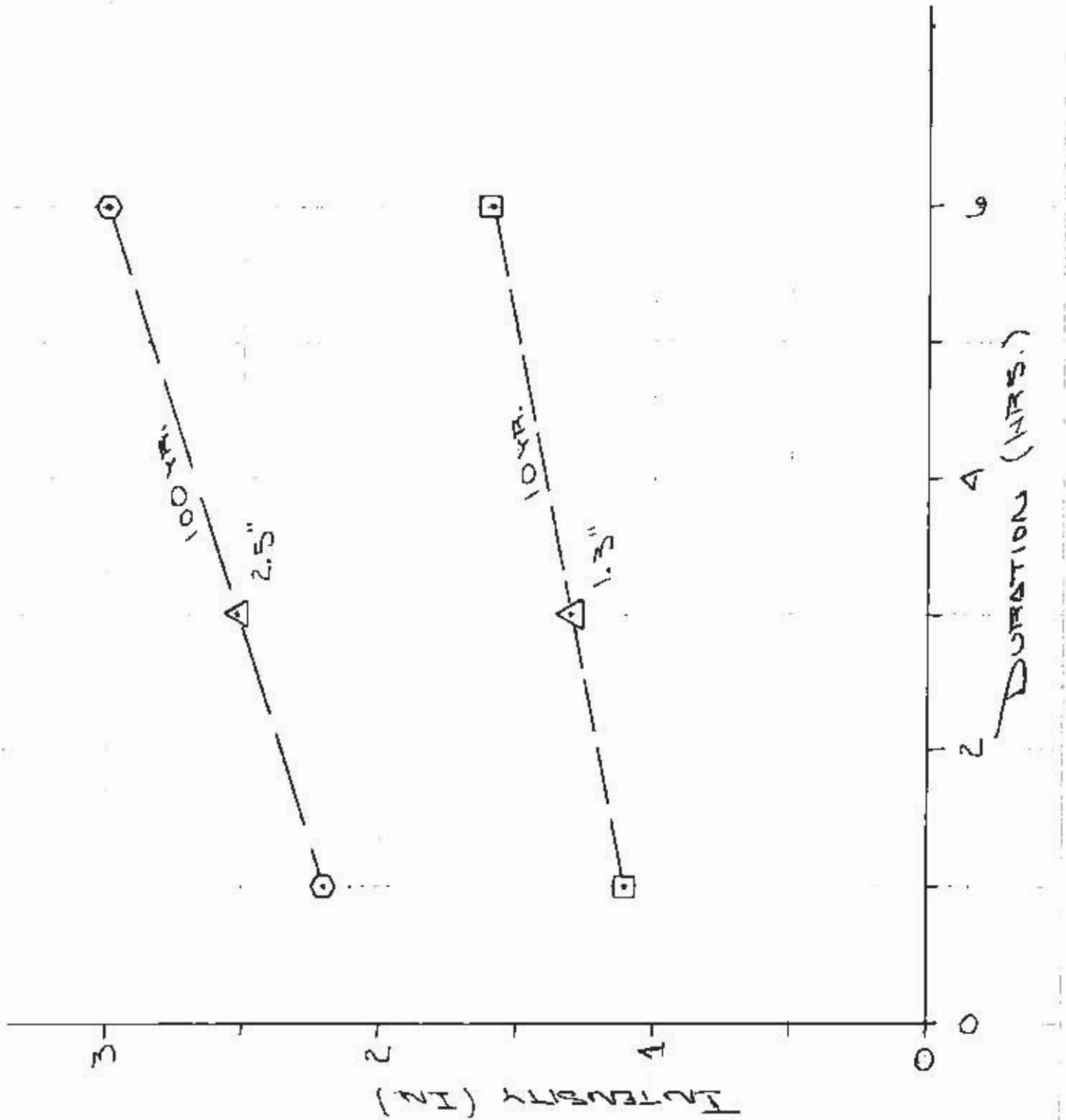
Project BLYTHA B.T.

Sheet 1 of 1

Date 8-17-11

Drawn by _____

EXHIBIT M



SECTION 3

**HYDROLOGY CALCULATIONS
ON-SITE**

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD BASIC DATA CALCULATION FORM	PROJECT: Blythe LCMG
		Job No.: _____
		BY: _____ N.O. _____ DATE: 7/16/12

PHYSICAL DATA

(1) CONCENTRATION POINT	
(2) AREA DESIGNATION	On site area
(3) AREA - ACRES	1.09
(4) L- FEET	400
(5) L- MILES	0.076
(6) La- FEET	200.00
(7) La- MILES	0.038
(8) ELEVATION OF HEADWATER	265
(9) ELEVATION OF CONCENTRATION POINT	260
(10) H- FEET	5
(11) S- FEET/MILE	68.0
(12) S^0.5	8.12
(13) L^1.49/S^0.5	0.000
(14) AVERAGE MANNINGS 'N'	0.02
(15) LAG TIME-HOURS	0.02
(16) LAG TIME-MINUTES	1.4
(17) 100% OF LAG-MINUTES	1.4
(18) 200% OF LAG-MINUTES	2.8

RAINFALL DATA

(1) AMC	II
(2) FREQUENCY-YEARS	10
(3) STORM DURATION:	Point Rain
1-HOUR	1.10 in
3-HOUR	1.30 in
6-HOUR	1.80 in
24-HOUR	2.20 in

STORM EVENT SUMMARY

STORM DURATION		1-HOUR	3-HOUR	6-HOUR	24-HOUR
EFFECTIVE RAIN	(in)	0.94	0.82	0.74	0.53
FLOOD VOLUME	(cu-ft)	3,711	3,232	2,933	2,091
	(acre-ft)	0.09	0.07	0.07	0.05
REQUIRED STORAGE	(cu-ft)	3,505	2,714	2,255	794
	(acre-ft)	0.08	0.06	0.05	0.02
FACTOR OF SAFETY		3.62	4.67	5.62	15.97
STORAGE PROVIDED	(cu-ft)	12,672			
	(acre-ft)	0.29			
PEAK FLOW	(cfs)	4.83	1.23	1.00	0.17
MAXIMUM WSEL	(ft)	2.29	2.10	1.96	1.35
DEPTH	(ft)	1.29	1.10	0.98	0.36
LOWEST FLOWLINE ELEVATION					
DIFFERENCE	(ft)				
LOWEST PAD ELEVATION					
DIFFERENCE	(ft)				
ESTIMATED TIME TO DEWATER BASIN					
Based on Total Flood Volume & Average Percolation Rate	(days)	0.8	0.7	0.8	0.8

NOTE: PEAK FLOW FOR THE 1-HOUR STORM IS NOT REPRESENTATIVE. PER RCFC PD PEAK DISCHARGES FROM THE 3-HOUR STORM SHOULD NORMALLY COMPARE WELL WITH RATIONAL PEAKS.

RCFC & WCD HYDROLOGY MANUAL		SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD 1-HOUR STORM UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM										PROJECT: Byline LCNG Job No.: N.D. DATE: 7/18/12 BY: N.D. DATE: 7/18/12	
Loss Time Period	Minutes	Hours	Storm Repts In/hr	Loss Rate In/hr	Effective Rain In/hr	Flood Hydrograph Flow CFS	Volumes In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin cu-ft	Basin WSEL ft	
1	5	0.08	0.48	0.18	0.31	0.34	103	103	1,576	11	92	1.04	
2	10	0.17	0.95	0.18	0.36	0.43	129	221	1,683	12	209	1.09	
3	15	0.25	0.58	0.16	0.42	0.49	136	347	1,757	14	335	1.15	
4	20	0.33	0.81	0.16	0.44	0.48	146	491	1,856	13	498	1.26	
5	25	0.42	0.68	0.18	0.50	0.55	164	652	1,968	14	619	1.27	
6	30	0.50	0.74	0.18	0.58	0.63	190	899	2,068	15	784	1.35	
7	35	0.58	0.84	0.18	0.68	0.75	225	1,019	2,254	16	1,003	1.44	
8	40	0.67	1.07	0.18	0.81	1.00	269	1,302	2,484	17	1,285	1.58	
9	45	0.75	1.73	0.18	1.47	1.72	517	1,802	2,834	20	1,763	1.76	
10	60	0.89	4.35	0.18	4.39	4.83	1,480	3,233	3,632	25	3,208	2.22	
11	85	0.92	0.88	0.18	0.72	0.76	238	3,449	3,731	26	3,420	2.27	
12	90	1.00	0.80	0.18	0.34	0.37	112	3,531	3,770	26	3,608	2.34	

DRAINAGE AREA-ACRES 1.04
 UNIT TIME-MINUTES 5
 LAG TIME - MINUTES 1.40
 UNIT TIME-PERCENT OF LAG 353.4
 TOTAL ADJUSTED STORM RAIN-INCHES 1.10
 CONSTANT LOSS RATE-IN/HR 0.16
 LOSS RATE - PERCENT 84.73%

Basin Percolation Rate 1.0 in/hr
 Maxwell Drywells Number 0
 Drywell Percolation Rate 0.15 cfs

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY	
EFFECTIVE RAIN	0.34 in
FLOOD VOLUME	0.08 ac-ft
FLOOD VOLUME	3,711 cu-ft
REQUIRED STORAGE	0.08 ac-ft
REQUIRED STORAGE	2,505 cu-ft
MAX WSEL	2.29 ft
PEAK FLOW RATE	4.83 cfs
AVERAGE PERCOLATION RATE	3.43 cu/ft/ft

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
3-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Bayne LCNG
Job No.:
BY: N.O. DATE
Basin Percolation Rate 1.0 in/hr
Maxwell Drywells Number 0
Drywell Percolation Rate 0.15 cfs
0.00 cfm

DRAINAGE AREA-ACRES 1.09
UNIT TIME-MINUTES 5
LAG TIME - MINUTES 1.40
UNIT TIME-PERCENT OF LAG 355.8
TOTAL ADJUSTED STORM RAIN (in) 1.30
CONSTANT LOSS RATE (in/hr) 0.16
LOW LOSS RATE - PERCENT 84.73%

Unit Time Period	Time		Pattern Percent (Phase E-5.8)	Loss Rate		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq ft	Total In Basin		Basin WSEL ft
	Minutes	Hours		Max in/hr	Low in/hr						cu-ft	acc-ft	
1	5	0.08	1.3	0.19	0.17	0.04	0.04	13	13	1,510	2	0.00	1.00
2	10	0.17	1.3	0.19	0.17	0.04	0.04	13	15	1,511	5	0.00	1.00
3	15	0.25	1.1	0.19	0.15	0.01	0.01	3	7	1,505	0	0.00	1.00
4	20	0.33	1.5	0.19	0.20	0.07	0.09	23	23	1,517	13	0.00	1.01
5	25	0.42	1.5	0.19	0.20	0.07	0.09	23	36	1,528	11	0.00	1.01
6	30	0.50	1.8	0.19	0.24	0.12	0.13	39	64	1,547	53	0.00	1.02
7	35	0.59	1.5	0.19	0.20	0.07	0.09	23	76	1,556	85	0.00	1.03
8	40	0.67	1.8	0.19	0.24	0.12	0.13	39	104	1,577	93	0.00	1.04
9	45	0.75	1.8	0.19	0.24	0.12	0.13	39	132	1,597	121	0.00	1.05
10	50	0.83	1.5	0.19	0.30	0.07	0.06	23	144	1,608	133	0.00	1.06
11	55	0.92	1.6	0.19	0.21	0.09	0.09	29	161	1,619	11	0.00	1.07
12	60	1.00	2.2	0.19	0.24	0.12	0.13	39	188	1,639	177	0.00	1.08
13	65	1.08	1.8	0.19	0.29	0.18	0.20	59	238	1,676	234	0.01	1.10
14	70	1.17	2.2	0.19	0.29	0.18	0.20	59	264	1,710	272	0.01	1.12
15	75	1.25	2.2	0.19	0.29	0.18	0.20	59	291	1,745	318	0.01	1.14
16	80	1.33	2.0	0.19	0.29	0.15	0.16	49	358	1,772	355	0.01	1.16
17	85	1.42	2.6	0.19	0.34	0.24	0.27	80	435	1,822	423	0.01	1.18
18	90	1.50	2.7	0.19	0.36	0.29	0.26	85	508	1,879	486	0.01	1.22
19	95	1.58	2.4	0.19	0.32	0.21	0.23	70	564	1,917	551	0.01	1.24
20	100	1.67	2.7	0.19	0.38	0.26	0.26	85	638	1,971	622	0.01	1.27
21	105	1.75	3.3	0.19	0.41	0.35	0.39	119	738	2,049	734	0.02	1.32
22	110	1.83	3.1	0.19	0.41	0.32	0.35	106	828	2,114	816	0.02	1.35
23	115	1.82	2.8	0.19	0.38	0.29	0.32	95	910	2,173	896	0.02	1.39
24	120	2.00	3.0	0.19	0.40	0.30	0.33	100	995	2,237	980	0.02	1.43

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
3-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Blythe LCNG
Job No.: N.D.
DATE: 1.0 9/17
BY: N.D.
Basin Percolation Rate: 1.0 9/17
Manwell Drywell Number: 0
Drywell Percolation Rate: 0.15 cfs

Unit Time Period	Minutes	Time Hours	Pedium Percent (Plate E-5.9)	Storm Rain In/hr	Loss Rate In/hr		Effective Rain In/hr	Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin		Basin WSEL ft
					Max	Low							cu-ft	sq-ft	
25	125	2.08	3.1	0.48	0.16	0.41	0.32	0.35	106	1,065	2,303	18	1,089	0.02	1.47
26	130	2.17	4.2	0.66	0.16	0.50	0.48	0.54	162	1,232	2,412	17	1,215	0.03	1.53
27	135	2.25	5.0	0.78	0.16	0.66	0.62	0.69	204	1,418	2,550	16	1,401	0.03	1.61
28	140	2.33	3.5	0.55	0.18	0.48	0.38	0.42	126	1,527	2,830	18	1,509	0.03	1.66
29	145	2.42	6.5	1.06	0.18	0.90	0.90	0.88	296	1,605	2,838	20	1,725	0.04	1.76
30	150	2.50	7.3	1.14	0.18	0.66	0.97	1.07	322	2,107	3,060	21	2,038	0.05	1.91
31	155	2.59	6.2	1.28	0.18	1.06	1.12	1.23	368	2,454	3,273	23	2,432	0.06	2.03
32	160	2.67	5.9	0.92	0.18	0.78	0.78	0.83	250	2,692	3,378	23	2,658	0.06	2.09
33	165	2.75	2.0	0.31	0.16	0.28	0.15	0.18	48	2,707	3,388	24	2,694	0.06	2.09
34	170	2.83	1.6	0.28	0.16	0.24	0.12	0.13	38	2,722	3,388	24	2,699	0.06	2.10
35	175	2.92	1.8	0.28	0.16	0.24	0.12	0.13	38	2,737	3,403	24	2,714	0.06	2.10
36	180	3.00	0.5	0.09	0.18	0.38	0.01	0.02	5	2,718	3,365	24	2,695	0.06	2.10

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN	0.02 in
FLOOD VOLUME	0.07 ac-ft
FLOOD VOLUME	3,332 cu-ft
REQUIRED STORAGE	0.08 ac-ft
REQUIRED STORAGE	2,714 cu-ft
MAX WSEL	2.10 ft
PEAK FLOW RATE	1.23 cfs
AVERAGE PERCOLATION RATE	3.00 cfs/ft/min

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
8-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Blythe LCNG

Job No.:

BY: N.O.

DATE

7/18/12

DRAINAGE AREA-ACRES 1.09
 UNIT TIME-MINUTES 5
 LAG TIME - MINUTES 1.40
 TOTAL ADJUSTED STORM RAIN (in) 355.8
 CONSTANT LOSS RATE (in/hr) 1.80
 LOW LOSS RATE - PERCENT 84.73%

Begin Percolation Rate 1.0 in/hr

Maxwell Drywells
 Number 0

Drywell Percolation Rate 0.15 cfs

0.00 cfm

Unit Time Period	Time		Storm Rain in/hr	Loss Rate in/hr		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Total In Basin		Basin WSEL ft
	Minutes	Hours		Max	Low						cu-ft	ac-ft	
1	5	0.06	0.10	0.16	0.08	0.01	0.02	5	5	1,504	0	0	1.00
2	10	0.17	0.12	0.16	0.10	0.02	0.02	6	6	1,504	0	0	1.00
3	15	0.25	0.12	0.16	0.10	0.02	0.02	6	6	1,504	0	0	1.00
4	20	0.33	0.12	0.16	0.10	0.02	0.02	6	6	1,504	0	0	1.00
5	25	0.42	0.12	0.16	0.10	0.02	0.02	6	6	1,504	0	0	1.00
6	30	0.50	0.13	0.16	0.11	0.02	0.02	7	7	1,505	0	0	1.00
7	35	0.58	0.13	0.16	0.11	0.02	0.02	7	7	1,505	0	0	1.00
8	40	0.67	0.13	0.16	0.11	0.02	0.02	7	7	1,505	0	0	1.00
9	45	0.75	0.13	0.16	0.11	0.02	0.02	7	7	1,505	0	0	1.00
10	50	0.83	0.13	0.16	0.11	0.02	0.02	7	7	1,505	0	0	1.00
11	55	0.92	0.13	0.16	0.11	0.02	0.02	7	7	1,505	0	0	1.00
12	60	1.00	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
13	65	1.08	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
14	70	1.17	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
15	75	1.25	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
16	80	1.33	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
17	85	1.42	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
18	90	1.50	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
19	95	1.58	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
20	100	1.67	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
21	105	1.75	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
22	110	1.83	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
23	115	1.92	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
24	120	2.00	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
25	125	2.08	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
26	130	2.17	0.15	0.16	0.13	0.02	0.03	8	8	1,508	0	0	1.00
27	135	2.25	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
28	140	2.33	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
29	145	2.42	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
30	150	2.50	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
31	155	2.58	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
32	160	2.67	0.17	0.16	0.15	0.01	0.01	3	3	1,602	0	0	1.00
33	165	2.75	0.19	0.16	0.16	0.03	0.03	8	8	1,607	0	0	1.00
34	170	2.83	0.19	0.16	0.16	0.03	0.03	8	8	1,607	0	0	1.00

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
6-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Blythe LCNG
Job No.:
BY: N.O. DATE 7/16/12
Basin Percolation Rate 1.0 in/hr
Maxwell Drywells Number 0
Drywell Percolation Rate 0.15 cfs 0.00 cfm

DRAINAGE AREA-ACRES 1.09
UNIT TIME-MINUTES 5
LAG TIME - MINUTES 1.40
TOTAL ADJUSTED STORM RAIN (in) 355.9
CONSTANT LOSS RATE (in/hr) 1.50
LOW LOSS RATE - PERCENT 0.16
84.73%

Unit Time Period	Time		Storm Rain in/hr	Loss Rate in/hr		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin		Basin WSEL ft
	Minutes	Hours		Max	Low							cu-ft	cu-ft	
35	175	2.92	0.19	0.16	0.03	0.03	9	9	9	1,507	10	0	0.00	1.00
36	180	3.00	0.19	0.16	0.03	0.03	9	9	9	1,507	10	0	0.00	1.00
37	185	3.08	0.19	0.16	0.03	0.03	9	9	9	1,507	10	0	0.00	1.00
38	190	3.17	0.21	0.16	0.05	0.05	18	18	18	1,512	10	5	0.00	1.00
39	195	3.25	0.21	0.16	0.05	0.05	18	21	21	1,515	11	10	0.00	1.00
40	200	3.33	0.21	0.16	0.05	0.05	18	26	26	1,518	11	15	0.00	1.01
41	205	3.42	0.23	0.16	0.07	0.07	22	37	37	1,528	11	27	0.00	1.01
42	210	3.50	0.25	0.16	0.09	0.09	28	55	55	1,541	11	44	0.00	1.02
43	215	3.58	0.27	0.16	0.10	0.10	35	78	78	1,558	11	66	0.00	1.03
44	220	3.67	0.27	0.16	0.10	0.10	35	103	103	1,576	11	92	0.00	1.04
45	225	3.75	0.28	0.16	0.12	0.12	41	133	133	1,588	11	122	0.00	1.05
46	230	3.83	0.28	0.16	0.12	0.12	41	163	163	1,620	11	151	0.00	1.07
47	235	3.92	0.31	0.16	0.14	0.14	47	198	198	1,647	11	187	0.00	1.08
48	240	4.00	0.31	0.16	0.14	0.14	47	235	235	1,674	12	223	0.01	1.10
49	245	4.09	0.33	0.16	0.16	0.16	54	277	277	1,705	12	265	0.01	1.12
50	250	4.17	0.35	0.16	0.20	0.20	60	325	325	1,740	12	313	0.01	1.14
51	255	4.25	0.38	0.16	0.22	0.22	66	378	378	1,781	12	367	0.01	1.16
52	260	4.33	0.39	0.16	0.24	0.24	73	438	438	1,825	13	427	0.01	1.18
53	265	4.42	0.40	0.16	0.24	0.24	79	505	505	1,874	13	493	0.01	1.21
54	270	4.50	0.40	0.16	0.24	0.24	79	572	572	1,923	13	558	0.01	1.24
55	275	4.58	0.42	0.16	0.26	0.26	85	644	644	1,978	14	630	0.01	1.27
56	280	4.67	0.44	0.16	0.28	0.28	92	722	722	2,034	14	706	0.02	1.31
57	285	4.75	0.46	0.16	0.30	0.30	98	806	806	2,096	15	781	0.02	1.34
58	290	4.83	0.46	0.16	0.30	0.30	98	898	898	2,168	15	874	0.02	1.38
59	295	4.92	0.48	0.16	0.32	0.32	104	979	979	2,224	15	963	0.02	1.42
60	300	5.00	0.50	0.16	0.34	0.34	111	1,074	1,074	2,295	16	1,058	0.02	1.46
61	305	5.08	0.50	0.16	0.34	0.34	111	1,164	1,164	2,389	17	1,164	0.03	1.52
62	310	5.17	0.50	0.16	0.34	0.34	111	1,261	1,261	2,505	17	1,261	0.03	1.58
63	315	5.25	0.50	0.16	0.34	0.34	111	1,358	1,358	2,635	18	1,358	0.03	1.64
64	320	5.33	0.50	0.16	0.34	0.34	111	1,454	1,454	2,778	19	1,454	0.04	1.74
65	325	5.42	0.50	0.16	0.34	0.34	111	1,552	1,552	2,945	20	1,552	0.04	1.84
66	330	5.50	0.50	0.16	0.34	0.34	111	1,653	1,653	3,153	22	1,653	0.05	1.98
67	335	5.58	0.50	0.16	0.34	0.34	111	1,758	1,758	3,408	22	1,758	0.05	2.10
68	340	5.67	0.50	0.16	0.34	0.34	111	1,868	1,868	3,711	22	1,868	0.05	2.23

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
6-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Blythe LCNG		Job No.:	N.O.	DATE	7/16/12							
BY:		Basin Percolation Rate	1.0 in/hr									
DRAINAGE AREA-ACRES		Maxwell Drywells Number	0									
UNIT TIME-MINUTES		Drywell Percolation Rate	0.15 cfs									
LAG TIME - MINUTES			0.00 cfs									
TOTAL ADJUSTED STORM RAIN (in)												
CONSTANT LOSS RATE (in/hr)												
LOW LOSS RATE - PERCENT												
Unit Time Period	Time Minutes	Hours	Storm Rain in/hr	Loss Rate in/hr	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volumes In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin ac-ft	Basin WSEL ft
98	345	5.75	0.12	Max 0.16 Low 0.10	0.02	0.02	6	2,242	3,159	22	2,220	1.87
70	350	5.83	0.10	0.16	0.01	0.02	5	2,235	3,147	22	2,203	1.98
71	355	5.92	0.05	0.16	0.01	0.01	3	2,208	3,133	22	2,184	1.95
72	360	6.00	0.04	0.16	0.01	0.01	2	2,188	3,118	22	2,165	1.84

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN	0.74 in
FLOOD VOLUME	0.07 ac-ft
FLOOD VOLUME	2,893 cu-ft
REQUIRED STORAGE	0.05 ac-ft
REQUIRED STORAGE	2,265 cu-ft
MAX WSEL	1.98 ft
PEAK FLOW RATE	1.00 cfs
AVERAGE PERCOLATION RATE	2.54 cuft/min

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
24-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Blythe LCNG
Job No.:
BY: N.O. DATE: 7/18/12

Unit Time Period	Time Minutes	Hours	Platform Percent. (Plate E-5.9)	Storm Rain In/hr	Loss Rate In/hr	Effective Rain In/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin	Basin WSEL ft
1	15	0.25	0.2	0.018	0.289	0.015	0.00	3	3	1,502	31	0	1.00
2	30	0.50	0.3	0.020	0.280	0.022	0.00	4	4	1,503	31	0	1.00
3	45	0.75	0.3	0.026	0.283	0.022	0.00	4	4	1,503	31	0	1.00
4	60	1.00	0.4	0.035	0.278	0.030	0.01	5	5	1,504	31	0	1.00
5	75	1.25	0.3	0.026	0.278	0.022	0.00	4	4	1,503	31	0	1.00
6	90	1.50	0.3	0.026	0.273	0.022	0.00	4	4	1,503	31	0	1.00
7	105	1.75	0.3	0.026	0.270	0.022	0.00	4	4	1,503	31	0	1.00
8	120	2.00	0.4	0.035	0.268	0.030	0.01	5	5	1,504	31	0	1.00
9	135	2.25	0.4	0.035	0.263	0.030	0.01	5	5	1,504	31	0	1.00
10	150	2.50	0.4	0.035	0.260	0.030	0.01	5	5	1,504	31	0	1.00
11	165	2.75	0.5	0.044	0.257	0.037	0.01	7	7	1,505	31	0	1.00
12	180	3.00	0.6	0.044	0.254	0.037	0.01	7	7	1,505	31	0	1.00
13	195	3.25	0.6	0.044	0.250	0.037	0.01	7	7	1,505	31	0	1.00
14	210	3.50	0.5	0.044	0.247	0.037	0.01	7	7	1,505	31	0	1.00
15	225	3.75	0.5	0.044	0.244	0.037	0.01	7	7	1,505	31	0	1.00
16	240	4.00	0.6	0.053	0.241	0.045	0.01	8	8	1,506	31	0	1.00
17	255	4.25	0.6	0.053	0.238	0.045	0.01	8	8	1,506	31	0	1.00
18	270	4.50	0.7	0.062	0.235	0.052	0.01	9	9	1,507	31	0	1.00
19	285	4.75	0.7	0.062	0.232	0.052	0.01	9	9	1,507	31	0	1.00
20	300	5.00	0.8	0.070	0.229	0.060	0.01	11	11	1,508	31	0	1.00
21	315	5.25	0.8	0.070	0.226	0.060	0.01	11	11	1,508	31	0	1.00
22	330	5.50	0.7	0.062	0.223	0.062	0.01	9	9	1,507	31	0	1.00
23	345	5.75	0.8	0.070	0.220	0.060	0.01	11	11	1,508	31	0	1.00
24	360	6.00	0.8	0.070	0.217	0.060	0.01	11	11	1,508	31	0	1.00
25	375	6.25	0.8	0.070	0.214	0.067	0.01	12	12	1,509	31	0	1.00
26	390	6.50	0.8	0.070	0.212	0.067	0.01	12	12	1,509	31	0	1.00
27	405	6.75	1.0	0.086	0.209	0.075	0.01	13	13	1,510	31	0	1.00
28	420	7.00	1.0	0.086	0.206	0.075	0.01	13	13	1,510	31	0	1.00
29	435	7.25	1.0	0.086	0.203	0.075	0.01	13	13	1,510	31	0	1.00
30	450	7.50	1.1	0.097	0.200	0.082	0.01	15	15	1,511	31	0	1.00
31	465	7.75	1.2	0.106	0.198	0.088	0.02	18	18	1,512	31	0	1.00
32	480	8.00	1.3	0.114	0.185	0.087	0.02	17	17	1,513	32	0	1.00
33	495	8.25	1.5	0.132	0.182	0.112	0.02	20	20	1,515	32	0	1.00
34	510	8.50	1.5	0.132	0.160	0.112	0.02	20	20	1,515	32	0	1.00
35	525	8.75	1.6	0.141	0.157	0.119	0.02	21	21	1,518	32	0	1.00
36	540	9.00	1.7	0.160	0.164	0.127	0.03	23	23	1,517	32	0	1.00
37	555	9.25	1.9	0.187	0.162	0.142	0.03	25	25	1,519	32	0	1.00
38	570	9.50	2.0	0.178	0.178	0.149	0.03	27	27	1,520	32	0	1.00
39	585	9.75	2.1	0.185	0.178	0.157	0.01	8	8	1,506	31	0	1.00
40	600	10.00	2.2	0.164	0.174	0.164	0.02	19	19	1,514	32	0	1.00
41	615	10.25	1.5	0.132	0.171	0.112	0.02	20	20	1,515	32	0	1.00
42	630	10.50	1.5	0.132	0.169	0.112	0.02	20	20	1,515	32	0	1.00

RCFC & WCD HYDROLOGY MANUAL		SYNTHETIC UNIT HYDROGRAPH METHOD SHORTCUT METHOD 24-HOUR STORM										PROJECT: BYYNS LONG Job No.: BY: N.D. DATE 7/18/12			
DRAINAGE AREA-ACRES UNIT TIME-MINUTES LAG TIME - MINUTES UNIT TIME-PERCENT OF LAG TOTAL ADJUSTED STORM RAIN (in)		UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM 0.09 0.00152 84.73%										Basin Percolation Rate 1.0 in/hr Maxwell Drywells Number 0 Drywell Percolation Rate 0.15 cfs Basin WSEL			
Unit Time Period	Time Minutes	Hours	Petition Percent (Plate E-5.6)	Storm Rain in/hr	Loss Rate in/hr	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sf	Percolation Out cu-ft	Total In Basin cu-ft	ac-ft	ac-ft	Basin WSEL
43	845	10.75	2.0	0.178	0.166	0.148	0.01	9	9	1,507	31	0	0	0.00	1.00
44	690	11.00	2.0	0.176	0.164	0.149	0.01	12	12	1,508	31	0	0	0.00	1.00
45	675	11.25	1.9	0.167	0.162	0.142	0.01	6	6	1,504	31	0	0	0.00	1.00
46	660	11.50	1.8	0.167	0.159	0.142	0.01	6	6	1,508	31	0	0	0.00	1.00
47	705	11.75	1.7	0.150	0.157	0.127	0.02	23	23	1,517	32	0	0	0.00	1.00
48	720	12.00	1.8	0.158	0.155	0.134	0.02	4	4	1,503	31	0	0	0.00	1.00
49	735	12.25	2.5	0.220	0.152	0.166	0.07	67	67	1,550	32	35	35	0.00	1.02
50	760	12.50	2.6	0.228	0.150	0.164	0.08	78	113	1,584	33	80	80	0.00	1.03
51	785	12.75	2.8	0.248	0.148	0.209	0.10	98	178	1,632	34	144	144	0.00	1.06
52	780	13.00	2.9	0.255	0.145	0.216	0.11	109	252	1,687	35	217	217	0.00	1.09
53	795	13.25	3.4	0.289	0.143	0.253	0.16	154	372	1,775	37	336	336	0.01	1.15
54	810	13.50	3.4	0.289	0.141	0.253	0.16	157	492	1,664	38	463	463	0.01	1.20
55	825	13.75	2.3	0.202	0.139	0.171	0.06	63	516	1,682	38	478	478	0.01	1.21
56	840	14.00	2.3	0.202	0.137	0.171	0.07	65	541	1,901	40	502	502	0.01	1.22
57	855	14.25	2.7	0.236	0.135	0.201	0.10	102	604	1,947	41	583	583	0.01	1.25
58	870	14.50	2.6	0.228	0.133	0.184	0.10	85	839	1,887	41	617	617	0.01	1.27
59	885	14.75	2.6	0.228	0.131	0.184	0.10	87	714	2,028	42	672	672	0.02	1.28
60	900	15.00	2.5	0.220	0.129	0.166	0.09	80	762	2,084	43	719	719	0.02	1.31
61	915	15.25	2.4	0.211	0.127	0.179	0.08	84	803	2,094	44	768	768	0.02	1.33
62	930	15.50	2.3	0.202	0.125	0.171	0.08	77	838	2,118	44	782	782	0.02	1.34
63	945	15.75	1.9	0.187	0.123	0.142	0.04	44	838	2,118	44	784	784	0.02	1.36
64	960	16.00	1.8	0.187	0.121	0.142	0.05	46	789	2,091	44	755	755	0.02	1.33
65	975	16.25	0.4	0.035	0.119	0.030	0.01	5	761	2,083	43	719	719	0.02	1.31
66	990	16.50	0.4	0.035	0.117	0.030	0.01	5	722	2,034	42	678	678	0.02	1.30
67	1005	16.75	0.3	0.028	0.116	0.022	0.00	4	853	2,068	42	841	841	0.01	1.28
68	1020	17.00	0.3	0.028	0.114	0.022	0.00	4	848	2,068	42	841	841	0.01	1.28
69	1035	17.25	0.5	0.044	0.112	0.037	0.01	7	814	1,864	41	607	607	0.01	1.25
70	1050	17.50	0.6	0.044	0.110	0.037	0.01	7	814	1,864	41	607	607	0.01	1.25
71	1065	17.75	0.5	0.044	0.109	0.037	0.01	7	578	1,828	40	538	538	0.01	1.23
72	1080	18.00	0.4	0.035	0.107	0.030	0.01	5	545	1,803	40	503	503	0.01	1.22
73	1095	18.25	0.4	0.035	0.106	0.030	0.01	5	477	1,878	38	471	471	0.01	1.21
74	1110	18.50	0.4	0.035	0.104	0.030	0.01	5	477	1,853	38	438	438	0.01	1.19
75	1125	18.75	0.3	0.028	0.103	0.022	0.00	4	442	1,627	38	404	404	0.01	1.18
76	1140	19.00	0.2	0.019	0.101	0.015	0.00	3	407	1,601	38	380	380	0.01	1.18
77	1155	19.25	0.3	0.026	0.100	0.022	0.00	4	373	1,779	37	339	339	0.01	1.15
78	1170	19.50	0.4	0.035	0.098	0.020	0.01	6	341	1,753	37	305	305	0.01	1.13
79	1185	19.75	0.3	0.028	0.097	0.022	0.00	4	308	1,728	36	273	273	0.01	1.12
80	1200	20.00	0.2	0.018	0.096	0.015	0.00	3	275	1,704	35	240	240	0.01	1.10
81	1215	20.25	0.3	0.028	0.094	0.022	0.00	4	244	1,681	35	209	209	0.00	1.09
82	1230	20.50	0.3	0.028	0.093	0.022	0.00	4	213	1,658	35	178	178	0.00	1.08
83	1245	20.75	0.3	0.028	0.092	0.022	0.00	4	182	1,635	34	148	148	0.00	1.06
84	1260	21.00	0.2	0.018	0.091	0.015	0.00	3	151	1,612	34	117	117	0.00	1.05

RCFC & WCD HYDROLOGY MANUAL		SYNTHETIC UNIT HYDROGRAPH METHOD										PROJECT: Bayline LCMG				
		SHORTCUT METHOD										Job No.:				
		24-HOUR STORM										BY: M.O. DATE 7/16/12				
		UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM										Basin Percolation Rate 1.0 in/hr				
		VARIABLE LOSS RATE (AVG) IN/HR										Basin WSEL ft				
		Fm = Minimum value on loss curve (in/hr)										Maxwell Drywells Number 0				
		C Low Loss Rate (percent)										Drywell Percolation Rate 0.15 cfs				
		TOTAL ADJUSTED STORM RAIN (in)														
Drainage Area - Acres	1.08	Time Period	Minutes	Hours	Pattern Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate Max in/hr	Loss Rate Low in/hr	Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume in cu-ft	Basin Volume cu-ft	Percolation Area ft	Percolation Out cu-ft	Total in Basin cu-ft	Basin WSEL ft
85	1275	21.25	0.3	0.026	0.080	0.022	0.00	0.00	0.00	4	121	1590	33	58	0.00	1.04
86	1280	21.50	0.2	0.016	0.089	0.015	0.00	0.00	0.00	3	81	1567	33	59	0.00	1.03
87	1305	21.75	0.3	0.026	0.088	0.022	0.00	0.00	0.00	4	82	1548	32	30	0.00	1.01
88	1320	22.00	0.2	0.016	0.087	0.015	0.00	0.00	0.00	3	33	1524	32	1	0.00	1.00
88	1335	22.25	0.3	0.026	0.086	0.022	0.00	0.00	0.00	4	5	1504	31	0	0.00	1.00
90	1350	22.50	0.2	0.016	0.085	0.015	0.00	0.00	0.00	3	3	1502	31	0	0.00	1.00
91	1365	22.75	0.2	0.016	0.084	0.015	0.00	0.00	0.00	3	3	1502	31	0	0.00	1.00
92	1380	23.00	0.2	0.016	0.084	0.015	0.00	0.00	0.00	3	3	1502	31	0	0.00	1.00
93	1395	23.25	0.2	0.016	0.083	0.015	0.00	0.00	0.00	3	3	1502	31	0	0.00	1.00
94	1410	23.50	0.2	0.016	0.083	0.015	0.00	0.00	0.00	3	3	1502	31	0	0.00	1.00
95	1425	23.75	0.2	0.016	0.082	0.015	0.00	0.00	0.00	3	3	1502	31	0	0.00	1.00
96	1440	24.00	0.2	0.016	0.082	0.015	0.00	0.00	0.00	3	3	1502	31	0	0.00	1.00

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY	
EFFECTIVE RAIN	0.53 in
FLOOD VOLUME	0.05 ac-ft
REQUIRED STORAGE	2.091 cu-ft
REQUIRED STORAGE	0.02 ac-ft
MAX WSEL	794 cu-ft
PEAK FLOW RATE	1.35 ft
AVERAGE PERCOLATION RATE	0.17 cfs
	2.25 cuft/min

BASIN VOLUME WORKSHEET

PROJECT

Blythe LONG

JOB No.

BASIN DESIGNATION:

BASIN CHARACTERISTICS

CONTOUR ELEVATION	DEPTH		AREA		VOLUME		
	INCR (ft)	TOTAL (ft)	INCR (sf)	TOTAL (sf)	INCR (cuft)	TOTAL (cuft)	TOTAL (acre-ft)
1	0	0		1,500	0	0	0.00
2	1	1	1,700	3,200	2,297	2,297	0.05
3	1	2	1,900	5,100	4,113	6,410	0.15
4	1	3	2,400	7,500	6,262	12,672	0.29

WHERE:
$$V = \frac{1}{3}(E_1 - E_2)(A_1 + A_2 + \sqrt{A_1 A_2})$$

RCFC & WCD HYDROLOGY MANUAL	SYNTHETIC UNIT HYDROGRAPH METHOD	PROJECT: <u>Blythe LCNG</u>
	BASIC DATA CALCULATION FORM	Job No.: _____
		BY: _____ N.O. _____ DATE: <u>7/16/12</u>
PHYSICAL DATA		
[1] CONCENTRATION POINT		
[2] AREA DESIGNATION		On-site Area
[3] AREA - ACRES		1.74
[4] L- FEET		400
[5] L- MILES		0.076
[6] La- FEET		200.00
[7] La- MILES		0.038
[8] ELEVATION OF HEADWATER		285
[9] ELEVATION OF CONCENTRATION POINT		260
[10] H- FEET		5
[11] S- FEET/MILE		66.0
[12] S ² 0.5		8.12
[13] L ³ LGAS ² 0.5		0.000
[14] AVERAGE MANNINGS 'N'		0.02
[15] LAG TIME-HOURS		0.02
[16] LAG TIME-MINUTES		1.4
[17] 100% OF LAG-MINUTES		1.4
[18] 200% OF LAG-MINUTES		2.8

RAINFALL DATA	
[1] AMC	1"
[2] FREQUENCY-YEARS	100
[3] STORM DURATION:	Point Rain
1-HOUR	2.20 in
3-HOUR	2.50 in
6-HOUR	3.00 in
24-HOUR	3.50 in

STORM EVENT SUMMARY					
STORM DURATION		1-HOUR	3-HOUR	6-HOUR	24-HOUR
EFFECTIVE RAIN	(in)	1.91	1.84	1.87	2.32
FLOOD VOLUME	(cu-ft)	12,044	10,380	11,797	14,654
	(acre-ft)	0.28	0.24	0.27	0.34
REQUIRED STORAGE	(cu-ft)	11,701	9,517	9,963	8,017
	(acre-ft)	0.27	0.22	0.23	0.18
FACTOR OF SAFETY		1.08	1.33	1.27	1.50
STORAGE PROVIDED	(cu-ft)	12,672			
	(acre-ft)	0.29			
PEAK FLOW	(cfs)	15.47	3.80	3.02	0.48
MAXIMUM WSEL	(ft)	3.65	3.50	3.57	3.26
DEPTH	(ft)	2.65	2.50	2.57	2.26
LOWEST FLOWLINE ELEVATION					
DIFFERENCE	(ft)				
LOWEST PAD ELEVATION					
DIFFERENCE	(ft)				
ESTIMATED TIME TO DEWATER BASIN					
Based on Total Flood Volume & Average Percolation Rate	(days)	1.5	1.5	1.6	1.7

NOTE: PEAK FLOW FOR THE 1-HOUR STORM IS NOT REPRESENTATIVE. PER RCFCO PEAK DISCHARGES FROM THE 3-HOUR STORM SHOULD NORMALLY COMPARE WELL WITH RATIONAL PEAKS.

**RCFC & WCD
HYDROLOGY
MANUAL**

SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
1-HOUR STORM

UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

PROJECT: **BYRNE LCNG**
Job No.:
BY: **N.O.** DATE: **7/18/12**

Basin Percolation Rate: **1.9 in/hr**
Maxwell Drywell Number: **0**
Drywell Percolation Rate: **0.15 cfs**
Basin WSEL: **0.00 cfm**

DRAINAGE AREA-ACRES: **1.74**
UNIT TIME-MINUTES: **5**
LAG TIME - MINUTES: **1.40**
UNIT TIME PERCENT OF LAG: **335.9**
TOTAL ADJUSTED STORM RAIN-INCHES: **2.20**
CONSTANT LOSS RATE-1/HR: **0.29**
LOW LOSS RATE - PERCENT: **10.00%**

Unit Time Period	Time		Storm Rain in/hr	Loss Rate		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume in cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Total In Basin		Basin WSEL
	Minutes	Hours		Max	Low						cu-ft	ac-ft	
1	5	0.08	0.85	0.29	0.10	0.86	1.16	346	1759	12	384	1.15	
2	10	0.17	1.11	0.29	0.11	0.82	1.43	429	2065	14	748	1.33	
3	15	0.25	1.18	0.29	0.12	0.87	1.52	457	2362	17	1769	1.52	
4	20	0.33	1.21	0.29	0.12	0.82	1.82	485	2789	18	1855	1.72	
5	25	0.42	1.32	0.29	0.13	1.03	1.80	540	3125	22	2174	1.95	
6	30	0.50	1.48	0.29	0.15	1.19	2.08	624	3431	24	2774	2.12	
7	35	0.58	1.68	0.29	0.17	1.40	2.46	733	3790	26	3463	2.29	
8	40	0.67	2.14	0.29	0.21	1.85	3.24	871	4196	29	4425	2.42	
9	45	0.75	3.48	0.29	0.35	3.17	5.85	1568	4953	34	6057	2.81	
10	50	0.83	8.11	0.29	0.81	8.81	16.47	4840	6743	47	10649	3.68	
11	55	0.92	1.77	0.29	0.19	1.48	2.56	777	7023	49	11377	3.78	
12	60	1.00	1.90	0.29	0.10	0.71	1.26	374	7167	50	11761	3.85	

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN	1.81 in
FLOOD VOLUME	0.28 ac-ft
FLOOD VOLUME	12,044 cu-ft
REQUIRED STORAGE	0.27 ac-ft
REQUIRED STORAGE	11,761 cu-ft
MAX WSEL	3.85 ft
PEAK FLOW RATE	15.47 cfs
AVERAGE PERCOLATION RATE	5.71 cu-ft/in

**RCFC & WCD
HYDROLOGY
MANUAL**

**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
3-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Bayliss LCNIG
Job No.:
BY: N.A.O. DATE:
Basin Percolation Ratio: 1.0 in/hr
Maxwell Drywells Number: 0
Drywell Percolation Ratio: 0.15 cfs
0.00 cfm

DRAINAGE AREA-ACRES: 1.74
UNIT TIME-MINUTES: 5
LAG TIME - MINUTES: 1.40
TOTAL ADJUSTED STORM RAIN (in): 334.9
CONSTANT LOSS RATE (in/hr): 2.60
LOW LOSS RATE - PERCENT: 0.28
10.00%

Unit Time Period	Time		Pattern Percent (Plate E-5.8)	Storm Rain In/hr	Loss Rate In/hr		Effective Rain In/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out		Basin WSEL ft
	Minutes	Hours			Max	Low						cu-ft	cu-ft	
1	5	0.08	1.3	0.38	0.28	0.04	0.10	0.17	51	61	1,508	11	40	1.02
2	10	0.17	1.3	0.38	0.28	0.04	0.10	0.17	51	61	1,508	11	60	1.03
3	15	0.25	1.1	0.33	0.29	0.03	0.04	0.09	18	100	1,274	11	89	1.04
4	20	0.33	1.3	0.45	0.28	0.05	0.16	0.29	83	171	1,027	11	190	1.07
5	25	0.42	1.5	0.45	0.28	0.05	0.16	0.29	83	243	1,060	12	231	1.10
6	30	0.50	1.8	0.54	0.28	0.05	0.25	0.43	130	381	1,767	12	349	1.15
7	35	0.58	1.5	0.45	0.28	0.05	0.18	0.28	83	431	1,618	13	419	1.18
8	40	0.67	1.6	0.54	0.28	0.05	0.25	0.43	130	548	1,806	13	535	1.23
9	45	0.75	1.6	0.54	0.28	0.05	0.25	0.43	130	665	1,892	14	651	1.28
10	50	0.83	1.5	0.45	0.28	0.05	0.18	0.28	83	734	2,043	14	720	1.31
11	55	0.92	1.6	0.49	0.28	0.05	0.18	0.28	83	818	2,105	15	803	1.35
12	60	1.00	1.8	0.54	0.28	0.05	0.25	0.43	130	933	2,181	15	919	1.40
13	65	1.08	2.2	0.66	0.28	0.07	0.37	0.64	183	1,111	2,322	18	1,095	1.48
14	70	1.17	2.2	0.66	0.28	0.07	0.37	0.64	183	1,288	2,453	17	1,271	1.55
15	75	1.25	2.2	0.66	0.28	0.07	0.37	0.64	183	1,464	2,584	18	1,448	1.63
16	80	1.33	2.0	0.60	0.28	0.08	0.31	0.54	162	1,808	2,888	18	1,580	1.69
17	85	1.42	2.6	0.76	0.28	0.08	0.48	0.85	256	1,945	2,888	20	1,825	1.79
18	90	1.50	2.7	0.81	0.28	0.08	0.52	0.81	272	2,097	3,052	21	2,076	1.90
19	95	1.59	2.4	0.72	0.28	0.07	0.43	0.75	276	2,301	3,202	22	2,278	1.99
20	100	1.67	2.7	0.81	0.28	0.08	0.52	0.81	272	2,551	3,317	23	2,528	2.06
21	105	1.73	3.3	0.88	0.28	0.10	0.70	1.22	367	2,885	3,479	24	2,870	2.14
22	110	1.83	3.1	0.83	0.28	0.08	0.64	1.12	335	3,208	3,620	25	3,160	2.21
23	115	1.92	2.9	0.67	0.28	0.08	0.58	1.01	304	3,484	3,748	26	3,458	2.28
24	120	2.00	3.0	0.60	0.28	0.09	0.61	1.06	316	3,777	3,854	27	3,750	2.35

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
3-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: **Bythe LONG**
Job No.:
BY: **N.O.** DATE:
Basin Percolation Rate: **1.0 in/hr**
Maxwell Drywells Number: **0**
Drywell Percolation Rate: **0.15 cfs** **0.00 cfm**

Unit Time Per/hr	Time Minutes	Time Hours	Papiam Percent (Plain E-5.5)	Storm Rain in/hr	Loss Rate in/hr		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volumes In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin		Basin WSEL ft
					Max	Low							cu-ft	sec-ft	
25	128	2.08	3.1	0.83	0.28	0.09	0.64	1.12	335	4,088	4,026	28	4,058	0.09	2.43
26	130	2.17	4.2	1.28	0.29	0.13	0.97	1.70	508	4,587	4,248	30	4,637	0.10	2.54
27	134	2.25	5.0	1.50	0.29	0.15	1.21	2.12	635	5,172	4,598	31	5,141	0.12	2.68
28	140	2.33	3.5	1.05	0.29	0.11	0.78	1.33	388	5,536	4,696	33	5,507	0.13	2.78
29	145	2.42	6.8	2.04	0.29	0.20	1.76	3.06	819	6,428	5,106	35	6,381	0.15	3.00
30	150	2.50	7.3	2.16	0.29	0.22	1.90	3.33	898	7,369	5,475	36	7,351	0.17	3.15
31	155	2.58	6.2	2.48	0.29	0.25	2.17	3.66	1,141	8,402	5,868	41	8,451	0.19	3.33
32	160	2.67	5.9	1.77	0.28	0.18	1.48	2.69	777	9,228	6,180	43	9,185	0.21	3.44
33	165	2.75	2.0	0.80	0.28	0.08	0.31	0.54	182	9,348	6,226	43	9,303	0.21	3.48
34	170	2.83	1.8	0.54	0.26	0.04	0.25	0.43	130	8,433	6,258	43	8,390	0.22	3.48
35	175	2.92	1.8	0.54	0.26	0.05	0.25	0.43	130	8,320	6,262	44	8,478	0.22	3.49
36	180	3.00	0.5	0.18	0.26	0.02	0.18	0.26	65	8,581	6,306	44	8,517	0.22	3.60

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN	1.64 in
FLOOD VOLUME	0.24 ac-ft
FLOOD VOLUME	10,390 cu-ft
REQUIRED STORAGE	0.22 ac-ft
REQUIRED STORAGE	9,517 cu-ft
MAX WSEL	3.50 ft
PEAK FLOW RATE	3.80 cfs
AVERAGE PERCOLATION RATE	4.79 cufmin

SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
6-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

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DRAINAGE AREA-ACRES 1.74
 UNIT TIME-MINUTES 5
 LAG TIME - MINUTES 1.40
 TOTAL ADJUSTED STORM RAIN (in) 355.9
 CONSTANT LOSS RATE (in/hr) 0.29
 LOW LOSS RATE - PERCENT 10.00%

PROJECT: Blythe LCNG
 Job No.:
 BY: N.O. DATE 7/18/12

Basin Percolation Rate 1.0 in/hr
 Mixed Drywells Number 0
 Drywell Percolation Rate 0.15 cfs 0.00 cfm

Unit Time Period	Time		Storm Rain in/hr	Loss Rate in/hr		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out		Total In Basin		Basin WSEL ft
	Minutes	Hours		Max	Low						cu-ft	sq-ft	cu-ft	sq-ft	
1	6	0.08	0.18	0.02	0.16	0.16	0.28	85	85	1,983	11	74	0.00	1.03	
2	10	0.17	0.22	0.02	0.18	0.18	0.34	102	177	1,931	11	165	0.00	1.07	
3	15	0.25	0.22	0.02	0.19	0.19	0.34	102	266	1,898	12	256	0.01	1.11	
4	20	0.33	0.22	0.02	0.18	0.18	0.34	102	358	1,765	12	346	0.01	1.15	
5	25	0.42	0.22	0.02	0.18	0.18	0.34	102	446	1,632	13	436	0.01	1.18	
6	30	0.50	0.25	0.03	0.23	0.23	0.40	118	555	1,911	13	542	0.01	1.24	
7	35	0.58	0.26	0.03	0.23	0.23	0.40	118	681	1,888	14	647	0.01	1.28	
8	40	0.67	0.26	0.03	0.23	0.23	0.40	118	787	2,067	14	752	0.02	1.33	
9	45	0.75	0.25	0.03	0.23	0.23	0.40	118	872	2,145	15	857	0.02	1.37	
10	50	0.83	0.25	0.03	0.23	0.23	0.40	118	976	2,222	15	961	0.02	1.42	
11	55	0.92	0.25	0.03	0.23	0.23	0.40	118	1,050	2,298	16	1,064	0.02	1.48	
12	60	1.00	0.28	0.03	0.26	0.26	0.45	136	1,201	2,368	17	1,184	0.03	1.52	
13	65	1.08	0.28	0.03	0.26	0.26	0.45	136	1,320	2,477	17	1,303	0.03	1.57	
14	70	1.17	0.28	0.03	0.26	0.26	0.45	136	1,440	2,565	18	1,422	0.03	1.62	
15	75	1.25	0.28	0.03	0.26	0.26	0.45	136	1,556	2,653	18	1,540	0.04	1.67	
16	80	1.33	0.28	0.03	0.26	0.26	0.45	136	1,678	2,741	19	1,657	0.04	1.72	
17	85	1.42	0.28	0.03	0.26	0.26	0.45	136	1,784	2,827	20	1,774	0.04	1.77	
18	90	1.50	0.29	0.03	0.26	0.26	0.46	136	1,910	2,914	20	1,890	0.04	1.82	
19	95	1.58	0.29	0.03	0.26	0.26	0.46	136	2,027	3,000	21	2,008	0.05	1.87	
20	100	1.67	0.28	0.03	0.26	0.26	0.45	136	2,142	3,085	21	2,121	0.05	1.92	
21	105	1.75	0.28	0.03	0.26	0.26	0.45	136	2,257	3,171	22	2,235	0.05	1.97	
22	110	1.83	0.28	0.03	0.26	0.26	0.45	136	2,372	3,255	22	2,348	0.05	2.01	
23	115	1.92	0.28	0.03	0.26	0.26	0.45	136	2,486	3,287	23	2,463	0.06	2.04	
24	120	2.00	0.32	0.03	0.30	0.30	0.51	154	2,478	3,264	23	2,456	0.06	2.04	
25	125	2.08	0.29	0.03	0.26	0.26	0.45	136	2,593	3,337	23	2,569	0.06	2.07	
26	130	2.17	0.32	0.03	0.30	0.30	0.51	154	2,598	3,333	23	2,563	0.06	2.06	
27	135	2.25	0.32	0.03	0.30	0.30	0.51	154	2,578	3,330	23	2,556	0.06	2.06	
28	140	2.33	0.32	0.03	0.30	0.30	0.51	154	2,572	3,327	23	2,548	0.06	2.06	
29	145	2.42	0.32	0.03	0.30	0.30	0.51	154	2,565	3,324	23	2,542	0.06	2.06	
30	150	2.50	0.32	0.03	0.30	0.30	0.51	154	2,558	3,321	23	2,535	0.06	2.06	
31	155	2.58	0.32	0.03	0.30	0.30	0.51	154	2,551	3,318	23	2,528	0.06	2.06	
32	160	2.67	0.32	0.03	0.30	0.30	0.51	154	2,545	3,314	23	2,522	0.06	2.05	
33	165	2.75	0.36	0.04	0.32	0.32	0.57	172	2,557	3,320	23	2,534	0.06	2.06	
34	170	2.83	0.36	0.04	0.32	0.32	0.57	172	2,568	3,328	23	2,548	0.06	2.06	

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
8-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Blythe LCNG

Job No.:

BY: N.O.

DATE

7/18/12

DRAINAGE AREA-ACRES 1.74
 UNIT TIME-MINUTES 5
 LAG TIME - MINUTES 1.40
 TOTAL ADJUSTED STORM RAIN (in) 355.8
 CONSTANT LOSS RATE (in/hr) 0.28
 LOW LOSS RATE - PERCENT 10.00%

Basin Percolation Rate 1.0 in/hr
 Maxwell Drywells Number 0
 Drywell Percolation Rate 0.15 cfs 0.00 cfm

Unit Time Period	Time		Storm Rain in/hr	Loss Rate in/hr		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin		Basin WSEL ft
	Minutes	Hours		Max	Low							cu-ft	ac-ft	
35	175	2.92	0.36	0.29	0.04	0.07	0.12	35	2,591	3,331	23	2,558	0.06	2.06
36	180	3.00	0.36	0.29	0.04	0.07	0.12	35	2,593	3,337	23	2,570	0.06	2.07
37	185	3.08	0.36	0.29	0.04	0.07	0.12	35	2,605	3,342	23	2,582	0.06	2.07
38	180	3.17	0.40	0.29	0.04	0.10	0.16	54	2,638	3,357	23	2,613	0.06	2.08
39	185	3.25	0.40	0.29	0.04	0.10	0.16	54	2,667	3,371	23	2,643	0.06	2.08
40	200	3.33	0.40	0.29	0.04	0.10	0.16	54	2,697	3,385	24	2,674	0.06	2.09
41	205	3.42	0.43	0.29	0.04	0.14	0.24	73	2,747	3,408	24	2,723	0.06	2.10
42	210	3.50	0.47	0.29	0.05	0.17	0.31	82	2,815	3,438	24	2,781	0.06	2.12
43	215	3.58	0.60	0.29	0.05	0.21	0.37	111	2,902	3,480	24	2,876	0.07	2.14
44	220	3.67	0.60	0.29	0.05	0.21	0.37	111	2,959	3,520	24	2,885	0.07	2.18
45	225	3.75	0.54	0.29	0.05	0.25	0.43	130	3,055	3,569	25	3,070	0.07	2.19
46	230	3.83	0.54	0.29	0.05	0.25	0.43	130	3,200	3,617	25	3,176	0.07	2.21
47	235	3.92	0.58	0.29	0.06	0.28	0.50	149	3,324	3,674	26	3,296	0.08	2.24
48	240	4.00	0.58	0.29	0.06	0.28	0.50	149	3,447	3,731	26	3,421	0.08	2.27
49	245	4.08	0.51	0.28	0.06	0.32	0.55	168	3,598	3,797	26	3,583	0.08	2.31
60	250	4.17	0.85	0.28	0.06	0.35	0.62	187	3,748	3,871	27	3,722	0.08	2.35
51	255	4.25	0.68	0.28	0.07	0.38	0.68	208	3,928	3,953	27	3,901	0.08	2.38
52	260	4.33	0.72	0.28	0.07	0.43	0.75	225	4,125	4,045	28	4,087	0.08	2.44
53	265	4.42	0.76	0.28	0.08	0.46	0.81	244	4,341	4,144	28	4,312	0.10	2.48
54	270	4.50	0.76	0.28	0.08	0.46	0.81	244	4,556	4,243	29	4,528	0.10	2.54
55	275	4.58	0.79	0.29	0.08	0.50	0.88	263	4,788	4,351	30	4,758	0.11	2.60
56	280	4.67	0.83	0.29	0.06	0.53	0.94	282	5,040	4,487	31	5,008	0.11	2.68
57	285	4.75	0.88	0.28	0.08	0.57	1.00	300	5,310	4,692	32	5,278	0.12	2.72
58	290	4.83	0.88	0.29	0.08	0.57	1.00	300	5,578	4,716	33	5,545	0.13	2.78
59	295	4.92	0.90	0.29	0.08	0.61	1.06	319	5,865	4,848	34	5,831	0.13	2.86
60	300	5.00	0.94	0.28	0.08	0.64	1.13	338	6,168	4,989	35	6,135	0.14	2.93
61	305	5.08	1.12	0.29	0.11	0.82	1.44	433	6,568	5,180	36	6,532	0.15	3.02
62	310	5.17	1.30	0.29	0.14	1.00	1.76	528	7,060	5,349	37	7,023	0.16	3.10
63	315	5.25	1.40	0.29	0.14	1.11	1.95	585	7,608	5,559	39	7,588	0.17	3.18
64	320	5.33	1.51	0.28	0.15	1.22	2.14	642	8,210	5,790	40	8,170	0.18	3.28
65	325	5.42	1.68	0.29	0.17	1.40	2.45	736	8,907	6,057	42	8,864	0.20	3.38
66	330	5.50	2.02	0.28	0.20	1.72	3.02	907	9,771	6,388	44	9,727	0.22	3.53
67	335	5.58	2.08	0.29	0.20	1.72	3.02	907	10,333	6,450	45	10,288	0.23	3.58
68	340	5.67	0.32	0.29	0.03	0.03	0.05	16	9,804	6,439	45	9,859	0.23	3.55

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**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
8-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM**

PROJECT: Hythe LCNG Job No.:		N.O.		DATE 7/18/12										
BY:		Basin Percolation Rate 1.0 in/hr		Maxwell Drywells Number 0										
DRAINAGE AREA-ACRES 1.74		UNIT TIME-MINUTES 5		Drywell Percolation Rate 0.15 cfs										
LAG TIME - MINUTES 1.40		UNIT TIME-PERCENT OF LAG 355.8		0.00 cfm										
TOTAL ADJUSTED STORM RAIN (in) 3.00		CONSTANT LOSS RATE (in/hr) 0.29												
LOW LOSS RATE - PERCENT 10.00%														
Unit Time Period	Time		Storm Rain In/hr	Loss Rate In/hr		Effective Rain In/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Total In Basin		Basin WSEL ft	
	Minutes	Hours		Max	Low						cu-ft	cu-ft		ac-ft
68	345	6.75	0.6	0.29	0.02	0.19	0.34	102	9,962	9,451	45	9,917	0.23	3.58
70	350	6.83	0.5	0.29	0.02	0.18	0.28	85	10,002	9,477	45	9,957	0.23	3.57
71	355	6.92	0.3	0.29	0.01	0.10	0.17	51	10,008	9,478	45	9,963	0.23	3.57
72	350	6.00	0.2	0.29	0.01	0.06	0.11	34	9,997	9,475	45	9,952	0.23	3.57

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN	1.87 in
FLOOD VOLUME	0.27 ac-ft
FLOOD VOLUME	11,797 cu-ft
REQUIRED STORAGE	0.23 ac-ft
REQUIRED STORAGE	9,963 cu-ft
MAX WSEL	3.57 ft
PEAK FLOW RATE	3.02 cfs
AVERAGE PERCOLATION RATE	5.12 cu-ft/min

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SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
24-HOUR STORM
UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM

Unit Time Period	Time Minutes	Hours	Pattern Percent (Table E-5.8)	Storm Rain in/hr		Loss Rate in/hr		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume in cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin Percolation Rate 0.15 cfs	Basin WSEL
				Max	Low	Max	Low								
1	15	0.25	0.2	0.028	0.318	0.003	0.003	0.03	0.04	40	40	1,528	32	8	0.00
2	30	0.50	0.3	0.042	0.512	0.004	0.004	0.04	0.07	80	80	1,550	32	35	0.00
3	45	0.75	0.3	0.042	0.508	0.004	0.004	0.04	0.07	80	85	1,570	33	62	0.00
4	60	1.00	0.4	0.056	0.500	0.006	0.006	0.05	0.06	80	142	1,605	33	108	0.00
5	75	1.25	0.3	0.042	0.494	0.004	0.004	0.04	0.07	80	168	1,624	34	134	0.00
6	90	1.50	0.3	0.042	0.488	0.004	0.004	0.04	0.07	80	194	1,644	34	160	0.00
7	105	1.75	0.3	0.042	0.482	0.004	0.004	0.04	0.07	80	219	1,662	35	185	0.00
8	120	2.00	0.4	0.056	0.478	0.006	0.006	0.05	0.09	80	264	1,699	35	229	0.01
9	135	2.25	0.4	0.056	0.471	0.006	0.006	0.05	0.08	80	308	1,728	38	273	0.01
10	150	2.50	0.4	0.056	0.465	0.006	0.006	0.05	0.08	80	352	1,761	37	316	0.01
11	165	2.75	0.5	0.070	0.459	0.007	0.007	0.06	0.11	89	415	1,807	39	377	0.01
12	180	3.00	0.5	0.070	0.454	0.007	0.007	0.06	0.11	89	477	1,853	39	439	0.01
13	195	3.25	0.5	0.070	0.448	0.007	0.007	0.06	0.11	89	538	1,898	40	499	0.01
14	210	3.50	0.5	0.070	0.442	0.007	0.007	0.06	0.11	89	597	1,942	40	557	0.01
15	225	3.75	0.5	0.070	0.437	0.007	0.007	0.06	0.11	89	658	1,986	41	615	0.01
16	240	4.00	0.6	0.084	0.431	0.008	0.008	0.06	0.13	119	735	2,044	43	692	0.02
17	255	4.25	0.6	0.084	0.428	0.008	0.008	0.06	0.13	119	811	2,101	44	768	0.02
18	270	4.50	0.7	0.098	0.420	0.010	0.010	0.06	0.15	139	907	2,171	45	862	0.02
19	285	4.75	0.7	0.098	0.415	0.010	0.010	0.06	0.15	139	1,001	2,241	47	964	0.02
20	300	5.00	0.8	0.112	0.410	0.011	0.011	0.10	0.18	168	1,114	2,324	48	1,065	0.02
21	315	5.25	0.8	0.112	0.404	0.010	0.010	0.06	0.18	168	1,184	2,377	50	1,135	0.03
22	330	5.50	0.7	0.089	0.398	0.010	0.010	0.06	0.15	139	1,274	2,443	51	1,233	0.03
23	345	5.75	0.8	0.112	0.394	0.011	0.011	0.10	0.19	169	1,382	2,523	53	1,330	0.03
24	360	6.00	0.8	0.112	0.389	0.011	0.011	0.10	0.19	169	1,499	2,602	54	1,435	0.03
25	375	6.25	0.9	0.126	0.384	0.013	0.013	0.11	0.20	179	1,614	2,694	58	1,558	0.04
26	390	6.50	0.9	0.126	0.378	0.013	0.013	0.11	0.20	179	1,737	2,783	58	1,678	0.04
27	405	6.75	1.0	0.140	0.373	0.014	0.014	0.19	0.22	189	1,878	2,890	60	1,818	0.04
28	420	7.00	1.0	0.140	0.368	0.014	0.014	0.13	0.22	169	2,017	2,982	82	1,954	0.04
29	435	7.25	1.0	0.140	0.363	0.014	0.014	0.13	0.22	169	2,155	3,084	84	2,089	0.05
30	450	7.50	1.1	0.154	0.358	0.015	0.015	0.14	0.24	219	2,308	3,205	87	2,241	0.05
31	465	7.75	1.2	0.168	0.353	0.017	0.017	0.15	0.27	238	2,490	3,341	88	2,411	0.06
32	480	8.00	1.3	0.182	0.349	0.018	0.018	0.18	0.29	269	2,670	3,472	70	2,600	0.06
33	495	8.25	1.5	0.210	0.344	0.021	0.021	0.18	0.33	268	2,868	3,617	72	2,829	0.06
34	510	8.50	1.5	0.210	0.338	0.021	0.021	0.18	0.33	268	3,074	3,772	75	3,048	0.07
35	525	8.75	1.6	0.224	0.334	0.022	0.022	0.20	0.35	318	3,294	3,895	77	3,281	0.06
36	540	9.00	1.7	0.236	0.328	0.024	0.024	0.21	0.36	338	3,528	4,015	79	3,540	0.06
37	555	9.25	1.8	0.268	0.325	0.027	0.027	0.24	0.42	378	3,782	4,145	82	3,845	0.06
38	570	9.50	2.0	0.280	0.320	0.028	0.028	0.25	0.46	388	4,048	4,283	85	4,158	0.10
39	585	9.75	2.1	0.294	0.318	0.029	0.029	0.26	0.48	418	4,376	4,432	89	4,487	0.10
40	600	10.00	2.2	0.308	0.311	0.031	0.031	0.29	0.49	438	4,725	4,582	92	4,833	0.11
41	615	10.25	1.5	0.210	0.307	0.031	0.031	0.19	0.33	288	5,131	4,739	94	5,037	0.12
42	630	10.50	1.5	0.210	0.302	0.031	0.031	0.19	0.33	288	5,396	4,804	96	5,240	0.12

RCFC & WCD HYDROLOGY MANUAL		SYNTHETIC UNIT HYDROGRAPH METHOD										PROJECT: Bayma LONG			
		SHORTCUT METHOD										Job No.:			
		24-HOUR STORM										BY: N.O. DATE 7/11/12			
		UNIT HYDROGRAPH and EFFECTIVE RAIN CALCULATION FORM										Basin Percolation Rate 1.0 in/hr			
		VARIABLE LOSS RATE (AVG) IN/HR										Basin Percolation Rate 1.0 in/hr			
		Fm = Minimum value on loss curve (in/hr)										Basin Percolation Rate 1.0 in/hr			
		Low Loss Rate (percent)										Basin Percolation Rate 1.0 in/hr			
		C										Basin Percolation Rate 1.0 in/hr			
		0.15										Basin Percolation Rate 1.0 in/hr			
		10.00%										Basin Percolation Rate 1.0 in/hr			
		0.00271										Basin Percolation Rate 1.0 in/hr			
		10.00%										Basin Percolation Rate 1.0 in/hr			
Unit Time Period	Time Minutes	Hours	Pattern Percent (Plate E-5.9)	Storm Rain In/hr	Max In/hr	Loss Rate In/hr	Effective Rain In/hr	Flood Hydrograph Flow cfs	Volume In cu-ft	Basin Volume cu-ft	Percolation Area sf	Percolation Out cu-ft	Total In Basin cu-ft	ac-ft	Basin WSEL ft
43	645	10.75	1.74	0.280	0.269	0.028	0.25	0.44	396	5,638	4,743	99	5,539	0.13	2.79
44	690	11.00	2.0	0.280	0.263	0.028	0.25	0.44	398	5,637	4,881	102	5,535	0.13	2.86
45	675	11.25	1.8	0.268	0.259	0.027	0.24	0.42	378	5,213	5,009	104	5,109	0.14	2.83
46	690	11.50	1.8	0.266	0.255	0.027	0.24	0.42	376	5,129	5,129	107	5,022	0.15	2.99
47	705	11.75	1.7	0.238	0.231	0.024	0.21	0.38	338	4,718	5,316	108	4,610	0.15	3.03
48	720	12.00	1.8	0.252	0.236	0.025	0.23	0.40	358	4,968	5,314	111	4,857	0.18	3.07
49	735	12.25	2.15	0.350	0.272	0.035	0.08	0.14	123	6,980	5,314	111	6,869	0.18	3.07
50	750	12.50	2.8	0.394	0.269	0.038	0.10	0.17	151	7,020	5,334	111	6,909	0.19	3.08
51	765	12.75	2.8	0.392	0.264	0.039	0.13	0.22	202	7,111	5,368	112	6,999	0.19	3.08
52	780	13.00	2.8	0.406	0.260	0.041	0.15	0.28	250	7,228	5,414	113	7,115	0.18	3.11
53	795	13.25	3.4	0.476	0.256	0.048	0.22	0.39	347	7,463	5,504	115	7,349	0.17	3.15
54	810	13.50	3.4	0.476	0.252	0.048	0.22	0.39	353	7,702	5,595	117	7,585	0.17	3.18
55	825	13.75	2.3	0.322	0.249	0.032	0.07	0.13	116	7,707	5,595	117	7,595	0.17	3.18
56	840	14.00	2.3	0.322	0.245	0.032	0.09	0.14	122	7,707	5,595	117	7,595	0.17	3.18
57	855	14.25	2.7	0.376	0.241	0.038	0.14	0.24	218	7,608	5,635	117	7,699	0.18	3.20
58	870	14.50	2.8	0.384	0.237	0.038	0.13	0.22	200	7,688	5,687	119	7,774	0.19	3.22
59	885	14.75	2.8	0.364	0.234	0.035	0.13	0.23	206	7,978	5,700	119	7,868	0.19	3.23
60	900	15.00	2.5	0.350	0.230	0.035	0.12	0.21	189	8,047	5,727	119	7,928	0.18	3.24
61	915	15.25	2.4	0.338	0.227	0.034	0.11	0.19	173	8,100	5,748	120	7,971	0.19	3.25
62	930	15.50	2.3	0.322	0.223	0.032	0.10	0.17	156	8,137	5,762	120	8,017	0.18	3.28
63	945	15.75	1.9	0.285	0.220	0.027	0.05	0.08	73	8,080	5,744	120	7,970	0.19	3.25
64	960	16.00	1.9	0.268	0.216	0.027	0.05	0.09	78	8,048	5,728	119	7,929	0.18	3.24
65	975	16.25	0.4	0.058	0.213	0.008	0.05	0.09	80	8,008	6,713	119	7,929	0.18	3.24
66	990	16.50	0.4	0.058	0.210	0.008	0.05	0.09	80	7,968	6,688	119	7,850	0.18	3.23
67	1005	16.75	0.3	0.042	0.207	0.004	0.04	0.07	60	7,810	6,675	118	7,752	0.18	3.22
68	1020	17.00	0.3	0.042	0.204	0.004	0.04	0.07	60	7,652	6,652	118	7,554	0.18	3.21
69	1035	17.25	0.5	0.070	0.200	0.007	0.06	0.11	89	7,615	6,632	117	7,558	0.18	3.21
70	1050	17.50	0.5	0.070	0.197	0.007	0.06	0.11	89	7,457	6,612	117	7,457	0.18	3.20
71	1065	17.75	0.5	0.070	0.195	0.007	0.06	0.11	89	7,299	6,592	117	7,299	0.18	3.20
72	1080	18.00	0.4	0.058	0.192	0.006	0.05	0.09	80	7,141	6,572	117	7,141	0.18	3.20
73	1095	18.25	0.4	0.058	0.189	0.006	0.05	0.09	80	6,983	6,552	117	6,983	0.17	3.19
74	1110	18.50	0.4	0.058	0.186	0.006	0.05	0.09	80	6,825	6,532	116	6,825	0.17	3.18
75	1125	18.75	0.3	0.042	0.183	0.004	0.04	0.07	60	6,667	6,512	116	6,667	0.17	3.18
76	1140	19.00	0.2	0.028	0.181	0.003	0.03	0.04	40	6,509	6,492	115	6,509	0.17	3.18
77	1155	19.25	0.3	0.042	0.178	0.004	0.04	0.07	60	6,351	6,472	115	6,351	0.17	3.18
78	1170	19.50	0.4	0.058	0.176	0.006	0.05	0.09	80	6,193	6,452	115	6,193	0.17	3.18
79	1185	19.75	0.3	0.042	0.173	0.004	0.04	0.07	60	6,035	6,432	115	6,035	0.17	3.18
80	1200	20.00	0.2	0.028	0.171	0.003	0.03	0.04	40	5,877	6,412	114	5,877	0.17	3.18
81	1215	20.25	0.3	0.042	0.168	0.004	0.04	0.07	60	5,719	6,392	114	5,719	0.17	3.18
82	1230	20.50	0.3	0.042	0.167	0.004	0.04	0.07	60	5,561	6,372	113	5,561	0.16	3.17
83	1245	20.75	0.3	0.042	0.164	0.004	0.04	0.07	60	5,403	6,352	113	5,403	0.16	3.17
84	1260	21.00	0.2	0.028	0.162	0.003	0.03	0.04	40	5,245	6,332	112	5,245	0.16	3.16

**RCFC & WCD
HYDROLOGY
MANUAL**

**SYNTHETIC UNIT HYDROGRAPH METHOD
SHORTCUT METHOD
24-HOUR STORM**

PROJECT: Blythe LCMG
Job No.:
BY: N.O. DATE 7/18/12

Unit Time Period	Time Minutes	Hours	Peak Percent (Plate E-5.9)	Storm Rain in/hr	Loss Rate in/hr		Effective Rain in/hr	Flood Hydrograph Flow cfs	Volume in cu-ft	Basin Volume cu-ft	Percolation Area sq-ft	Percolation Out cu-ft	Total In Basin		Basin WSEL ft
					Max	Low							cu-ft	ac-ft	
85	1275	21.25	0.3	0.042	0.161	0.004	0.04	0.07	60	7,047	6,344	111	6,935	0.16	3.08
88	1290	21.50	0.2	0.028	0.158	0.003	0.03	0.04	40	6,975	5,318	111	6,984	0.16	3.07
87	1305	21.75	0.3	0.042	0.157	0.004	0.04	0.07	60	6,924	5,297	110	6,914	0.16	3.08
88	1320	22.00	0.2	0.028	0.155	0.003	0.03	0.04	40	6,853	5,270	110	6,744	0.15	3.05
89	1335	22.25	0.3	0.042	0.154	0.004	0.04	0.07	60	6,803	5,251	109	6,894	0.15	3.05
90	1350	22.50	0.2	0.028	0.152	0.003	0.03	0.04	40	6,734	5,224	109	6,825	0.16	3.03
81	1365	22.75	0.2	0.028	0.151	0.003	0.03	0.04	40	6,665	5,197	108	6,558	0.16	3.02
82	1380	23.00	0.2	0.028	0.150	0.003	0.03	0.04	40	6,596	5,171	108	6,468	0.16	3.01
83	1385	23.25	0.2	0.028	0.148	0.003	0.03	0.04	40	6,526	5,145	107	6,421	0.16	3.00
84	1410	23.50	0.2	0.028	0.148	0.003	0.03	0.04	40	6,481	5,119	107	6,354	0.15	2.99
85	1425	23.75	0.2	0.028	0.147	0.003	0.03	0.04	40	6,394	5,092	106	6,286	0.14	2.97
86	1440	24.00	0.2	0.028	0.147	0.003	0.03	0.04	40	6,328	5,062	106	6,222	0.14	2.95

VARIABLE LOSS RATE (AVG) IN/HR 0.15
 Fm = Minimum value on loss curve (in/hr) 0.00271
 C 10.00%

Basin Percolation Rate 1.0 in/hr
 Maswell Drywells
 Number 0
 Drywell Percolation Rate 0.15 cfs

EFFECTIVE RAIN & FLOOD VOLUMES SUMMARY

EFFECTIVE RAIN	2.32 in
FLOOD VOLUME	0.34 ac-ft
REQUIRED STORAGE	14,854 cu-ft
MAX WSEL	3.98 ft
PEAK FLOW RATE	0.48 cfs
AVERAGE PERCOLATION RATE	5.96 cuf/ft/min

BASIN VOLUME WORKSHEET

PROJECT

Blythe LCNG

JOB No.

BASIN DESIGNATION:

BASIN CHARACTERISTICS

CONTOUR ELEVATION	DEPTH		AREA		VOLUME		
	INCR (ft)	TOTAL (ft)	INCR (sf)	TOTAL (sf)	INCR (cuft)	TOTAL (cuft)	TOTAL (acre-ft)
1	0	0		1,500	0	0	0.00
2	1	1	1,700	3,200	2,297	2,297	0.05
3	1	2	1,900	5,100	4,113	6,410	0.15
4	1	3	2,400	7,500	6,262	12,672	0.29

WHERE:
$$V = \frac{1}{3}(E_1 - E_2)(A_1 + A_2 + \sqrt{A_1 A_2})$$

**Excerpt from
Blackhawk Logistics, Inc.
Application to the Energy Commission
Under PON-11-602**

Executive Summary and Project Narrative

ATTACHMENT A

Grant Proposal Cover Page

Solicitation Number Listed on the Solicitation Notice: PON-11-602
Applicant's Legal Name: Blackhawk Logistics LLC (a jointly held company of HayDay Farms and Border Valley Trading)
Project Title (not to exceed 10 words): Blythe LNG Public Access Infrastructure Project
Project Description (brief paragraph): Blackhawk Logistics LLC (Blackhawk) requests grant funding support from the California Energy Commission in the amount of \$600,000 to develop a publicly accessible liquefied natural gas (LNG) station to fuel HayDay Farm's existing fleet of 20 extremely high mileage LNG-powered goods movement vehicles, in addition to other retail fleet users. This project will make natural gas fuel accessible to confirmed goods movement trucks operating in the Blythe region and along one of the busiest stretches of highway in the nation: the I-10 connection between California and Arizona. This project will therefore assist the Energy Commission in displacing petroleum use and greenhouse gas emissions from HayDay Farm's existing LNG fleet and from the numerous heavy-duty diesel trucks traveling between the nearly 400 mile stretch from Los Angeles to Phoenix.
Amount of Grant Funding Requested: \$600,000
Project Location: 450 S. Willow Street, Blythe, CA
Will the project be located at an existing facility (e.g., existing parking lot or existing retail gas station)? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
Based on the expected CEQA approval date, what round of funding does the proposed project qualify for (See section 11 in the Application Manual for more detail)? <input checked="" type="checkbox"/> Round 1 (Requires CEQA documentation to be submitted to the Energy Commission for review by April 16, 2012) <input type="checkbox"/> Round 2 (Projects expecting to submit CEQA documentation to the Energy Commission for review after April 16, 2012)
Amount of Match Funding: \$1,125,000 Source of Match Funding (cash and/or in-kind): Corporate Capital and Mojave Desert AQMD Grant Funding
Proposed Agreement Duration (must not exceed 33 months): July 2012-December 2013

Principal Investigator/Project Manager (serves as single point of contact for all communications):

Name: Greg Braun
Organization's Legal Name: Blackhawk Logistics LLC
Position/Title: President
Address: 15500 South Commercial, Blythe, CA 92225
Phone: (760) 344-6700
Fax: (760) 344-4305
Email: Greg@bordervalley.com

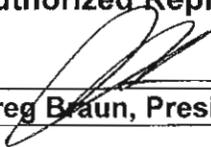
Principal Investigator/Project Manager Certification: To the best of my knowledge, I certify that the information contained in this grant application package is true, and discloses all requested information. This package does not contain any confidential information. (This signature is only necessary if the Principle Investigator/Project Manager is not the Authorized Representative.)

Principal Investigator/Project Manager Signature:


_____ Date: 3/19

Authorized Representative Certification: To the best of my knowledge, I certify that the information contained in this grant application package is true, and discloses all requested information. I have read and agree to be bound by the ARFVT Program Grant Terms and Conditions for any agreement resulting from this solicitation. This package does not contain any confidential information.

Authorized Representative Signature:


_____ Date: 3/19

Greg Braun, President

**California Energy Commission
Alternative and Renewable Fuel and
Vehicle Technology Program**

Response to Program Opportunity Notice:
PON-11-602

***Alternative Fuels Infrastructure: Electric, Natural Gas,
Propane, E85 & Diesel Substitutes***

**BLYTHE LNG PUBLIC ACCESS
INFRASTRUCTURE PROJECT**

Submitted by:

Blackhawk Logistics LLC,
A jointly held company of HayDay Farms and Border Valley Trading
15500 South Commercial
Blythe, CA 92225
www.haydayfarms.com and www.bordervalley.com



March 2012

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B. PROJECT NARRATIVE

Executive Summary

Blackhawk Logistics LLC (Blackhawk), a jointly held company of HayDay Farms (HDF) and Border Valley Trading (BVT), requests grant funding support from the California Energy Commission (CEC) in the amount of \$600,000 to develop a publicly accessible liquefied natural gas (LNG) station in Blythe, California to fuel HDF's expanding fleet of natural gas powered goods movement vehicles. In conjunction with this Energy Commission supported LNG station project, HDF and BVT plan to include LCNG fueling capacity at this facility. This initial LNG station project will therefore provide alternative fueling options for LNG and CNG vehicle users with routes along I-10 and that operate in the Imperial Valley. The primary objective of this project is to establish the LNG fueling infrastructure to support our fleet and others operating along one of the busiest stretches of highway in the nation. This project will make natural gas fuel accessible to the HDF fleet and the and the general retail market, predominantly goods movement trucks operating along the I-10 between Arizona and California, including Swift, Western Milling, Apex Bulk Commodities, and other retail users. This project also will help regional goods movement and public agency fleets transition to clean natural gas, including, Mallet & Sons, CV Ice, the Palo Verde Irrigation District, and the City of Blythe. These companies are specifically examining natural gas fuel and are interested in using the Blythe station as they adopt LNG and CNG. This project will therefore assist the Energy Commission in displacing petroleum use and greenhouse gas emissions from the existing HDF LNG fleet, as well as numerous heavy-duty diesel trucks domiciled locally or traveling on I-10 between Los Angeles and Phoenix.

HDF and its partner BVT are existing natural gas fleet users with an extremely high fuel demand from 40 LNG trucks (20 trucks per fleet). Both fleets transitioned to LNG in 2008 in response to the San Pedro Bay Ports Clean Air Action Plan and used the Sunline LNG station for refueling, until it went offline in late 2008. HDF and BVT remained committed to LNG fueling and have been working together to construct public-access stations for both their operations, plus other regional fleets. This partnership was formalized with the creation of Blackhawk Logistics LLC and led to an Energy Commission supported LNG/LCNG station in Palm Springs. Blackhawk is now seeking Energy Commission funding for this LNG station in Blythe to support HDF's LNG operations, although the fleet will continue to use the Palm Springs station for fueling redundancy and en-route fueling.

Once established, this station will close an existing "gap" in clean fuel infrastructure in this region. The closest public access fueling stations to Blythe are currently 100 miles away in El Centro, California, and 120 miles away in Palm Springs, California. Therefore, this public access station will fill an important gap in natural gas availability for natural gas vehicle users looking to travel lengthy distances along the I-10 and or through the Imperial Valley. In addition to HDF's own fleets of vehicles, several regional heavy-duty fleet operators are also expected to utilize this planned facility.

This station will serve an important economic function for a region that has been negatively impacted by the recession by providing a more economical fueling option for local fleets. This station will also reduce greenhouse gas and criteria pollutant emissions in an area that is heavily impacted by emissions, geography and weather patterns. Lastly, this station will support businesses located in hard-hit communities, helping them to save money, displace large quantities of petroleum, and use entirely low-carbon fueling operations. This station will also enable goods movement fleets to reliably reach the ports and create the last needed link into LNG fueling markets 150 miles away in Phoenix, AZ. This Blythe station will also connect with public retail stations in Palm Springs and in Ontario, CA, creating a true interstate regional clean fuel corridor that will enable Inland Empire and Arizona goods movement fleets to fuel with LNG and CNG across the states of California and Arizona.

HDF and BVT will jointly own the land, the team has already contracted with GreenFIX to oversee project implementation, and the team is in the process of vendor selection for the station development. Permitting, site design, and vendor research is all currently underway in preparation for potential Energy Commission funding. Led by a prepared and seasoned team with a seasoned understanding of the technology, HDF, BVT, and GreenFIX are fully prepared to immediately implement this important project. The full cost of this station project will be \$1,725,000, with HDF requesting \$600,000 in Energy Commission funding to support a project that will achieve the following goals:

- Support and bolster the regional refueling infrastructure strategy being developed in Southern California and Arizona through the development of a new publicly-accessible station along a key goods movement corridor;
- Promote regional growth in alternative fuel vehicle deployments and the replacement of heavy-duty diesel trucks;
- Provide natural gas refueling for HDF and other retail fleets;
- Displace 212,500 gallons of diesel from HDF in 2013.
- Displace 758,275 gallons of annual diesel use with LNG from conservative estimates of HDF and retail use in 2015;
- Reduce 638 metric tons of annual greenhouse gas (GHG) emissions in 2013;
- Reduce 2,486 metric tons of annual greenhouse gas (GHG) emissions in 2015;
- Displace 4,798 metric tons of GHG emissions from 2013-2015.
- Complete these goals at a cost-effectiveness as low as \$0.40 per gallon of diesel fuel displaced and \$125 per metric ton of GHGs reduced from 2013-2015.

Section 1 – Project Overview

HDF and BVT are seeking to construct this 24-hour public-access LNG/LCNG station in order to support HDF's LNG vehicle operations, as well as to offer a critical natural gas refueling station for other alternative fuel fleets along the I-10 corridor. Currently, there are no California-based LNG or CNG fueling facilities along the I-10 corridor between Phoenix and the City of Palm Springs, even though I-10 is the primary route between Phoenix and the Ports of Los Angeles and Long Beach. This lack of natural gas fueling infrastructure has prevented the conversion to natural gas from diesel for countless vehicles that use this route on a frequent, if not daily, basis. HDF will locate the station in the City of Blythe, where its fleet is domiciled, and which sits on the border of California and Arizona in a prime retail location just off I-10.

HDF has enough fueling volume to justify a full station and seeks to cooperatively develop this fueling solution to help facilitate other fleets in the region to also adopt natural gas vehicles in their own operation. HDF will own and operate the station, with operational support to be provided by the selected fueling vendor. The Blackhawk team has also identified enough CNG fueling interest to justify adding LCNG at this site, and is therefore designing the station to incorporate LCNG fueling capacity in addition to the LNG fueling project requested under this funding application. Because this LNG fueling station project and LNG storage will provide the base for CNG fueling derived from LNG, this Energy Commission-supported LNG station will therefore provide comprehensive natural gas refueling for light-duty, medium-duty and heavy-duty fleets.

No confidential information is included with this application. The proposed station will be built in California, and complies with Eligibility Criteria No. 2 for CNG/LNG – Vehicle fueling infrastructure for existing fleet

operations; the application is for new fueling infrastructure that supports an existing natural gas vehicle fleet used for other fleet operations.

Project Location

HDF and BVT seek to construct a public-access LNG station at 450 S. Willow Street in Blythe, CA, located approximately one-half mile off the Lovekin Blvd exit on the I-10 freeway, in a very convenient and visible location that will support a region-wide transition to low-emission natural gas powered trucks. The location is adjacent to the intersection of Lovekin and 14th Street, which is a main trucking offramp and an ideal location to promote an LNG station for vehicles traveling from Los Angeles and Phoenix on I-10.

The I-10 Corridor is one of the most prominent, most congested main transport routes on the West Coast. Interstate 10 stretches coast-to-coast spanning eight states and connects two of the nation's largest container and bulk ports from Long Beach to Houston. It is over 2,400 miles long and includes all of the U.S./Mexico border gateways. These international trade gateways moving through Texas are among the fastest growing transportation segments in the country. Currently, the average daily vehicle traffic throughout the entire corridor is over 41,000 with a maximum over 300,000. Average daily truck traffic is over 8,000 with a maximum over 55,000. In fact, truck travel along the I-10 corridor is expected to grow 250 percent by 2035, and the average daily traffic will be over 85,000 vehicles¹. These projected increases in sheer volume of vehicles on this corridor present a clear picture of the critical need for natural gas refueling infrastructure along this major transportation artery. Without supplying natural gas infrastructure along these routes, vehicle operators have little choice but to depend on petroleum-based fuel. This project will target this niche market in hopes of shifting some of this petroleum demand to clean alternative fuels such as LNG and CNG.

Most importantly, this station creates the last missing link from California's network of natural gas fueling infrastructure into natural gas fueling markets 150 miles away in Phoenix, AZ. This Blythe station will also connect with public retail stations in Palm Springs and in Ontario, CA, creating a true interstate regional clean fuel corridor that will enable the goods movement fleets to fuel with LNG and CNG from Arizona all the way to the San Pedro Bay Ports.

Station Overview

HDF already secured a \$310,451.06 grant from the Mojave Desert Air Quality Management District to support the development of this station. With approval of this Energy Commission grant application, the project team will have enough public funding and private capital to move forward with project implementation. HDF and BVT have already developed the station specifications and begun soliciting vendor bids. Upon award, the team will immediately select from among the competitive bids from the multiple parties qualified to build this fueling station (Chart, NorthStar, EFS West, General Physics, etc.). The goal for vendor selection and station installation is for there to be no pause or delay as the project makes its way through the funding process. Major station components will comply with Title 8, California Code of Regulations, NFPA and any other local, state and federal rules and codes as applicable.

The proposed LNG station will be constructed on vacant property that is zoned for commercial development. Blackhawk is in the process of purchasing this parcel from an HDF family trust and the final transfer of the property to Blackhawk will occur immediately upon Energy Commission contract award. There is no risk involved in this acquisition, and the team is therefore moving forward with station planning. HDF has already reached out to the City of Blythe regarding permitting and planning. The City of Blythe has

¹ U.S. Department of Transportation. "Corridor: Interstate 10 (I-10) Freight Corridor – California to Florida". 04 April 2011. <http://www.fhwa.dot.gov/pressroom/fsi10.htm>.

confirmed that the project is a use allowed by right in the General Commercial zone and as such no entitlements are necessary. Because the building permit is ministerial and no discretionary action is required, the facility is not subject to review under CEQA. City of Blythe staff will review the facility through the Project Review Committee during the week of April 9th to inform the applicant of applicable Municipal and Building Code requirements that should be considered during facility design.

Because of the large potential retail use of this facility, and the need to accommodate the unloading of full trailer quantities of LNG, the minimum LNG storage requirement for this project is 15,000-gallons. The containment structure will be designed to allow the addition of a second 15,000-gallon LNG storage tank at a later date. The initial design and construction of the fueling station will be capable of fueling 150 to 200 LNG trucks per day. The site will be available to the public on a 24-hour operation through a card-lock system and will have a fill rate of approximately 40 gallons per minute. Though not a part of the current scope of work for the Energy Commission project, the team's site plan and project specifications will provide for LCNG fueling at this location.

Other relevant technical details and specifications are provided further below. As the station equipment and component manufactures and models will be determined by the contractor ultimately selected for this project, the known specifications are provided below:

Station Equipment List

- One (1) 15,000 gallon vertical LNG storage vessel
- One (1) dual pump LNG skid
- One (1) offload manifold
- Two (2) Weights & Measures dispensers
- One (1) LNG saturation vaporizer
- One (1) card reader
- One (1) PLC panel
- Safety System
- Lighting
- Civil work to directly support station, including
 - Foundation and containment system
 - Stair access to containment
 - LNG fuel island and trenching

Project Approach and Implementation

The project team members' individual and collective experiences implementing similar LNG fueling infrastructure projects, concise and organized business practices and successful project management will ensure the successful completion of the planned effort in the most cost-effective and efficient manner. Despite a lack of supporting natural gas infrastructure, HDF and BVT have successfully transitioned 40 trucks in their fleets to LNG and have extensively researched viable site locations, projected costs, and throughput needs to build stations that support their operations. Both companies have been intimately involved with station developments at the Border Valley Palm Springs LNG/LCNG Station, which is supported by an Energy Commission grant, and with temporary LNG refueling via an ORCA unit. The addition of GreenFIX, a leader in natural gas project development in the Inland Empire, rounds out the well experienced team. Vendor selection is underway, and a reputable vendor with experience in LNG station construction will be chosen.

The Blythe LNG Public Access Infrastructure Project is backed by a detailed schedule of tasks, milestones, decision points, and quality control initiatives. The team will implement a very concise and efficient scope of

work, beginning with a planning and permitting upon Notice of Proposed Award (NOPA), and resulting in commissioning 11 months later, and ending with six months of data collection and a final report. The entire timeframe, from NOPA through final reporting, will take 18 months.

The project team has scheduled appropriately, allowing for a detailed and extensive permitting process before construction commences. Thorough training will be provided to all personnel involved in the project to ensure that codes, safety requirements, and all operating procedures are followed to ensure a safe and well-managed construction site. Eventually, training will be expanded to include the safe handling of LNG vehicle fuel. The team will work to actively promote the project efforts among key stakeholders throughout the project period and will ensure that all project administration and reporting is completed as required.

In the project solicitation, the CEC indicates that awards for projects that have submitted CEQA documentation by April 16 will announced in April 2012. Based on this information, and assuming that the April 9 meeting with the City of Blythe has a favorable outcome, HDF has prepared a schedule of tasks with a project kickoff date of August 2012. The project team is has already started work on preliminary permitting tasks and station specifications and will begin action on these tasks in earnest as soon as Blackhawk receives a NOPA. Upon award approval, the team will contract with the Energy Commission. HDF and BVT are fully prepared to move forward with the task orders upon final execution of the grant agreement. Immediately following the kickoff meeting, the team will order its long lead-time equipment for arrival in approximately 7 months.

The project team has broken down the project implementation tasks into Administrative and Technical categories as required in the Scope of Work. A graphic representation of these milestones, including the expected start and end dates is shown in the chart below, dependent on the notice of proposed award and contract execution.

Task	Project Milestone	Start Date	End Date
2.1	Engineering and Preconstruction	May 2012	Nov 2012
2.2	Permitting	May 2012	Nov 2012
1	Project Kickoff	Aug 2012	Aug 2012
4.1	Order LNG Equipment	Aug 2012	Aug 2012
3	Site Work and Civil Improvement	Nov 2012	Feb 2013
4.2	LNG Equipment Installation	Feb 2013	Mar 2013
5	Station Startup and Commissioning	Mar 2013	Apr 2013
6	Data Collection	May 2013	Nov 2013

Section 2, Complements Existing Air Quality Guidelines

The Blythe LNG Public Access Infrastructure Project is being developed specifically in response to federal, state and local agency demands for improved air quality and a reduction in the transportation industry's dependence on imports of carbon intensive conventional fuels. The clean-burning natural gas fuel dispensed at this station will be used in heavy-duty trucks that would otherwise be using diesel fuel. Transitioning from diesel to natural gas for transportation fuel is precisely the low emission strategy that has been approved by the CEC as a technologically simple approach for near-term cost-effective benefits. Additional infrastructure to support the widespread adoption and implementation of alternative fuel technology into fleet operations is a fundamental component in achieving the CEC's AB118 goals.

Heavy-duty diesel engines have long been viewed as a significant contributor to ground level ozone and fine particulate emissions and therefore the California Air Resources Board (ARB) and United States

Environmental Protection Agency (EPA) have adopted increasingly stringent emission standards for NO_x, NMHC and PM for this source. More recently, the EPA has also developed greenhouse gas emission requirements for heavy-duty engines and vehicles which will reduce fuel consumption and GHG emissions by an estimated nine to 23 percent, with phase-in starting 2017. Hayday Farm's development of a reliable, publicly accessible source of transportation grade LNG will allow for expanded deployment of natural gas engines that are certified to the strict standard of 0.2 g/bhp-hr NO_x without the use of average, banking and trading (ABT) credits. Furthermore, in that diesel exhaust is classified as a toxic air contaminant (TAC), expanding LNG sources will also reduce emissions of TACs through the displacement of diesel as a fuel source.

The use of LNG dispensed from the Blythe LNG Public Access Infrastructure Project complements California Phase 3 Reformulated Gasoline standard and diesel fuel regulations by achieving greater emission benefits than the goals of the standards. Furthermore, the dedicated use of alternative fuels enhances the diversification of transportation fuel sources, and the economic superiority of LNG for end users will provide a strong incentive for gasoline and diesel suppliers to seek solutions that further reduce the carbon impact of conventional fuels. Having a reliable, operationally feasible low-cost natural gas fuel at convenient locations provides economic incentives and fuel source security which can encourage fleets to make new purchases of natural gas powered trucks.

Section 3, Complies with AB 118 Regulations

The authors of AB118 were particularly concerned in verifying that the public funding provided through the Alternative and Renewable Fuel and Vehicle Technology Program would not be used to fund projects that were already required for regulations such as the broad ranging Airborne Toxic Control Measures (ATCMs) being adopted under ARB's Diesel Risk Reduction Plan (DRRP) and AB32. The bulk of the regulations that would be supported by the Blythe LNG Public Access Infrastructure Project are specific to reducing emissions from the truck engine or fleet, not the specific fuel source, and therefore do not proscribe funding. The ARB and EPA regulations for new engines and DRRP ATCMs do not require HDF and BVT to operate an LNG fueling source and therefore the project only interacts in a supporting role as detailed above.

The second related early action measure is the LCFS, which requires a 10% reduction in the carbon intensity of fuels used in the state by 2020. The LCFS will be implemented through policies designed to promote the use of alternative fuels and fuel blends while decreasing petroleum use for transportation fuels. The LCFS requirements are currently aimed at refiners and fuel providers. The LNG dispensed at the Hayday Farms Blythe LNG Infrastructure facility has an extremely low carbon intensity which far exceeds the 10% requirement of 2020. The fact that the proposed project goes beyond what is anticipated to be required under the final adopted LCFS results in the project benefits being surplus and therefore fundable under AB 118. Indeed, this station is exactly the sort of infrastructure that the CARB and CEC should consider due to its ability to not only serve existing demand for LNG, but open up the option of alternative fuel vehicles to a whole region and along an important goods movement corridor.

Section 4, Data Collection and Reporting

The LNG fuel station will be equipped with advanced data monitoring, tracking and recording hardware and software. These systems are built into the LNG fuel station control system and are standard issue for all new LNG stations. The station design for this project includes such control systems.

Reports provided by the team in executing the Blythe LNG Public Access Infrastructure Project will produce invaluable information that will serve to advance infrastructure operations and technology beyond the scope

of this project. This data will be compiled and analyzed along with the project's quarterly reports to be implemented in the Final Report to the Energy Commission. Information drawn from the six-month period will be used to optimize station throughput and efficiency.

During the project development phase, monthly reports will include, at a minimum: data collected on the executed station development progress and budget expenditure, the amount of an assessment of the ability to complete the agreement within the current budget, any cost overruns, any troubleshooting issues and the solution implemented, any energy efficiency measures that may exceed Title 24 standards in Part 6 of the CCR, any agreement activities, and other relevant information. Once the station is operational, the team will collect and report on 6 months of throughput, usage, and operations data from the project including: the fueling source of LNG, the maximum capacity of the station, the daily vehicles served, refueling quantities dispensed at the station, the diesel gallons displaced by the LNG (and associated mileage estimations), and the emission and carbon reductions due to the diesel displacement. These calculations will include any LCNG fueling due to LNG, since this CNG use will be directly dependent on the LNG fuel storage capacity installed under this Energy Commission project. The team will also compare any project performance and expectations provided in the proposal to Energy Commission with actual project performance and accomplishments and will report on future expansion plans and their potential impact on state revenues and petroleum replacement goals.

Section 5, Scoring Criteria

Fuel Throughput/Vehicles and Fleets Affected

The niche markets targeted for this project are the heavy-duty freight movement trucks traveling along the I-10 Corridor, particularly between Phoenix and Southern California. This project is also targeting local goods movement and other regional fleet users, such as municipalities, county fleets, water districts, and other public agencies. As described in Section 1, the I-10 Corridor is one of the most prominent, most congested main transport routes on the West Coast and this station will close the gap between natural gas refueling infrastructure in Southern California's Palm Springs (120 miles from Blythe) and Phoenix (150 miles from Blythe), creating a true multi-state I-10 natural gas corridor. Currently, the average daily traffic throughout the entire nationwide I-10 corridor is over 41,000 with a maximum over 300,000. Average daily truck traffic is over 8,000 with a maximum over 55,000. Truck travel along the I-10 corridor is expected to grow 118% by 2025 and the average daily traffic will be over 85,000 vehicles.² Currently, all these vehicle operators have to depend on petroleum-based fuel. This project will target this market in hopes to help shift some of this petroleum demand to clean alternative fuels such as LNG and LNG-derived LCNG.

HDF and BVT have secured preliminary commitments from seven (7) fleets and one Arizona dealership to utilize the natural gas station in Blythe, including Swift Transportation, Western Milling, Apex Bulk Commodities, Mallet & Sons, CV Ice, the Palo Verde Irrigation District, the City of Blythe, and Freightliner of Arizona. Only two of these fleets currently operate natural gas: the City of Blythe and CV Ice. All of the other fleets are undergoing serious examinations of NGV operations, with the major hurdle being infrastructure. Although it is difficult for diesel-powered fleets to explicitly commit to a natural gas transition prior to the existence of reliable infrastructure, each of these companies is in serious discussions with either HDF or BVT to utilize natural gas fueling at the proposed Blythe station and provided a letter of support and estimate of first-year turnover plans for NGVs and associated diesel displacement. Below are the first-year

² U.S. Department of Transportation. "Corridor: Interstate 10 (I-10) Freight Corridor – California to Florida". 04 April 2011. <http://www.fhwa.dot.gov/pressroom/fsi10.htm>.

projected diesel displacement figures estimated from these seven fleets, as documented in Appendix 6: Letters of Commitment:

Fleet	NG Fuel	Annual Diesel Gallon Displacement (LNG transition fleets)	Annual Diesel Gallon Displacement (LCNG transition fleets)
Apex Bulk Commodities	LNG	260,000	
City of Blythe	LCNG		21,500
CV Ice	LCNG		8,000
Mallett & Sons	LNG	260,000	
Palo Verde Irrigation District	LCNG		55,000
Swift	LCNG		2,800,000 (200 trucks)
Western Milling	LCNG		672,000
		520,000 gallons/year	3,556,500 gallons/year

Several of these fleets have significant operations, namely Swift (200-400 trucks proposed for CNG in the first year), Apex (200 total trucks, 20 proposed for LNG in the first year), and Western Milling (48 total trucks, proposed initial displacement of 672,000 diesel gallons each year). Specifically, Swift Transportation, Western Milling and Freightliner of Arizona have identified the natural gas fueling gap along the Arizona-Southern California route as their and their customers' primary barrier to natural gas vehicle adoption. With Freightliner of Arizona looking to develop more Arizona fueling, this Blythe station could support tremendous levels of LNG-sourced fueling by 2015. The referenced transportation studies in this proposal further reinforce the market growth potential of this fueling station.

For the purposes of fuel use calculations, Blackhawk took a conservative approach to projecting future LNG fuel use from I-10 retail sales from these outside user fleets. Although each of the fleets gave natural gas turnover projections anywhere from 10% - 25% of their existing diesel fleet, the project team has estimated that these fleets would only eliminate 5% of their *projected* diesel fuel use by 2014 and another 5% of their by 2015 with a transition to natural gas. Should one single fleet fully commit to their projected turnover, these numbers could be greatly exceeded:

	LCNG fleets	LNG fleets
Fleets' Projected Diesel displacement	520,000 diesel gallons	3,556,500 diesel gallons
5% of projected diesel (2014)	26,000 diesel gallons	177,825 diesel gallons
10% of projected diesel (2015)	52,000 diesel gallons	355,650 diesel gallons

The station's initial base of fleet users will be HDF's existing LNG fleet of 20 high-mileage trucks. These trucks travel between Blythe and the Ports of Long Beach and Los Angeles each day, with an extremely high annual mileage of 112,500 per truck. This translates into per-truck diesel use of 18,750. Instead, their ISX-powered LNG trucks use 27,187 LNG DGE each year and 2,813 gallons of diesel each year, displacing 15,938 gallons of diesel each year. Once the station is operational, HDF will finally feel confident in expanding its existing fleet of LNG trucks, aiming to replace 10 trucks in the first five years of station operation. Assuming the station will be operational in mid-to-late 2013, HDF will add two trucks a year from 2015 through 2019.

Accordingly, considering the projected natural gas retail traffic and HDF's existing and projected trucks, the following is a conservative projection of the LNG-derived fuel use due to the Blythe LNG Public Access Infrastructure Project:

Blythe Station LNG DGE Use				
Year	2012	2013	2014	2015
HDF LNG	-	362,487	543,730	598,104
Retail Users LNG	-	-	44,351	88,702
Retail Users LCNG	-	-	210,532	421,064
TOTAL	-	362,487	798,615	1,107,871

Project Budget and Cost-Effectiveness

The total budget for this project is \$1,725,000 and is sufficient to cover the expenses incurred for land acquisition, station equipment, installation, site work, and associated labor for the LNG project development and site plans that incorporate LCNG. Although Blackhawk team has not yet selected a vendor for the Blythe LNG Public Access Infrastructure Project, it has solicited bids for the similar Palm Springs station project in both LNG and LNG/LCNG configurations, and has been working with industry consultants to identify reasonable and realistic pricing, based on current equipment costs from qualified manufacturers. The team is requesting \$600,000 from the Energy Commission, or a 35% investment in the project budget, while HDF, BVT, and other match fund partners will provide the remaining 65% of total project funding.

In addition to the funding being requested from the CEC, a \$310,451 grant has been won through the Mojave Desert Air Quality Management District (MDAQMD), with the contract signed in October 2011. The contract and a letter noting the modification from an LNG/LCNG project to an LNG project have been included in Appendix 8. With these combined grant awards from the MDAQMD and the Energy Commission, The team can now justify investing the significant capital required to successfully develop this critical public access LNG refueling station. Without public subsidies, the cost for this project would be too high to justify the risk to a company such as HDF or BVT. Therefore, public funding assistance is required to get critical stations like this developed and operational in order that other fleets can then transition to natural gas trucks, which will reduce their operational costs, displace the use of petroleum fuels, improve the environment, and stimulate domestic jobs and energy production.

Funding from the CEC is only being sought for the acquisition of fuel station hardware. The station will incorporate an Industry Standard, universal card reader system to provide access and billing services only to trained users. It is expected that the station will be operational by April 2013. It is believed that by allocating the budget request to these equipment items, it will facilitate the grant payment process and contract administration overall.

This project is extremely cost effective, supplying the Energy Commission and California with significant petroleum reduction, greenhouse gas, and criteria pollutant benefits for its \$600,000 investment.

Cost-Effectiveness of Energy Commission Funding	
	2015 Build-Out (HDF and Retail Users)
Cost-Effectiveness of Petroleum Reductions	
Annual Diesel Displacement in 2013 - partial year (gallons)	212,500
Annual Diesel Displacement in 2015 (gallons)	758,275
Diesel Displacement (2013 and 2013-2015)	1,493,350
Energy Commission Funding Requested	\$600,000

<i>Cost Effectiveness of Petroleum Reductions (Energy Commission Funding/Petroleum Reduction)</i>	\$0.4018
Cost-Effectiveness of GHG Reductions	
Annual GHG Reductions in 2013 - partial year (Metric Tons of CO2e)	638
Annual GHG Reductions in 2015 (Metric Tons of CO2e)	2,486
GHG Reductions (2013-2015) in Metric Tons of CO2e	4,798
Energy Commission Funding Requested	\$600,000
<i>Cost Effectiveness of GHG (Energy Commission Funding/GHG Reduction)</i>	\$125.04

In the first months of operation, through the end of 2013, this station project will dispense 212,500 gallons of LNG for the 20 class-8 HDF tractor fleet, effectively eliminating 362,487 gallons of diesel. Throughputs in 2014 will include the addition of 5% of the fleets' projected fuel use, for a total of 522,575 diesel gallons displaced. In 2015, HDF will add two trucks and, in combination with the retail fleet user projected diesel displacement, the station will support the elimination of 758,275 diesel gallons.

Blythe Station Diesel Gallon Displacement				
Year	2012	2013	2014	2015
HayDay Farms	-	212,500	318,750	350,625
Retail Users		0	203,825	407,650
TOTAL		212,500	522,575	758,275

Over the two year and 8 month period from commissioning through the end of 2015, this project will displace over 1.49 million gallons of diesel fuel and reduce GHG emissions by 4,798 metric tons. In addition, and solely based upon the LNG tractors in HayDay Farm's existing fleet, this project will support NOx emission reductions of by 39.88 tons. This project will achieve cost-effective petroleum and emission reductions at an Energy Commission cost of \$0.40 per diesel gallon displaced and \$125 per metric ton of CO2e reduced.

Station projects such as this one are critical to supporting the displacement of diesel and achieving reductions of GHGs and NOx. Unfortunately, LNG stations cost nearly 2 million dollars apiece, putting them out of economic reach of many fleets that are interested in natural gas operations. Accordingly, an Energy Commission investment in the Blythe LNG Public Access Station Project will provide important petroleum, greenhouse gas, and public health benefits for the station of California.

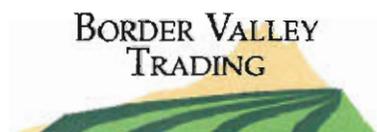
California Energy Commission's Alternative and
Renewable Fuel and Vehicle Technology Program

Response to PON-11-602

Appendix 1:
Scope of Work
(Attachment D)

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**



**Attachment D
Scope of Work Template**

TECHNICAL TASK LIST

Task #	CPR	Task Name
1		Kick Off Meeting and Project Administration
2		Engineering and Preconstruction
3		Site Work and Civil Improvement
4	X	Order and Install LNG Equipment
5		Station Startup and Commissioning
6		Data Collection and Analysis

KEY NAME LIST

Task #	Key Personnel	Key Subcontractor(s)	Key Partner(s)
1	Ulrich J. Sauerbrey, GreenFIX	TBD	
2	Ulrich J. Sauerbrey, GreenFIX	TBD	
3	Ulrich J. Sauerbrey, GreenFIX	TBD	
4	Ulrich J. Sauerbrey, GreenFIX	TBD	
5	Ulrich J. Sauerbrey, GreenFIX	TBD	
6	Ulrich J. Sauerbrey, GreenFIX	TBD	

GLOSSARY

Specific terms and acronyms used throughout this scope of work are defined as follows:

Term/ Acronym	Definition
AB118	Assembly Bill 118, Alternative & Renewable Fuel and Vehicle Technology Program
AB32	Assembly Bill 32, The Global Warming Solutions Act of 2006
ABT	Average Banking and Trading Credits
ARB	California Air Resources Board
ATCM	Airborne Toxic Control Measures
BCF	Billion Cubic Feet
BVT	Border Valley Trading
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPR	Critical Project Review

CSF	Critical Success Factors
DRRP	Diesel Risk Reduction Plan
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
FTD	Fuels and Transportation Division
g/bhp-hr	Grams per Brake Horsepower/Hour
GHG	Greenhouse Gases
GPD	Gallons Per Day
HDF	HayDay Farms
ILEV	Inherently Low Emission Vehicles
LCFS	Low Carbon Fuel Standard
LFG	Landfill Gas
LFGTE	Landfill Gas to Energy
LNG/LCNG/LCNG	Liquefied Natural Gas
MRC	Mixed Refrigerant Cycles
MSW	Municipal Solid Waste
NEPA	National Environmental Policy Act
NGV	Natural Gas Vehicle
NMHC	Non-Methane Hydrocarbons
NMOC	Non-Methane Organic Compound
NOx	Nitrogen Oxide
PDI	Process Design Instrument
PERI	Political Economy Research Institute
PM	Particulate Matter
psig	Pounds per Square Inch Gauge
PFD	Process Flow Diagram
PSA	Pressure Swing Adsorption
SCAQMD	South Coast Air Quality Management District
SCFM	Standard Cubic Feet per Minute
TAC	Toxic Air Contaminant
TSA	Temperature Swing Adsorption

Background:

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007), created the Alternative and Renewable Fuel and Vehicle Technology Program (ARFVT Program). The statute, subsequently amended by AB 109 (Núñez) Chapter 313, Statutes of 2008), authorizes the Energy Commission to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. The Energy Commission has an annual program budget of approximately \$100 million and provides financial support for projects that:

- Develop and improve alternative and renewable low-carbon fuels;

- Optimize alternative and renewable fuels for existing and developing engine technologies;
- Produce alternative and renewable low-carbon fuels in California;
- Decrease, on a full fuel cycle basis, the overall impact and carbon footprint of alternative and renewable fuels and increase sustainability;
- Expand fuel infrastructure, fueling stations, and equipment;
- Improve light-, medium-, and heavy-duty vehicle technologies;
- Retrofit medium- and heavy-duty on-road and non-road vehicle fleets;
- Expand infrastructure connected with existing fleets, public transit, and transportation corridors; and
- Establish workforce training programs, conduct public education and promotion, and create technology centers.

The California Energy Commission issued solicitation PON-11-602 to provide funding opportunities under the ARFVT Program for projects which develop infrastructure necessary to store, distribute, and dispense electricity, E-85, propane, diesel substitutes, and natural gas. To be eligible for funding under PON-11-602, the projects must also be consistent with the Energy Commission's ARFVT Investment Plan updated annually. In response to PON-11-602, the Recipient submitted application *<the Energy Commission will fill in the Application number>*, which was proposed for funding in the Energy Commission's Notice of Proposed Awards *<the Energy Commission will add the date of the proposed award>*, and is incorporated by reference to this Agreement in its entirety.

Problem Statement:

The Blythe Public Access LNG Infrastructure Project will provide solutions to overcome key barriers that have hindered the development and widespread use of natural gas as a transportation fuel. The primary barrier to natural gas vehicle deployment is the lack of supporting infrastructure. This LNG station project (that will also provide LCNG outside the scope of the Energy Commission grant) will therefore provide alternative fueling options for natural gas vehicle users with routes along I-10 and that operate in the Imperial Valley. The primary objective of this project is to establish the LNG fueling infrastructure to support Blackhawk's fleet and others operating along one of the busiest stretches of highway in the nation. This project will make natural gas fuel accessible to the BVT and HDF fleet and the and the general retail market, predominantly goods movement trucks operating in the along I-10 between Arizona and California, including Swift, Western Milling, Apex Bulk Commodities, and other retail users. This project also will help regional goods movement and public agency fleets transition to clean natural gas, including, Mallet & Sons, CV Ice, the Palo Verde Irrigation District, and the City of Blythe. These companies are specifically examining natural gas fuel and interested in using the Blythe station as they adopt LNG and CNG. This project will therefore assist the Energy Commission in displacing petroleum use and greenhouse gas emissions from the existing BVT and HDF LNG fleet as well as numerous heavy-duty diesel trucks domiciled locally or traveling on I-10 between the nearly 400 mile stretch from Los Angeles to Phoenix. Overall, this single station project will have a significant impact on assisting with the region's transition to an alternative fuel marketplace.

These barriers have not been previously addressed given the significant financial investment and operational commitment required to engineer, construct, and operate a natural gas fueling station. There is a lack of knowledge of best practices for constructing a new natural gas fueling station especially for an operator who hasn't used natural gas operations in the past and whose core business is not fueling station development or operation. It is imperative that these barriers be addressed at this time as doing so will:

- Provide California with the ability to achieve its goals as outlined in AB 32, the Low Carbon Fuel Standard
- Provide a clean, reliable, cost-efficient and domestically produced source of fuel for transportation and encourage market development for natural gas vehicles; and
- Strengthen the necessary web of LNG/LCNG fueling station coverage across the region and state, thereby supporting a region-wide transition opportunity for heavy-duty fleets interested in alternative fuels.

Goal of the Agreement:

The goal of this project is to close an existing "gap" in clean fuel infrastructure in this region. The closest public access fueling stations to Blythe are currently 100 miles away in El Centro, California, and 120 miles away in Palm Springs, California. Therefore, this public access station will fill an important gap in LNG/LCNG availability for natural gas vehicle users looking to travel lengthy distances along the I-10 and through the Imperial Valley. In addition to BVT's and HDF's own fleets of vehicles, several regional heavy-duty fleet operators are also expected to utilize this planned facility.

Objectives of the Agreement:

The objective of this project is to construct this 24-hour public-access LNG/LCNG station in order to support BVT's and HDF's LNG vehicle operations, as well as to offer a critical natural gas refueling station for other alternative fuel fleets along the I-10 corridor. Currently, there is no California-based LNG or CNG fueling facility along the I-10 corridor between Phoenix and the City of Palm Springs, even though I-10 is the primary route between Phoenix and the Ports of Los Angeles and Long Beach. Additional objectives are as follows:

- Support and bolster the regional refueling infrastructure strategy being developed in Southern California and Arizona through the development of a new publicly-accessible station along a key goods movement corridor;
- Promote regional growth in alternative fuel vehicle deployments and the replacement of heavy-duty diesel trucks;
- Provide natural gas refueling for HDF and other retail fleets;
- Displace 212,500 gallons of diesel from HDF in 2013.
- Displace 758,275 gallons of annual diesel use with LNG from conservative estimates of HDF and retail use in 2015;
- Reduce 638 metric tons of annual greenhouse gas (GHG) emissions in 2013;

- Reduce 2,486 metric tons of annual greenhouse gas (GHG) emissions in 2015;
- Displace 4,798 metric tons of GHG emissions from 2013-2015.
- Complete these goals at a cost-effectiveness as low as \$0.40 per gallon of diesel fuel displaced and \$125 per metric ton of GHGs reduced from 2013-2015.

Success will be measured by the quantitative measurement of stated objectives. Additionally, this project will serve as a demonstration of the feasibility of constructing, owning, and operating a 24-hour public access station to supply an ultra-low carbon fuel for transportation. Doing so will strengthen the likelihood of adoption of additional natural gas vehicle adoption throughout California and the further development of associated infrastructure.

TASK 1 ADMINISTRATION

Task 1.1 Attend Kick-off Meeting

The goal of this task is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a “Kick-Off” meeting with the Commission Project Manager, the Grants Officer, and a representative of the Accounting Office. The Recipient shall bring its Project Manager, Agreement Administrator, Accounting Officer, and others designated by the Commission Project Manager to this meeting. The administrative and technical aspects of this Agreement will be discussed at the meeting. Prior to the kick-off meeting, the Commission Project Manager will provide an agenda to all potential meeting participants.

The administrative portion of the meeting shall include a discussion of the following:

- The terms and conditions of the Agreement
- Critical Project Review (Task 1.2)
- Match fund documentation (Task 1.6) No work may be done until this documentation is in place.
- Permit documentation (Task 1.7)
- Subcontracts needed to carry out project (Task 1.8)

The technical portion of the meeting shall include a discussion of the following:

- The Commission Project Manager’s expectations for accomplishing tasks described in the Scope of Work
- An updated Schedule of Products
- Progress Reports (Task 1.4)
- Technical Products (Product Guidelines located in Section 5 of the Terms and Conditions)

- Final Report (Task 1.5)

The Commission Project Manager shall designate the date and location of this meeting.

Recipient Products:

- Updated Schedule of Products
- Updated List of Match Funds
- Updated List of Permits

Commission Project Manager Product:

- Kick-Off Meeting Agenda

Task 1.2 Critical Project Review (CPR) Meetings

The goal of this task is to determine if the project should continue to receive Energy Commission funding to complete this Agreement and to identify any needed modifications to the tasks, products, schedule or budget.

CPRs provide the opportunity for frank discussions between the Energy Commission and the Recipient. CPRs generally take place at key, predetermined points in the Agreement, as determined by the Commission Project Manager and as shown in the Technical Task List above. However, the Commission Project Manager may schedule additional CPRs as necessary, and any additional costs will be borne by the Recipient.

Participants include the Commission Project Manager and the Recipient and may include the Commission Grants Officer, the Fuels and Transportation Division (FTD) team lead, other Energy Commission staff and Management as well as other individuals selected by the Commission Project Manager to provide support to the Energy Commission.

The Commission Project Manager shall:

- Determine the location, date, and time of each CPR meeting with the Recipient. These meetings generally take place at the Energy Commission, but they may take place at another location.
- Send the Recipient the agenda and a list of expected participants in advance of each CPR. If applicable, the agenda shall include a discussion on both match funding and permits.
- Conduct and make a record of each CPR meeting. One of the outcomes of this meeting will be a schedule for providing the written determination described below.
- Determine whether to continue the project, and if continuing, whether or not modifications are needed to the tasks, schedule, products, and/or budget for the remainder of the Agreement. Modifications to the Agreement may require a formal amendment (see the Terms and Conditions, Section 8). If the Commission Project Manager concludes that

satisfactory progress is not being made, this conclusion will be referred to the Lead Commissioner for Transportation activities for his or her concurrence.

- Provide the Recipient with a written determination in accordance with the schedule. The written response may include a requirement for the Recipient to revise one or more product(s) that were included in the CPR.

The Recipient shall:

- Prepare a CPR Report for each CPR that discusses the progress of the Agreement toward achieving its goals and objectives. This report shall include recommendations and conclusions regarding continued work of the projects. This report shall be submitted along with any other products identified in this scope of work. The Recipient shall submit these documents to the Commission Project Manager and any other designated reviewers at least 15 working days in advance of each CPR meeting.
- Present the required information at each CPR meeting and participate in a discussion about the Agreement.

Commission Project Manager Products:

- Agenda and a list of expected participants
- Schedule for written determination
- Written determination

Recipient Product:

- CPR Report(s)

Task 1.3 Final Meeting

The goal of this task is to closeout this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present the findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement.

This meeting will be attended by, at a minimum, the Recipient, the Commission Grants Office Officer, and the Commission Project Manager. The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be two separate meetings at the discretion of the Commission Project Manager.

The technical portion of the meeting shall present an assessment of the degree to which project and task goals and objectives were achieved, findings, conclusions, recommended next steps (if any) for the Agreement,

and recommendations for improvements. The Commission Project Manager will determine the appropriate meeting participants.

The administrative portion of the meeting shall be a discussion with the Commission Project Manager and the Grants Officer about the following Agreement closeout items:

- What to do with any equipment purchased with Energy Commission funds (Options)
- Energy Commission’s request for specific “generated” data (not already provided in Agreement products)
- “Surviving” Agreement provisions
- Final invoicing and release of retention
- Prepare a schedule for completing the closeout activities for this Agreement.

Products:

- Written documentation of meeting agreements
- Schedule for completing closeout activities

Task 1.4 Monthly Progress Reports

The goal of this task is to periodically verify that satisfactory and continued progress is made towards achieving the research objectives of this Agreement on time and within budget.

The objectives of this task are to summarize activities performed during the reporting period, to identify activities planned for the next reporting period, to identify issues that may affect performance and expenditures, and to form the basis for determining whether invoices are consistent with work performed.

The Recipient shall:

- Prepare a Monthly Progress Report which summarizes all Agreement activities conducted by the Recipient for the reporting period, including an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. Each progress report is due to the Commission Project Manager within 10 days of the end of the reporting period. The recommended specifications for each progress report are contained in Section 6 the Terms and Conditions of this Agreement.

Product:

- Monthly Progress Reports

Task 1.5 Final Report

The goal of the Final Report is to assess the project's success in achieving its goals and objectives, advancing science and technology, and providing energy-related and other benefits to California.

The objectives of the Final Report are to clearly and completely describe the project's purpose, approach, activities performed, results, and advancements in science and technology; to present a public assessment of the success of the project as measured by the degree to which goals and objectives were achieved; to make insightful observations based on results obtained; to draw conclusions; and to make recommendations for further projects and improvements to the FTD project management processes.

The Final Report shall be a public document. If the Recipient has obtained confidential status from the Energy Commission and will be preparing a confidential version of the Final Report as well, the Recipient shall perform the following activities for both the public and confidential versions of the Final Report.

The Recipient shall:

- Prepare an Outline of the Final Report.
- Prepare a Final Report following the approved outline and the latest version of the Final Report guidelines which will be provided by the Commission Project Manager. The Commission Project Manager shall provide written comments on the Draft Final Report within fifteen (15) working days of receipt. The Final Report must be completed at least 60 days before the end of the Agreement Term.
- Submit one bound copy of the Final Report with the final invoice.

Products:

- Draft Outline of the Final Report
- Final Outline of the Final Report
- Draft Final Report
- Final Report

Task 1.6 Identify and Obtain Matching Funds

The goal of this task is to ensure that the match funds planned for this Agreement are obtained for and applied to this Agreement during the term of this Agreement.

The costs to obtain and document match fund commitments are not reimbursable through this Agreement. Although the Energy Commission budget for this task will be zero dollars, the Recipient may utilize match funds for this task. Match funds shall be spent concurrently or in advance of Energy Commission funds for each task during the term of this Agreement. Match funds must be identified in writing and the associated commitments obtained before the Recipient can incur any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a letter documenting the match funding committed to this Agreement and submit it to the Commission Project Manager at least 2 working days prior to the kick-off meeting. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state such in the letter. If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter a list of the match funds that identifies the:
 - Amount of each cash match fund, its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied.
 - Amount of each in-kind contribution, a description, documented market or book value, and its source, including a contact name, address and telephone number and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient shall identify its owner and provide a contact name, address and telephone number, and the address where the property is located.
- Provide a copy of the letter of commitment from an authorized representative of each source of cash match funding or in-kind contributions that these funds or contributions have been secured. For match funds provided by a grant a copy of the executed grant shall be submitted in place of a letter of commitment.
- Discuss match funds and the implications to the Agreement if they are reduced or not obtained as committed, at the kick-off meeting. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide the appropriate information to the Commission Project Manager if during the course of the Agreement additional match funds are received.
- Notify the Commission Project Manager within 10 days if during the course of the Agreement existing match funds are reduced. Reduction in match funds must be approved through a formal amendment to the Agreement and may trigger an additional CPR.

Products:

- A letter regarding match funds or stating that no match funds are provided
- Copy(ies) of each match fund commitment letter(s) (if applicable)
- Letter(s) for new match funds (if applicable)
- Letter that match funds were reduced (if applicable)

Task 1.7 Identify and Obtain Required Permits

The goal of this task is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track.

Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement. Although the Energy Commission budget for this task will be zero dollars, the Recipient shall budget match funds for any expected expenditures associated with obtaining permits. Permits must be identified in writing and obtained before the Recipient can make any expenditure for which a permit is required.

The Recipient shall:

- Prepare a letter documenting the permits required to conduct this Agreement and submit it to the Commission Project Manager at least 2 working days prior to the kick-off meeting. If there are no permits required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies the:
 - Type of permit
 - Name, address and telephone number of the permitting jurisdictions or lead agencies
 - The schedule the Recipient will follow in applying for and obtaining these permits.
- Discuss the list of permits and the schedule for obtaining them at the kick-off meeting and develop a timetable for submitting the updated list, schedule and the copies of the permits. The implications to the Agreement if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in the Progress Reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, provide the appropriate information on each permit and an updated schedule to the Commission Project Manager.
- As permits are obtained, send a copy of each approved permit to the Commission Project Manager.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the Commission Project Manager within 5 working days. Either of these events may trigger an additional CPR.

Products:

- Letter documenting the permits or stating that no permits are required
- A copy of each approved permit (if applicable)
- Updated list of permits as they change during the term of the Agreement (if applicable)
- Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)

Task 1.8 Obtain and Execute Subcontracts

The goal of this task is for Recipients to identify any subcontracts required to carry out the tasks under this Agreement and to procure them consistent with the terms and conditions of this Agreement and the Recipient's own procurement policies and procedures. It will also provide the Energy Commission an opportunity to review the subcontracts to ensure that the tasks are consistent with this Agreement and that the budgeted expenditures are reasonable and consistent with applicable cost principles.

The Recipient shall:

- Prepare a letter documenting the subcontracts required to conduct this Agreement, and submit it to the Commission Project Manager at least 2 working days prior to the kick-off meeting. If there are no subcontracts required at the start of this Agreement, then state such in the letter. If it is known at the beginning of the Agreement that subcontracts will be required during the course of the Agreement, provide in the letter:
 - A list of the subcontracts that describes the anticipated maximum budget and general scope of work for each,
 - A description of the procurement process to be used, and
 - The schedule the Recipient will follow in applying for and obtaining these subcontracts
- Submit a draft of the subcontract that will include a budget with the information required in the budget details to the Commission Project Manager for review.
- Submit a final copy of the executed subcontract.

Products:

- Letter describing the subcontracts needed, or stating that no subcontracts are required
- Draft subcontracts
- Final subcontracts

TECHNICAL TASKS

TASK 2 ENGINEERING & PRECONSTRUCTION

The goal of this task is to perform civil and architectural engineering, including design management services and preconstruction planning.

The Recipient shall:

- Finalize layout of the station.
- Finalize station engineering and design.
- Provide design management services.

- Provide preconstruction planning services.

Products:

- Final station design.

TASK 3 SITE WORK & CIVIL IMPROVEMENT

The goal of this task is to perform construction activities at the site in accordance with the design specifications, in preparation for the arrival of the equipment to the site.

The Recipient shall:

- Oversee and manage the site construction.
- Site electrical and mechanical work, and civil improvements.
- Develop the Final Site Construction Report.

Products:

- Final Site Construction Report

TASK 4 LNG EQUIPMENT PROCURMENT & INSTALLATION

The goal of this task is to order, take delivery of, and install all necessary equipment and supplies at the site. Installation of equipment, controls, and support infrastructure will be completed in accordance with the system design specifications.

The Recipient shall:

- Place order for all equipment and parts that require processing and delivery time.
- Track and inventory all equipment and supplies arriving at the site.
- Provide quality assurance checks on key components of the system.
- Coordinate placement and logistics for equipment and component skids.
- Install equipment on their respective foundations.
- Install underground and above-ground piping and conduits to transport gas on site to the plant and to provide necessary utilities and communication lines to the equipment locations.
- Perform final checks of design prior to start-up.

Products:

- List of equipment
- Copies of equipment and parts order forms
- Final installation report

TASK 5 STARTUP & COMMISSIONING

The goal of this task is to perform start-up of the system and equipment on-site and commission of the system into operation.

The Recipient shall:

- Develop start-up test plan.
- Perform necessary checks of the system prior to start-up and address any findings from prestart check list and take corrective actions.
- Perform start-up and commission system into service per test plan.
- Troubleshoot any issues identified.
- Collect operational data, analyze and report.

Products:

- Start-up and initial operation results

Task 6 DATA COLLECTION AND ANALYSIS

The goal of this task is to collect operational data from the station, to analyze that data for economic and environmental impacts, and to include the data and analysis in the Final Report.

The Recipient shall:

- Develop data collection test plan.
- Troubleshoot any issues identified.
- Collect 6 months of throughput, usage, and operations data from the project including, but not limited to:
 - Number of vehicles fueled per day per station
 - Number of days per year vehicles for fueled per station
 - Maximum capacity of the new fueling system
 - Gallons of gasoline and/or diesel fuel displaced by using natural gas (with associated mileage information)
 - Expected air emissions reduction, for example:
 - Non-methane hydrocarbons
 - Oxides of nitrogen
 - Non-methane hydrocarbons plus oxides of nitrogen
 - Particulate Matter
 - Formaldehyde
 - Duty cycle of the current fleet and the expected duty cycle of future vehicle acquisitions
 - Specific jobs and economic development resulting from this project
- Identify any current and planned use of renewable energy at the facility.
- Identify the source of the alternative fuel.
- Describe any energy efficiency measures used in the facility that may exceed Title 24 standards in Part 6 of the California Code Regulations.
- Provide data on potential job creation, economic development, and increased state revenue as a result of expected future expansion.
- Provide a quantified estimate of the project's carbon intensity values for life-cycle greenhouse gas emissions.
- Compare any project performance and expectations provided in the proposal to Energy Commission with actual project performance and accomplishments.

Products:

- None. Data collection information and analysis will be included in the Final Report

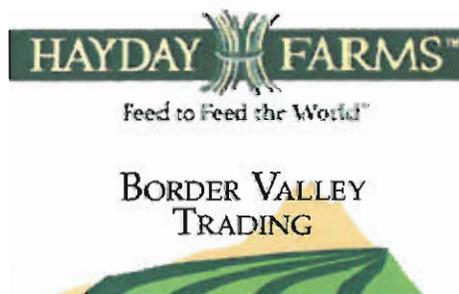
California Energy Commission's Alternative and
Renewable Fuel and Vehicle Technology Program

Response to PON-11-602

Appendix 2:
Schedule of Products
and Due Dates
(Attachment E)

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**



Schedule of Products and Due Dates

Task Number	Task Name	Product(s)	Due Date
1.1	Attend Kick-off Meeting		
		Updated Schedule of Products	2 days before the kick-off meeting
		Updated List of Match Funds	2 days before the kick-off meeting
		Updated List of Permits Kick-Off Meeting Agenda (CEC)	2 days before the kick-off meeting Commission
1.2	Critical Project Review Meetings	CPR Report	2/28/2013
		1st CPR Meeting Agenda and a list of expected participants (CEC)	Commission
		Schedule for written determination (CEC)	Commission
		Written determination (CEC)	Commission
1.3	Final Meeting	Written documentation of meeting agreements	4/15/2013
		Schedule for completing closeout activities	4/15/2013
1.4	Monthly Progress Reports		
		Monthly Progress Reports	The 10th calendar day after each month during the approved term of this Agreement
1.5	Final Report	Draft Outline of the Final Report	5/15/2013
		Final Outline of the Final Report	6/17/2013
		Draft Final Report	7/15/2013
		Final Report (no less than 60 days before the end term of the agreement)	8/15/2013
1.6	Identify and Obtain Match Funds	A letter regarding match funds or stating that no match funds are provided	2 days before the kick-off meeting
		Copy(ies) of each match fund commitment letter(s) (if applicable)	2 days before the kick-off meeting
		Letter(s) for new match funds (if applicable)	Within 10 days of identifying new match funds
		Letter that match funds were reduced (if applicable)	Within 10 days of identifying reduced match funds

1.7 Identify and Obtain Required Permits	Letter documenting the permits or stating that no permits are required	2 days before the kick-off meeting
	A copy of each approved permit (if applicable)	Within 10 days of receiving each permit
	Updated list of permits as they change during the term of the Agreement (if applicable)	Within 10 days of change in list of permits
	Updated schedule for acquiring permits as changes occur during the term of the Agreement (if applicable)	Within 10 days of change in schedule for obtaining permits
1.8 Obtain and Execute Subcontracts	Letter describing the subcontracts needed, or stating that no subcontracts are required	2 days before the kick-off meeting
	Draft subcontracts	15 days before the scheduled date of execution
	Final subcontracts	Within 10 days of execution
2 ENGINEERING AND PRECONSTRUCTION	Final station design	12/17/2012
3 SITE WORK AND CIVIL IMPROVEMENT	Final site construction report	3/15/2013
4 LNG EQUIPMENT PROCUREMENT AND INSTALLATION	List of equipment	10/15/2012
	Copies of equipment and parts order forms	12/17/2012
	Final equipment report	4/15/2013
5 START UP AND COMMISSIONING	Start-up and initial operation results	5/15/2013
6 DATA COLLECTION AND ANALYSIS	None. Information will be included in Final Report.	N/A

**California Energy Commission's Alternative and
Renewable Fuel and Vehicle Technology Program**

Response to PON-11-602

**Appendix 3:
Budget
(Attachment F)**

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**

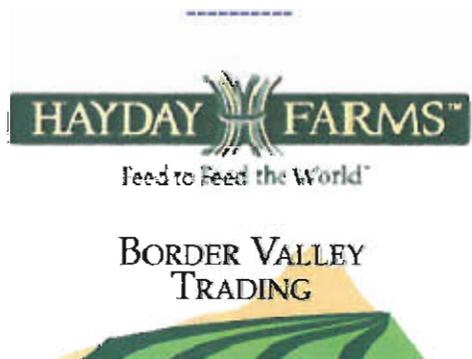


EXHIBIT B
Exh B-1a Task Summary

Summary Task Budget		Prime Recipient Reimbursable Costs		Major Subcontractor #1 Reimbursable Costs		Commission Reimbursable Costs	Match Funding	Totals
		BlackHawk	Turnkey Station Developer					
1.0	Administration	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 43,750	\$ 43,750
2.0	Engineering and Preconstruction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 327,500	\$ 327,500
3.0	Site Work and Civil Improvement	\$ -	\$ -	\$ 600,000	\$ 600,000	\$ 600,000	\$ 156,250	\$ 756,250
4.0	Order and Install LNG Equipment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 537,500	\$ 537,500
5.0	Station Start Up and Commissioning	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 22,500	\$ 22,500
6.0	Data Collection and Analysis	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 37,500	\$ 37,500
Grand Totals		\$ -	\$ -	\$ 600,000	\$ 600,000	\$ 600,000	\$ 1,125,000	\$ 1,725,000

PLEASE SEE THE INSTRUCTIONS SHEET FOR DETAILED INFORMATION ON COMPLETING THIS FORM.

If the budget forms are not filled out completely your application may be rejected.

For these boxes, be sure to include all costs: labor (unloaded rates) and non-labor costs (fringe, overhead, general & administrative, and other direct operating costs). The totals are total costs to perform each task.

EXHIBIT B
Exh B-1b Category Summary

Summary Category Budget	Prime Recipient Reimbursable Costs	Major Subcontractor #1 Reimbursable Costs	Totals
	BlackHawk	Turnkey Station Developer	
Direct Labor			\$ -
Fringe Benefits			\$ -
Travel			\$ -
Equipment		\$ 600,000.00	\$ 600,000.00
Materials/ Misc.			\$ -
Minor Subcontractors*			\$ -
Total Direct	\$ -	\$ 600,000.00	\$ 600,000.00
Indirect Overhead	\$ -	\$ -	\$ -
General & Administrative	\$ -	\$ -	\$ -
Total Indirect	\$ -	\$ -	\$ -
Grand Total	\$ -	\$ 600,000.00	\$ 600,000.00

EXHIBIT B
Exh B-4 Direct Operating Expenses

Pre-approved Travel List *							
Task No.	cost incurred by	Trip #	Who	Departure and Destination	Trip Purpose	Amount	
						Commission Funds	Match Funds
2	Recipient	2-1	Bob Williams & Jane Condor	Los Angeles to Sacramento	Kickoff Meeting	\$100	\$0
3	Sub 1	3-1 - 3-4	Principal Investigator & Research Assistant	Los Angeles to Mobile, AL	Four trips for PAC Meetings @ \$300 per trip	\$0	\$1,200
Total:						\$0	\$0

EXAMPLE

EXAMPLE

* Travel is reimbursed at state rates.

Equipment**							
Task No.	cost incurred by	Description	Purpose	# Units	Unit Cost	Amount	
						Commission Funds	Match Funds
		15,000-gallon Vertical LNG Storage Tank		1	\$ 220,000.00	\$ 220,000.00	\$ -
		Submersible LNG Pump Skid		1	\$ 60,000.00	\$ 60,000.00	\$ -
		Off-load Panel & Pump for Delivery Tanker		1	\$ 65,000.00	\$ 65,000.00	\$ -
		W&M LNG Dispenser		2	\$ 90,000.00	\$ 180,000.00	\$ -
		Saturation Vaporizer		1	\$ 20,000.00	\$ 20,000.00	\$ -
		Vacuum Jacketed Piping		1	\$ 50,000.00	\$ -	\$ 50,000.00
		Fuel Management System		1	\$ 20,000.00	\$ -	\$ 20,000.00
		LNG Control Panel		1	\$ 60,000.00	\$ 55,000.00	\$ 5,000.00
		Valves, conduits, switches, gauges, sensors, wiring, piping, relief valves		1	\$ 150,000.00	\$ -	\$ 150,000.00
Total:						\$600,000	\$225,000

** Equipment is defined as having an acquisition unit cost of at least \$5,000. See instructions for more details.

EXHIBIT B
Exh B-4 Direct Operating Expenses

Minor Subcontractors					
Task No.	cost incurred by	Subcontractor Legal Name	Purpose	Amount	
				Commission Funds	Match Funds
N/A					
			Total:	\$0	\$0

PLEASE SEE THE INSTRUCTIONS SHEET FOR DETAILED INFORMATION ON COMPLETING THIS FORM.
If the budget forms are not filled out completely your application may be rejected.

EXHIBIT B
Exh B-5 Match Funding

Task Match Funding Budget		Prime Contractor Match Contribution	Major Subcontractor #1 Match Contribution	Match Funding
1.0	Administration		\$ 43,750	\$ 43,750
2.0	Engineering and Preconstruction	\$ 200,000	\$ 127,500	\$ 327,500
3.0	Site Work and Civil Improvement		\$ 156,250	\$ 156,250
4.0	Order and Install LNG Equipment		\$ 537,500	\$ 537,500
5.0	Station Start Up and Commissioning		\$ 22,500	\$ 22,500
6.0	Data Collection and Analysis	\$ 37,500		\$ 37,500
	Grand Totals	\$ 237,500	\$ 887,500	\$ 1,125,000

PLEASE SEE THE INSTRUCTIONS SHEET FOR DETAILED INFORMATION ON COMPLETING THIS FORM.
If the budget forms are not filled out completely your application may be rejected.

**Not a Contract Document
Exh B-6 Loaded Rate Calculation**

Job Classification/Title	DL	FB %	FB Base	FB \$	IOH %	IOH Base	IOH \$	G&A %	G&A Base	G&A \$	Loaded Hourly Rate
EXAMPLE 1	\$ 40.00	40%	\$ 40.00	\$ 16.00	35%	\$ 40.00	\$ 14.00	15%	\$ 40.00	\$ 6.00	\$ 76.00
EXAMPLE 2	\$ 40.00	40%	\$ 40.00	\$ 16.00	35%	\$ 40.00	\$ 14.00	15%	\$ 56.00	\$ 8.40	\$ 78.40
		9%	\$ -	\$ -	25%	\$ -	\$ -	0%	\$ -	\$ -	\$ -
		9%	\$ -	\$ -	25%	\$ -	\$ -	0%	\$ -	\$ -	\$ -
		9%	\$ -	\$ -	25%	\$ -	\$ -	0%	\$ -	\$ -	\$ -
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		0%	\$ -	\$ -	0%	\$ -	\$ -	0%	\$ -	\$ -	\$ -

Instructions:

The purpose of this form is to illustrate how the previous forms capture the break-out of a company's loaded rates. This is not a contract document. This form may be used in some solicitations for Cost Evaluation purposes but is otherwise just for the Bidder's Use. The loaded rate is the sum of the unloaded hourly rate/ Direct Labor Rate (DL), plus Fringe Benefits (FB), plus Indirect Overhead (IOH), plus General & Administrative (G&A).

1. Insert all Job Classifications to be charged to this agreement.
2. Insert the DL Rate for each classification. This is the rate that is actually paid to the employee (before FB, IOH, or G&A).
3. Insert the FB% to be charged to this agreement and copy for each job classification.
4. Insert the Base \$ amount for FB (usually just the DL amount).
5. The FB \$ will automatically calculate based on the FB% and the FB Base.
6. Complete steps 3 and 4 for IOH, and G&A.

NOTE: This form automatically calculates the base for all indirect rates as the Unloaded Hourly/ Direct Labor rate (FB% x DL = FB \$) (See Example 1). Some companies may charge indirects on other indirects, for example, the G&A % rate may be charged on a base of DL +FB. If this is the case, the G&A Base must be modified to read =B2+E2 instead of just =B2. (See example 2)

7. If your company standard is to charge clients at a Loaded Rate, verify that the Loaded Rate calculated on this sheet is accurate. The Loaded Rate is for verification purposes only. Contractor must invoice with detailed break-out information.

Acronyms:	
Direct Labor (Unloaded Hourly Rate)	DL
Fringe Benefits	FB
Indirect Overhead	IOH
General & Administrative	G&A

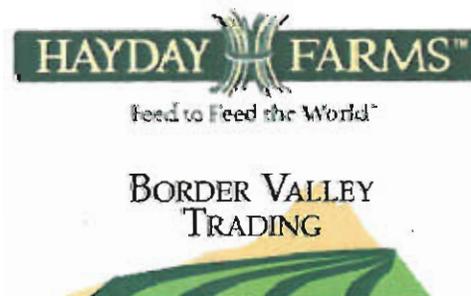
**California Energy Commission's Alternative and
Renewable Fuel and Vehicle Technology Program**

Response to PON-11-602

**Appendix 4:
Local Health Impacts
(Attachment G)**

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**



Attachment G – Local Health Impacts Information

Air Quality Guidelines (California Code of Regulations, Title 13, Chapter 8.1, Section 2343(c)(6)(A)) require the Energy Commission to analyze the aggregate locations of the funded projects, analyze the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, and identify agency outreach to community groups and other affected stakeholders.

This information must be provided for all AB 118 funding categories, including fueling stations, fuel production, feedstock production or procurement, and vehicle or technology component production.

INSTRUCTIONS

Please complete the following information for the site(s) of the proposed project that will require a permit. Attach additional pages if necessary. If the project includes multiple sites, you may submit this information in a table format using the bolded font below as column headers.

PROJECT NAME: Blythe LNG Public Access Infrastructure Project

APPLICANT'S NAME AND ORGANIZATION Greg Braun, Blackhawk Logistics LLC

PROJECT SITE(S) DESCRIPTION

Provide the address(es) of the site(s) and a description of existing infrastructure or facilities (if any), surrounding structures, reference to any regional plans or zoning requirements for that location, and its proximity to residences, day care facilities, elder care facilities, and schools.

(E.g., Site 1: 123 Main Street, Grand Terrace, CA, 92313, Vacant lot in a commercially-zoned area. Commercial buildings surround the lot. No residences within ¼ mile; Site 2: 321 Beach Street, San Francisco, CA, Existing gasoline/diesel fueling station. Residential area within 200 on South and East ends of project site.)

Blackhawk wishes to construct a public-access liquefied natural gas (LNG) station located approximately one-half mile off the Lovekin Blvd exit on the I-10 freeway, in a very convenient and visible location that will support a region-wide transition to low-emission natural gas powered trucks. The location at the intersection of Lovekin and 14th Street, which is a main trucking offramp and an ideal location to promote an LNG station for vehicles traveling from Los Angeles and Phoenix on I-10. The proposed NG station will be constructed on land zoned for General Commercial (GC) land uses consistent with the project.

DEMOGRAPHIC DATA

Provide demographic data at the city or Zip code level for either the project location or the location of the potential health impacts, including:

- Total population
- Median education level
- Unemployment rate
- Percentage of minorities (by ethnicity)
- Percentage of population falling under the poverty level
- Percentage of population under 5 years and over 65 years of age

Suggested sources: Census Data, www.census.gov, city website, local economic development department, Employment Development Department Labor Market Information Data Division

Cite your data sources including name of data source, and date of data

The following data is provided at the city level for the project location in the City of Blythe. The source used was the U.S. Census Bureau, as well as the City of Blythe websites, with the exact addresses provided below.

- **The 2010 estimate for total population in the City of Blythe is 20,817.**
- **The median education level is – N/A (Energy Commission instructed us not to complete this bullet, as we cannot find this statistic.)**
- **The unemployment rate in the City of Blythe was 9 percent as of 2008.**
- **The percentage of minorities (by ethnicity) is provided below:**
 - **59.5% white persons**
 - **15.0% black persons**
 - **1.2% American Indian and Alaska Native persons**
 - **1.5% Asian persons**
 - **0.2% Native Hawaiian and Other Pacific Islander**
 - **3.2% Persons reporting two or more races**
 - **53.2% persons of Hispanic or Latino origin**
 - **28.3% white persons not Hispanic**
- **The percentage of population falling under the poverty level as estimated from 2006-2010 is 16.8%.**
- **The percentage of population under 5 years as of 2010 is 5.3%.**
- **The percentage of population over 65 years of age is 8.6%.**

Sources: [U.S. Census Bureau Quick Fact](#)

PROJECT-GENERATED EMISSIONS

Provide a quantified description of the air emissions (criteria and toxic) directly associated with the project's operations, including, but not limited to: 1) transport of fuel, feedstock or other material to project site as required for operations and production; 2) production of fuel or technology components; 3) fueling of alternatively-fueled vehicles.

The Blackhawk Blythe LNG Refueling Station project will achieve the following specific goals:

- Displace 212,500 gallons of diesel in 2013.
- Provide for the annual displacement of 758,275 gallons of annual diesel use with 100% domestically produced low-carbon natural gas by 2015;
- Provide for the total displacement of 1,493,350 diesel gallons by 2015;
- Provide for the annual use of over 362,487 DGE of LNG by 2013 and 1,107,871 DGE by 2015
- Provide for the total use of 2,268,973 DGE of LNG by 2015 for vehicle refueling.
- Provide for the reduction of 957 metric tons of greenhouse gas (GHG) emissions by 2013 and 2,489 metric tons of GHGs by 2015;
- Provide for the total reduction of more than 5,117 metric tonnes of GHG emissions by 2015; and,
- Provide for the reduction of 39.88 tons of NOx emissions by 2015.

PROJECT HEALTH IMPACTS

Using the demographic data and emissions information, provide a description of the project's potential localized health impacts. For this section, "potential localized health impact" denotes the project's potential to add criteria pollutants and toxic air contaminants to a localized air shed and affect ambient air quality levels to an extent that local community health is adversely affected.

Blackhawk's proposed project to build a liquefied natural gas (LNG) fueling station will support HayDay Farms goals to replace its entire diesel fleet with clean-burning natural gas. While LNG is a fossil-fuel and does produce trace amounts of criteria pollutants (0.08 tons per unit), the alternative fuel provides a huge reduction over that of diesel fuel. This project is being developed specifically in response to federal, state, and local agency demands for improved air quality and a reduction in the transportation industry's dependence on highly-emitting and carbon-intensive conventional fuels. The clean-burning natural gas fuel dispensed at this location will be used in heavy-duty trucks that would otherwise be using diesel. Transitioning from diesel to natural gas for transportation fuel is precisely the low-emission strategy that has been approved by the Energy Commission as a technologically simple approach for near-term benefits. As such, this project will actually *improve* ambient air quality levels and remove criteria pollutants and toxic air contaminants from the air to an extent in which local community health is extremely positively affected.

PROJECT SUMMARY

Provide the page number in the proposal that describes the project goal and proposed infrastructure changes.

The project goal and proposed infrastructure changes are all summarized and described on Page 3 of the proposal in the Executive Summary. They are additionally described in the Project Overview on Page 3 to 6.

Provide estimate of environmental benefits and/or impacts from the proposed project.

The environmental benefits of the project are documented below:

Over the two year and 8 month period from commissioning through the end of 2015, this project will displace over 1.49 million gallons of diesel fuel and reduce GHG emissions by 5,117 metric tons. In addition, and solely based upon the LNG tractors in HayDay Farm's existing fleet, this project will support NOx emission reductions of by 39.88 tons. This project will achieve cost-effective petroleum and emission reductions at an Energy Commission cost of \$0.40 per diesel gallon displaced and \$117.25 per metric ton of CO2e reduced.

Station projects such as this one are critical to supporting the displacement of diesel and achieving reductions of NOx, PM and GHGs. We simply can't get large numbers of vehicles on the road without well-located stations. Unfortunately, LNG stations cost several million dollars apiece, putting them out of economic reach of many fleets that are interested in natural gas operations. Accordingly, the Blackhawk Blythe LNG Station Project can provide significant sustainability benefits to the region and state. Beyond HayDay's plan for 25 vehicles, this station could handle the fuel needs of additional high-volume fuel use vehicles each day that will be served by the fast-fill component of the project.

OUTREACH EFFORTS

Describe outreach efforts to be implemented throughout the project to educate the surrounding community of these benefits and/or impacts. Include method of outreach (e.g. flyer, town hall meeting), frequency of outreach, number of targeted stakeholders, and information to be provided.

BlackHawk will release a press release to document the opening of its new public access LNG station to educate the surrounding community about the benefits of the station. The release has the potential to reach all of Blythe's more than 20,000 community members. It will include the emissions and economic benefits for the local and regional community.

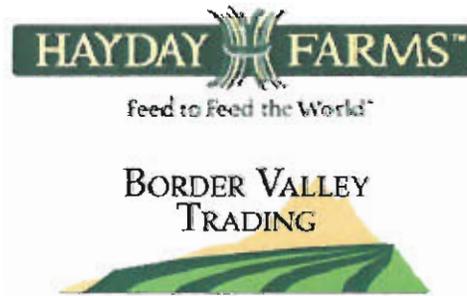
**California Energy Commission's Alternative and
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Response to PON-11-602

**Appendix 5:
CEQA Worksheet
*(Attachment L)***

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**



ATTACHMENT L

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) WORKSHEET

The California Environmental Quality Act (CEQA) (Public Resources Code §§ 21000 et seq.) requires public agencies to identify the significant environmental impacts of their actions and to avoid or mitigate them, if feasible.¹ Under CEQA, an activity that may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment is called a “project.” (Public Resources Code § 21065.) Approval of a contract, grant, or loan may be a “project” under CEQA if the activity being funded may cause a direct physical change or a reasonably foreseeable indirect physical change in the environment. Agencies must comply with CEQA before they approve a “project.” This can include preparing a Notice of Exemption or conducting an Initial Study and preparing a Negative Declaration, a Mitigated Negative Declaration, or, if there are significant impacts, an Environmental Impact Report.

The Lead Agency is the public agency that has the greatest responsibility for preparing environmental documents under CEQA, and for carrying out, supervising, or approving a project. Where the award recipient is a public agency, the Lead Agency is typically the recipient. Where the award recipient is a private entity, the Lead Agency is the public agency that has greatest responsibility for supervising or approving the project as a whole.² When issuing contracts, grants or loans, the Energy Commission is typically a “Responsible Agency” under CEQA, which means that it must make its own CEQA findings based on review of the Lead Agency’s environmental documents. If the Energy Commission is the only public agency with responsibility for approving the project, then the Energy Commission must act as the Lead Agency and prepare its own environmental documents before approving the project.

This worksheet will help the Energy Commission determine what kind of CEQA review, if any, is necessary before it can approve the award, and which agency will be performing that review as a Lead Agency. Please answer all questions as completely as possible. It may also help you to think through the CEQA process necessary for your proposed project. The Energy Commission may request additional information in order to clarify responses provided on this worksheet.

¹ For a brief summary of the CEQA process, please visit <http://ceres.ca.gov/ceqa/summary.html>.

² 14 C.C.R. §§ 15050, 15051. The Lead Agency typically has general governmental powers (such as a city or county), rather than a single or limited purpose (such as an air pollution control district).

1. What are the physical aspects of the project? (Check all that apply and provide brief description of work, including any size or dimensions of the project).

Type of Project	Yes	No	Project Description
Construction (including grading, paving, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>-Minor site excavation for the LNG tank containment pit structure.</p> <p>-Construction of 36-inch concrete LNG tank pad.</p> <p>-Trenches would be backfilled and patched with either asphalt or concrete.</p> <p>-Installation of new chain-link fencing around the new LNG refueling station equipment.</p>
Trenching	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>-Trenching approximately 36-inches deep to run new electrical power from the existing main breaker to the new control panel for the LNG refueling station.</p> <p>-Trenching approximately 36-inches deep to run new telephone service from the existing office building in the truck yard, to the LNG fuel station control panel.</p> <p>-Trenching approximately 36-inches deep to run new electrical service, conduit, and cryogenic fuel lines from the LNG refueling station to the location of the new LNG dispenser.</p> <p>-Trenching approximately 36-inches deep to connect the new LNG dispenser with the existing card reader system used for diesel refueling.</p>
New or replaced pipelines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Modification or conversion of a facility	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
New or modified operation of a facility or equipment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
On-road demonstration	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Paper study (including analyses on economics, feedstock availability, workforce availability, etc.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Laboratory research	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Temporary or mobile structures (skid-mounted)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Design/Planning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Other (describe and add pages as necessary)	<input type="checkbox"/>	<input type="checkbox"/>	

2. Where is the project located or where will it be located? (Attach additional sheets as necessary.)

Address	County	Type of Work to Be Completed at Site
450 S. Willow Street Blythe, CA	Riverside	Construction of public access LNG station including grading, utility installation, equipment installation and paving.

3. Will the project potentially have environmental impacts that trigger CEQA review? (Check a box and explain for each question.)

Question	Yes	No	Don't Know	Explanation
Is the project site environmentally sensitive?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed NG station will be constructed on vacant property planned for commercial development. The flora and fauna are not protected and a commercial access road is already constructed.
Is the project site on agricultural land?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed NG station will be constructed on land zoned for General Commercial (GC) land uses consistent with the project.

Is this project part of a larger project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed NG station does not include other construction activities.
Is there public controversy about the proposed project or larger project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The proposers have not received public or private comments in opposition to the project.
Will historic resources or historic buildings be impacted by the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed NG station will be constructed on vacant property devoid of historic significance.
Is the project located on a site the Department of Toxic Substances Control and the Secretary of the Environmental Protection have identified as being affected by hazardous wastes or cleanup problems?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed NG station has not been identified by EPA as being affected by hazardous waste or cleanup problems and site surveys and soils investigations have not revealed the potential for same.
Will the project generate noise or odors in excess of permitted levels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The proposed NG station will conform to maximum noise and odor requirements.
Will the project increase traffic at the site and by what amount?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The proposed NG station will receive approximately 40 heavy-duty trucks per weekday.

4. Will the project require discretionary permits or determinations, as listed below?

Type of Permit	No	Modified	New	Approving Agency	Reason for Permit, Summary of Process, and Anticipated Date of Issuance
Air Quality Permit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		The project does not have a back up generator and will not require AQMD approval.

Water Quality Permit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	City of Blythe	Water Quality permits are required for all construction projects. The application will be submitted and approved in conjunction with civil permits with initial submittal in 3 rd quarter 2012 and anticipated approval in 1 st quarter 2013.
Conditional Use Permit or Variance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		The proposed NG station will be constructed on land zoned GC which allows construction of the facility without a discretionary action.
Building Expansion Permit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		The proposed NG station will not require a building expansion.
Hazardous Waste Permit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		The proposed NG station does not entail the use or storage of hazardous waste that will trigger the requirement for a hazardous waste permit.
Rezoning	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		The proposed NG station will be constructed on land zoned GC which is consistent with the project.
Authority to Construct	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		Authority to Construct is required for all construction projects. The application will be submitted and approved in conjunction with civil permits with initial submittal late in the 2 nd quarter of 2012 and anticipated approval in 4 th quarter 2012.
Other Permits (List types)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

5. Of the agencies listed in #4, have you identified and contacted the public agency who will be the lead CEQA agency on the project?

Yes. Provide the name of and contact information for the lead agency.

City of Blythe
 Ms. Barbara Burrow
 Planning Department
 235 North Broadway
 Blythe, CA 92225
 Phone: (760) 922-6130, Fax (760) 922-6334

No. Explain why no contact has been made and/or a proposed process for making contact with the lead agency.

6. Has the public agency prepared environmental documents (e.g., Notice of Exemption, Initial Study/Negative Declaration/Mitigated Negative Declaration, Environmental Impact Report, Notice of Determination) under CEQA for the proposed project?

Yes.

Please complete the following and attach the CEQA document to this worksheet. (For "Not a project," the title of the document may be an e-mail, resolution, or letter.)

Type of Environmental Review	Title of Environmental Document	State Clearinghouse Number	Completion Date	Planned Completion Date (must be before approval of award)
"Not a project"		N/A		N/A
Exempt (Resolution of public agency or Agenda Item approving Exemption)		N/A		N/A
Exempt (Notice of Exemption)		N/A		
Initial Study				
Negative Declaration				
Mitigated Negative Declaration				

Notice of Preparation				
Environmental Impact Report				
Master Environmental Impact Report				
Notice of Determination				
NEPA Document (Environmental Assessment, Finding of No Significant Impact, and/or Environmental Impact Statement)				

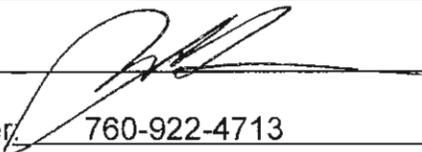
No. Explain why no document has been prepared. Propose a process for obtaining lead agency approval and estimated date for that approval (must occur before the Energy Commission will approve the award).

City of Blythe has confirmed that the project is a use allowed by right in the General Commercial zone and as such no entitlements are necessary. Because the building permit is ministerial and no discretionary action is required, the facility is not subject to review under CEQA. City of Blythe staff will review the facility through the Project Review Committee during the week of April 9th to inform the applicant of applicable Municipal and Building Code requirements that should be considered during facility design.

Certification: I certify to the best of my knowledge that the information contained in this worksheet is true and complete. I further certify that I am authorized to complete and sign this form on behalf of the proposing organization.

Name: Greg Braun

Title: President, Blackhawk Logistics LLC

Signature: 

Phone Number: 760-922-4713

Email: Greg@bordervalley.com

Date: 03/10/12

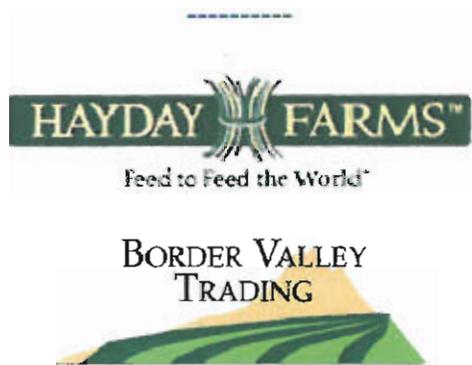
**California Energy Commission's Alternative and
Renewable Fuel and Vehicle Technology Program**

Response to PON-11-602

Appendix 6: Letters of Commitment

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**





P.O. Box 29243 • Phoenix, Arizona 85038-9243
2200 S. 75th Avenue • Phoenix, Arizona 85043
(800) 800-2200

March 20, 2012

Dr. Robert Weisenmiller, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: Blythe Natural Gas Fueling Station Application

Dear Commissioner Weisenmiller:

I am writing to express our support for the application submitted by HayDay Farms (HayDay) for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. HayDay's project will establish publicly accessible natural gas infrastructure along I-10 at a critical location between Phoenix and Southern California. There is a critical gap in the natural gas fueling infrastructure along this corridor.

Once completed, this natural gas refueling station will allow Swift Transportation the opportunity to purchase and deploy natural gas trucks in our operation that runs between Phoenix, Arizona and Fontana, California.

We envision that we would not only refuel at this location in Blythe, but this site would serve as a meeting point and trailer-swap location for our trucks coming in from both Phoenix and Fontana. Given the use of this site and our everyday operation along I-10, we would thus meet the Energy Commission's requirement that we operate within 25 miles of the station site location.

Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling gap, Swift urges you to provide the requested funding for this station. Should you have any questions about our company, our natural gas truck program efforts, or our support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,

A handwritten signature in black ink, appearing to read "Russ Thompson".

Russ Thompson
VP Equipment Purchasing & Shop Operations
Swift Transportation Company
623-907-7542
Russ_thompson@swifttrans.com



Apex
Bulk Commodities, LLC.

12531 Violet Rd.
Adelanto, CA 92301
Telephone (760) 246-6077

March 19, 2012

Dr. Robert Weisenmiller, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: Blythe Natural Gas Fueling Station Application

Dear Commissioner Weisenmiller:

I am writing to express our strong support for the application submitted by HayDay Farms and Border Valley Trading for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. This project will establish publicly accessible alternative fuel infrastructure along I- at a critical location that will serve both the goods movement traffic along I-10 and the underserved Imperial Valley. The I-10 freeway corridor is an essential trucking route that connects Phoenix, through Blythe along the California/Arizona border, with the Ports of Los Angeles and Long Beach. Currently, there is a critical gap in the natural gas fueling infrastructure along this corridor and the expense associated with developing a natural gas station of our own has proven cost-prohibitive. As such, HayDay's natural gas fueling station would finally afford Apex the opportunity to try natural gas trucks into our operations.

Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling gap, Apex strongly urges you to provide the requested funding for this station. Over the past few years, Apex has increasingly considered LNG operations. Our company deploys a fleet of 200 vehicles that currently use 10,000 gallons of diesel every day. If our fueling needs could be replaced by natural gas, we would reduce 10% of petroleum usage over a one year period, in addition to lowering emissions and experiencing savings due to the less expensive cost of natural gas. However, the lack of convenient, publically accessible fueling infrastructure has thus far prevented us from deploying natural gas trucks.

At this point, given existing infrastructure options, we cannot afford get involved with natural gas operations, despite the carbon and emission benefits. The

development of alternative fueling stations such as this one in such a key corridor location is encouraging to Apex and sends a strong message about the staying power and commitment in California to natural gas fueling options. Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling station gap, Apex strongly urges you to provide the requested funding for this critical station. Our fleet operates within 25 miles of the Blythe station site and would be eager to test natural gas operations at this refueling infrastructure site.

A commitment by the Energy Commission to comprehensive natural gas fueling corridor development would provide us with the opportunity to stay ahead of the curve when it comes to investing in alternative fuel technologies that improve environmental operations and reduce dependency on foreign oil. We are excited to see continuing advances of natural gas vehicle technology options and a growing commitment to develop supporting infrastructure. We strongly urge the Energy Commission to support this project along such a critical interstate corridor. It is efforts like these, combined with the commitments being made by companies such as HayDay Farms that will allow us to more quickly advance to a low carbon economy.

Should you have any questions about our company, our sustainability efforts, or our support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,

Steve Gale
President
Apex Bulk Commodities LLC
760-246-6077 x 2101
sgale@apexbulk.com



CITY OF BLYTHE

235 North Broadway / Blythe, California 92225
Phone (760) 922-6161 / Fax (760) 922-4938

March 5, 2012

Ms. Karen Douglas, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: HayDay Farms Natural Gas Fueling Station Application

Dear Commissioner Douglas:

I am writing to express our strong support for the application submitted by HayDay Farms, Inc. (HayDay) for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. HayDay's project will establish publicly accessible alternative fuel infrastructure along I-10 at a critical location that will serve both the goods movement traffic along I-10 and the underserved Palo Verde Valley. The I-10 freeway corridor is an essential trucking route that connects Phoenix, through Blythe along the California/Arizona border, with the Ports of Los Angeles and Long Beach. Currently, there is a critical gap in the natural gas fueling infrastructure along this corridor and, as such, HayDay's natural gas fueling station would afford the City of Blythe the opportunity to add additional, natural gas vehicles into our operations. The project will accommodate the deployment of a growing number of alternative fuel vehicles (AFVs), reduce the use of petroleum fuels, reduce greenhouse gas (GHG) emissions to help our state achieve its policy goals, provide competition in the transportation fuels market, and improve economic vitality in California.

The City of Blythe is a strong proponent of natural gas vehicle fuel due to its economic, environmental, and energy security benefits. Over the past four years, the City of Blythe has increasingly added CNG vehicles to its operations. Our company operates a fleet of two natural gas vehicles, with more on the way, that currently use 90 gallons of natural gas every day. Consequently, our fleet displaces 21,500 gallons of petroleum usage over a one year period, in addition to lowering emissions caused by diesel vehicles. However, the lack of publically accessible fueling infrastructure is a significantly limiting

factor and the number one disadvantage preventing us from expanding our fleet of natural gas trucks. The development of alternative fueling stations such as this one in such a key corridor location is encouraging to the City of Blythe and sends a strong message about the staying power and commitment in California to alternative fueling options.

Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling station gap, the City of Blythe strongly urges you to provide the requested funding for this critical station. Our fleet is eager to utilize the Blythe station and increase our opportunities to efficiently and cost-effectively support our growing natural gas fleet. Our fleet operates within 25 miles of the Blythe station site and would be eager to use this refueling infrastructure.

A commitment by the Energy Commission to comprehensive natural gas fueling corridor development would provide us with the opportunity to stay ahead of the curve when it comes to investing in alternative fuel technologies that improve environmental operations and reduce dependency on foreign oil. We are extremely excited to see continuing advances of natural gas vehicle technology options and a growing commitment to the development of supporting infrastructure. We strongly urge the Energy Commission to support this project along such a critical interstate corridor. It is efforts like these, combined with the commitments being made by companies such as HayDay Farms, Inc., that will allow us to more quickly advance to a low carbon economy.

Should you have any questions about the City of Blythe, its sustainability efforts, or its support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,



David A. Lane
City Manager
(760) 922-6161 ext. 236
dlane@cityofblythe.ca.gov



C.V. ICE COMPANY, INC.

March 16, 2012

Ms. Karen Douglas, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: HayDay Farms Natural Gas Fueling Station Application

Dear Commissioner Douglas:

I am writing to express our strong support for the application submitted by HayDay Farms (HayDay) for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. HayDay's project will establish publicly accessible alternative fuel infrastructure along I-10 at a critical location that will serve both the goods movement traffic along I-10 and the underserved Imperial Valley. The I-10 freeway corridor is an essential trucking route that connects Phoenix, through Blythe along the California/Arizona border, with the Ports of Los Angeles and Long Beach. Currently, there is a critical gap in the natural gas fueling infrastructure along this corridor and, as such, HayDay's natural gas fueling station would afford C.V. Ice Company the opportunity to add natural gas trucks into our operations. The project will accommodate the deployment of a growing number of alternative fuel vehicles (AFVs), reduce the use of petroleum fuel use and greenhouse gas (GHG) emissions to help our state achieve its policy goals, provide competition in the transportation fuels market, and improve economic vitality in California.

C.V. Ice is a strong proponent of natural gas vehicle fuel due to its economic, environmental, and energy security benefits. Over the past year, C.V. Ice has added CNG vehicles to its operations. Our company operates one natural gas vehicle that currently use 33 gallons of natural gas every day. Consequently, our fleet displaces 8000 gallons of petroleum usage over a one year period, in addition to lowering emissions caused by diesel vehicles. However, the lack of publically accessible fueling infrastructure is a significantly limiting factor and the number one disadvantage

preventing us from expanding our fleet of natural gas trucks. The development of alternative fueling stations such as this one in such a key corridor location is encouraging to CV Ice and sends a strong message about the staying power and commitment in California to alternative fueling options.

Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling station gap, C.V. Ice strongly urges you to provide the requested funding for this critical station. Upon completion of this important station project, C.V. Ice would fuel 1 vehicle at Blythe in the first year of operation, with the likelihood of expanding our commitment as we expand our fleet. Currently, we anticipate deploying 3 NGVs in each of the next 2 years. Our fleet operates within 25 miles of the Blythe station site and would be eager to use this refueling infrastructure.

A commitment by the Energy Commission to comprehensive natural gas fueling corridor development would provide us with the opportunity to stay ahead of the curve when it comes to investing in alternative fuel technologies that improve environmental operations and reduce dependency on foreign oil. We are extremely excited to see continuing advances of natural gas vehicle technology options and a growing commitment to develop supporting infrastructure. We strongly urge the Energy Commission to support this project along such a critical interstate corridor. It is efforts like these, combined with the commitments being made by companies such as HayDay Farms that will allow us to more quickly advance to a low carbon economy.

Should you have any questions about our company, our sustainability efforts, or our support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,



Kevin Mason
President

C.V. Ice Company, Inc.
(760) 347-3529
Kevin@cvice.com



COMMERCIAL VEHICLE SALES AND SERVICE

March 20, 2012

Dr. Robert Weisenmiller, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814



RE: Blythe Natural Gas Fueling Station Application



Dear Commissioner Weisenmiller:



I am writing to express our strong support for the application submitted by HayDay Farms and Border Valley Trading for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. HayDay's project will establish publicly accessible natural gas infrastructure along I-10 at a critical location between Phoenix and Southern California. There is a critical gap in the natural gas fueling infrastructure along this corridor and the development of this project in this gap location will allow our customers to more easily purchase and deploy natural gas trucks into the California market.



Freightliner of Arizona works with many customers that are extremely interested in transitioning to natural gas. Many of our customers operate routes between Phoenix and Los Angeles, and the major barrier to their adoption of natural gas fuel is the lack of infrastructure. Freightliner of Arizona firmly believes that natural gas will power the future for fleets, and we are currently working to help establish local Arizona infrastructure to support increased natural gas truck sales. The proposed Blythe natural gas fueling station will unquestionably allow our customers to more aggressively adopt natural gas trucks in their operations. Based upon ongoing discussions we are having with our customers, we estimate that several of our customers would adopt natural gas for routes between Arizona and California, with approximately fifty to one hundred trucks to be deployed along this route in the first year of station operation. Given our natural gas station and fleet development efforts in Arizona for fleets operating along I-10, our customers would thus meet the Energy Commission's requirement that prospective natural gas users operate within 25 miles of the station site location.

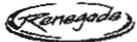


Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling gap, Freightliner of Arizona strongly urges you to provide the requested funding for this station. Should you have any questions about our company, our natural gas truck sales and program development efforts, or our support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,

Danny Cuzick

Danny Cuzick
President and CEO
Freightliner of Arizona
(623) 907-6600
dcuzick@fswaz.com



Phoenix

9899 West Roosevelt Street
Tolleson, Arizona 85353
(623) 907-9900
fax: (623) 907-6401

Chandler

1230 South Akimel Drive
Chandler, Arizona 85226
(480) 282-4000
fax: (480) 282-4059

Flagstaff

4201 East Huntington Drive
Flagstaff, Arizona 86004
(928) 522-0400
fax: (928) 522-0072

Tucson

4340 East Tennessee Street
Tucson, Arizona 85714
(520) 514-5700
fax: (520) 514-5900

MALLET & SONS TRUCKING CO. INC.

P.O. BOX 241 BLYTHE, CA 92226-0241
(760) 922-2297 OFFICE (760) 922-9515 FAX

March 1, 2012

Ms. Karen Douglas, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: HayDay Farms, Inc. Natural Gas Fueling Station Application

Dear Commissioner Douglas:

I am writing to express our strong support for the application submitted by HayDay Farms, Inc. (HayDay) for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. HayDay's project will establish publicly accessible alternative fuel infrastructure along I-10 at a critical location that will serve both the goods movement traffic along I-10 and the underserved Palo Verde Valley. The I-10 freeway corridor is an essential trucking route that connects Phoenix, through Blythe along the California/Arizona border, with the Ports of Los Angeles and Long Beach. Currently, there is a critical gap in the natural gas fueling infrastructure along this corridor and the expense associated with developing a natural gas station of our own has proven cost-prohibitive. As such, HayDay's natural gas fueling station would finally afford Mallett and Sons Trucking Co. Inc. the opportunity to try natural gas trucks into our operations.

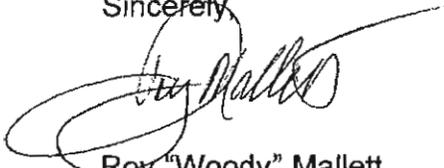
Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling gap, Mallett and Sons strongly urges you to provide the requested funding for this station. Over the past few years, Mallett and Sons have increasingly considered LNG and CNG vehicle operations. Our company deploys a fleet of 20 vehicles that currently use 4,000 gallons of diesel every day. If our fueling needs could be replaced by natural gas, we would reduce 25% of petroleum usage over a one year period, in addition to lowering emissions and experiencing savings due to the less expensive cost of natural gas. However, the lack of convenient, publically accessible fueling infrastructure has thus far prevented us from deploying natural gas trucks.

At this point, given existing infrastructure options, we cannot afford to get involved with natural gas operations, despite the carbon and emission benefits. The development of alternative fueling stations such as this one in such a key corridor location is encouraging to Mallett and Sons and sends a strong message about the staying power and commitment in California to natural gas fueling options. Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling station gap, Mallett and Sons strongly urges you to provide the requested funding for this critical station. Our fleet operates within 25 miles of the Blythe station site and would be eager to test natural gas operations at this refueling infrastructure site.

A commitment by the Energy Commission to comprehensive natural gas fueling corridor development would provide us with the opportunity to stay ahead of the curve when it comes to investing in alternative fuel technologies that improve environmental operations and reduce dependency on foreign oil. We are excited to see continuing advances of natural gas vehicle technology options and a growing commitment to develop supporting infrastructure. We strongly urge the Energy Commission to support this project along such a critical interstate corridor. It is efforts like these, combined with the commitments being made by companies such as HayDay Farms, Inc. that will allow us to more quickly advance to a low carbon economy.

Should you have any questions about our company, our sustainability efforts, or our support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,

A handwritten signature in black ink, appearing to read "Roy Mallett", with a large, sweeping flourish underneath.

Roy "Woody" Mallett
President/Owner
Mallett and Sons Trucking Co. Inc.
(760) 922-2297
mallett33@frontier.com



PALO VERDE IRRIGATION DISTRICT

180 WEST 14TH AVENUE - BLYTHE, CALIFORNIA 92225-2714

TELEPHONE (760) 922-3144 - FAX (760) 922-8294

March 6, 2012

Ms. Karen Douglas, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: HayDay Farms Natural Gas Fueling Station Application

Dear Commissioner Douglas:

I am writing to express our strong support for the application submitted by HayDay Farms (HayDay) for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. HayDay's project will establish publicly accessible alternative fuel infrastructure along I-10 at a critical location that will serve both the goods movement traffic along I-10 and the underserved Palo Verde Valley. The I-10 freeway corridor is an essential trucking route that connects Phoenix, through Blythe along the California/Arizona border, with the Ports of Los Angeles and Long Beach. Currently, there is a critical gap in the natural gas fueling infrastructure along this corridor and the expense associated with developing a natural gas station of our own has proven cost-prohibitive. As such, HayDay's natural gas fueling station would finally afford Palo Verde Irrigation District (PVID) the opportunity to try natural gas trucks into our operations.

Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling gap, PVID strongly urges you to provide the requested funding for this station. Over the past few years, PVID has increasingly considered LNG and CNG vehicle operations. Our company deploys a fleet of 14 diesel vehicles that currently use 30 thousand gallons of diesel and a fleet of 52 gas vehicles that currently use 55 thousand gallons every year. If our fueling needs could be replaced by natural gas, we would reduce the numbers of gallons by 25 thousand gallons of petroleum usage over a one year period, in addition to lowering

emissions and experiencing savings due to the less expensive cost of natural gas. However, the lack of convenient, publically accessible fueling infrastructure has thus far prevented us from deploying natural gas trucks.

At this point, given existing infrastructure options, we cannot afford get involved with natural gas operations, despite the carbon and emission benefits. The development of alternative fueling stations such as this one in such a key corridor location is encouraging to PVID and sends a strong message about the staying power and commitment in California to natural gas fueling options. Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling station gap, PVID strongly urges you to provide the requested funding for this critical station. Our fleet operates within 25 miles of the Blythe station site and would be eager to test natural gas operations at this refueling infrastructure site.

A commitment by the Energy Commission to comprehensive natural gas fueling corridor development would provide us with the opportunity to stay ahead of the curve when it comes to investing in alternative fuel technologies that improve environmental operations and reduce dependency on foreign oil. We are excited to see continuing advances of natural gas vehicle technology options and a growing commitment to develop supporting infrastructure. We strongly urge the Energy Commission to support this project along such a critical interstate corridor. It is efforts like these, combined with the commitments being made by companies such as HayDay Farms that will allow us to more quickly advance to a low carbon economy.

Should you have any questions about our company, our sustainability efforts, or our support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,



Edward W. Smith
General Manager
Palo Verde Irrigation District

Phone 760-922-3144

E-mail ed.smith@pvid.org



March 14, 2012

Ms. Karen Douglas, Chair
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

RE: HayDay Farms Natural Gas Fueling Station Application

Dear Commissioner Douglas:

I am writing to express our strong support for the application submitted by HayDay Farms (HayDay) for Energy Commission funding to establish the infrastructure necessary to store, distribute, and dispense natural gas vehicle fuel in Blythe, California. HayDay's project will establish publicly accessible alternative fuel infrastructure along I-10 at a critical location that will serve both the goods movement traffic along I-10 and the underserved agricultural community and businesses. The I-10 freeway is an essential trucking route that connects our business interests just outside of Phoenix with the I-5, I-99 and the Central Valley. Although Western Milling LLC is seriously considering its natural gas transportation options, there is a critical gap in the natural gas fueling infrastructure along our trucking route and the expense associated with developing a natural gas station of our own has proven cost-prohibitive. As such, HayDay's natural gas fueling station in Blythe would afford Western Milling LLC the opportunity to try natural gas trucks into our operations between Phoenix, through Blythe to Southern California, and up to the Central Valley.

Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling gap, Western Milling strongly urges you to provide the requested funding for this station. Over the past few years, Western Milling has increasingly considered LNG and CNG vehicle operations. Our company is a bulk feed and grain operation based in Goshen, CA. We are building a new grain facility in Buckeye, AZ and are exploring natural gas as an alternative fuel for some of our truck fleet. Additionally, we are exploring the development of small scale liquefaction facility in AZ, which could support natural gas fueled transport into California, if adequate supporting infrastructure were available.

Our company deploys a fleet of 48 Class A vehicles that currently use 58,000 gallons of diesel every day. If our fueling needs could be replaced by natural gas, we would reduce 672,000 gallons of #2 diesel of petroleum usage over a one year period, in addition to lowering emissions and experiencing savings due to the less expensive cost of natural gas. However, the



31120 West Street • Post Office Box 1029 • Goshen, California 93227
Phone (559) 302-1000 • Fax (559) 651-0246



lack of convenient, publically accessible fueling infrastructure has thus far prevented us from deploying natural gas trucks.

At this point, given existing infrastructure options, we cannot afford get involved with natural gas operations, despite the carbon and emission benefits. The development of alternative fueling stations such as this one in such a key corridor location is encouraging to Western Milling and sends a strong message about the staying power and commitment in California to natural gas fueling options. Given the tremendous economic and environmental benefits of this project, and the potential for it to bridge a critical natural gas fueling station gap, Western Milling strongly urges you to provide the requested funding for this critical station. Our fleet operates within 25 miles of the Blythe station site and would be eager to test natural gas operations at this refueling infrastructure site.

A commitment by the Energy Commission to comprehensive natural gas fueling corridor development would provide us with the opportunity to stay ahead of the curve when it comes to investing in alternative fuel technologies that improve environmental operations and reduce dependency on foreign oil. We are excited to see continuing advances of natural gas vehicle technology options and a growing commitment to develop supporting infrastructure. We strongly urge the Energy Commission to support this project along such a critical interstate corridor. It is efforts like these, combined with the commitments being made by companies such as HayDay Farms that will allow us to more quickly advance to a low carbon economy.

Should you have any questions about our company, our sustainability efforts, or our support for this natural gas fueling station project, please do not hesitate to contact me at any time.

Sincerely,



Kevin Kruse

President/CEO

Western Milling, LLC

559.302.1000

khkruse@westernmilling.com

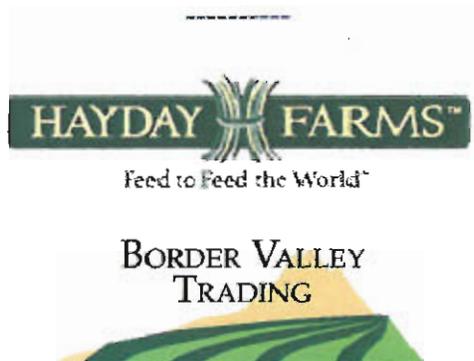
**California Energy Commission's Alternative and
Renewable Fuel and Vehicle Technology Program**

Response to PON-11-602

**Appendix 7:
Regional Fuel Use Analysis,
Emission and Petroleum
Reduction Calculations**

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**



Blythe LNG Public Access Station - Cost Effectiveness

Cost-Effectiveness of Energy Commission Funding	
	2015 Build-Out (HDF and Retail Users)
Cost-Effectiveness of Petroleum Reductions	
Annual Diesel Displacement in 2013 - partial year (gallons)	212,500
Annual Diesel Displacement in 2015 (gallons)	758,275
Diesel Displacement (2013 and 2013-2015)	1,493,350
Energy Commission Funding Requested	\$600,000
<i>Cost Effectiveness of Petroleum Reductions (Energy Commission Funding/Petroleum Reduction)</i>	\$0.4018
Cost-Effectiveness of GHG Reductions	
Annual GHG Reductions in 2013 - partial year (Metric Tons of CO ₂ e)	638
Annual GHG Reductions in 2015 (Metric Tons of CO ₂ e)	2,486
GHG Reductions (2013-2015) in Metric Tons of CO ₂ e	4,798
Energy Commission Funding Requested	\$600,000
<i>Cost Effectiveness of GHG (Energy Commission Funding/GHG Reduction)</i>	\$125.04

Blythe LNG Public Access Station - Fuel Use and Displacement Projections

Blythe Station Diesel Displacement				
Year	2012	2013	2014	2015
HayDay Farms	-	212,500	318,750	350,625
Retail Users		0	203,825	407,650
TOTAL		212,500	522,575	758,275

Blythe Station LNG DGE Use				
Year	2012	2013	2014	2015
HDF LNG	-	362,487	543,730.97	598,104.07
Retail Users LNG	-	-	44,351.39	88,702.78
Retail Users LCNG	-	-	210,532.15	421,064.30
TOTAL	-	362,487	798,615	1,107,871

Blythe LNG Public Access Station - HDF Greenhouse Gas Emission Reductions 2013

	Diesel	Alternative Fuel/Technology	Reduction
FUEL		LNG	
% of Operations on Diesel	100%	15%	
% of Operations on ALT FUEL	0%	85%	
Annual Diesel Consumption (Diesel gallons/truck)	18750	2813	15937.5
Annual Fuel Consumption ALT FUEL (gallons/truck)		27187	
Fuel Economy Penalty	0%	0%	
Annual Energy Consumption (MJ)	2,521,313	2,521,313	
GHG for Diesel (gCO ₂ e/Mj)	94.71	94.71	
GHG for ALT FUEL (gCO ₂ e/Mj)	72.38	72.38	
Energy Content Diesel (MJ/gal)	134.47	134.47	
Energy Content ALT FUEL (MJ/gal)	78.83	78.83	
Annual GHG Emissions (CO ₂ e tonnes)	238.79	190.94	47.86
Number of Trucks		20	
Total Annual GHG Emission Reductions (tonnes)			957
Total 2013 GHG Emission Reductions (April - Dec)			638

Blythe LNG Public Access Station - HDF GHG Emission Reductions 2014

	Diesel	Alternative Fuel/Technology	Reduction
FUEL		LNG	
% of Operations on Diesel	100%	15%	
% of Operations on ALT FUEL	0%	85%	
Annual Diesel Consumption (Diesel gallons/truck)	18750	2813	15937.5
Annual Fuel Consumption ALT FUEL (gallons/truck)		27187	
Fuel Economy Penalty	0%	0%	
Annual Energy Consumption (MJ)	2,521,313	2,521,313	
GHG for Diesel (gCO ₂ e/Mj)	94.71	94.71	
GHG for ALT FUEL (gCO ₂ e/Mj)	72.38	72.38	
Energy Content Diesel (MJ/gal)	134.47	134.47	
Energy Content ALT FUEL (MJ/gal)	78.83	78.83	
Annual GHG Emissions (CO ₂ e tonnes)	238.79	190.94	47.86
Number of Trucks		20	
Total Annual GHG Emission Reductions (tonnes)			957
Total Annual Diesel Displaced (gallons)			318,750
Total Diesel Displaced (10 Years)			3,187,500

Blythe LNG Public Access Station - HDF GHG Emission Reductions 2015

	Diesel	Alternative Fuel/Technology	Reduction
FUEL		LNG	
% of Operations on Diesel	100%	15%	
% of Operations on ALT FUEL	0%	85%	
Annual Diesel Consumption (Diesel gallons/truck)	18750	2813	15937.5
Annual Fuel Consumption ALT FUEL (gallons/truck)		27187	
Fuel Economy Penalty	0%	0%	
Annual Energy Consumption (MJ)	2521313	2521313	
GHG for Diesel (gCO2e/Mj)	94.71	94.71	
GHG for ALT FUEL (gCO2e/Mj)	72.38	72.38	
Energy Content Diesel (MJ/gal)	134.47	134.47	
Energy Content ALT FUEL (MJ/gal)	78.83	78.83	
Annual GHG Emissions (CO2e tonnes)	238.79	190.94	47.86
Number of Trucks		22	
Total Annual GHG Emission Reductions (tonnes)			1,053
Total Annual Diesel Displaced (gallons)			350,625
Total Diesel Displaced (10 Years)			3,506,250

Blythe LNG Public Access Station - LNG Retail GHG Emission Reductions 2014

	Diesel	Alternative Fuel/Technology	Reduction
FUEL		LNG	
% of Operations on Diesel	100%	0%	
% of Operations on ALT FUEL	0%	100%	
Annual Diesel Consumption (Diesel gallons/truck)	26000	0	26000
Annual Fuel Consumption ALT FUEL (gallons/truck)		44351	
Fuel Economy Penalty	0%	0%	
Annual Energy Consumption (MJ)	3496220	3496220	
GHG for Diesel (gCO ₂ e/Mj)	94.71	94.71	
GHG for ALT FUEL (gCO ₂ e/Mj)	72.38	72.38	
Energy Content Diesel (MJ/gal)	134.47	134.47	
Energy Content ALT FUEL (MJ/gal)	78.83	78.83	
Annual GHG Emissions (CO ₂ e tonnes)	331.13	253.06	78.07
Total Annual GHG Emission Reductions (tonnes)			78
Total Annual Diesel Displaced (gallons)			26,000
Total Diesel Displaced (10 Years)			260,000

Blythe LNG Public Access Station - Retail LNG GHG Emission Reductions 2015

	Diesel	Alternative Fuel/Technology	Reduction
FUEL		LNG	
% of Operations on Diesel	100%	0%	
% of Operations on ALT FUEL	0%	100%	
Annual Diesel Consumption (Diesel gallons/truck)	52000	0	52000
Annual Fuel Consumption ALT FUEL (gallons/truck)		88703	
Fuel Economy Penalty	0%	0%	
Annual Energy Consumption (MJ)	6992440	6992440	
GHG for Diesel (gCO ₂ e/Mj)	94.71	94.71	
GHG for ALT FUEL (gCO ₂ e/Mj)	72.38	72.38	
Energy Content Diesel (MJ/gal)	134.47	134.47	
Energy Content ALT FUEL (MJ/gal)	78.83	78.83	
Annual GHG Emissions (CO ₂ e tonnes)	662.25	506.11	156.14
Total Annual GHG Emission Reductions (tonnes)			156
Total Annual Diesel Displaced (gallons)			52,000
Total Diesel Displaced (10 Years)			520,000

Blythe LNG Public Access Station - CNG Retail User GHG Emission Reductions 2014

	Diesel	Alternative Fuel/Technology	Reduction
FUEL		CNG	
% of Operations on Diesel	100%	0%	
% of Operations on ALT FUEL	0%	100%	
Annual Diesel Consumption (Diesel gallons/truck)	177825	0	177825
Annual Fuel Consumption ALT FUEL (gallons/truck)		210532	
Fuel Economy Penalty	0%	0%	
Annual Energy Consumption (MJ)	23912128	23912128	
GHG for Diesel (gCO ₂ e/Mj)	94.71	94.71	
GHG for ALT FUEL (gCO ₂ e/Mj)	68	68	
Energy Content Diesel (MJ/gal)	134.47	134.47	
Energy Content ALT FUEL (MJ/gal)	113.57946	113.57946	
Annual GHG Emissions (CO ₂ e tonnes)	2264.72	1626.02	638.69
Total Annual GHG Emission Reductions (tonnes)			639
Total Annual Diesel Displaced (gallons)			177,825
Total Diesel Displaced (10 Years)			1,778,250

Blythe LNG Public Access Station - CNG Retail GHG Emission Reductions 2015

	Diesel	Alternative Fuel/Technol ogy	Reduction
FUEL		CNG	
% of Operations on Diesel	100%	0%	
% of Operations on ALT FUEL	0%	100%	
Annual Diesel Consumption (Diesel gallons/truck)	355650	0	355650
Annual Fuel Consumption ALT FUEL (gallons/truck)		421064	
Fuel Economy Penalty	0%	0%	
Annual Energy Consumption (MJ)	47824256	47824256	
GHG for Diesel (gCO ₂ e/Mj)	94.71	94.71	
GHG for ALT FUEL (gCO ₂ e/Mj)	68	68	
Energy Content Diesel (MJ/gal)	134.47	134.47	
Energy Content ALT FUEL (MJ/gal)	113.57946	113.57946	
Annual GHG Emissions (CO ₂ e tonnes)	4529.44	3252.05	1277.39
Total Annual GHG Emission Reductions (tonnes)			1,277
Total Annual Diesel Displaced (gallons)			355,650
Total Diesel Displaced (10 Years)			3,556,500

Blythe LNG Public Access Station - 2013 Criteria Pollutant Emission Reductions

Criteria Pollutant Emission Reduction Calculation	NOx
Baseline Emission Factor (g/mi) Diesel	6.36
Baseline Emission Factor (g/mi) w/PM Retrofit	6.36
Reduced Emission Factor (g/bhp-hr) ISX G	0.16
Conversion Factor (bhp-hr/mi)	2.90
Energy Consumption Factor (bhp-hr/gal)	18.50
Annual Fuel Consumption (diesel)	18,750
Annual Mileage	75,000
% in Operation in CA (1.0 = 100%)	1.0
(ton/907,200 g)	0.00000110229277
Projected Baseline Emissions (tons/year)	0.53
Projected Reduced Emissions (tons/year)	0.06
Annual Emission Reductions (tons/year)	0.47
Emission Weighting for Cost Effectiveness Calculations	1.00
Project Life	8
Number of Vehicles	20
TOTAL ANNUAL WEIGHTED EMISSION REDUCTIONS	9.30
TOTAL PROJECT TONS	74.40

Blythe LNG Public Access Station - 2014 Criteria Pollutant Emission Reductions

Criteria Pollutant Emission Reduction Calculation	NOx
Baseline Emission Factor (g/mi) Diesel	6.36
Baseline Emission Factor (g/mi) w/PM Retrofit	6.36
Reduced Emission Factor (g/bhp-hr) ISX G	0.16
Conversion Factor (bhp-hr/mi)	2.90
Energy Consumption Factor (bhp-hr/gal)	18.50
Annual Fuel Consumption (diesel)	18,750
Annual Mileage	112,500
% in Operation in CA (1.0 = 100%)	1.0
(ton/907,200 g)	0.00000110229277
Projected Baseline Emissions (tons/year)	0.79
Projected Reduced Emissions (tons/year)	0.06
Annual Emission Reductions (tons/year)	0.73
Emission Weighting for Cost Effectiveness Calculations	1.00
Project Life	8
Number of Vehicles	20
TOTAL ANNUAL WEIGHTED EMISSION REDUCTIONS	14.56
TOTAL PROJECT TONS	116.48

Blythe LNG Public Access Station - Criteria Pollutant Emission Reductions in 2015

Criteria Pollutant Emission Reduction Calculation	NOx
Baseline Emission Factor (g/mi) Diesel	6.36
Baseline Emission Factor (g/mi) w/PM Retrofit	6.36
Reduced Emission Factor (g/bhp-hr) ISX G	0.16
Conversion Factor (bhp-hr/mi)	2.90
Energy Consumption Factor (bhp-hr/gal)	18.50
Annual Fuel Consumption (diesel)	18,750
Annual Mileage	112,500
% in Operation in CA (1.0 = 100%)	1.0
(ton/907,200 g)	0.00000110229277
Projected Baseline Emissions (tons/year)	0.79
Projected Reduced Emissions (tons/year)	0.06
Annual Emission Reductions (tons/year)	0.73
Emission Weighting for Cost Effectiveness Calculations	1.00
Project Life	8
Number of Vehicles	22
TOTAL ANNUAL WEIGHTED EMISSION REDUCTIONS	16.02

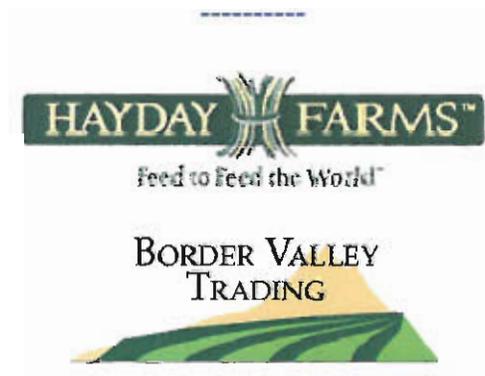
**California Energy Commission's Alternative and
Renewable Fuel and Vehicle Technology Program**

Response to PON-11-602

**Appendix 8:
Match-Funding
Agreements**

Blackhawk Logistics LLC,

**A jointly held company of HayDay Farms and
Border Valley Trading**





Mojave Desert Air Quality Management District

14306 Park Avenue, Victorville, CA 92392-2310

760.245.1661 • fax 760.245.2699

Visit our web site: <http://www.mdaqmd.ca.gov>

Eldon Heaston, Executive Director

March 19, 2012

Dale Tyson
Vice President
HayDay Farms
15500 South Commercial
Blythe, CA 92225

RE: HayDay Farms Blythe AB 2766 Contract Change Request

Dear Mr. Tyson:

We are in receipt of the above change request.

We certainly understand your need to make the HayDay Farms alternative fuels facility financially viable. As you know, the MDAQMD supports all efforts to create alternative fuel operations within our District.

We appreciate that HayDay Farms will include plans for a future CNG component within the approval documents for the Blythe project currently underway. On this basis, we approve your request to amend your current grant contract with the MDAQMD to remove the operating CNG component as a condition of completion.

As market demand warrants, we look forward to the installation of CNG at your facility. In the meantime, all other obligations of the AB 2766 grant contract will remain the same.

I will direct staff to prepare a formal amendment to our existing contract, however; this letter will serve as authorization to proceed until such time as that amendment is signed.

The MDAQMD is pleased to hear that your project is progressing and we look forward to updates on the project and its completion. Your effort to establish alternative fuel facilities throughout Southern California and Arizona is commendable.

Sincerely,

A handwritten signature in black ink, appearing to read "Eldon Heaston". The signature is stylized and somewhat cursive.

Eldon Heaston
Executive Officer/APCO

hn



Mojave Desert Air Quality Management District

14306 Park Avenue, Victorville, CA 92392-2310

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Visit our web site: <http://www.mdaqmd.ca.gov>

Eldon Heaston, Executive Director

September 29, 2011

Mr. Dale Tyson
HayDay Farms
15500 South Commercial
Blythe, CA 92225

RE: AB2766 Grant Contract

Dear Mr. Tyson:

Please find enclosed two (2) copies of the contract for your LCNG Project. These documents have been reviewed and approved by the Mojave Desert Air Quality Management District (MDAQMD) Counsel.

Please review and sign the enclosed documents and return them to my office at your earliest convenience.

Once we have received the signed copies, our Executive Director will sign to execute the contract. An original signed copy of the executed contract will then be returned to your office.

Thank you again for participating in our 2011-13 AB 2766 Call for Projects. We look forward to working with you and wish you great success with your project. Should you have any questions, please call Holly Noel at (760)245-1661 X1885.

Warmest regards,

A handwritten signature in black ink, appearing to read "Alan J. De Salvio".

Alan J. De Salvio
Supervising Engineer

AJD/hn

CC: Ulrich Sauerbrey

COPY

1 **AGREEMENT BETWEEN HAYDAY FARMS AND THE MOJAVE DESERT**
2 **AIR QUALITY MANAGEMENT DISTRICT**

3 This Agreement is made and entered between **Hayday Farms** (hereinafter **Grantee**), located at **15500**
4 **South Commercial, Blythe, California 92225**; and the Mojave Desert Air Quality Management
5 District (hereinafter MDAQMD), located at 14306 Park Avenue, Victorville, California 92392-2310
6 (**Grantee** and MDAQMD are collectively referred to as "the Parties"). This Agreement shall be
7 effective from **October 1, 2011** until it is terminated as provided herein.

8 **WITNESSETH:**

9 WHEREAS, the MDAQMD established the AB 2766 Competitive Bidding program pursuant to
10 the authority granted by H & S Code §§44220 et. seq. (AB 2766, Statutes of 1990); and

11 WHEREAS, the AB 2766 Competitive Bidding Program funds projects to reduce air pollution
12 from motor vehicles and for related planning, monitoring, enforcement, and technical studies necessary
13 to implement the California Clean Air Act; and

14 WHEREAS, **Grantee** submitted a proposal to the AB 2766 Competitive Bidding Program for
15 the **development of a LNG/LCNG fueling station adjacent to the I-10 in the City of Blythe**; and

16 WHEREAS, the AB 2766 Competitive Bidding Program Evaluation Committee recommended,
17 and the MDAQMD Governing Board approved, funding for the **development of a LNG/LCNG fueling**
18 **station adjacent to the I-10 in the City of Blythe** which was proposed by **Grantee**; and

19 WHEREAS, **Grantee** is willing, able, and qualified to render competently the services as
20 described herein and pursuant to the terms and conditions contained herein and its exhibit.

21 NOW THEREFORE, in consideration of mutual covenants and conditions, the Parties hereto
22 agree as follows:

23 **TERMS AND CONDITIONS**

24 1. **Due Diligence:** Upon the commencement of the term of this Agreement, **Grantee** agrees to
25 proceed with due diligence to perform the work as described in the Scope of Work, attached hereto and
26 incorporated herein as Exhibit "A".

27 2. **Purpose:** The purpose of this Agreement is for **Grantee** to use toward the **development of a**
28 **LNG/LCNG fueling station adjacent to the I-10 in the City of Blythe**. **Grantee** shall produce

1 deliverables and a Final Report as specified in "Exhibit A" and containing sufficient information to
2 substantiate that the AB 2766 funds were used for activities related to reduction of emissions from motor
3 vehicles.

4 3. Schedule: Grantee shall follow the general schedule specified in the Scope of Work, and shall
5 provide, on or before the completion date set forth therein, five (5) copies of the Final Report to the Air
6 Pollution Control Officer, MDAQMD, 14306 Park Avenue, Victorville, CA 92392-2310.

7 4. Term: This Agreement shall commence on **October 1, 2011**, and terminate thirty days after the
8 performance of the last obligation of the Parties as provided herein, or thirty days after the delivery of
9 the Final Report as specified in "Exhibit A" whichever is later; or a later date as mutually agreed upon in
10 writing by MDAQMD and Grantee.

11 5. Cost: The total payment to Grantee shall not exceed **Three Hundred Ten Thousand Five**
12 **Hundred Forty One Dollars and Six Cents (\$310,541.06)**. Payment toward the project shall not
13 exceed the cost of the project as specified in the project proposal or **Threc Hundred Ten Thousand**
14 **Five Hundred Forty One Dollars and Six Cents (\$310,541.06)** whichever is less. Grantee shall
15 obtain through other sources sufficient additional monies to fund the total cost of the project as outlined
16 in the Scope of Work. Grantee shall provide written evidence of commitment for such funding to
17 MDAQMD and the MDAQMD may not release any funds under this Agreement until it finds such
18 evidence satisfactory. In the event funding from such other sources is not received by Grantee,
19 MDAQMD reserves the right to terminate or re negotiate this Agreement.

20 a. Payments.

21 i. MDAQMD shall not make any advance payment under this Agreement.

22 ii. Grantee shall support each claim for payment under this Agreement by proper invoice(s)
23 that set forth the work completed, receipt(s) and/or other documents necessary for the
24 MDAQMD to verify the validity of each claim. Claims for payment must be submitted
25 to MDAQMD, Attention: Holly Noel, Grants Program Coordinator. Such claims for
26 payment may be submitted on a monthly basis.

27 iii. MDAQMD will pay Grantee for claims in arrears within forty-five (45) calendar days of
28 receipt of proper documentation and verification that Grantee has satisfactorily

1 completed the work for which payment is sought.

2 iv The amount to be paid to **Grantee** under this Agreement includes all sales and use taxes
3 incurred pursuant to this Agreement, including but not limited to any taxes due on
4 equipment purchased by **Grantee**. **Grantee** shall not receive additional funds for
5 reimbursement of such taxes and shall not decrease work to compensate therefore.

6 v. Concurrently with the submission of any claim for payment, **Grantee** shall certify that
7 complete payment has been made to any and all subcontractors. **Grantee** shall support
8 such certification by appropriate copies of invoices issued, checks, receipts, and similar
9 documents.

10 b. Close-out Period: All final claims shall be submitted by **Grantee** within sixty (60) days
11 following the final month of activities for which payment is claimed. MDAQMD will have no
12 obligation to pay or take any action on claims submitted after the 60-day close-out period.

13 6. Non-Allocation of Funds: The terms of this Agreement and the services to be provided
14 thereunder are contingent on the approval of funds by the appropriating government agency. Should
15 sufficient funds not be allocated, the services provided may be modified or this Agreement terminated at
16 any time by giving **Grantee** 30 days prior written notice.

17 7. Independent Contractors:

18 a. The relationship of **Grantee** to MDAQMD under this Agreement is that of an independent
19 Contractor. **Grantee** is to exercise its own discretion as to the method and manner of performing its
20 duties. MDAQMD will not exercise control over **Grantee**, its employees, agents, or subcontractors,
21 except regarding the result to be obtained and to verify compliance with the terms of this Agreement.
22 **Grantee** and MDAQMD shall comply with all applicable provisions of law and the rules and
23 regulations, if any, of governmental authorities having jurisdiction over matters the subject thereof.

24 b. **Grantee** understands that this Agreement does not preclude **Grantee** from performing services
25 for other projects under the jurisdiction of the MDAQMD as long as such services are not in conflict
26 with this Agreement and as long as such services do not create conflict of interest under applicable laws.

27 c. The Parties further agree that since the status of **Grantee** is that of an independent contractor,
28 **Grantee** shall not become entitled to any employment rights or benefits that are available to the

1 employees of MDAQMD. The Parties further agree that **Grantee** shall be solely responsible for
2 providing to itself, and on behalf of itself, all legally required employment benefits.

3 8. Termination:

4 a. Breach of Agreement: MDAQMD may immediately suspend or terminate this Agreement, in
5 whole or in part, where in the reasonable determination of MDAQMD there is:

- 6 i. An illegal or improper use of funds;
- 7 ii. A breach by **Grantee** of any material term of this Agreement and failure to cure such
8 breach within thirty (30) days following written notice from MDAQMD; or
- 9 iii. A substantially incorrect or incomplete report submitted to MDAQMD that is not
10 corrected within thirty (30) days following written notice by the MDAQMD of the
11 reported deficiencies.

12 In no event shall any payment by MDAQMD constitute a waiver by MDAQMD of any breach of this
13 Agreement or any default which may then exist on the part of **Grantee**. Neither shall such payment
14 impair or prejudice any remedy available to MDAQMD with respect to the breach or default.

15 MDAQMD shall have the right to demand of **Grantee** the repayment to MDAQMD of any funds
16 disbursed to **Grantee** under this Agreement which in the judgment of MDAQMD were not expended in
17 accordance with the terms of this Agreement. **Grantee** shall promptly refund any such funds upon
18 demand. In addition to immediate suspension or termination, MDAQMD may seek any other remedies
19 available at law, in equity, or otherwise specified in this Agreement.

20 b. Without Cause: Either Party may terminate this Agreement upon giving written notice to the
21 other Party at least 30 days before the effective date of such termination. In the event of such
22 termination, **Grantee** shall, subject to section 5 of this Agreement, be paid the actual, reasonable costs
23 incurred up to the time of termination for those portions of the project which were satisfactorily
24 completed, provided that the completed tasks achieve, or provide the means of achieving, actual
25 emission reductions from motor vehicles as determined by MDAQMD. If completed project tasks do
26 not achieve or provide the means of achieving actual emission reductions from motor vehicles, **Grantee**
27 shall reimburse MDAQMD for all funds which MDAQMD has paid. Upon such termination, all the
28 work produced by **Grantee** shall be delivered promptly to MDAQMD.

1 c. For Cause: MDAQMD may terminate this Agreement upon the conviction for any criminal act
2 by **Grantee**, its agents, officers, and employees if such act directly relates to this Agreement.

3 d. Non-Compliance with Scope of Work: The MDAQMD may terminate agreement and request
4 refund of unspent funds if the project or milestones identified on the Scope of Work with an "*" are not
5 met by the date specified in the Scope of Work, unless the Scope of Work has been modified pursuant to
6 the provisions of Paragraph 19.

7 9. Indemnification: **Grantee** agrees to indemnify, defend and hold harmless MDAQMD and its
8 authorized agents, officers, volunteers and employees against any and all claims or actions arising from
9 **Grantee** acts, errors or omissions in performing services pursuant to this Agreement. **Grantee** agrees to
10 indemnify, defend, and hold harmless MDAQMD against any and all losses sustained due to the
11 installation and use of equipment pursuant to this Agreement for the life of the equipment. MDAQMD
12 agrees to indemnify, defend and hold harmless **Grantee** and its authorized agents, officers, volunteers
13 and employees against any and all claims or actions arising from MDAQMD's acts, errors or omissions
14 in performing services pursuant to this Agreement.

15 10. Insurance:

16 a. In order to accomplish the indemnification herein provided for, **Grantee** shall secure and
17 maintain, throughout the term of the Agreement, the following types of insurance issued by companies
18 reasonably acceptable to MDAQMD. **Grantee** will procure and maintain insurance as required by law
19 or regulation. At a minimum, **Grantee** will procure and maintain the following types of insurance:

- 20 i. Workers' compensation insurance in amounts to satisfy applicable state laws;
- 21 ii. Employer's liability insurance in the amount of \$1,000,000;
- 22 iii. Automobile liability insurance in the amount of \$1,000,000 per occurrence;
- 23 iv. General commercial liability insurance for bodily injury, death or loss of or damage to
24 property of third persons in the minimum amount of \$1,000,000 per occurrence and in the
25 aggregate.

26 b. Such insurance policies shall name MDAQMD, its officers, agents, employees, individually and
27 collectively, as additional insured (except workers' compensation insurance), for purposes of the matter
28 covered under this Agreement. Such coverage for additional insured shall apply as primary insurance,

1 and any other insurance maintained by MDAQMD, its officers, agents, and employees, shall be excess
2 only and not contributing with insurance provided under **Grantee** policies herein. This insurance shall
3 not be canceled or changed without a minimum of thirty (30) days prior written notice given to
4 MDAQMD.

5 c. Prior to the commencement of performing its obligations under this Agreement, **Grantee** shall
6 provide to MDAQMD appropriate certificates from its insurance carrier or carriers stating that such
7 insurance coverages have been obtained and are in full force; that MDAQMD, its officers, agents and
8 employees will not be responsible for any premiums on the policies; that such insurance names
9 MDAQMD, its officers, agents, and employees, individually and collectively, as additional insureds and
10 stating policy number, dates of expiration, limits of liability thereunder, and special endorsements
11 (except workers' compensation insurance), for purposes of the matter covered under this Agreement;
12 that such coverage for additional insured shall apply as primary insurance and any other insurance
13 maintained by MDAQMD, its officer, agents, and employees, shall be excess only and not contributing
14 with insurance provided under **Grantee** policies herein.

15 d. If **Grantee** is a government entity, then it may self-insure such of those risks identified in
16 subsections 10.a.i-iv of this Agreement, provided, however, that:

- 17 i. MDAQMD, its officers, agents, and employees, individually and collectively, shall be
18 named as additional insured (except for workers' compensation insurance) on **Grantee**
19 self-insurance plans, but only insofar as the operations under this Agreement are
20 concerned;
- 21 ii. Such self-insurance plans shall be reasonably satisfactory to MDAQMD; and
- 22 iii. All those provisions identified in subsection 10.c. of this Agreement concerning the
23 relationship of **Grantee** primary and MDAQMD's excess insurance to each other, the
24 requirement of **Grantee** delivering a certificate of insurance or other suitable evidence to
25 MDAQMD, and the cancellation/change of insurance requirements shall apply to such
26 self-insurance plans.

27 11. Audits and Inspections:

28 a. **Grantee** shall at any time during regular business hours, and as often as MDAQMD may deem

1 necessary, make available to MDAQMD for examination all of its records and data with respect to the
2 matters covered in this Agreement. **Grantee** shall, and upon request by MDAQMD, permit MDAQMD
3 to audit and inspect all of such records and data necessary to ensure **Grantee** compliance with the terms
4 of this Agreement.

5 b. **Grantee** shall be subject to an audit by MDAQMD or its authorized representative to determine
6 if the funds received by **Grantee** were spent for the reduction of pollution as provided in AB 2766 and
7 to determine whether said funds were spent as provided by law and this Agreement. If after audit
8 MDAQMD makes a determination that funds provided to **Grantee** pursuant to this Agreement were not
9 spent in conformance with this Agreement or the requirements of AB 2766 or any other applicable
10 provisions of law, **Grantee** agrees to immediately reimburse MDAQMD all funds determined to have
11 been expended not in conformance with said provisions.

12 c. **Grantee** shall retain all records and data for activities performed under this Agreement for at
13 least three (3) years from the date of final payment beyond the performance of the final obligation
14 required pursuant to this Agreement or until all state and federal audits are completed for that fiscal year,
15 whichever is later.

16 12. Notices: The persons and their addresses having authority to give and receive notices under this
17 Agreement are as follows:

18 GRANTEE	MDAQMD	MDAQMD
19 Dale Tyson	Eldon Heaston	Alan De Salvio
20 Vice-President	Executive Officer/APCO	Supervising Air Quality Engineer
21 Hayday Farms, Inc.	14306 Park Avenue	14306 Park Avenue
22 15500 South Commercial	Victorville, CA 92392	Victorville, CA 92392
Blythe, California 92225		

23 Any and all notices to MDAQMD and **Grantee** provided for or permitted under this Agreement
24 or by law shall be in writing and shall be deemed duly served when personally delivered, or in lieu of
25 such personal service, when actually received or when deposited in the United States mail, postage
26 prepaid, addressed to such party.

27 13. Political Activity Prohibited: None of the funds, materials, property, or services provided under
28 this Agreement shall be used for any political activity, or to further the election or defeat of any
candidate for public office contrary to federal or state laws, statutes, regulations, rules, or guidelines.

1 14. Lobbying Prohibited: None of the funds provided under this Agreement shall be used for
2 publicity, lobbying, or propaganda purposes designed to support or defeat legislation before the
3 Congress of the United States of America or the Legislature of the State of California.

4 15. Conflict Of Interest: No officer, employee or agent of MDAQMD who exercises any function or
5 responsibility for planning and carrying out the services provided under this Agreement shall have any
6 direct or indirect personal financial interest in this Agreement. **Grantee** shall comply with all federal,
7 state and local conflict of interest laws, statutes, and regulations.

8 16. Succession:

9 a. Each Party and the partners, successors, and legal representatives of each Party, and to the extent
10 permitted herein the assigns of each Party, are hereby bound to the other Party and to the partners,
11 successors, legal representatives and assigns, of such other Party, in respect to all covenants, agreements
12 and obligations of this Agreement.

13 b. Neither Party will assign, sublet or transfer any rights or obligations under this Agreement
14 without the written consent of the other. However, **Grantee** is authorized to use employees of or assign
15 this Agreement to an affiliate as it may deem appropriate to assist in the performance of services or as
16 result of an internal reorganization.

17 17. Time is of Essence: Time is of the essence in completion of the services in this Agreement.

18 18. Benefit to Parties: Nothing contained in this Agreement will be construed to give any rights or
19 benefits to any person other than the Parties, and all duties and responsibilities undertaken pursuant to
20 this Agreement will be for the sole and exclusive benefit of the Parties and not for the benefit of any
21 other person.

22 19. Change in Scope of Work: Changes or amendments to the Scope of Work contained in this
23 Agreement, including any increase or decrease in the amount of program funds awarded, and changes in
24 the terms of this Agreement, shall be mutually agreed upon in writing by and between MDAQMD and
25 **Grantee**, and shall only be effective by duly executed written amendments to this Agreement.

26 20. Severability: In the event that any word, phrase, clause, sentence, paragraph, section, article or
27 provision contained in this Agreement is held to be unenforceable for any reason by a court of
28 competent jurisdiction, such holding shall not affect the remaining portions of this Agreement, and the

1 Agreement shall then be construed as if such unenforceable provisions are not a part hereof.

2 21. Captions: The paragraph captions of this Agreement shall have no effect on its interpretations.

3 22. Execution of Agreement: This agreement may be executed via facsimile and in two or more
4 counterparts, each of which shall be deemed an original, but all of which shall be considered one and the
5 same instrument.

6 23. Entire Agreement: This Agreement, together with its Exhibit "A," constitutes the entire
7 Agreement between the Parties and will supersede all prior written or oral understandings. This
8 Agreement and its Exhibits may only be amended, supplemented, modified or canceled by a duly
9 executed written instrument signed by the Parties.

10 24. Governing Law: This Agreement shall be interpreted under the laws of the State of California.
11 Venue for any action arising out of this Agreement shall only be in San Bernardino County, California.
12 This Agreement was entered into in Victorville, California.

13 MOJAVE DESERT AIR QUALITY
14 MANAGEMENT DISTRICT

GRANTEE

15 _____
16
17 ELDON HEASTON
18 Executive Director



DALE TYSON

Vice-President, Hayday Farms, Inc.

19 Dated: _____

Dated: 10/10/2011

20 Approved as to legal form:

21
22 

23 KAREN K. NOWAK
24 District Counsel

25 Dated: 9/26/11

26 END OF CONTRACT.
27
28

Project Stage	Project Tasks	Responsible Party	Start (Month -Year)	End
Land Acquisition	• Identify LCNG Site	Grantee, The Holt Group	<u>7/22/2011</u>	<u>11/14/2011</u>
	Title report		7/22/2011	9/23/2011
	Meeting with the City-Prelim approval of site		9/26/2011	9/28/2011
	Letter of Intent		9/28/2011	10/10/2011
	Site Due Dilligence		10/10/2011	10/24/2011
	Phase 1 Environmental Assessment		10/10/2011	10/24/2011
	Boundary Survey		10/10/2011	10/24/2011
	Draft MOU with City for CNG		10/10/2011	10/31/2011
Option Agreement-10-25% down, the rest at land use approval		10/31/2011	11/14/2011	
Site Planning and Land Use Approvals	• Land Use Approvals	Grantee, The Holt Group	<u>10/10/2011</u>	<u>5/21/2012</u>
	Prepare prelim site plan-HD, BVT and City buy In	Grantee, The Holt Group	10/10/2011	11/28/2011
	Prepare studies for CEQA	Grantee, The Holt Group	11/14/2011	1/16/2012
	Traffic, noise and lIne of site	Grantee, The Holt Group	11/14/2011	1/16/2012
	Habitat and Environment	Grantee, The Holt Group	11/14/2011	1/16/2012
	Emissions	Grantee, The Holt Group	11/14/2011	1/16/2012
	Water, sewer, utilities	Grantee, The Holt Group	11/14/2011	1/16/2012
	City Submittal and review	Grantee, The Holt Group	1/16/2012	3/5/2012
	CEQA review and approvals incl. Public Comment	City of Blythe	3/5/2012	4/23/2012
	City Council Approval	City of Blythe	<u>5/21/2012</u>	<u>5/21/2012</u>
Complete Purchase Parcel-COE	Grantee	<u>5/29/2012</u>	<u>5/29/2012</u>	
Grant Processing and Agency Coordination	• Coordinate grant processing, contracting and reporting	Grantee	<u>9/1/2011</u>	<u>12/20/2012</u>
	Prepare Budgets	Grantee	9/1/2011	9/9/2011
	Prepare Schedules	Grantee	9/1/2011	9/1/2011
	Prepare monthly and quarterly reports	Grantee	11/7/2011	12/20/2012
	Prepare disbursement requests	Grantee	4/23/2012	12/20/2012
Site Engineering	• Finalize site plan	Grantee, The Holt Group	<u>2/12/2012</u>	<u>6/5/2012</u>
	Site grading	Grantee, The Holt Group	2/12/2012	4/23/2012
	PM-10 Dust Control and SWPPP Plans	Grantee, The Holt Group	2/12/2012	4/23/2012
	Water, sewer and utilities	Grantee, The Holt Group	2/12/2012	4/23/2012
	Site paving and concrete	Grantee, The Holt Group	2/12/2012	4/23/2012
	QRS Electrical and Mechanical design	Grantee, Consultant TBD	3/26/2012	4/23/2012
	Offsite street, water and sewer (as required)	Grantee, The Holt Group	3/26/2012	4/23/2012
	City Engineering approvals	City of Blythe	4/23/2012	6/4/2012
City Fees and Permits	Grantee	6/5/2012	6/5/2012	
Bid and Award	• Prepare scopes of work and solicit bids	Grantee	<u>9/1/2011</u>	<u>6/22/2012</u>
	Prepare construction schedule	Grantee	9/1/2011	9/9/2011
	Prepare scopes of work	Grantee	5/7/2012	5/21/2012
	Bid work	Grantee	5/21/2012	6/11/2012
	Award work	Grantee	6/12/2012	6/18/2012
	Contract work	Grantee	6/18/2012	6/22/2012
Site Construction	Pre-construction	Grantee, Subcontractors TBD	7/2/2012	7/2/2012
	Install Temporay Constrction Signage incl Mojave Funding Particpate	Grantee	7/2/2012	7/9/2012
	Prepare disbursement requests	Grantee	6/22/2012	11/12/2012
	Site Construction	Grantee, Subcontractors TBD	7/9/2012	11/12/2012
	Site Start up and Operation	Grantee	<u>11/12/2012</u>	<u>12/17/2012</u>
	Install Permanent Signage Incl Mojave Funding Participation	Grantee	11/19/2012	12/10/2012
	Media Day Announcing Project Start up and Operation	Grantee	12/16/2012	12/12/2016
Site Fully Operational	Grantee	<u>12/17/2012</u>	<u>12/17/2012</u>	

Operational Reporting	Final Report at 30 Days (# of users, Gallons Fuel, Media hits, etc)	Grantee	1/15/2013	1/15/2013
	Final Report at 3 months of Operation	Grantee	3/15/2013	3/15/2012
	Final Report at 6 months of Operation	Grantee	6/15/2013	6/15/2013
	Final Report at 1 Year of Operation	Grantee	12/15/2013	12/15/2013



Award Number: Blackhawk Logistics LLC

Date: 05 / 29 / 2012

Note: The Energy Commission Project Managers Manual includes detailed instructions on how to complete this section, with examples of grants that are “Projects” and are not “Projects”. When the Project Manager is completing this section, if questions arise as to the appropriate answers to the questions below, please consult with the Energy Commission attorney assigned to review grants or loans for your division.

1. Is grant/loan considered a “Project” under CEQA? Yes (skip to question #2) No (continue with question #1)

Please complete the following: [Public Resources Code (PRC) 21065 and 14 California Code of Regulations (CCR) 15378]:

Explain why the grant/loan is **not** considered a “Project”? The grant/loan will not cause a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment because grant/loan involves:

2. If grant/loan is considered a “Project” under CEQA: (choose either **IS** or **IS NOT**)

Grant/loan **IS** exempt:

Statutory Exemption: (List PRC and/or CCR section numbers) _____

Categorical Exemption: (List CCR section number) TBD

Common Sense Exemption. (14 CCR 15061(b)(3))

Explain reason why the grant/loan is exempt under the above section:

Please attach draft Notice of Exemption (NOE). Consult with the Energy Commission attorney assigned to your division for instructions on how to complete the NOE.

Grant/loan **IS NOT** exempt. The Project Manager needs to consult with the Energy Commission attorney assigned to your division and the Siting Office regarding a possible initial study.

**Draft Notice of Determination for the Proposed
Mitigated Negative Declaration**

