PROJECT REPORT

TO: ENVIRONMENTAL EVALUATION COMMITTEE **AGENDA DATE: December 15, 2022**

FROM: PLANNING & DEVELOPMENT SERVICES **AGENDA TIME 1:30 PM/ No. 2**

Conditional Use Permit #22-0021
PROJECT TYPE: Jesus & Liliana Aguirre (Aguirre's Propane, LLC) SUPERVISORY DISTRICT: #4

LOCATION: 1338 Glendale Avenue APN: 014-031-005-000

Salton City, CA 92274 PARCEL SIZE: +/- 1.05 acres

GENERAL PLAN (existing) Urban Area (West Shores/ Salton City Urban Area Plan) GENERAL PLAN (proposed) N/A

ZONE (existing) M-1 (Light Industrial) ZONE (proposed) N/A

GENERAL PLAN FINDINGS ☒ CONSISTENT ☐ INCONSISTENT ☐ MAY BE/FINDINGS

PLANNING COMMISSION DECISION: HEARING DATE: _____

☐ APPROVED ☐ DENIED ☐ OTHER

PLANNING DIRECTORS DECISION: HEARING DATE: _____

☐ APPROVED ☐ DENIED ☐ OTHER

ENVIROMENTAL EVALUATION COMMITTEE DECISION: HEARING DATE: 12/15/2022

INITIAL STUDY: #22-0035

☐ NEGATIVE DECLARATION ☐ MITIGATED NEG. DECLARATION ☐ EIR

DEPARTMENTAL REPORTS / APPROVALS:

PUBLIC WORKS	☒ NONE	☐ ATTACHED
AG	☐ NONE	☒ ATTACHED
APCD	☐ NONE	☒ ATTACHED
E.H.S.	☐ NONE	☒ ATTACHED
FIRE / OES	☐ NONE	☒ ATTACHED
SHERIFF.	☒ NONE	☐ ATTACHED
OTHER	Quechan Indian Tribe, IID, Coachella Valley Water District, CUPA	

REQUESTED ACTION:

(See Attached)

☐ NEGATIVE DECLARATION
☐ MITIGATED NEGATIVE DECLARATION

Initial Study & Environmental Analysis
For:

Conditional Use Permit #22-0021
Initial Study #22-0035
Jesus & Liliana Aguirre (Aguirre's Propane, LLC)

Prepared By:

COUNTY OF IMPERIAL
Planning & Development Services Department
801 Main Street
El Centro, CA 92243
(442) 265-1736
www.icpds.com

November 2022

TABLE OF CONTENTS

PAGE

SECTION 1

I. INTRODUCTION 3

SECTION 2

II. ENVIRONMENTAL CHECKLIST 8
PROJECT SUMMARY 10
ENVIRONMENTAL ANALYSIS 13

I. AESTHETICS *14*
II. AGRICULTURE AND FOREST RESOURCES *14*
III. AIR QUALITY *15*
IV. BIOLOGICAL RESOURCES *16*
V. CULTURAL RESOURCES *17*
VI. ENERGY *17*
VII. GEOLOGY AND SOILS *16*
VIII. GREENHOUSE GAS EMISSION *19*
IX. HAZARDS AND HAZARDOUS MATERIALS *19*
X. HYDROLOGY AND WATER QUALITY *20*
XI. LAND USE AND PLANNING *22*
XII. MINERAL RESOURCES *22*
XIII. NOISE *22*
XIV. POPULATION AND HOUSING *23*
XV. PUBLIC SERVICES *23*
XVI. RECREATION *24*
XVII. TRANSPORTATION *24*
XVIII. TRIBAL CULTURAL RESOURCES *21*
XIX. UTILITIES AND SERVICE SYSTEMS *25*
XX. WILDFIRE *25*

SECTION 3

III. MANDATORY FINDINGS OF SIGNIFICANCE 23
IV. PERSONS AND ORGANIZATIONS CONSULTED 24
V. REFERENCES 25
VI. NEGATIVE DECLARATION - COUNTY OF IMPERIAL 26
27 FINDINGS 27

SECTION 4

VIII. RESPONSE TO COMMENTS (IF ANY) 28
IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP) (IF ANY) 29

SECTION 1
INTRODUCTION

A. PURPOSE

This document is a ☐ policy-level, ☒ project level Initial Study for evaluation of potential environmental impacts resulting with the proposed Conditional Use Permit (Refer to Exhibit "A" & "B").

B. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) REQUIREMENTS AND THE IMPERIAL COUNTY'S GUIDELINES FOR IMPLEMENTING CEQA

As defined by Section 15063 of the State California Environmental Quality Act (CEQA) Guidelines and Section 7 of the County's "CEQA Regulations Guidelines for the Implementation of CEQA, as amended", an **Initial Study** is prepared primarily to provide the Lead Agency with information to use as the basis for determining whether an Environmental Impact Report (EIR), Negative Declaration, or Mitigated Negative Declaration would be appropriate for providing the necessary environmental documentation and clearance for any proposed project.

☐ According to Section 15065, an **EIR** is deemed appropriate for a particular proposal if the following conditions occur:

- The proposal has the potential to substantially degrade quality of the environment.
- The proposal has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- The proposal has possible environmental effects that are individually limited but cumulatively considerable.
- The proposal could cause direct or indirect adverse effects on human beings.

☐ According to Section 15070(a), a **Negative Declaration** is deemed appropriate if the proposal would not result in any significant effect on the environment.

☐ According to Section 15070(b), a **Mitigated Negative Declaration** is deemed appropriate if it is determined that though a proposal could result in a significant effect, mitigation measures are available to reduce these significant effects to insignificant levels.

This Initial Study has determined that the proposed applications will not result in any potentially significant environmental impacts and therefore, a Negative Declaration is deemed as the appropriate document to provide necessary environmental evaluations and clearance as identified hereinafter.

This Initial Study and Negative Declaration are prepared in conformance with the California Environmental Quality Act of 1970, as amended (Public Resources Code, Section 21000 et. seq.); Section 15070 of the State & County of Imperial's Guidelines for Implementation of the California Environmental Quality Act of 1970, as amended (California Code of Regulations, Title 14, Chapter 3, Section 15000, et. seq.); applicable requirements of the County of Imperial; and the regulations, requirements, and procedures of any other responsible public agency or an agency with jurisdiction by law.

Pursuant to the County of Imperial Guidelines for Implementing CEQA, depending on the project scope, the County of Imperial Board of Supervisors, Planning Commission and/or Planning Director is designated the Lead Agency, in accordance with Section 15050 of the CEQA Guidelines. The Lead Agency is the public agency which has the

principal responsibility for approving the necessary environmental clearances and analyses for any project in the County.

C. INTENDED USES OF INITIAL STUDY AND NEGATIVE DECLARATION

This Initial Study and Negative Declaration are informational documents, which are intended to inform County of Imperial decision makers, other responsible or interested agencies, and the general public of potential environmental effects of the proposed applications. The environmental review process has been established to enable public agencies to evaluate environmental consequences and to examine and implement methods of eliminating or reducing any potentially adverse impacts. While CEQA requires that consideration be given to avoiding environmental damage, the Lead Agency and other responsible public agencies must balance adverse environmental effects against other public objectives, including economic and social goals.

The Initial Study and Negative Declaration, prepared for the project will be circulated for a period of 20 days (*30-days if submitted to the State Clearinghouse for a project of area-wide significance*) for public and agency review and comments. At the conclusion, if comments are received, the County Planning & Development Services Department will prepare a document entitled "Responses to Comments" which will be forwarded to any commenting entity and be made part of the record within 10-days of any project consideration.

D. CONTENTS OF INITIAL STUDY & NEGATIVE DECLARATION

This Initial Study is organized to facilitate a basic understanding of the existing setting and environmental implications of the proposed applications.

SECTION 1

I. INTRODUCTION presents an introduction to the entire report. This section discusses the environmental process, scope of environmental review, and incorporation by reference documents.

SECTION 2

II. ENVIRONMENTAL CHECKLIST FORM contains the County's Environmental Checklist Form. The checklist form presents results of the environmental evaluation for the proposed applications and those issue areas that would have either a potentially significant impact, potentially significant unless mitigation incorporated, less than significant impact or no impact.

PROJECT SUMMARY, LOCATION AND EVIRONMENTAL SETTINGS describes the proposed project entitlements and required applications. A description of discretionary approvals and permits required for project implementation is also included. It also identifies the location of the project and a general description of the surrounding environmental settings.

ENVIRONMENTAL ANALYSIS evaluates each response provided in the environmental checklist form. Each response checked in the checklist form is discussed and supported with sufficient data and analysis as necessary. As appropriate, each response discussion describes and identifies specific impacts anticipated with project implementation.

SECTION 3

III. MANDATORY FINDINGS presents Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

IV. PERSONS AND ORGANIZATIONS CONSULTED identifies those persons consulted and involved in

preparation of this Initial Study and Negative Declaration.

V. REFERENCES lists bibliographical materials used in preparation of this document.

VI. NEGATIVE DECLARATION – COUNTY OF IMPERIAL

VII. FINDINGS

SECTION 4

VIII. RESPONSE TO COMMENTS (IF ANY)

IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP) (IF ANY)

E. SCOPE OF ENVIRONMENTAL ANALYSIS

For evaluation of environmental impacts, each question from the Environmental Checklist Form is summarized and responses are provided according to the analysis undertaken as part of the Initial Study. Impacts and effects will be evaluated and quantified, when appropriate. To each question, there are four possible responses, including:

1. **No Impact:** A "No Impact" response is adequately supported if the impact simply does not apply to the proposed applications.

2. **Less Than Significant Impact:** The proposed applications will have the potential to impact the environment. These impacts, however, will be less than significant; no additional analysis is required.

3. **Potentially Significant Unless Mitigation Incorporated:** This applies where incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact".

4. **Potentially Significant Impact:** The proposed applications could have impacts that are considered significant. Additional analyses and possibly an EIR could be required to identify mitigation measures that could reduce these impacts to less than significant levels.

F. POLICY-LEVEL or PROJECT LEVEL ENVIRONMENTAL ANALYSIS

This Initial Study and Negative Declaration will be conducted under a ☐ policy-level, ☒ project level analysis. Regarding mitigation measures, it is not the intent of this document to "overlap" or restate conditions of approval that are commonly established for future known projects or the proposed applications. Additionally, those other standard requirements and regulations that any development must comply with, that are outside the County's jurisdiction, are also not considered mitigation measures and therefore, will not be identified in this document.

G. TIERED DOCUMENTS AND INCORPORATION BY REFERENCE

Information, findings, and conclusions contained in this document are based on incorporation by reference of tiered documentation, which are discussed in the following section.

1. Tiered Documents

As permitted in Section 15152(a) of the CEQA Guidelines, information and discussions from other documents can be included into this document. Tiering is defined as follows:

"Tiering refers to using the analysis of general matters contained in a broader EIR (such as the one prepared

for a general plan or policy statement) with later EIRs and negative declarations on narrower projects; incorporating by reference the general discussions from the broader EIR; and concentrating the later EIR or negative declaration solely on the issues specific to the later project."

Tiering also allows this document to comply with Section 15152(b) of the CEQA Guidelines, which discourages redundant analyses, as follows:

"Agencies are encouraged to tier the environmental analyses which they prepare for separate but related projects including the general plans, zoning changes, and development projects. This approach can eliminate repetitive discussion of the same issues and focus the later EIR or negative declaration on the actual issues ripe for decision at each level of environmental review. Tiering is appropriate when the sequence of analysis is from an EIR prepared for a general plan, policy or program to an EIR or negative declaration for another plan, policy, or program of lesser scope, or to a site-specific EIR or negative declaration."

Further, Section 15152(d) of the CEQA Guidelines states:

"Where an EIR has been prepared and certified for a program, plan, policy, or ordinance consistent with the requirements of this section, any lead agency for a later project pursuant to or consistent with the program, plan, policy, or ordinance should limit the EIR or negative declaration on the later project to effects which:

(1) Were not examined as significant effects on the environment in the prior EIR; or

(2) Are susceptible to substantial reduction or avoidance by the choice of specific revisions in the project, by the imposition of conditions, or other means."

2. Incorporation By Reference

Incorporation by reference is a procedure for reducing the size of EIRs/MND and is most appropriate for including long, descriptive, or technical materials that provide general background information, but do not contribute directly to the specific analysis of the project itself. This procedure is particularly useful when an EIR or Negative Declaration relies on a broadly-drafted EIR for its evaluation of cumulative impacts of related projects (*Las Virgenes Homeowners Federation v. County of Los Angeles* [1986, 177 Ca.3d 300]). If an EIR or Negative Declaration relies on information from a supporting study that is available to the public, the EIR or Negative Declaration cannot be deemed unsupported by evidence or analysis (*San Francisco Ecology Center v. City and County of San Francisco* [1975, 48 Ca.3d 584, 595]). This document incorporates by reference appropriate information from the "Final Environmental Impact Report and Environmental Assessment for the "County of Imperial General Plan EIR" prepared by Brian F. Mooney Associates in 1993 and updates.

When an EIR or Negative Declaration incorporates a document by reference, the incorporation must comply with Section 15150 of the CEQA Guidelines as follows:

- The incorporated document must be available to the public or be a matter of public record (CEQA Guidelines Section 15150[a]). The General Plan EIR and updates are available, along with this document, at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.

- This document must be available for inspection by the public at an office of the lead agency (CEQA Guidelines Section 15150[b]). These documents are available at the County of Imperial Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 Ph. (442) 265-1736.

- These documents must summarize the portion of the document being incorporated by reference or briefly

describe information that cannot be summarized. Furthermore, these documents must describe the relationship between the incorporated information and the analysis in the tiered documents (CEQA Guidelines Section 15150[c]). As discussed above, the tiered EIRs address the entire project site and provide background and inventory information and data which apply to the project site. Incorporated information and/or data will be cited in the appropriate sections.

- These documents must include the State identification number of the incorporated documents (CEQA Guidelines Section 15150[d]). The State Clearinghouse Number for the County of Imperial General Plan EIR is SCH #93011023.

- The material to be incorporated in this document will include general background information (CEQA Guidelines Section 15150[f]). This has been previously discussed in this document.

II. Environmental Checklist

1. **Project Title**: Conditional Use Permit #22-0021
2. **Lead Agency**: Imperial County Planning & Development Services Department
3. **Contact person and phone number**: Gerardo A. Quero, Planner I, (442)265-1736, ext. 1748
4. **Address**: 801 Main Street, El Centro CA, 92243
5. **E-mail**: gerardoquero@co.imperial.ca.us
6. **Project location**: 1338 Glendale Ave., Salton City, CA 92274, Assessor's Parcel Number (APN) 014-031-005
7. **Project sponsor's name and address**: Jesus & Liliana Aguirre (Aguirre's Propane, LLC)

   P.O. Box 2822, Indio, CA 92202
8. **General Plan designation**: Urban Area per the West Shores/Salton City Urban Area
9. **Zoning**: M-1 (Light Industrial)

10. **Description of project**: The applicants, Jesus & Liliana Aguirre (Aguirre's Propane, LLC), propose the construction and operation of a Liquefied Petroleum Gas (LPG) bulk plant to store and distribute Liquid Propane Gas for commercial business purposes. The subject property contains approximately 1.05 acres.

Aguirre's Propane, LLC is expecting to receive a bulk delivery of Liquefied Petroleum Gas every two weeks on an annual average. Liquefied Petroleum Gas will be stored on a thirty thousand (30,000) gallon Propane Gas tank on site guarded with guard posts around it. The LPG bulk plant property will be fenced all around with chain link fencing. Received bulk delivery of Liquefied Petroleum Gas (LPG) will used to refill company's bobtail trucks of 2300 to 2600 gallon capacity for dispensing fuel (LPG) to company customers' residences and business locations. The company will be using two bobtail trucks for business operations.

Aguirre's Propane, LLC will not be dispensing fuel (LPG) to the public at this location, therefore, there will be no public access at this location. The refilling operations of company's bobtail trucks will be twice a week on an average annual basis. The refilling procedures should take approximately two (2) hours from 7 am to 9 am on Monday, Wednesday, or Friday. There shall be two company personnel during the refilling of company's bobtail trucks.

Aguirre's Propane, LLC will be using Service Road and Glendale Avenue on their routes and travels to the LPG bulk plant. The applicant plans to continue providing service to their current service area throughout the Coachella Valley and grow their business operations in the Salton City and surrounding communities.

11. **Surrounding land uses and setting**: The project is located between Service Road and Pasadena Avenue, bounded to the south by Glendale Avenue in the unincorporated community of Salton City, County of Imperial, CA. The subject property is described as Lot 07, Block 07, Tract 570, FM 528, Township 10 South, Range 10 East of the San Bernardino Base and Meridian, containing approximately 1.05 acres. The property is also known as Assessor's Parcel Number (APN) 014-031-005. The project is surrounded by parcels zoned as M-1 (Light Industrial) on the North, South, East, and West.

12. **Other public agencies whose approval is required** (e.g., permits, financing approval, or participation agreement.): Planning Commission.

13. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentially, etc.?

The Quechan, Torres Martinez Desert Cahuilla, and Augustine Band of Cahuilla Mission Indian Tribes have requested to be consulted under Assembly Bill 52. Consultation letters were sent to the Quechan, Torres Martinez Desert Cahuilla, and Augustine Band of Cahuilla Indian Tribes. The County received on October 3, 2022, an email response from the Quechan Indian Tribe advising they had no comments for this project. No comments have been received from Torres Martinez Desert Cahuilla and Augustine Band of Cahuilla Mission Indian Tribes for this project to this date.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☐	Air Quality
☐	Biological Resources	☐	Cultural Resources	☐	Energy
☐	Geology /Soils	☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials
☐	Hydrology / Water Quality	☐	Land Use / Planning	☐	Mineral Resources
☐	Noise	☐	Population / Housing	☐	Public Services
☐	Recreation	☐	Transportation	☐	Tribal Cultural Resources
☐	Utilities/Service Systems	☐	Wildfire	☐	Mandatory Findings of Significance

ENVIRONMENTAL EVALUATION COMMITTEE (EEC) DETERMINATION

After Review of the Initial Study, the Environmental Evaluation Committee has:

☐ Found that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ Found 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.

☐ Found that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ Found 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.

☐ Found 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.

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DE MINIMIS IMPACT FINDING: ☐ Yes ☐ No

EEC VOTES	YES	NO	ABSENT
PUBLIC WORKS	☐	☐	☐
ENVIRONMENTAL HEALTH SVCS	☐	☐	☐
OFFICE EMERGENCY SERVICES	☐	☐	☐
APCD	☐	☐	☐
AG	☐	☐	☐
SHERIFF DEPARTMENT	☐	☐	☐
ICPDS	☐	☐	☐

Jim Minnick, Director of Planning/EEC Chairman Date:

PROJECT SUMMARY

A. **Project Location**: The project is located at 1338 Glendale Avenue, Salton City, CA 92274; Assessor's Parcel Number: 014-031-005-000.

B. **Project Summary**: The applicants, Jesus and Liliana Aguirre (Aguirre's Propane, LLC), propose the construction and operation of a Liquefied Petroleum Gas (LPG) bulk plant to store and distribute Liquid Propane Gas for commercial business purposes. The subject property contains approximately 1.05 acres.

Aguirre's Propane, LLC is expecting to receive a bulk delivery of Liquefied Petroleum Gas every two weeks on an annual average. Liquefied Petroleum Gas will be stored on a thirty thousand (30,000) gallon Propane Gas tank on site guarded with guard posts around it. The LPG bulk plant property will be fenced all around with chain link fencing. Received bulk delivery of Liquefied Petroleum Gas (LPG) will used to refill company's bobtail trucks of 2300 to 2600 gallon capacity for dispensing fuel (LPG) to company customers' residences and business locations. The company will be using two bobtail trucks for business operations.

Aguirre's Propane, LLC will not be dispensing fuel (LPG) to the public at this location, therefore, there will be no public access at this location. The refilling operations of company's bobtail trucks will be twice a week on an average annual basis. The refilling procedures should take approximately two (2) hours from 7 am to 9 am on Monday, Wednesday, or Friday. There shall be two company personnel during the refilling of company's bobtail trucks.

Aguirre's Propane, LLC will be using Service Road and Glendale Avenue on their routes and travels to the LPG bulk plant. The applicant plans to continue providing service to their current service area throughout the Coachella Valley and grow their business operations in the Salton City and surrounding communities.

C. **Environmental Setting**: The proposed project is located within an area surrounded by already developed parcels with existing industrial uses. The proposed project site is relatively flat, located on Glendale Avenue, bounded by Pasadena Avenue and Service Road in the County of Imperial, CA. The City of Coachella is located approximately 30 miles northwest of the project site.

D. **Analysis**: According to the West Shores/Salton City Urban Area, the land use designation of the project site "Urban", and it is classified as M-1 (Light Industrial) per Zone Map #64 of the Imperial County Land Use Ordinance (Title 9). Initial Study #22-0035 will analyze any impacts related with the proposed project.

E. **General Plan Consistency**: The project is located within the County's General Plan designation of "Urban", according to the West Shores/Salton City Urban Area and is zoned M-1 (Light Industrial). The proposed project is consistent with the General Plan and County Land Use Ordinance (Title 9) Division 5, Section §90515.02 (k) since a Conditional Use Permit has been applied for the bulk fuel storage facility pursuant to Division 2, Section §90203.01 of the aforementioned title.

Exhibit "A"
Vicinity Map

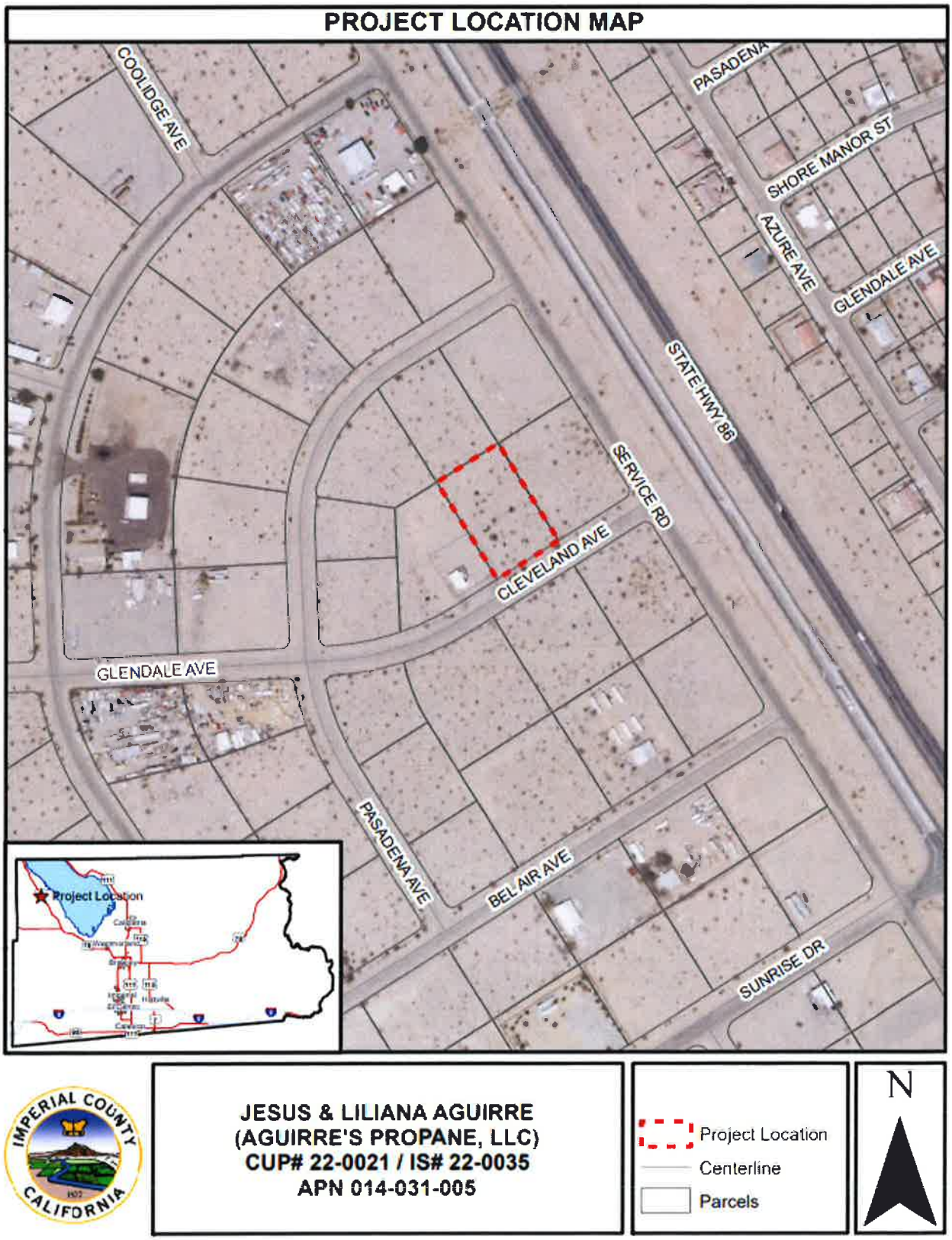
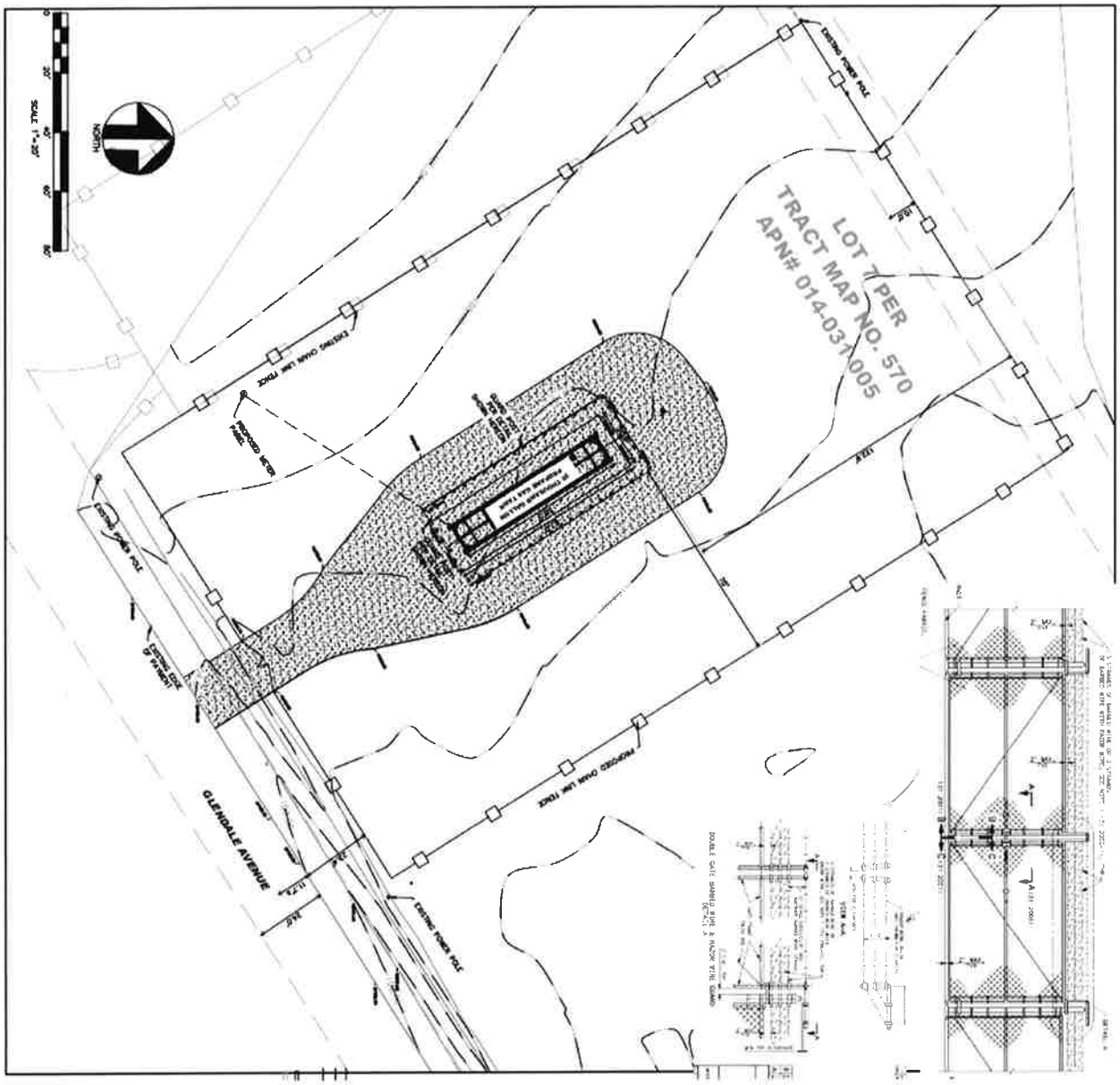


Exhibit "B"
Site Plan



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

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

I. *AESTHETICS*

Except as provided in Public Resources Code Section 21099, would the project:

a) Have a substantial adverse effect on a scenic vista or scenic highway? ☐ ☐ ☐ ☒

a) Four areas within the County have the potential as state-designated scenic highways; however, the project site is not located near any scenic vista or scenic highway according to the Imperial County General Plan Circulation and Scenic Highway Element[1] and California State Scenic Highway System Map[2]. No impacts are expected.

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

b) As previously stated on section (I)(a), the proposed project is not located near a scenic vista or scenic highway and would not substantially damage any scenic resources. No impacts are expected.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surrounding? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? ☐ ☐ ☒ ☐

c) A Liquefied Petroleum Gas (LPG) bulk plant for storage and distribution for commercial business purposes are all part of the project's planned construction and operation. Given that the proposed site's zone is intended for industrial purposes, it would not materially or physically impair the present aesthetic character or quality of public views of the site and its surroundings. It would also not violate any applicable zoning or other laws governing scenic quality. Any effects are anticipated to 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? ☐ ☐ ☒ ☐

d) The proposed project entails the development and management of a liquefied petroleum gas (LPG) bulk plant for commercial distribution and storage. It is not anticipated that a new source of significant light or glare would negatively impact daytime or nighttime views in the region as all on-site lighting will be required to be shielded from neighboring properties and the road. Any impacts are anticipated to be less than significant.

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) 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? ☐ ☐ ☐ ☒

a) The proposed project site is listed as "Area Not Mapped" located outside the survey boundary per the California Farmland Mapping & Monitoring Program: Imperial County Important Farmland 2018 Map[3]. Therefore, the proposed project will not convert any type of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use. No impacts are expected.

b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract? ☐ ☐ ☐ ☒

b) The County of Imperial has no current active Williamson Act contracts; therefore, the proposed project is not expected to conflict with existing zoning for agricultural use, or a Williamson Act Contract. No Impacts are expected.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), ☐ ☐ ☐ ☒

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

c) Per Imperial County General Plan Land Use Map[4], the proposed project site is designated as "Urban Area" with no forest land on its vicinity and surroundings; therefore, it is not expected to 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 5114(g)). No impacts are expected.

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

d) As previously stated under item (II)(c) above, the proposed project is not located in a forest land, therefore, it is not expected to result in the loss of forest land or conversion of forest land to non-forest. No impacts are expected.

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? ☐ ☐ ☐ ☒

e) As previously stated under item (II)(c), the proposed project site is located within an "Urban Area" according to the West Shores/Salton City Urban Area and Imperial County General Plan Land Use Map[4], and is zoned M-1 (Light Industrial). Additionally, there are no existing farmland or forestland on or in the immediate vicinity. Development of the proposed project would not result in the loss or conversion of farmland to non-agricultural use or conversion of forestland to non-forest use. Therefore, no impacts are expected. The Office of Agricultural Commission provided a letter with information regarding Point-of-Sale Scanners and Electronic Pricing Devices as required for businesses to register with the Imperial County Sealer of Weights and Measures Department. It is the responsibility of the applicant to reach out to their office for compliance with all forms.

III. *AIR QUALITY*

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to the following determinations. Would the Project:

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

a) The proposed project is for the construction and operation of a Liquefied Petroleum Gas (LPG) bulk plant for commercial business purposes, and it is not expected to conflict with or obstruct implementation of the applicable air quality plan. Additionally, per Imperial County Air Pollution Control District's comment letter[5] dated October 14, 2022, the project would not require an Air District permit at this time. However, the Air District requests to be informed of any changes or modifications to the project equipment or processes to verify any additional requirements that may be triggered by the change. The project must comply with Regulation VIII, which is a collection of rules, designed to limit emissions of fugitive dust to 20% opacity. Adherence and compliance to ACPD's rules and regulations will bring any impacts to less than significant.

b) 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? ☐ ☐ ☒ ☐

b) As previously stated under item (III)(a) above, any future construction shall comply with the ICAPCD's Regulation VIII and other regulations, therefore, it is not expected that the proposed project would substantially contribute to an existing or projected air quality violation. Therefore, any impacts are expected to be less than significant.

c) Expose sensitive receptors to substantial pollutants concentrations? ☐ ☐ ☒ ☐

c) The proposed project is expected to expose sensitive receptors to substantial pollutants concentrations during the construction of the LPG bulk plant. However, any exposure would be temporary and would be lessened by adhering to Air Pollution Control District's rules and regulations. Compliance with APCD's requirements would bring any impacts to less than significant.

d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people? ☐ ☐ ☒ ☐

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

d) The proposed project does not anticipate to create objectionable odors that would adversely affect a substantial number of people. Although some pollutants may be emitted during construction activities and as previously stated on item (III)(a) above, compliance with ACPD's rules and regulations and adherence to the California Building Code would bring any impacts to less than significant.

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 Wildlife or U.S. Fish and Wildlife Service? ☐ ☐ ☒ ☐

a) The proposed project location is within an industrial zoned area with nearby properties already impacted by ongoing industrial operations. According to the Imperial County General Plan's Conservation and Open Space Element[6], Figure 1 "Sensitive Habitat Map[6a]," the project is not located within a sensitive habitat area. Figure 2 "Sensitive Species Map[6b]" shows that the project is located within the Burrowing Owl Species Distribution Model area; however, no substantial adverse effects are expected as a result of project approval and construction since the project design will consist of tanks and no other structures. The proposed tank height will not exceed the zone's height limit of six (6) stories or eighty (80) feet. Less than significant impacts are expected.

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

b) According to the Imperial County General Plan's Conservation and Open Space Element[6], the project site is not within a sensitive or riparian habitat, or on other sensitive natural community; therefore, it does not appear to have a substantial effect in local regional plans, policies, and regulations with respect to sensitive natural communities or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Any impacts are expected to be less than significant.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? ☐ ☐ ☒ ☐

c) According to the National Wetlands Inventory: Surface Waters and Wetlands Map[7], the proposed project is not located within a riparian habitat and which will not cause a substantial adverse effect on federal protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Any impacts are expected to be less than significant.

d) Interfere substantially with the movement of any 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? ☐ ☐ ☒ ☐

d) The proposed project site is located on a vacant parcel zoned as M-1 (Light Industrial) with an area of approximately ±1.05 acres and is surrounded by other parcels with same zoning with existing industrial uses. As previously stated on item (IV)(b) above, the project site is not located within a Sensitive Habitat and is therefore not expected to interfere substantially with the movement of any 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. Any impacts are expected to be less than significant.

e) Conflict with any local policies or ordinance protecting biological resource, such as a tree preservation policy or ordinance? ☐ ☐ ☐ ☒

e) The proposed project does not conflict with any local policy or ordinance protecting biological resources, such as tree preservation policies or ordinances. No impacts are expected.

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? ☐ ☐ ☒ ☐

f) The proposed project site is not located within a designated sensitive area according to the Imperial County General Plan's

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

Conservation and Open Space Element[6], therefore, it would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Any impacts are expected to be less than significant.

V. *CULTURAL RESOURCES Would the project:*

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5? ☐ ☐ ☒ ☐

a) According to the Imperial County General Plan's Conservation and Open Space Element[6], Figure 5, the project site is not located within an "Area of Heightened Historic Period Sensitivity[6c]." Additionally, in accordance with Figure 6, "Known Areas of Native American Cultural Sensitivity[6d]," does not locate the proposed project within a designated area of possible impact. In addition, on October 3, 2022, the County received an email from the Quechan Historic Preservation Officer stating they had no comments on this project[8]. The surrounding area is already disturbed with existing industrial operations with no documented nor known historical resources. Any impacts are expected to be less than significant.

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

b) The proposed project is located on an already disturbed area with surrounding industrial zones and no archeological resources have been found. The proposed Liquefied Petroleum Gas bulk plant is not likely to cause a substantial adverse change to any archeological resource. Any impacts are expected to be less than significant.

c) Disturb any human remains, including those interred outside of dedicated cemeteries? ☐ ☐ ☒ ☐

c) As previously stated on items (V)(a) and (V)(b) above, the proposed project site is not located within or adjacent to any cemeteries, therefore, the proposed project would not disturb any human remains, including those interred outside of dedicated cemeteries. Any impacts are expected to be less than significant.

VI. *ENERGY Would the project:*

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? ☐ ☐ ☒ ☐

a) The proposed Liquefied Petroleum Gas storage and distribution facility does not propose any changes in the existing zone, which is currently Industrial; therefore, it will not result in potentially significant environmental impact due to wasteful, insufficient, or unnecessary consumption of energy resources, during the project construction or operation. Any developments would require compliance with the latest edition of the California Building Code and a new building permit application with the Imperial County Planning and Development Services Department. Additionally, per comment letter received from the Imperial Irrigation District[9] dated October 4, 2022, for any temporary and/or permanent electrical service for the project, the applicant should be advised to contact them. Any impacts are expected to be less than significant.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? ☐ ☐ ☒ ☐

b) The proposed project is not expected to conflict with or obstruct a state for renewable energy or energy efficiency. There are no known local plans for renewable energy that could be obstructed due to the approval of this project. Any impacts are expected to be less than significant.

VII. *GEOLOGY AND SOILS Would the project:*

a) Directly or indirectly cause potential substantial adverse effects, including risk of loss, injury, or death involving: ☐ ☐ ☒ ☐

a) The proposed project does not appear to conflict with the geology and soils of adjacent parcels in the area. Additionally, industrial uses are proposed as permitted on current zoning. Any developments will be subjected to compliance with the latest edition of the California Building Code as well as to go through a ministerial building permit review. Therefore, the proposed project would not directly or indirectly cause potential substantial adverse effects regarding impacts to geology and soils. Any expected are expected to be less than significant.

1) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning ☐ ☐ ☒ ☐

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

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?

1) According to the most recent Alquist-Priolo Earthquake Fault Zoning Map[10], California Department of Conservation: Fail Activity Map[11], and the United States Geological Survey's Quaternary Faults Map[12], the proposed project site is not located within a Fault Zone. However, Imperial County is classified as Seismic Zone D per the Uniform Building Code, which required that any developments within this zone be required to incorporate the most stringent earthquake resistant measures. Any developments will be subject to compliance with the latest edition of the California Building Code as well as to go through an administrative building permit review. Adherence and compliance to these standards and regulations would bring any impacts to less than significant.

2) Strong Seismic ground shaking? ☐ ☐ ☒ ☐

2) As previously stated on item (VII)(a)(1) above, the proposed project is not located within a Fault Zone. However, Imperial County is classified as Seismic Zone D per the Uniform Building Code, which required that any developments within this zone be required to incorporate the most stringent earthquake resistant measures. Adherence to the latest edition of the California Building Code and as well as to go through a ministerial building permit review would bring any impacts to less than significant.

3) Seismic-related ground failure, including liquefaction and seiche/tsunami? ☐ ☐ ☒ ☐

3) The proposed project site is not located in a seiche/tsunami area per the California Tsunami Data Maps[13]. Any impacts are expected to be less than significant.

4) Landslides? ☐ ☐ ☒ ☐

4) According to Imperial County General Plan's Seismic and Public Safety Element[14], "Landslide Activity Map[14a]," Figure 2, the proposed project is not located within a landslide activity area. The topography within the proposed project site is generally flat; therefore, any impacts are expected to be less than significant.

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

b) According to Imperial County General Plan's Seismic and Public Safety Element[14], "Erosion Activity Map[14b]," Figure 3, the proposed project is not located within an area of substantial soil erosion. Any impacts are expected to be 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 landslides, lateral spreading, subsidence, liquefaction or collapse? ☐ ☐ ☒ ☐

c) The proposed project site is not located on a geological unit that would become unstable or collapse as a result of the proposed LPG bulk plant. Any construction will be subjected to compliance with the latest edition of the California Building Code as well as to go through a ministerial building permit review. Adherence and compliance to these standards and regulations would bring any impacts to less than significant.

d) Be located on expansive soil, as defined in the latest Uniform Building Code, creating substantial direct or indirect risk to life or property? ☐ ☐ ☒ ☐

d) The proposed project is not located on an expansive soil area. However, as previously stated on section (VII)(c), any new developments will require adherence and compliance to the California Building Code, standards and regulations, as well as to go through a ministerial building permit review which would bring any impacts to less than significant.

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? ☐ ☐ ☒ ☐

e) The proposed project is for the construction and operation of a Liquefied Petroleum Gas facility for storage and distribution. Per email received from the Imperial County Division of Environmental Health[15] dated October 19, 2022, advises that due to the nature of the project, the agency has no comments; however, the applicant may reach out to the Department of Toxic Substances Control/Certified Unified Program Agencies to ensure they meet their standards. Any future construction proposing any septic or alternative waste water disposal systems shall comply with applicable standards and regulations from the Imperial County Public Health Department, Division of Environmental Health. Adherence and compliance to these standards would bring any impacts to less than significant.

		Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
f)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

f) The proposed project site is located on an area surrounded by already disturbed parcels with existing industrial uses. The proposed Liquefied Petroleum Gas bulk plant does not appear to directly or indirectly destroy a unique paleontological resource or site of unique geologic feature on site as there are no known unique resources or features on site nor records of. Additionally, in the event of any paleontological findings on site during construction, all work shall stop and the Imperial Valley College Desert Museum shall be contacted to have a qualified specialist inspect the site. Any impacts are expected to be less than significant.

VIII. *GREENHOUSE GAS EMISSION Would the project:*

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

a) The proposed LPG bulk plant is located on an area surrounded by already disturbed parcels with existing industrial uses. The action is not expected to generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Additionally, as previously stated on item (III)(a) above, adherence and compliance to ACPD's rules and regulations will bring any impacts to less than significant.

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

b) The proposed project would not conflict with any regulations under AB 32 Global Warming Solutions Act of 2006, of reducing the emissions of greenhouse gases to 1990 levels by 2020 provided that the applicant adheres to APCD's regulations. Less than significant impacts are expected.

IX. *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?	☐	☐	☒	☐

a) The proposed project is for the construction and operation of a Liquefied Petroleum Gas bulk plant for storage and distribution of LP Gas and is not expected to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Per comment email received from the Department of Toxic Substances Control (DTSC)-Imperial Certified Unified Program Agencies (CUPA)[16] dated October 19, 2022, the facility must conform to all regulatory design and system operational requirements, and must notify DTSC Imperial CUPA and County Environmental Health upon start of operations. They will be in the Hazardous Materials Program and will need to create a California Environmental Reporting System (CERS) account prior to operation. Additionally, per Imperial County Compliance and adherence to the Department of Toxic Substances Control Imperial CUPA and Imperial County Environmental Health rules and regulations will bring any impacts to less than significant.

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

b) The proposed project does not anticipate to create a significant hazard to the public or the environment through reasonable foreseeable upset and accidental conditions involving the release of hazardous materials into the environment. Additionally, as previously stated on item (IX)(a) above, compliance and adherence to the Department of Toxic Substances Control Imperial CUPA and Imperial County Environmental Health rules and regulations will bring any impacts to less than significant.

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

c) The proposed project does not anticipate the emitting of hazardous emissions or the handling of hazardous or acutely hazardous materials, substance, or waste. Additionally, the project site is not located within a ¼ mile of any schools. The nearest school in the area is Desert Shores High School, which is approximately 1.3 miles northeast of the proposed project site; therefore, it would not represent a risk to educational facilities. Furthermore, as previously stated on item (IX)(a) above, compliance and adherence to the Department of Toxic Substances Control Imperial CUPA and Imperial County Environmental Health rules and regulations will bring any impacts to less than significant.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

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? ☐ ☐ ☐ ☒

d) The proposed project is not located on a site included on a list of hazardous materials sites according to California Department of Toxic Substances Control EnviroStor[17]; therefore, no impacts are expected.

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 or excessive noise for people residing or working in the project area? ☐ ☐ ☐ ☒

e) The proposed project is not located within an airport land use plan per Imperial County Airport Land Use Compatibility Maps[18]. The nearest airport in the area is the Salton Sea Airport located approximately 3.8 miles southeast of the project site; therefore, it would not result or create a significant hazard or excessive noise for people residing or working in the project area. No impacts are expected.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? ☐ ☐ ☒ ☐

f) The proposed LPG bulk plant would not interfere with an adopted emergency response plan or emergency evacuation plan. Additionally, on November 3, 2022, ICPDS received a comment letter from the Imperial County Fire Department[19] advising the applicant shall provide an Emergency Response Plan for covering possible emergencies (Examples: fire, leak and/or spill, earthquake, other emergencies). According to ICFD, there shall be at least one employee "on-call" at all times available to respond to emergencies at the facility to coordinate with emergency responders and provide information about the site if needed. The emergency contact coordinator shall be thoroughly familiar with the facility, the emergency response plan and federal, state, and local regulations on hazardous material storage and release. Adherence to ICFD's requirements will bring any impacts to less than significant.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? ☐ ☐ ☒ ☐

g) According to Cal Fire "Fire Hazard Severity Zones in State Responsibility Areas – Imperial County[20]" adopted November 7, 2007, the proposed project site is located within an unincorporated Local Responsibility Area. According to comment letter received from the Imperial County Fire Department[19] dated November 3, 2022, an approved fire hydrant installed within 300 feet of the facility. Currently the closest fire hydrant is 800 feet away. This requirement will help with a reliable water source for tank cooling within 10 minutes of a fire emergency as noted in the facility fire safety analysis. Additionally, an adequate number of fire extinguishers onsite should be provided. Furthermore, the development will be subjected to compliance with the latest edition of the California Building Code as well as to go through a ministerial building permit review. Adherence and compliance with ICFD's standards and with the California Building Code would bring any impacts to less than significant.

X. *HYDROLOGY AND WATER QUALITY Would the project:*

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? ☐ ☐ ☒ ☐

a) The proposed project is for the construction and operation of a Liquefied Petroleum Gas bulk plant which would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. Additionally, on October 10, 2022 ICPDS received a comment letter from the Coachella Valley Water District[21] stating that flood protection measures shall comply with California Drainage Law and shall require 100 percent on-site retention of the incremental increase of runoff from the 100-year storm. In addition, they stated that for domestic water service the applicant will be subject to the satisfaction of terms and conditions established by CVWD and imposed from time to time, including, but not limited to fees and charges, water conservation measures, etc. Furthermore, on October 19, 2022 ICPDS received a comment email from the Imperial County Division of Environmental Health[15] stating they had no comments for this project. Any impacts are expected to be less than significant.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? ☐ ☐ ☒ ☐

		Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

b) The proposed LPG bulk plant will continue with the existing industrial use in the area and is not expected to substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. Any impacts are expected to be less than significant.

c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐

c) The proposed project does not anticipate a physical alteration to the site that would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course or a stream or river or though the addition of impervious surfaces. Any proposed grading will require drainage review and approval from the Imperial County Public Works Department. Any impacts are expected to be less than significant.

	(i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐

(i) According to Imperial County General Plan's Seismic and Public Safety Element[14], "Erosion Activity Map[14b]," Figure 3, the proposed site is not located within an area of substantial soil erosion or siltation on- or off-site. Therefore, any impacts are expected to be less than significant.

	(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐

(ii) The proposed LPG bulk plant project is not expected to substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or offsite. Any proposed grading will require drainage reviews and approval with the Imperial County Department of Public Works. Compliance with Imperial County Department of Public Works rules and regulations would bring any impacts to less than significant.

	(iii) 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; or;	☐	☐	☒	☐

(iii) The proposed project does not anticipate creating or contributing runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. As previously stated on items (X)(c) and (X)(c)(ii) above, Any proposed grading will require drainage review and approval from the Imperial County Public Works Department. Compliance with Imperial County Public Works Department standards would ensure that any runoff water impacts would be reduced to less than significant.

	(iv) impede or redirect flood flows?	☐	☐	☒	☐

(iv) According to the Federal Emergency Management Agency (FEMA) Flood Map Service Center[22], Flood Insurance Rate Map, the proposed project site is located within "Zone X" of flood map 06025C0336C, effective September 26, 2008. The parcel's Industrial use is proposed to remain and as a result, it would not impede or redirect flood flows. Additionally, a reviewed and approved grading/drainage letter is to be required by the Imperial County Public Works Department. Therefore, compliance with ICPWD's standards would bring any impacts to be less than significant.

d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐

d) The proposed project will continue with the existing industrial use in the area; therefore, impacts related to risk release of pollutants due to project inundation are considered to be low. Additionally, as previously stated on item (X)(c)(iv) above, the proposed project site is located within "Zone X" of flood map 06025C0336C. Compliance with ICDPW's standards would contribute to lower any impacts to less than significant.

e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐

e) As previously stated on item (X)(c) above, any proposed grading will require drainage review and approval from the Imperial County Department of Public Works; therefore, it is not expected that the proposed LPG bulk plant would conflict with or obstruct the implementation of a water quality control plan or sustainable groundwater management plan. Adherence and compliance with ICDPW's regulations would bring any impacts to less than significant.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

XI. ***LAND USE AND PLANNING Would the project:***

a) Physically divide an established community? ☐ ☐ ☐ ☒

a) The proposed project is for the construction of a Liquefied Petrolium Gas (LPG) bulk plant for storage and distribution and would not physically divide an established community. Additionally, the zoning designation for the mentioned parcel is Light Industrial (M-1) per Imperial County Land Use Ordinance, Title 9, Division 5, Chapter 12 and does not anticipate changing the existing land use designation and zoning established; therefore, no land use nor planning impacts are expected.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? ☐ ☐ ☒ ☐

b) The proposed project is consistent with the Imperial County General Plan and the County's Land Use Ordinance; bulk fuel storage facilities are allowed in an M-1 (Light Industrial) zone with an approved Conditional Use Permit per Division 5, Chapter 15, Section 90515.02(k). Any impacts are expected to be less than significant.

XII. ***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? ☐ ☐ ☐ ☒

a) The proposed project does not anticipate the removal of mineral resources and it is not located within the boundaries of an active mine per Imperial County General Plan's Conservation and Open Space Element[6], "Existing Mineral Resources Map[6e]" Figure 8. No impacts are expected.

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? ☐ ☐ ☐ ☒

b) The proposed LPG bulk plant will not result in the loss of availability of locally-important mineral resources recovery site delineated on a local general plan, specific plan or other land use plan. No impacts are expected.

XIII. ***NOISE Would the project result in:***

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? ☐ ☐ ☒ ☐

a) The proposed project is for a LPG bulk plant that would not result in the generation of temporary or permanent noise beyond that which already occurs on the surrounding area. However, any construction would be subject to the Imperial County General Plan's Noise Element,[23] which states that construction equipment operation shall be limited to the hours of 7 a.m. to 7 p.m., Monday through Friday, and from 9 a.m. to 5 p.m. on Saturday. Additionally, construction noise from a single piece of equipment or combination, shall not exceed 75 dB Leq when averaged over an eight (8) hour period. Compliance with Imperial County General Plan's Noise Element would bring any impacts to less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels? ☐ ☐ ☒ ☐

b) Excessive groundborne vibration and noise levels are not expected with the construction of the proposed project. Additionally, as previously stated on item (XIII)(a) above, any construction would be subject to Imperial County General Plan's Noise Element. Any impacts are expected to be less than significant.

c) For a project located within the vicinity of a private airstrip or 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? ☐ ☐ ☐ ☒

c) The proposed project site is not located within the vicinity of a private airstrip; therefore, no impact are expected.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

XIV. ***POPULATION AND HOUSING*** ***Would the project:***

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

a) The proposed LPG bulk plant construction would not induce a substantial unplanned population growth in an area, either directly or indirectly, as no changes to the designated industrial use on the parcel is proposed. Therefore, any impacts are expected to be less than significant.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? ☐ ☐ ☒ ☐

b) The proposed project will not displace substantial numbers of people necessitating the construction or replacement housing elsewhere as the industrial use designated on the parcel is proposed to remain. Any impacts are expected to be less than significant.

XV. ***PUBLIC SERVICES***

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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: ☐ ☐ ☒ ☐

a) The proposed LPG bulk plant construction and operation does not anticipate that such use would result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios. Any impacts would be less than significant.

1) Fire Protection? ☐ ☐ ☒ ☐

1) The proposed project is not expected to result in substantial impacts on fire protection. As stated on comment letter received from the Imperial County Fire Department[19] on November 3, 2022:

- **An approved fire hydrant installed within 300 feet of the facility. Currently the closet fire hydrant is 800 feet away. This requirement will help with a reliable water source for tank cooling within 10 minutes of a fire emergency noted in the facility fire safety analysis;**
- **Leak mitigation and Hazmat equipment shall be kept on site in approved location determined by Imperial County Fire Department official(s). Equipment needed shall be determined by Imperial County Fire Department official(s);**
- **Fire department access roads shall be a width of a least 20 feet and all weather surface capable of supporting fire apparatus. Fire department access roads will be provided with approved turn around approved by Imperial County Fire Department. Gates will be in accordance with the current adapted fire code and the facility will maintain a Knox Box/lock for access on site;**
- **Provide an adequate number of fire extinguishers onsite, as determined by Imperial County Fire Department official(s);**
- **All storage and handling of flammable and combustible gas shall be in accordance with the California Fire Code and all federal, state, and local regulations, codes, and ordinances;**
- **Compliance with all required sections of the fire code.**

An Emergency Response Plan shall be provided to Imperial County Fire Department/OES for covering possible emergencies (Examples: fire, leak and/or spill, earthquake, other emergencies). There shall be at least one employee "on-call" at all times available to respond to emergencies at the facility to coordinate with emergency responders and provide information about the site if needed. The emergency contact coordinator shall be thoroughly familiar with the facility, the emergency response plan and federal, state, and local regulations on hazard material storage and release.

The project shall be in compliance at all times with requirements in the California Fire Code and local ordinances and requirements. Imperial County Fire Department shall conduct annual fire and life safety inspections.

Imperial County Fire Department reserves the right to comment and request additional requirements pertaining to this project regarding fire and life safety measures, California Building and Fire Code, and National Fire Protection Association standards at a later time as we see necessary.

Adherence and compliance with ICFD/OES requirements will bring any impacts to less than significant.

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)
2) Police Protection?	☐	☐	☒	☐

2) The proposed project is not expected to result in substantial impacts on police protection. Both the California Highway Patrol and Sheriff's Office Salton City Patrol have active policing and patrol operations in the area. Any impacts are expected to be less than significant.

3) Schools?	☐	☐	☒	☐

3) The proposed LPG bulk plant is not expected to have a substantial impact on schools. Any impacts are expected to be less than significant.

4) Parks?	☐	☐	☐	☒

4) The proposed project is not expected to create a substantial impact on parks. No impacts are expected.

5) Other Public Facilities?	☐	☐	☒	☐

5) The proposed project is not expected to have a substantial impact on other public facilities. Any impacts are expected to be less than significant.

XVI. *RECREATION*

a)	Would the project increase the use of the existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒

a) The proposed project is for the construction of a Liquefied Petroleum Gas facility for storage and distribution. Subsequently, the proposed LPG bulk plant would not 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. No impacts are expected.

b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse effect on the environment?	☐	☐	☐	☒

b) The proposed project does not include nor require the construction or expansion of recreational facilities as it is projected to serve as a storage and distribution facility of Liquefied Petroleum Gas; therefore, no impacts are expected.

XVII. *TRANSPORTATION* *Would the project:*

a)	Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐

a) The proposed project consists on the construction and operation of a Liquefied Petroleum Gas facility for storage and distribution with LP Gas bulk delivery to the site once every two weeks and there will be no public access at this location. The refilling procedures should take approximately two (2) hours from 7 am to 9 am on Monday, Wednesday, or Friday. The proposed project is not expected to create a substantial impact to surrounding roads nor conflicting with Imperial County General Plan's Circulation and Scenic Highway Element[1]. Any traffic impacts are expected to be less than significant.

b)	Would the project conflict or be inconsistent with the CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐

b) The proposed project will not conflict or be inconsistent with the CEQA Guidelines section 15064.3, subdivision (b) as it is not expected to have a significant transportation impact within transit priority areas with no proposed change on the existing land use. Additionally, although the proposed project site is located within ½ mile of the intersection of Sunrise Drive and State Route 86, it does not appear to conflict or affect any transit, bicycle, or pedestrian facilities. Less than significant impacts are expected.

c)	Substantially increases hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐

c) The existing industrial use on the proposed project site is compatible with the Imperial County General Plan Land Use Designation and the site design is not expected to increase hazards. Therefore, any impacts are expected to be less than

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

significant.

d) Result in inadequate emergency access? ☐ ☐ ☒ ☐

d) The proposed project would not result in inadequate emergency access. Additionally, no change on existing land use nor zoning are proposed. Access to the proposed project site from Glendale Avenue appears to be suitable for emergency response vehicles. Additionally, per comment letter received from the Imperial County Fire Department[19] dated November 3, 2022, access roads shall be of a width of at least 20 feet and all weather surface capable of supporting fire apparatus. Fire department access roads will be provided with approved turn around approved by Imperial County Fire Department. Gates will be in accordance with the current adapted fire code and the facility will maintain a Knox Box/lock for access on site. Adherence and compliance with ICFD's requirements will bring any impacts to less than significant.

XVIII. *TRIBAL CULTURAL RESOURCES*

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place or object with cultural value to a California Native American tribe, and that is: ☐ ☐ ☒ ☐

a) According to the Imperial County General Plan's Conservation and Open Space Element[6d], Figure 6, the project site is not located within any known Native American cultural sensitivity area. Additionally, the County has consulted with the appropriate tribes with potential interest in the area. On October 3, 2022, the County received a response email from the Quechan Indian Tribe advising they had no comments for this project[8]. On September 30, 2022, the Campo Band of Mission Indians, the Augustine Band of Cahuilla Mission Indians, and the Torres-Martinez Desert Cahuilla Indians were also consulted under Assembly Bill 52 via mail and email for this project with no comments received to this date. The surrounding area to the proposed project site is already disturbed with existing industrial uses with no documented nor known historical resources. Any impacts are expected to be less than significant.

(i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as define in Public Resources Code Section 5020.1(k), or ☐ ☐ ☒ ☐

(i) According to the California Historic Resources[24] in Imperial County, the proposed project site is not listed or seem to be eligible under the Public Resources Code Section 21074 or 5020.1 (k); therefore, any impacts are expected to be less than significant.

0 (ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth is subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe. ☐ ☐ ☒ ☐

(ii) No significant resources listed as defined in the Public Resources Code Section 5024.1 are expected to be impacted by the proposed LPG facility construction. Any impacts are expected to be less than significant.

XIX. *UTILITIES AND SERVICE SYSTEMS Would the project:*

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects? ☐ ☐ ☒ ☐

a) The proposed bulk plant is for storage and distribution of Liquefied Petroleum Gas and does not require or result in the relocation or construction of a new expanded water, wastewater treatment or stormwater drainage, electric power, natural gas or telecommunication facilities, the construction of which could cause significant environmental effects. Additionally,

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

on October 10, 2022 ICPDS received a comment letter from the Coachella Valley Water District[21] advising that for domestic water service the applicant will be subject to the satisfaction of terms and conditions established by CVWD and imposed from time to time, including, but not limited to fees and charges, water conservation measures, etc. Furthermore, on October 19, 2022 ICPDS received a comment email from the Imperial County Division of Environmental Health[15] stating they had no comments for this project. Any impacts are considered to be less than significant.

b) Have sufficient water supplies available to serve the project from existing and reasonably foreseeable future development during normal, dry and multiple dry years? ☐ ☐ ☒ ☐

b) The proposed project does not anticipate a change to the designated industrial use on the parcel. Additionally, as previously stated on sections "(X) - Hydrology and Water Quality" and (XIX)(a) above, for domestic water service, the applicant will be subject to the satisfaction of terms and conditions established by Coachella Valley Water District and imposed from time to time, including, but not limited to fees and charges, water conservation measures, etc. Any impacts are expected to be less than significant.

c) Result in a determination by the wastewater treatment provider which 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? ☐ ☐ ☒ ☐

c) Less than significant impacts are expected since the project does not include any structures that will require wastewater or wastewater treatment. The applicant shall contact Public Works and comply with their drainage requirements.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? ☐ ☐ ☒ ☐

d) Excess solid waste generation is not expected by the proposed LPG bulk plant. Less than significant impacts are expected.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? ☐ ☐ ☒ ☐

e) As previously stated on item (XIX)(d) above, the proposed project does not anticipate an expansion of the designated industrial on the parcel. The proposed LPG bulk plant shall comply with federal, state, and local management and reduction statutes and regulations related to solid waste. Any impact are expected to be less than significant.

XX. *WILDFIRE*

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan? ☐ ☐ ☒ ☐

As previously stated under item (IX)(f) – "Hazards and Hazardous Materials" above, the proposed LPG bulk plant would not substantially impair an adopted emergency response plan or emergency evacuation plan. On November 3, 2022, ICPDS received a comment letter from the Imperial County Fire Department[19] advising the applicant shall provide an Emergency Response Plan for covering possible emergencies (Examples: fire, leak and/or spill, earthquake, other emergencies). According to ICFD, there shall be at least one employee "on-call" at all times available to respond to emergencies at the facility to coordinate with emergency responders and provide information about the site if needed. The emergency contact coordinator shall be thoroughly familiar with the facility, the emergency response plan and federal, state, and local regulations on hazardous material storage and release. Adherence to ICFD's requirements will bring any impacts to less than significant.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? ☐ ☐ ☒ ☐

b) The proposed project is not located within a Very High Fire Hazard Severity Zone (VHFHZ); therefore, impacts due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire are expected to be less than significant with the adherence and compliance of ICFD's standards.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the ☐ ☐ ☒ ☐

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

environment?

c) As previously stated under item (XV)(a)(1) – "Public Services" above, per comment letter received from the Imperial County Fire Department[19], an approved fire hydrant installed within 300 feet of the facility. Currently the closest fire hydrant is 800 feet away. This requirement will help with a reliable water source for tank cooling within 10 minutes of a fire emergency as noted in the facility fire safety analysis. Additionally, an adequate number of fire extinguishers onsite should be provided. Adherence and compliance with ICFD's requirements will bring any impacts to less than significant.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

d) As previously stated on item (VII)(a)(4) above, per Imperial County General Plan's Seismic and Public Safety Element[14], "Landslide Activity Map[14a]," Figure 2, the proposed project is not located within a landslide activity area. The topography within the proposed project site is generally flat. Development on the parcel will be subjected to compliance with the latest edition of the California Building Code as well as to go through a ministerial building permit review. Additionally, as previously stated under item (XV)(a)(1) above, per comment letter from the Imperial County Fire Department[19], the proposed project shall be in compliance at all times with requirements in the California Fire Code and local ordinances and requirements. Adherence and compliance to the California Building Code and Imperial County Fire Department requirements and regulations will bring any impacts to less than significant.

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; Sundstrom v. County of Mendocino,(1988) 202 Cal.App.3d 296; Leonoff v. Monterey Board of Supervisors, (1990) 222 Cal.App.3d 1337; Eureka Citizens for Responsible Govt. v. City of Eureka (2007) 147 Cal.App.4th 357; Protect the Historic Amador Waterways v. Amador Water Agency (2004) 116 Cal.App.4th at 1109; San Franciscans Upholding the Downtown Plan v. City and County of San Francisco (2002) 102 Cal.App.4th 656.

Revised 2009- CEQA
Revised 2011- ICPDS
Revised 2016 – ICPDS
Revised 2017 – ICPDS
Revised 2019 – ICPDS

	Potentially Significant Impact (PSI)	Potentially Significant Unless Mitigation Incorporated (PSUMI)	Less Than Significant Impact (LTSI)	No Impact (NI)

SECTION 3
III. MANDATORY FINDINGS OF SIGNIFICANCE

The following are Mandatory Findings of Significance in accordance with Section 15065 of the CEQA Guidelines.

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, substantially reduce the number or restrict the range of a rare or endangered plant or animal, eliminate tribal cultural resources or eliminate important examples of the major periods of California history or prehistory?**	☐	☐	☐	☐
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.)**	☐	☐	☐	☐
c)	**Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?**	☐	☐	☐	☐

IV. PERSONS AND ORGANIZATIONS CONSULTED

This section identifies those persons who prepared or contributed to preparation of this document. This section is prepared in accordance with Section 15129 of the CEQA Guidelines.

A. COUNTY OF IMPERIAL

- Jim Minnick, Director of Planning & Development Services
- Michael Abraham, AICP, Assistant Director of Planning & Development Services
- Diana Robinson, Planning Division Manager
- Gerardo A. Quero, Project Planner
- Imperial County Air Pollution Control District
- Department of Public Works
- Fire Department
- Ag Commissioner
- Environmental Health Services
- Sheriff's Office

B. OTHER AGENCIES/ORGANIZATIONS

- Quechan Indian Tribe
- Imperial Irrigation District
- California Department of Toxic Substances Control: Certified Unified Program Agencies (CUPA) - Imperial
- Coachella Valley Water District

(Written or oral comments received on the checklist prior to circulation)

V. REFERENCES

1. Imperial County General Plan: Circulation and Scenic Highway Element
   https://www.icpds.com/assets/planning/circulation-scenic-highway-element-2008.pdf
2. California State Scenic Highway System Map
   https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa
3. California Farmland Mapping & Monitoring Program: Imperial County Important Farmland Map 2018
   https://maps.conservation.ca.gov/DLRP/CIFF/
4. Imperial County General Plan Land Use Plan Map
   https://icpds.maps.arcgis.com/apps/webappviewer/index.html?id=078e1e32c6dc4223ba8c7d69d7c6c383
5. Imperial County Air Pollution Control District comment letter dated October 14, 2022
6. Imperial County General Plan: Conservation and Open Space Element
   https://www.icpds.com/assets/planning/conservation-open-space-element-2016.pdf
   a) Figure 1: Sensitive Habitat Map
   b) Figure 2: Sensitive Species Map
   c) Figure 5: Areas of Heighten Historic Period Sensitivity Map
   d) Figure 6: Known Areas of Native American Cultural Sensitivity Map
   e) Figure 8: Existing Mineral Resources Map
7. National Wetlands Inventory Map: Surface Waters and Wetlands
   https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/
8. Quechan Indian Tribe comment email dated October 3, 2022
9. Imperial Irrigation District comment letter dated October 4, 2022
10. California Geological Survey Hazard Program: Alquist-Priolo Fault Hazard Zones
    https://gis.data.ca.gov/maps/ee92a5f9f4ee4ec5aa731d3245ed9f53/explore?location=32.538703%2C-110.920388%2C6.00
11. California Department of Conservation: Fault Activity Map
    https://maps.conservation.ca.gov/cgs/fam/
12. United States Geological Survey's Quaternary Faults Map
    https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=5a6038b3a1684561a9b0aadf88412fcf
13. California Tsunami Data Maps
    https://www.conservation.ca.gov/cgs/tsunami/maps
14. Imperial County General Plan: Seismic and Public Safety Element
    https://www.icpds.com/assets/planning/seismic-and-public-safety.pdf
    a) Figure 2: Landslide Activity Map
    b) Figure 3: Erosion Activity Map
15. Imperial County Division of Environmental Health comment email dated October 19, 2022
16. California Department of Toxic Substances Control (DTSC)-Imperial: Certified Unified Program Agencies (CUPA) comment email dated October 19, 2022
17. California Department of Toxic Substances Control: EnviroStor
    https://www.envirostor.dtsc.ca.gov/public/
18. Imperial County Airport Land Use Compatibility Maps
    https://www.icpds.com/planning/maps/airport-land-use-compatibility-maps
19. Imperial County Fire Department comment letter dated November 3, 2022
20. Cal Fire: Fire Hazard Severity Zones Maps – Imperial County
    https://osfm.fire.ca.gov/media/6680/fhszs_map13.pdf
21. Coachella Valley Water District comment letter dated October 10, 2022
22. Federal Emergency Management Agency (FEMA) Flood Map Service Center: Flood Insurance Rate Map
    https://msc.fema.gov/portal/search?AddressQuery=851%20pitzer%20road%20heber%20ca#searchresultsanchor
23. Imperial County General Plan: Noise Element
    https://www.icpds.com/assets/planning/noise-element-2015.pdf
24. California Historic Resources: Imperial County
    https://ohp.parks.ca.gov/ListedResources/?view=county&criteria=13
25. "County of Imperial General Plan EIR", prepared by Brian F. Mooney & Associates in 1993; and as Amended by County in 1996, 1998, 2001, 2003, 2006 & 2008, 2015, 2016.

VI. NEGATIVE DECLARATION – County of Imperial

The following Negative Declaration is being circulated for public review in accordance with the California Environmental Quality Act Section 21091 and 21092 of the Public Resources Code.

Project Name: Conditional Use Permit (CUP) #22-0021

Project Applicant: Jesus and Liliana Aguirre (Aguirre's Propane, LLC)

Project Location: 1338 Glendale Avenue, Salton City, CA 92274

Description of Project: The applicants, Jesus & Liliana Aguirre (Aguirre's Propane, LLC), propose the construction and operation of a Liquefied Petroleum Gas (LPG) bulk plant to store and distribute Liquid Propane Gas for commercial business purposes.

VII. FINDINGS

This is to advise that the County of Imperial, acting as the lead agency, has conducted an Initial Study to determine if the project may have a significant effect on the environment and is proposing this Negative Declaration based upon the following findings:

☐ The Initial Study shows that there is no substantial evidence that the project may have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

☐ The Initial Study identifies potentially significant effects but:

(1) Proposals made or agreed to by the applicant before this proposed Mitigated Negative Declaration was released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur.

(2) There is no substantial evidence before the agency that the project may have a significant effect on the environment.

(3) Mitigation measures are required to ensure all potentially significant impacts are reduced to levels of insignificance.

A MITIGATED NEGATIVE DECLARATION will be prepared.

If adopted, the Negative Declaration means that an Environmental Impact Report will not be required. Reasons to support this finding are included in the attached Initial Study. The project file and all related documents are available for review at the County of Imperial, Planning & Development Services Department, 801 Main Street, El Centro, CA 92243 (442) 265-1736.

NOTICE

The public is invited to comment on the proposed Negative Declaration during the review period.

Date of Determination Jim Minnick, Director of Planning & Development Services

The Applicant hereby acknowledges and accepts the results of the Environmental Evaluation Committee (EEC) and hereby agrees to implement all Mitigation Measures, if applicable, as outlined in the MMRP.

Applicant Signature Date

SECTION 4

VIII. RESPONSE TO COMMENTS

(ATTACH DOCUMENTS, IF ANY, HERE)

IX. MITIGATION MONITORING & REPORTING PROGRAM (MMRP)

(ATTACH DOCUMENTS, IF ANY, HERE)

COMMENT LETTERS

Gerardo Quero

From: Quechan Historic Preservation <historicpreservation@quechantribe.com>
Sent: Monday, 3 October, 2022 7:52 AM
To: Aimee Trujillo; ICPDSCommentLetters
Subject: RE: CUP22-0021 Request for Comments

CAUTION: This email originated outside our organization; please use caution.

This email is to inform you that we do not wish to comment on this project.

From: Aimee Trujillo [mailto:aimeetrujillo@co.imperial.ca.us]
Sent: Friday, September 30, 2022 3:46 PM
To: Carlos Ortiz; Sandra Mendivil; Jolene Dessert; Margo Sanchez; Ana L Gomez; Belen Leon; Monica Soucier; Ryan Kelley; Miguel Figueroa; Rosa Lopez; Vanessa Ramirez; Jeff Lamoure; Alphonso Andrade; Jorge Perez; Mario Salinas; Janette Angulo; Alfredo Estrada Jr; Robert Malek; Andrew Loper; Guillermo Mendoza; John Gay; Ray Loera - Sheriff; Manuel Deleon; Vargas, Donald A; sara.Lockett@parks.ca.gov; jbarrett@cvwd.org; incoming@cvwd.org; Mitch Mansfield; info@saltonsea.com; roger.sanchez-rangel@dot.ca.gov; robert.krug@dtsc.ca.gov; hhaines@augustinetribe.com; info@augustinetribe-nsn.gov; Marcus Cuero ; jmesa@campo-nsn.gov; Quechan Historic Preservation Officer; 'Jordan D. Joaquin'; thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; jfreeman@semprautilities.com; byronfrontier@yahoo.com
Cc: Jim Minnick; Michael Abraham; Diana Robinson; Gerardo Quero; Aimee Trujillo; Allison Galindo; John Robb; Laryssa Alvarado; Leslie Martinez; Maria Scoville; Melina Rizo; Rosa Soto
Subject: CUP22-0021 Request for Comments

Good afternoon,

Please see attached Request for Comments packet for CUP22-0021/ APN 014-031-005-000 located at 1338 Glendale Ave, Thermal CA 92274 .

Comments are due by **October 17th at 5:00PM.**

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments packet is being sent to you via this email.

Should you have any questions, please feel free to contact Gerardo at (442) 265-1736, or submit your comment letters to ICPDScommentletters@co.imperial.ca.us.

Thank you,

Aimee Trujillo
Office Assistant III
Imperial County Planning & Development Services
801 Main Street
El Centro, CA 92243
(442) 265-1736
(442) 265-1735 (Fax)
aimeetrujillo@co.imperial.ca.us

RECEIVED
OCT 03 2022
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Office of the
Agricultural Commissioner
Sealer of Weights and Measures

Carlos Ortiz
Agricultural Commissioner
Sealer of Weights and Measures

Jolene Dessert
Asst. Agricultural Commissioner
Asst. Sealer of Weights and Measures

RECEIVED
OCT 04 2022
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

POINT-OF-SALE SCANNERS & ELECTRONIC PRICING DEVICES

The Imperial County Weighing and Measuring Devices and Point-of-Sale Systems ordinance (Chapter 5.68) requires businesses to register with the Imperial County Sealer of Weights and Measures Department and pay an annual registration fee. Registration certificate fees are based on the number of point of sale stations at each retail location. This registration certificate is required in addition to any other certificate, license or permit which may be required by the county, cities, or any public entity. Any registration certificate for which fees have not been paid within forty –five (45) days from the date that such payment is due, will be subject to a twenty percent (20%) penalty. See the attached fee schedule for reference.

All retail locations that utilize a point of sale system are subject to the county ordinance. Such systems include Universal Product Code (UPC) scanners, price look-up codes, or any other system that relies on the retrieval of electronically stored information to complete a transaction. Per the ordinance, all systems shall be available for testing and inspection by the county sealer of weights and measures.

The Imperial County Weights and Measures Office enforces the California Business and Professions Code as well as the California Code of Regulations as it pertains to point-of-sale systems. Below is a summary of applicable code sections:

In accordance to the California Business and Professions Code § 12024.2 and § 12024.6, it is unlawful for any person, at the time of sale of a commodity, to do any of the following:

- Charge an amount greater than the price, or to compute an amount greater than a true extension of a price per unit, that is then advertised, posted, marked, displayed, or quoted for that commodity.
- Charge an amount greater than the lowest price posted on the commodity itself or on a shelf tag that corresponds to the commodity, notwithstanding any limitation of the time period for which the posted price is in effect.

- No person, firm, corporation, or association shall advertise, solicit, or represent by any means, a product for sale or purchase if it is intended to entice a customer into a transaction different from that originally represented.

In accordance to the California Business and Professions Code sections § 13300-13303 and § 12024.6:

- Any business that uses a point-of-sale system must have a display of the prices charged visible to the customer from a reasonable and typical position
- When a price reduction or discount regarding an item is advertised, the checkout system customer indicator shall display either the discounted price for that item, or alternatively, the regular price and a credit or reduction of the advertised savings
- Any surcharges and the total value to be charged for the overall transaction also shall be displayed for the consumer at least once before the consumer is required to pay for the goods or services
- "Point-Of-Sale System" means any computer or electronic price look-up system that retrieves the price of the item being purchased

The Imperial County Sealer of Weights and Measures is authorized to levy a civil penalty against a person violating any provision of this law or regulation adopted pursuant to this law, of not more than one thousand dollars ($1,000) for each violation.

Please remember that it is the responsibility of the owner/operator of a business to obtain a current registration from the Sealer's Office before using an electronic point-of-sale checkout system. Our office is open to the public from 8:00AM to 5:00PM, Monday through Friday. If you have any questions or need assistance, please contact us at (442) 265-1500. We will be happy to assist you.

Sincerely,

Margo Sanchez
Deputy Sealer of Weights & Measures
Special Projects Division

Office of the
Agricultural Commissioner
Sealer of Weights & Measures

Carlos Ortiz
Agricultural Commissioner
Sealer of Weights & Measures

Jolene Dessert
Asst. Agricultural Commissioner
Asst. Sealer of Weights & Measures

ANNUAL REGISTRATION/RENEWAL APPICATION (expires December 31, 2022)

Registration No.: *Please update any outdated or missing information.*

Company Headquarters:

Name: _____ Contact: _____

Mailing Address: _____ Phone: _____

City/State/Zip: _____ Fax: _____

Email: _____

Physical Location:

Business Name: _____ Primary Contact: _____

Physical Address: _____ Phone: _____

City/State/Zip: _____ Fax: _____

Device Type	Location Fee	Quantity	Fee per Device	Device Fee Subtotal	DMS Fee per Device	DMS Fee Subtotal	Device Total

TOTAL FEES DUE: _____

For Department Use Only

DMS Receipt #: _____ DMS Date: _____

Deposit #: _____ Deposit Date: _____

Make check or money order payable to:
IMPERIAL COUNTY WEIGHTS & MEASURES
852 Broadway
El Centro, CA 92243

I CERTIFY THAT THE INFORMATION SUBMITTED IN THIS APPLICATION IS TRUE AND CORRECT.

Print Name of Authorized Representative **Signature** **Date**

We gladly accept checks.
If your check is returned unpaid, your account will be debited electronically for the original amount and electronically or via paper for the state's maximum allowable service fee. Payment by check constitutes authorization of these transactions. You may revoke this authorization by calling (800) 666-5222, ext. 2, to arrange payment for any outstanding checks and service fees due. **www.fiserv.com**

fiserv.

County of Imperial Division of Weights and Measures

Registration Fees = Location fee + Device fee + DMS fee (State Surcharge)

Fees are based on a statewide fee structure approved by the State Legislature and Governor. Fees partially offset the cost of administering the commercial weighing and measuring program, and are based on the number and type(s) in use per location. These fees have been adopted in the Imperial County Ordinance Chapter 5.68 and are authorized by the California Business and Professions Code: Device Fees Section 12240(f)-(t); Location Fee Section 12240(u); State Administrative Fee: Section 12241 and California Code of Regulations Title 4, Division 9, Chapter 3, Article 3, Section 4075.

All fees are due and payable by January 1st. Any registration paid after forty-five (45) days will be considered delinquent and be subject to penalties. The penalties are twenty percent (20%) of total device registration fee and location fee accruing each forty-five (45) days in arrears.

Device Location Fee: Each location (scanner/point-of-sale excluded) is charged a location fee of $100. A location is considered a business with one or more types of devices that require specialized testing equipment that will necessitate more than one trip. Additionally, if a commercial device is installed on a vehicle, each vehicle is considered a single location.

Device Registration Fees	**Fee per Device**	**DMS fee per Device**
CNG Meter	$20.00	$16.00
Computing Scales <2,000#	$20.00	$2.20
Counter Scale < 2,000#	$50.00	$2.20
Electric Submeter	$3.00	$0.50
Fabric/Cord/Wire	$20.00	$2.20
Hanging Scale < 2,000#	$50.00	$2.20
Hanging Scale 2,000-10,000#	$150.00	$16.00
Hopper & Tank > 10,000#	$250.00	$24.00
Hopper & Tank 2,000-10,000#	$150.00	$16.00
L.P.G. Meter	$185.00	$16.00
Livestock Scale > 10,000#	$150.00	$24.00
Livestock Scale 2,000-10,000#	$100.00	$16.00
Misc. Measuring Devices	$20.00	$2.20
Misc. Weighing Devices < 2,000#	$50.00	$2.20
Monorail/Meat < 2,000#	$50.00	$2.20
Monorail/Meat 2,000-10,000#	$150.00	$16.00
Odometers	$60.00	$2.20
Platform/Dormant <2,000#	$50.00	$2.20
Platform/Dormant > 10,000#	$250.00	$16.00
Platform/Dormant 2,000-10,000#	$150.00	$16.00
Class II Scale (Non-prescription/jewelry)	$20.00	$2.20
Pres/Jewel Scale <2,000#	$80.00	$2.20
Railway Scale > 10,000#	$250.00	$24.00
Retail Meter Fuel (Gas pumps)	$20.00	$2.20
Retail Water Meter (Dispensers, Vending)	$20.00	$2.20
Vehicle Meter (Any vehicle mounted meter)	$75.00	$2.20
Vehicle Scale > 10,000#	$250.00	$24.00
Water Submeters	$2.00	$0.50
Wholesale Meter (Stationary Hi-volume sale)	$75.00	$2.20
Scanner/Point of Sale Registration Fees	**Fee per Scanners**	**DMS Fee per Scanners**
Scanners (1-3)	$89.00	$0.00
Scanners (4-16)	$129.00	$0.00
Scanners (17-30)	$190.00	$0.00
Scanners (31 or more)	$240.00	$0.00

Please note that some device types cap at $1,000 per location. If you have any questions please call the Division of Weights and Measures at (442) 265-1500.

Chapter 5.68 - WEIGHING AND MEASURING DEVICES AND POINT-OF-SALE SYSTEMS

Footnotes:
— (12) —
***Editor's note**— Sec. II of Ord. No. 1492, adopted Oct. 1, 2013, amended Ch. 5.68 in its entirety to read as herein set out. Former Ch. 5.68 pertained to a similar subject matter and derived from Ord. 1358, 2002; Ord. 1382, 2004; and Ord. 1416, 2006.*

5.68.010 - County sealer of weights and measures.

A. Pursuant to the provisions of Section 12200 of the Business and Professions Code of the state of California, there is created in the county of Imperial the office of county sealer of weights and measures. The county sealer of weights and measures shall have the authority, duties and responsibilities of such office as provided by the provisions of Article 2 of Chapter 2 of Division 5 of the Business and Professions Code of the state of California, and as further provided for by the board of supervisors of the county of Imperial.

B. The county board of supervisors establishes the maxim um fees as set forth below, which are necessary to cover the cost of services under this chapter. Such fees shall not exceed the total cost of inspecting or testing weighing and measuring devices as required by law. The sealer is directed to collect such fees. If the sealer finds that the cost of providing such services is less than the maximum amount, the sealer shall bring a fee schedule reduction to the board of supervisors.

(Ord. No. 1492, § II, 10-1-13)

5.68.020 - Inspection and testing of weighing and measuring devices.

A. No weight, scale, beam or measure of any kind, instrument or mechanical device for weighing or measurement, or tool, appliance and accessories connected with any or all such measures, instruments or appliances may be sold or used for commercial purposes in the county of Imperial, unless inspected, tried or tested by the county sealer of weights and measures appointed pursuant to Section 12200 or 12201 of the Business and Professions Code of the state of California, as such sections now exist or may hereafter be amended.

B. Upon the written request of any person, firm or corporation, the county sealer of weights and measures may calibrate, test, weigh and measure, and certify to the accuracy of, weights and measures and weighing and measuring devices, and instruments, tools and accessories connected therewith used for noncommercial purposes.

(Ord. No. 1492, § II, 10-1-13)

5.68.030 - Registration of certain weighing and measuring devices.

A. It is unlawful for any person to use any weighing or measuring instrument not specifically excluded by Section 12240 of the Business and Professions Code for commercial purposes, such as that section now exists or may hereafter be amended, unless such device has been inspected, tried or tested pursuant to Section 5.68.010 of this chapter and, in addition, such device and its location are registered with the county sealer of weights and measures.

B. Applications for registration of weighing or measuring devices, and renewal thereof, shall be filed with the county sealer. The county sealer shall issue registration certificates that shall be valid upon receipt of the applicable fee prescribed in the current agricultural commissioner's fee schedule. Registration shall be effective for one calendar year or portion thereof and shall expire on December 31st of that year. Registration shall be renewed annually.

C. Every person using any weighing or measuring device or point-of-sale station for which a registration certificate is required under the provisions of this chapter shall keep such certificate (or a true and accurate copy thereof) available for inspection by the county sealer of weights and measures at all times at the location where such instrument(s) is/are being used.

5.68.040 - Fees and noncompliance penalties—Weighing and measuring devices.

A. Annual registration fees for a business that uses a commercial weighing or measuring device or devices shall consist of a business location fee; a Department of Food and Agriculture administrative fee, as specified in Section 12241 of the Business and Professions Code; and a device fee, as specified in subdivision C of this section. The business location fee and the device fee for any business registered by a new owner after July 1 shall only be charged half of the fee listed below for that calendar year and there shall be no annual registration fees for any business registered by a new owner after December 1 for that calendar year.

B. The business location fee shall be up to one hundred dollars ($100.00) per calendar year. For the purposes of this section, a single business location is defined as:

1. Each business location that uses one or more categories or types of commercial devices as set forth in subdivision C.1. to C.8. inclusive, and in subdivision C.10.; that require the use of specialized testing equipment; and that necessitate not more than one inspection trip by a weights and measures official.
2. Each vehicle, except for those vehicles that are employed in vehicle rental transactions, in which one or more commercial devices is installed and used.
3. (a) For vehicles that are employed in vehicle rental transactions and that are not subject to Section 1936 of the Civil Code, each business location at

which vehicles are stored or maintained by a vehicle rental company for the purpose of renting vehicles to customers.

(b) A facility that meets all of the following criteria shall not be considered a business location for the purposes of this paragraph:

(i) The facility is not wholly, or in any part, owned, leased, or operated by the vehicle rental company.

(ii) The facility is not operated or staffed by an employee of the vehicle rental company.

(iii) The facility stores or maintains, on a temporary basis, vehicles at the location for customer convenience.

(c) If a person files a complaint with the county sealer regarding the accuracy of an odometer in a vehicle found or located at a facility described in subparagraph (b), the county sealer may charge a fee to the operator of the vehicle rental company sufficient to recover, but not to exceed, the reasonable cost of testing the device in investigation of the complaint.

C. Device fees shall be assessed as follows:

1. For marinas, mobile home parks, recreational vehicle parks, and apartment complexes, where the owner of the marina, park, or complex owns and is responsible for the utility meters, the device fee shall not exceed the following:

(a) For water submeters, two dollars ($2.00) per device per space or apartment.

(b) For electric submeters, three dollars ($3.00) per device per space or apartment.

(c) For vapor submeters, four dollars ($4.00) per device per space or apartment.

2. For weighing devices, other than livestock, with capacities of ten thousand (10,000) pounds or greater, the device fee shall not exceed two hundred fifty dollars ($250.00) per device; for weighing devices, other than livestock scales, with capacities of at least two thousand (2,000) pounds but less than ten thousand (10,000) pounds, the device fee shall not exceed one hundred fifty dollars ($150.00) per device.

3. For livestock scales with capacities of ten thousand (10,000) pounds or greater, the device fee shall not exceed one hundred fifty dollars ($150.00) per device; for livestock scales with capacities of at least two thousand (2,000) pounds but less than ten thousand (10,000) pounds, the device fee shall not exceed one hundred dollars ($100.00) per device.

4. For liquefied petroleum gas (LPG) meters, truck mounted or stationary, the device fee shall not exceed one hundred eighty-five dollars ($185.00) per device.

5. For wholesale and vehicle meters, the device fee shall not exceed seventy-five dollars ($75.00) per device.

6. For computing scales, the device fee shall not exceed twenty dollars ($20.00) per device. For purposes of this subdivision, a computing scale shall be a weighing device with a capacity of less than one hundred (100) pounds that indicates the money value of any commodity weighed, at predetermined unit prices, throughout all or part of the weighing range of the scale. For the purposes of this subdivision, the portion of the annual registration fee consisting of the business location fee and the device fees authorized by this subdivision shall not exceed the sum of one thousand dollars ($1,000.00) for each business location.

7. For jewelry and prescription sales, the device fee shall not exceed eighty dollars ($80.00) per device.

8. For weighing devices, other than computing, jewelry, and prescription scales as defined in subdivisions C.6. and C.7., with capacities of at least one hundred (100) pounds but less than two thousand (2,000) pounds, the device fee shall not exceed fifty dollars ($50.0) per device.

9. For vehicle odometers utilized to charge mileage usage fees in vehicle rental transactions or in computing other charges for service, including, but not limited to, ambulance, towing, or limousine services, the device fee shall not exceed sixty dollars ($60.00) per device. For vehicle odometers utilized to charge mileage usage fees in vehicle rental transactions involving non-passenger vehicles that are not subject to Section 1936 of the Civil Code, the portion of the annual registration fee consisting of the business location fee and the device fee shall not exceed the sum of three hundred forty dollars ($340.00) for each business location.

10. For all other commercial weighing or measuring devices not listed in subdivisions C.1. to C.9., inclusive, the device fee shall not exceed twenty dollars ($20.00) per device. For the purposes of this subdivision, the total portion of the annual registration fee consisting of the business location fee and the device fees authorized by this subdivision shall not exceed the sum of one thousand dollars ($1,000.00), for each business location.

D. The registration fees assessed pursuant to this section shall be up to the maximum charges prescribed in Section 12240 of the California Business and Professions Code.

E. The following fees will be charged for the re-inspection or reexamination of those devices that have been previously inspected and found incorrect or deficient, and for inspection or examination of any weighing device at the request of the owner, distributor or repair person. Electric meters will not be re-inspected. All charges will be made on a portal-to-portal basis and will not be charged for devices registered pursuant to subsection B. of this section:

Small capacity scales, per hour $60.00

Large capacity scales (All scales exceeding 3,000 pounds capacity), per hour $110.00

Retail meters, per hour $60.00

Wholesale meters, per hour $110.00

Liquefied petroleum gas meters, per hour $110.00

All other commercial devices $60.00

F. Standby fees shall be paid at the above hourly rates for the time the sealer of weights and measures is requested to wait, for the convenience of the

owner, distributor or repair person, while the weighing and measuring device is placed into proper condition to be tested or inspected.

G. Any registration certificate for which the fees have not been paid within forty-five (45) days from the date such payment is due will be subject to a twenty percent (20%) penalty, with a like amount accruing each forty-five (45) days which elapse without payment received.

(Ord. No. 1492, § II, 10-1-13; Ord. No. 1501, § 1, 10-28-14)

5.68.050 - Inspection and testing of point-of-sale devices.

All individual, separate locations where consumers are charged for the purchase of commodities by using equipment that is capable of recovering electronically stored price information by reading a bar code printed on the product or on a label, including, but not limited to, equipment that uses Universal Product Code, price look-up codes or any other system that relies on the retrieval of electronically stored information to complete a transaction of commerce between a retailer and a customer that are used for commercial purposes in the county of Imperial shall be available for testing and inspection by the county sealer of weights and measures.

(Ord. No. 1492, § II, 10-1-13)

5.68.060 - Registration certificate requirements for point-of-sale devices.

A. It is unlawful for a person to use a point-of-sale station for commercial purposes without first obtaining a registration certificate in accordance with the provisions of this chapter. A separate registration certificate shall be obtained for each location. The registration certificate shall be required for each location. The registration certificate shall be in addition to any other certificate, license or perm it which may be required by the county or any public entity.

B. Registration certificates shall not be issued by the county until all applicable fees as set forth in Section 5.68.070 of this chapter have been paid.

5.68.070 - Fees and noncompliance penalties—Point-of-sale devices.

A. Registration certificate fees for point-of-sale devices shall be based upon the number of sales stations at each retail location and shall be as follows:

1—3 point-of-sale devices $89.00

4—16 point-of-sale devices $129.00

17—30 point-of-sale devices $190.00

More than 30 point-of-sale devices $240.00

B. Any registration certificate for point-of-sale devices for which the fees have not been paid within forty-five (45) days from the date such payment is due will be subject to a twenty percent (20%) penalty, with a like amount accruing each forty-five (45) days which elapse without payment received.

(Ord. No. 1492, § II, 10-1-13)

IID

A century of service.

www.iid.com

Since 1911

October 4, 2022

RECEIVED

OCT 04 2022

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Mr. Gerardo Quero
Planner I
Planning & Development Services Department
County of Imperial
801 Main Street
El Centro, CA 92243

SUBJECT: LPG Storage and Distribution Facility Project, CUP22-0021

Dear Mr. Quero:

On September 30, 2022, the Imperial Irrigation District received from the Imperial County Planning & Development Services Department, a request for agency comments on Conditional Use Permit application No. 22-0021 for a liquid petroleum gas storage and distribution facility project. The applicants, Jesus and Liliana Aguirre, propose the construction and operation of a commercial LPG storage and distribution facility at 1338 Glendale Ave, Thermal CA (APN 014-031-005-000).

The IID has reviewed the application and has the following comments:

1. If the project requires temporary and/or permanent electrical service, the applicant should be advised to contact Gabriel Ramirez, IID project development service planner, at (760) 339-9257 or e-mail Mr. Ramirez at gramirez@iid.com to initiate the customer service application process. In addition to submitting a formal application (available for download at the district website http://www.iid.com/home/showdocument?id=12923), the applicant will be required to submit a complete set of approved project plans by the County of Imperial (including AutoCAD files of the site plan), project schedule, estimated in-service date, electrical one-line diagram, electrical loads and panel schedules, electrical panel specifications (size, voltage and location), and the applicable fees, permits, easements and environmental compliance documentation pertaining to the provision of electrical service to the project. The applicant shall be responsible for all costs and mitigation measures related to providing new electrical service to the project.

2. Electrical capacity is limited in the project area. A circuit study may be required. Any system improvements or mitigation identified in the circuit study to enable the provision of electrical service to the project shall be the financial responsibility of the applicant.

3. Any construction or operation on IID property or within its existing and proposed right of way or easements including but not limited to: surface improvements such as proposed new streets, driveways, parking lots, landscape; and all water, sewer, storm water, or any other above ground or underground utilities; will require an encroachment permit, or encroachment agreement (depending on the circumstances). A copy of the IID encroachment permit application and instructions for its completion are available at https://www.iid.com/about-iid/department-directory/real-estate. The IID Real Estate

Section should be contacted at (760) 339-9239 for additional information regarding encroachment permits or agreements. No foundations or buildings will be allowed within IID's right of way.

4. Any new, relocated, modified or reconstructed IID facilities required for and by the project (which can include but is not limited to electrical utility substations, electrical transmission and distribution lines, water deliveries, canals, drains, etc.) need to be included as part of the project's California Environmental Quality Act (CEQA) and/or National Environmental Policy Act (NEPA) documentation, environmental impact analysis and mitigation. Failure to do so will result in postponement of any construction and/or modification of IID facilities until such time as the environmental documentation is amended and environmental impacts are fully analyzed. Any and all mitigation necessary as a result of the construction, relocation and/or upgrade of IID facilities is the responsibility of the project proponent.

Should you have any questions, please do not hesitate to contact me at 760-482-3609 or at dvargas@iid.com. Thank you for the opportunity to comment on this matter.

Respectfully,

Donald Vargas
Compliance Administrator II

Enrique B. Martinez – General Manager
Mike Pacheco – Manager, Water Dept.
Jamie Asbury – Manager, Energy Dept.
Constance Bergmark – Deputy Mgr. Energy Dept., Energy Business, Regulatory & Transactions Admin.
Geoffrey Holbrook – General Counsel
Michael P. Kemp – Superintendent, Regulatory & Environmental Compliance
Laura Cervantes. – Supervisor, Real Estate
Jessica Humes – Environmental Project Mgr. Sr., Water Dept.

COACHELLA VALLEY WATER DISTRICT
Established in 1918 as a public agency

GENERAL MANAGER
Jim Barrett

CLERK OF THE BOARD
Sylvia Bermudez

ASSISTANT GENERAL MANAGER
Robert Cheng

ASSISTANT GENERAL MANAGER
Dan Charlton

October 10, 2022

RECEIVED
OCT 13 2022
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Gerado Quero
Imperial County Planning and Building Department
801 Main Street
El Centro, CA 92243

Dear Mr. Quero:

Subject: Imperial County Planning & Development Services, CUP 22-0021, LPG Bulk Plant, Storage and Distribution of LPG Gas, APN 014-031-005, 1338 Glendale Avenue, Thermal

This area is designated Zone X on Federal Flood Insurance rate maps, which are in effect at this time by the Federal Emergency Management Agency (FEMA).

Flood protection measures for local drainage and valley floor drainage shall comply with California Drainage Law and provide that stormwater flows are received onto and discharged from this property in a manner that is reasonably compatible with predevelopment conditions.

Imperial County (County) shall require mitigation measures to be incorporated into the development to prevent flooding of the site or downstream properties. These measures shall require 100 percent on-site retention of the incremental increase of runoff from the 100-year storm. In addition, flood protection measures shall comply with California Drainage Law and provide that offsite stormwater flows are received onto the property and discharged from the property in a manner that is reasonably compatible with redevelopment conditions. Coachella Valley Water District (CVWD) requests review of said flood protection measures for compliance with California Drainage Law from a regional valley floor drainage perspective.

The project is located within the service area of CVWD for the provision of domestic water service. The initiation of said service to this area will be subject to the satisfaction of terms and conditions established by CVWD and imposed from time to time, including but not limited to fees and charges, water conservation measures, etc.

CVWD may need additional facilities to provide for the orderly expansion of its domestic water systems. These facilities may include pipelines, wells, reservoirs, booster pumping stations, and other facilities. The developer may be required to construct/install these facilities and then convey said facilities to CVWD along with the land and/or easements on which these facilities will be located. The terms and conditions for the planning, design, construction/installation, and conveyance of property interests shall be determined by CVWD pursuant to its rules and regulations as said requirements may be revised from time to time. These sites shall be shown on the parcel map as lots and/or easements to be deeded to CVWD for "CVWD public services" purposes.

This notice of domestic water service availability only applies to the specific property for which it was issued and shall expire three (3) years from date of issuance. Unless or until all requirements for the initiation of service are met, the developer shall not be deemed to have any vested right or other commitment to receive water and/or sanitation service. In the event all of the terms, conditions, fees and charges are not satisfied on or before the expiration date, this notice shall expire. Upon expiration, the developer will be required to submit a new application and otherwise comply with any and all new or amended requirements for the provision of service as may be determined by CVWD pursuant to its rules and regulations.

This parcel may be encumbered by a CVWD domestic water easement on the northerly side of the parcel.

Domestic water service remains at all times subject to changes in regulations adopted by CVWD's Board of Directors including reductions in, or suspensions of, service.

If you have any questions, please call Tommy Fowlkes, Development Services Supervisor, extension 3535.

Sincerely,

Carrie Oliphant

Carrie Oliphant
Director of Engineering

TH: ms\Eng\Dev Srvs\2022\Oct\DRL PZ 22-14058 Imperial County.doc
File: 0163.1, 0421.1, 1150.21
Geo. 101019-2
PZ 22-14058

150 SOUTH NINTH STREET
EL CENTRO, CA 92243-2850

TELEPHONE: (442) 265-1800
FAX: (442) 265-1799

AIR POLLUTION CONTROL DISTRICT

October 14, 2022

RECEIVED

OCT 14 2022

IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

Jim Minnick
Planning & Development Services Director
801 Main Street
El Centro, CA 92243

SUBJECT: Conditional Use Permit 22 0021 – Jesus & Liliana Aguirre

Dear Mr. Minnick,

The Imperial County Air Pollution Control District ("Air District") appreciates the opportunity to review and comment on Conditional Use Permit ("CUP") 22-0021 ("Project"). The Project proposes the construction and operation of an LPG Bulk Plant, storage and distribution of LPG gas for commercial and business purposes, and is located at 1338 Glendale Ave, Thermal CA 92274 also identified as Assessor's Parcel Number 014-031-005.

Reviewing the project information provided, the project would not require an Air District permit at this time. However, the Air District requests to be informed of any changes or modifications to the project equipment or processes to verify any additional requirements that may be triggered by the change.

The Air District would also like to remind the applicant that the project must comply with all Air District rules, and would emphasize Regulation VIII. Regulation VIII is a collection of rules designed to maintain fugitive dust emissions below 20% opacity.

For your convenience, the Air District's rules and regulations are available via the web at https://apcd.imperialcounty.org/rules-and-regulations/. Please feel free to call should you have questions at (442) 265-1800.

Respectfully,

Ismael Garcia
Environmental Coordinator I

Reviewed by,
Monica N. Soucier
APC Division Manager

AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

Gerardo Quero

From: Allison Galindo
Sent: Tuesday, 18 October, 2022 4:36 PM
To: Gerardo Quero
Subject: FW: CUP22-0021 Request for Comments

FYI

Allison Galindo
Office Assistant III
Imperial County Planning & Development Services
801 Main St.
El Centro, CA 92243
(442)265-1736

RECEIVED
OCT 18 2022
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

From: Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>
Sent: Tuesday, October 18, 2022 4:25 PM
To: Allison Galindo <allisongalindo@co.imperial.ca.us>
Subject: RE: CUP22-0021 Request for Comments

CAUTION: This email originated outside our organization; please use caution.

The facility must conform to all regulatory design and system operational requirements, and must notify the DTSC Imperial CUPA and County Environmental Health upon start of operations. They will be in the Hazardous Materials program and will need to create a CERS account prior to operation. Any questions, call the CUPA at 760-352-0381.
Bob

Robert Krug
Supervisor / Senior Environmental Scientist
Department of Toxic Substances Control
Imperial CUPA
627 Wake Avenue
El Centro, CA 92243
Robert.Krug@dtsc.ca.gov
(760) 336-8919 Work
(760) 457-7376 Cell

From: Allison Galindo <allisongalindo@co.imperial.ca.us>
Sent: Tuesday, October 18, 2022 1:50 PM
To: Krug, Robert@DTSC <Robert.Krug@dtsc.ca.gov>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Alfredo Estrada Jr <AlfredoEstradaJr@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>
Cc: Gerardo Quero <gerardoquero@co.imperial.ca.us>; Aimee Trujillo <aimeetrujillo@co.imperial.ca.us>; Allison Galindo

<allisongalindo@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Laryssa Alvarado <laryssaalvarado@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca.us>; Melina Rizo <melinarizo@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>
Subject: FW: CUP22-0021 Request for Comments

Good afternoon,

Please see attached Request for Comments packet for CUP22-0021/ APN 014-031-005-000 located at 1338 Glendale Ave, Thermal CA 92274 .

Comments were due by **October 17th at 5:00PM.** If you can please reply with any comments towards this project.

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments packet is being sent to you via this email.

Should you have any questions, please feel free to contact Gerardo at (442) 265-1736, or submit your comment letters to ICPDScommentletters@co.imperial.ca.us.

Thank you,

Allison Galindo
Office Assistant III
Imperial County Planning & Development Services
801 Main St.
El Centro, CA 92243
(442)265-1736

From: Aimee Trujillo <aimeetrujillo@co.imperial.ca.us>
Sent: Friday, September 30, 2022 3:46 PM
To: Carlos Ortiz <CarlosOrtiz@co.imperial.ca.us>; Sandra Mendivil <SandraMendivil@co.imperial.ca.us>; Jolene Dessert <JoleneDessert@co.imperial.ca.us>; Margo Sanchez <MargoSanchez@co.imperial.ca.us>; Ana L Gomez <analgomez@co.imperial.ca.us>; Belen Leon <BelenLeon@co.imperial.ca.us>; Monica Soucier <MonicaSoucier@co.imperial.ca.us>; Ryan Kelley <RyanKelley@co.imperial.ca.us>; Miguel Figueroa <miguelfigueroa@co.imperial.ca.us>; Rosa Lopez <RosaLopez@co.imperial.ca.us>; Vanessa Ramirez <VanessaRamirez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Mario Salinas <MarioSalinas@co.imperial.ca.us>; Janette Angulo <JanetteAngulo@co.imperial.ca.us>; Alfredo Estrada Jr <AlfredoEstradaJr@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>; Ray Loera - Sheriff <rloera@icso.org>; Manuel Deleon <mdeleon@icso.org>; Vargas, Donald A <DVargas@IID.com>; sara.Lockett@parks.ca.gov; jbarrett@cvwd.org; incoming@cvwd.org; Mitch Mansfield <mmansfield@saltoncsd.ca.gov>; info@saltonsea.com; roger.sanchez-rangel@dot.ca.gov; robert.krug@dtsc.ca.gov; hhaines@augustinetribe.com; info@augustinetribe-nsn.gov; Marcus Cuero <marcuscuero@campo-nsn.gov>; jmesa@campo-nsn.gov; Quechan Historic Preservation Officer <historicpreservation@quechantribe.com>; 'Jordan D. Joaquin' <tribalsecretary@quechantribe.com>; thomas.tortez@torresmartinez-nsn.gov; joseph.mirelez@torresmartinez-nsn.gov; jfreeman@semprautilities.com; byronfrontier@yahoo.com

Gerardo Quero

From: Jorge Perez
Sent: Wednesday, 19 October, 2022 2:32 PM
To: Allison Galindo; Robert Krug; Andrew Loper; Robert Malek; Alfredo Estrada Jr; Jeff Lamoure; Alphonso Andrade; Guillermo Mendoza; John Gay
Cc: Gerardo Quero; Aimee Trujillo; John Robb; Laryssa Alvarado; Maria Scoville; Melina Rizo; Rosa Soto
Subject: RE: CUP22-0021 Request for Comments

Hi Allison,

Our agency has no comments. However, please have the applicant reach out to DTSC/CUPA to ensure they are meeting their standards, if any.

Thank you,
Jorge A. Perez
Imperial County Division of Environmental Health
P: 442-265-1888 – C: 760-427-1190

RECEIVED
OCT 19 2022
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

From: Allison Galindo <allisongalindo@co.imperial.ca.us>
Sent: Tuesday, October 18, 2022 1:50 PM
To: Robert Krug <Robert.Krug@dtsc.ca.gov>; Andrew Loper <AndrewLoper@co.imperial.ca.us>; Robert Malek <RobertMalek@co.imperial.ca.us>; Alfredo Estrada Jr <AlfredoEstradaJr@co.imperial.ca.us>; Jorge Perez <JorgePerez@co.imperial.ca.us>; Jeff Lamoure <JeffLamoure@co.imperial.ca.us>; Alphonso Andrade <AlphonsoAndrade@co.imperial.ca.us>; Guillermo Mendoza <GuillermoMendoza@co.imperial.ca.us>; John Gay <JohnGay@co.imperial.ca.us>
Cc: Gerardo Quero <gerardoquero@co.imperial.ca.us>; Aimee Trujillo <aimeetrujillo@co.imperial.ca.us>; Allison Galindo <allisongalindo@co.imperial.ca.us>; John Robb <JohnRobb@co.imperial.ca.us>; Laryssa Alvarado <laryssaalvarado@co.imperial.ca.us>; Maria Scoville <mariascoville@co.imperial.ca.us>; Melina Rizo <melinarizo@co.imperial.ca.us>; Rosa Soto <RosaSoto@co.imperial.ca.us>
Subject: FW: CUP22-0021 Request for Comments

Good afternoon,

Please see attached Request for Comments packet for CUP22-0021/ APN 014-031-005-000 located at 1338 Glendale Ave, Thermal CA 92274 .

Comments were due by **October 17th at 5:00PM.** If you can please reply with any comments towards this project.

In an effort to increase the efficiency at which information is distributed and reduce paper usage, the Request for Comments packet is being sent to you via this email.

Should you have any questions, please feel free to contact Gerardo at (442) 265-1736, or submit your comment letters to ICPDScommentletters@co.imperial.ca.us.

Thank you,

ADMINISTRATION / TRAINING
1078 Dogwood Road
Heber, CA 92249

Administration
Phone: (442) 265-6000
Fax: (760) 482-2427

Training
Phone: (442) 265-6011

OPERATIONS/PREVENTION
2514 La Brucherie Road
Imperial, CA 92251

Operations
Phone: (442) 265-3000
Fax: (760) 355-1482

Prevention
Phone: (442) 265-3020

November 3, 2022

RECEIVED
NOV 03 2022
IMPERIAL COUNTY
PLANNING & DEVELOPMENT SERVICES

RE: Condition Use Permit 22-0021
Jesus and Liliana Aguirre, Bulk Propane Storage
1338 Glendale Ave, Thermal, CA 92274

Imperial County Fire Department would like to thank you for the opportunity to review and comment on CUP 22-0021 for Jesus and Liliana Aguirre Bulk Propane Storage Facility located at 1338 Glendale Ave, Thermal, CA 92274

Imperial County Fire Department has the following comments and/or requirements.

- An approved fire hydrant installed within 300 feet of the facility. Currently the closet fire hydrant is 800 feet away. This requirement will help with a reliable water source for tank cooling within 10 minutes of a fire emergency as noted in the facility fire safety analysis*.
- Leak mitigation and Hazmat equipment shall be kept on site in approved location determined by Imperial County Fire Department official(s). Equipment needed shall be determined by Imperial County Fire Department official(s).
- Fire department access roads shall be a width of a least 20 feet and all weather surface capable of supporting fire apparatus. Fire department access roads will be provided with approved turn around approved by Imperial County Fire Department. Gates will be in accordance with the current adapted fire code and the facility will maintain a Knox Box/lock for access on site.
- Provide an adequate number of fire extinguishers onsite, as determined by Imperial County Fire Department official(s)
- All storage and handling of flammable and combustible gas shall be in accordance with the California Fire Code and all federal, state, and local regulations, codes, and ordinances.
- Compliance with all required sections of the fire code.

An Emergency Response Plan shall be provided to Imperial County Fire Department/OES for covering possible emergencies (Examples: fire, leak and/or spill, earthquake, other emergencies). There shall be at least one employee "on-call" at all times available to respond to emergencies at the facility to coordinate with emergency responders and provide information about the site if needed. The emergency contact coordinator shall be thoroughly familiar with the facility, the emergency response plan and federal, state, and local regulations on hazard material storage and release.

ADMINISTRATION / TRAINING
1078 Dogwood Road
Heber, CA 92249

Administration
Phone: (442) 265-6000
Fax: (760) 482-2427

Training
Phone: (442) 265-6011

OPERATIONS/PREVENTION
2514 La Brucherie Road
Imperial, CA 92251

Operations
Phone: (442) 265-3000
Fax: (760) 355-1482

Prevention
Phone: (442) 265-3020

The project shall be in compliance at all times with requirements in the California Fire Code and local ordinances and requirements. Imperial County Fire Department shall conduct annual fire and life safety inspections

Imperial County Fire Department reserves the right to comment and request additional requirements pertaining to this project regarding fire and life safety measures, California Building and Fire Code, and National Fire Protection Association standards at a later time as we see necessary.

*An Fire Safety Analysis report was created and provided to Imperial County Fire Department for the project. Requirements noted were based on findings of the Fire Safety Analysis report and can be provided for review if needed.

If you have any questions, please contact the Imperial County Fire Prevention Bureau at 442-265-3020 or 442-265-3021.

Sincerely
Andrew Loper
Lieutenant/Fire Prevention Specialist
Imperial County Fire Department
Fire Prevention Bureau

Robert Malek
Deputy Chief
Imperial County Fire Department
Fire Prevention Bureau

Fire Safety Analysis Manual

for

LP-Gas Storage Facilities

Based on the 2017 Edition of NFPA 58 Liquefied Petroleum Gas Code

Developed by the National Fire Protection Association and the National Propane Gas Association

Funded by a Grant from the Propane Education & Research Council

© 2017

PRC-005025

Fire Safety Analysis Manual
For
LP-Gas Storage Facilities

Based on the 2017 Edition of NFPA 58 *Liquefied Petroleum Gas Code*

The official position of the NFPA on all aspects regarding propane storage facility safety is in NFPA 58, the *Liquefied Petroleum Gas Code*. This manual is not intended to replace NFPA 58.

The Propane Education & Research Council (PERC) is a non-profit 501(c)6 trade organization authorized by the Propane Education and Research Act of 1996 (PERA), Public Law 104-284. PERC was created "to enhance consumer and employee safety and training, to provide for research and development of clean and efficient propane utilization equipment, and to inform and educate the public about safety and other issues associated with the use of propane."

PERC is governed by a twenty-one member Board of Directors appointed by the National Propane Gas Association (NPGA) and the Gas Processors Association (GPA). PERC program beneficiaries include propane retail marketers, producers, transporters' and agricultural cooperatives, as well as representatives of allied service and supply industries (industry members).

The recommendations, standards, or recommended practices, as reflected in this document, were developed by independent consultants retained by PERC. While PERC administers the process of obtaining the information, it does not independently test or verify the accuracy of the information or methods used to collect the data that supports the conclusions or recommendations reflected in this document.

PERC, NPGA, GPA and the industry members disclaim any liability for any personal injury, property damage, business losses or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use, or reliance on this document, or any information, apparatus, method, process, or similar item disclosed in this document. This disclaimer of liability shall apply even if such loss or damage results, in whole or in part, from any acts or omissions of or by any negligence on the part of PERC, NPGA, GPA or industry members or any persons who contributed to the development of the information contained in this document. PERC, NPGA, GPA and industry members make no warranty or guaranty as to the accuracy or completeness of any information published in this document.

The procedures and information in this document are intended to implement the standards set forth in the documents referenced with capabilities of the personnel and equipment available. It does not create new standards or criteria for compliance. The order of steps

in any procedure may or may not be of importance. This material is not sold nor is it a product of any consulting or engineering activity.

Users of this document should consult the law of their individual jurisdictions for codes, standards and legal requirements applicable to them. This document is not intended nor should it be construed to (1) set forth policies or procedures which are the general custom or practice in the propane industry; (2) to establish the legal standards of care owed by propane distributors to their customers; or (3) to prevent the user from using different methods to implement applicable codes, standards or legal requirements.

By disseminating or publishing this document, PERC is not undertaking to render any professional or other service to or on behalf of any person or entity. PERC, NPGA, GPA and the industry members are not undertaking to perform any duty owed by any person or entity to any third party. Anyone reading or using this document should rely on his or her own judgment or, as appropriate, should seek the advice of a competent professional in determining the exercise of reasonable care in any and all circumstances.

Origin and Development of the Fire Safety Analysis Manual

The requirement for a Fire Safety Analysis (FSA) was introduced in the 1976 edition of NFPA 58, along with the requirement for emergency shutoff valves at locations where hoses and swivel type piping were used (for connection to cargo tank vehicles and rail cars). A Fire Safety Analysis was required for new propane storage plants with capacities of more than 4,000 gallons located in "heavily populated or congested areas".

This requirement was basically unchanged until the 2001 edition of NFPA 58, where the FSA was required for all propane storage plants with capacities of more than 4,000 gallons, with a three year period for existing facilities to be brought into compliance. As the majority of plants requiring a FSA did not have one in 2001, the need for guidance on how to conduct the FSA became apparent. Prior to 2001, the FSA was usually conducted by an independent consultant with knowledge of propane and fire safety. The concept of a consistent methodology was identified by a propane marketer in New England, Jim Hurley of Eastern Propane. The first two editions of the Manual were dedicated to Jim in recognition of his vision.

The recommendation resulted in NFPA working with NPGA to submit a proposal to PERC to develop a FSA manual to assist marketers in complying with the FSA requirement. When the project was approved, NPGA established an advisory committee and worked with NFPA to develop the manual.

Since the 2001 edition of the manual, it has been updated thrice to retain correct numbers

Fire Safety Analysis Manual for LP-Gas Storage Facilities

Based on the 2017 Edition of NFPA 58 Liquefied Petroleum Gas Code

Developed by the National Fire Protection Association and the National Propane Gas Association

Funded by a Grant from the Propane Education & Research Council

© 2017

PRC-005025

Fire Safety Analysis Manual
For
LP-Gas Storage Facilities

Based on the 2017 Edition of NFPA 58 *Liquefied Petroleum Gas Code*

The official position of the NFPA on all aspects regarding propane storage facility safety is in NFPA 58, the *Liquefied Petroleum Gas Code*. This manual is not intended to replace NFPA 58.

The Propane Education & Research Council (PERC) is a non-profit 501(c)6 trade organization authorized by the Propane Education and Research Act of 1996 (PERA), Public Law 104-284. PERC was created "to enhance consumer and employee safety and training, to provide for research and development of clean and efficient propane utilization equipment, and to inform and educate the public about safety and other issues associated with the use of propane."

PERC is governed by a twenty-one member Board of Directors appointed by the National Propane Gas Association (NPGA) and the Gas Processors Association (GPA). PERC program beneficiaries include propane retail marketers, producers, transporters' and agricultural cooperatives, as well as representatives of allied service and supply industries (industry members).

The recommendations, standards, or recommended practices, as reflected in this document, were developed by independent consultants retained by PERC. While PERC administers the process of obtaining the information, it does not independently test or verify the accuracy of the information or methods used to collect the data that supports the conclusions or recommendations reflected in this document.

PERC, NPGA, GPA and the industry members disclaim any liability for any personal injury, property damage, business losses or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use, or reliance on this document, or any information, apparatus, method, process, or similar item disclosed in this document. This disclaimer of liability shall apply even if such loss or damage results, in whole or in part, from any acts or omissions of or by any negligence on the part of PERC, NPGA, GPA or industry members or any persons who contributed to the development of the information contained in this document. PERC, NPGA, GPA and industry members make no warranty or guaranty as to the accuracy or completeness of any information published in this document.

The procedures and information in this document are intended to implement the standards set forth in the documents referenced with capabilities of the personnel and equipment available. It does not create new standards or criteria for compliance. The order of steps

in any procedure may or may not be of importance. This material is not sold nor is it a product of any consulting or engineering activity.

Users of this document should consult the law of their individual jurisdictions for codes, standards and legal requirements applicable to them. This document is not intended nor should it be construed to (1) set forth policies or procedures which are the general custom or practice in the propane industry; (2) to establish the legal standards of care owed by propane distributors to their customers; or (3) to prevent the user from using different methods to implement applicable codes, standards or legal requirements.

By disseminating or publishing this document, PERC is not undertaking to render any professional or other service to or on behalf of any person or entity. PERC, NPGA, GPA and the industry members are not undertaking to perform any duty owed by any person or entity to any third party. Anyone reading or using this document should rely on his or her own judgment or, as appropriate, should seek the advice of a competent professional in determining the exercise of reasonable care in any and all circumstances.

Origin and Development of the Fire Safety Analysis Manual

The requirement for a Fire Safety Analysis (FSA) was introduced in the 1976 edition of NFPA 58, along with the requirement for emergency shutoff valves at locations where hoses and swivel type piping were used (for connection to cargo tank vehicles and rail cars). A Fire Safety Analysis was required for new propane storage plants with capacities of more than 4,000 gallons located in "heavily populated or congested areas".

This requirement was basically unchanged until the 2001 edition of NFPA 58, where the FSA was required for all propane storage plants with capacities of more than 4,000 gallons, with a three year period for existing facilities to be brought into compliance. As the majority of plants requiring a FSA did not have one in 2001, the need for guidance on how to conduct the FSA became apparent. Prior to 2001, the FSA was usually conducted by an independent consultant with knowledge of propane and fire safety. The concept of a consistent methodology was identified by a propane marketer in New England, Jim Hurley of Eastern Propane. The first two editions of the Manual were dedicated to Jim in recognition of his vision.

The recommendation resulted in NFPA working with NPGA to submit a proposal to PERC to develop a FSA manual to assist marketers in complying with the FSA requirement. When the project was approved, NPGA established an advisory committee and worked with NFPA to develop the manual.

Since the 2001 edition of the manual, it has been updated thrice to retain correct numbers of the paragraphs referenced in NFPA 58, as they are sometimes revised and renumbered. No technically substantive changes have been made to the manual since the first edition was published.

The models used in the Fire Safety Analysis (FSA) Manual to determine the distances to hazards (presented in Table B-1 of the FSA Manual) are based on published models in the literature. These models have been published in government reports, journal articles[1,2], EPA-suggested procedures[3] and engineering monographs and books. The models used are considered conservative and have been simplified for the purposes of the FSA Manual.

---

1 A general reference on hazard distance assessment models is: Lees, F.P. (Editor), "*Loss Prevention in the Process Industries*," 2nd Edition, Vol 1, 2 & 3, Butterworth Heinemann Publishers, Oxford, England, 1996.

2 Raj, P.K., "*Exposure of a liquefied gas container to an external fire*," Journal of Hazardous Materials, v 122, Issues 1-2, p 37-49, June 2005.

3 US EPA, "*Technical Guidance for Hazard Analysis*," Emergency Planning for Extremely Hazardous Substances, EPA/FEMA/DOT, December 1987.

Acknowledgments

This fifth edition of the Fire Safety Analysis (FSA) Manual, based on the 2017 edition of NFPA 58, is a continuation of the effort to fulfill a need for an easily used and simple aid for the members of propane industry to fulfill their obligations under NFPA 58 (2001, 2004, 2008, 2011 and 2017 editions) which require developing a written FSA. The project was funded by the Propane Education & Research Council through the National Propane Gas Association (NPGA). The National Fire Protection Association (NFPA) was the principal contractor for the first edition of the manual. Technology & Management Systems, Inc. (TMS) developed the technical analyses and several chapters of the first edition of the manual, as a subcontractor to NFPA.

Mr. Theodore C. Lemoff, Principal Gases Engineer, was the principal investigator at NFPA. Dr. Phani K. Raj was the principal investigator and analyst at TMS. Mr. Bruce Swiecicki, P.E., Senior Technical Advisor at NPGA, served as a staff technical reviewer.

In preparation for the first edition, NPGA assembled an Advisory Committee consisting of representatives from the propane industry, a Fire Department of a major city in the US and a Fire Protection Engineer. The Committee provided technical inputs and guidance to the project team on industry safety practices, types of information that an authority having jurisdiction and emergency responders would want to see in an FSA, an insight into the levels of understanding of various issues related to FSA in the industry, etc. The Advisory Committee set not only the direction of the project but made policy decisions related to the scope of the FSA manual. Except for the contractors, every member of the Advisory Committee had a vote and many decisions were made on the basis of a Committee vote. The Advisory Committee consisted of the following (voting) members.

1	Michael Merrill **(Chairman)**	Suburban Propane LP	Whippany, NJ
2	Mr. Greg Benton	Georgia Gas Distributors	Atlanta, GA
3	Mr. Billy Cox	O'Nealgas Inc.	Choudrant, LA
4	Mr. James Howe	Howe Engineers, Inc.	West Falmouth, MA
5	Mr. Jerry Lucas	Heritage Propane Partners, LP	Sallisaw, OK
6	Mr. Rob Scott	Scott & Associates	Kingsburg, CA
7	Mr. Cliff Slisz	Ferrellgas	Liberty, MO
8	Mr. Scott Stookey	City of Phoenix Fire Department	Phoenix, AZ
9	Mr. Ron Stover	Mutual Liquid Gas & Equipment	Gardena, CA
10	Mr. Robert Wallace	Dowdle Butane Gas Co Inc	Maryville, TN
11	Mr. Brent Wolcott	Ag Valley Coop	Edison, NE

Mr. Theodore Lemoff and Dr. Phani Raj participated in the deliberations of the meetings of the Advisory Committee as non-voting members.

About the Authors

Phani K. Raj, Ph.D.
Dr. Raj is the President of Technology & Management Systems, Inc. (TMS). He holds S.M. and Ph.D. degrees in Mechanical Engineering as well as an MBA degree.

He has over 30 years professional experience in conducting safety research and assessing risks in the storage, transportation, handling and utilization of hazardous materials, including energy fluids. His research has included the development of mathematical models to describe the accidental release behavior of chemicals and flammable materials. In addition, he has developed easy to follow safety guideline documents and hazard assessment manuals for a number of clients including the Federal Agencies and industrial clients.

Dr. Raj developed a number of models for the "Chemical Hazard Response Information System" (CHRIS), which the U.S. Coast Guard and the National Response Center use for assisting in case of hazardous material emergencies. He is the author of CHRIS Manual III "Hazard Assessment Handbook."

Since 1996 he has been a member of the NFPA's Technical Committee on Liquefied Petroleum Gases which writes NFPA 58, *Liquefied Petroleum Gas Code*. He was a member of the Committee Transportation of Hazardous Materials (of the National Research Council), and emeritus member of the Editorial Board of the Journal of Hazardous Materials. He has held the post of visiting lecturer at MIT and taught, in the Chemical Engineering Department, a graduate level course. He is the principal author of over 100 technical reports and over 40 technical papers.

Theodore C. Lemoff, PE
Mr. Lemoff is retired from the National Fire Protection Association (NFPA). While at NFPA, he served as the Principal Gases Engineer. He holds a Bachelor of Engineering degree in Chemical Engineering and is a registered professional engineer in Massachusetts.

He has over 40 years experience in the fire safety and the chemical industry, including 25 years at NFPA working in the flammable gases area. He served as the staff liaison and secretary to the NFPA Technical Committee on Liquefied Petroleum Gases, responsible for NFPA 58, and for other NFPA codes and standards on flammable gases.

Mr. Lemoff is a member of the American Institute of Chemical Engineers, the Society of Fire Protection Engineers, the Society of Gas Engineers, and the American Society of Plumbing Engineers.

Table of Contents

	Page #
Origin and Development of the Fire Safety Analysis Manual	(ii)
Acknowledgments	(iv)
About the authors	(v)
CHAPTER 1 Introduction	
1.1 Background	1-1
1.2 Scope of the Manual	1-2
1.3 Need for a FSA Manual	1-3
1.4 LP-Gas Safety Record and Risks	1-4
1.5 Organization of the FSA Manual	1-5
CHAPTER 2 LP-Gas Storage Container Safety Features	
2.1 A Historical Perspective	2-1
2.2 Current LP-Gas Storage Container Safety Features	2-3
CHAPTER 3 Principal Elements of Fire Safety Analysis	
3.1 Important Steps in Conducting the Analysis	3-1
3.2 Completing the FSA	3-2
CHAPTER 4 Facility Information	
4.1 Initial Data for the LP-Gas Facility	4-1
4.2 Facility Storage Capacity and Other Details	4-1
4.3 Additional Facility Information	4-2
CHAPTER 5 Analysis of Product Control Measures in Containers and Transfer Piping	
5.1 Product Control Measures in Containers	5-1
5.1.1 Individual Containers of Water Capacity less than or equal to 2,000 gallons	5-2
5.1.2 Individual Containers greater than 2,000 gallons water capacity and less than or equal to 4,000 gallons water capacity	5-8
A) Containers used in Residential and Commercial Facilities	5-8
B) Containers used in Bulk and Industrial Facilities	5-11
5.1.3 Individual Containers of Water Capacity greater than 4,000 gallons used in Bulk Plants and Industrial Plants	5-17
5.2 Product Control Measures in Transfer Piping	5-23
5.2.1 Manifolded and Remotely Filled Containers	5-23
5.3 Alternate Provisions for the Installation of ASME Containers	5-26
5.3.1 ASME Container Appurtenances and Redundant Fail-Safe Product Control Systems	5-26
5.3.2 Low Emission Transfer Equipment	5-28

CHAPTER 6 Analysis of Local Conditions of Hazard
6.1 Physical Protection Measures 6-1
6.2 Ignition Sources and Control 6-2
6.3 Separation Distances 6-3
6.3.1 Separation Distances between Container and Important Buildings, Other Properties and Transfer Points 6-3
6.3.2 Separation Distances between Transfer Points and other Exposures 6-4
6.4 Special Protection 6-5
6.5 Vehicular Protection 6-6

CHAPTER 7 Exposure to and from Other Properties, Population Density
7.1 Exposure to off-site properties and persons from in-plant propane releases 7-1
7.2 Exposure to Propane Plants From External Events 7-3

CHAPTER 8 Evaluation of Fire Services and Water Supply Requirements
8.1 Details of the Fire Service 8-1
8.2 Water Needs and Availability 8-3

CHAPTER 9 Evaluation Summary for a Proposed New LP-Gas Facility

CHAPTER 10 Fire Safety Analysis Examples
10.1 Illustrative Example # 1 10-2
10.2 Illustrative Example # 2 10-21
10.3 Illustrative Example # 3 10-39
10.4 Illustrative Example # 4 10-57

Glossary and Acronyms G-1

Appendix A: Fill-In Forms A-1

Appendix B: Results of Hazard Distance Calculations for Different LPG Release Scenarios B-1

Copyright 2015 Propane Education & Research Council. All rights reserved. Reproduction of this publication in other than its entirety is prohibited without permission in writing from the Propane Education & Research Council and the authors.

List of Forms

		Page #
Form 4.1	Initial Data on the LP-Gas Facility	4-1
Form 4.2	Facility Storage Capacity	4-2
Form 4.3	Additional Information on the LP-Gas Facility	4-3
Form 5.1	Compliance with Code Requirements for Appurtenances on Containers of 2,000 Gallons Water Capacity or Less	5-3
Form 5.2	Compliance with Code Requirements for Appurtenances on Containers of Water Capacity 2,001 Gallons Through 4,000 Gallons Used in Residences and Commercial Facilities	5-10
Form 5.3	Compliance with Code Requirements for Appurtenances on Containers of Water Capacity 2,001 Gallons Through 4,000 Gallons Used in Bulk Plants and Industrial Plants	5-12
Form 5.4	Compliance with Code Requirements for Appurtenances on Containers of Greater than 4,000 Gallons Water Capacity Used in Bulk Plants and Industrial Plants	5-18
Form 5.5	Requirements for Transfer Lines of 1½ inch Diameter or Larger, Liquid-into-Containers	5-23
Form 5.6	Requirements for Transfer Lines of 1½ inch Diameter or Larger, Liquid Withdrawal from Containers	5-24
Form 5.7	Requirements for Vapor Transfer Lines 1¼-inch Diameter or Larger	5-25
Form 5.8	Evaluation of Redundant Fail-Safe Design	5-26
Form 5.9	Evaluation of Low Emission Transfer Equipment	5-28
Form 6.1	Evaluation of Physical Protection and Other Measures	6-1
Form 6.2	Ignition Source Control Assessment	6-2
Form 6.3	Separation Distances between Containers and Buildings, Property Line, etc.	6-3
Form 6.4	Separation Distances between Points of Transfer and Other Exposures	6-4
Form 6.5	Special Protection Measures, Passive Systems	6-5
Form 6.6	Special Protection Measures, Active Systems	6-6
Form 6.7	Protection Against Vehicular Impact	6-6
Form 7.1	Types of Occupancies Near or Surrounding the LP-Gas Plant	7-3
Form 7.2	Exposure to LP-Gas Plant from External Hazards	7-4
Form 8.1	Data on the Responding Fire Department	8-2
Form 8.2	Response Time Data for the Fire Departments	8-4
Form 8.3	Water Flow Rate and Total Water Volume Required to Cool Containers Exposed to a Fire	8-5
Form 8.4	Evaluation of Water Availability in or Near the LP-Gas Facility	8-7
Form 9.1	Analysis Summary on Product Control and Local Conditions of Hazard	9-1
Form 9.2	Analysis Summary on Exposure From and to the LP-Gas Facility	9-2
Form 9.3	Analysis Summary on Fire Department Evaluations	9-3

Form 9.4	Redundant and Fail-Safe Design for Containers	9-5
Form 9.5	Low Emission Transfer Equipment	9-6
Form 9.6	Special Protection Measures –Passive Systems	9-7
Form 9.7	Special Protection Measures –Active Systems	9-7

List of Tables

Table 3.1	Description of the Various Steps in Performing the FSA	3-3
Table 5.1	Container Size Dependant Evaluations	5-1
Table 7.1	Distances to Various Types of Propane Hazards Under Different Release Models	7-2
Table 9.1	Suggested Alternative Methods for Industrial and Bulk Plants That Do Not Pose a Hazard But Lack a Water Supply	9-8
Table B-1	LPG Release Cases for Hazard Assessment	B-2
Table B-2	Distances to LFL Concentrations and Hazard Areas	B-4
Table B-3	Various Parameters and their Values Used in the Cases	B-6
Table B-4	Thermodynamic Properties of Propane	B-7
Table B-5	Calculation of the Mass Fraction of LPG and n-Butane	B-9

List of Figures

		Page #
Figure 5-1	Schematic Representation of the NFPA 58 Requirements for Product Control Appurtenances on Containers of Water Capacity Less Than or Equal to 2,000 Gallons, With Different Service Configurations	5-4
	Figure 5-1A: Single Vapor Service Line in a Manifolded Configuration	5-4
	Figure 5-1B: Regulator in the Vapor Service Line	5-5
	Figure 5-1C: Container with both Liquid and Vapor Service, Regulator in the Vapor Service Line	5-6
	Figure 5-1D: Container Feeding Liquid to a Vaporizer	5-7
	Figure 5-1E: Vertical Container for Liquid Service	5-8
Figure 5-2	Vapor Inlet Appurtenances on Containers of Water Capacity Greater Than 2,000 Gallons	5-13
Figure 5-3	Vapor Outlet Appurtenances on Containers of Water Capacity Greater Than 2,000 Gallons	5-14
Figure 5-4	Liquid Inlet Valves on Containers 2,001 through 4,000 Gallons Water Capacity	5-15
Figure 5-5	Liquid Outlet Valves on Containers 2,001 through 4,000 Gallons Water Capacity	5-16
Figure 5-6A	Liquid Inlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in New Bulk Plants and Industrial Plants	5-19
Figure 5-6B	Liquid Inlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in Existing Bulk Plants and Industrial Plants	5-20
Figure 5-7A	Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in New Bulk Plants and Industrial Plants	5-21
Figure 5-7B	Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in Existing Bulk Plants and Industrial Plants	5-22

CHAPTER 1

Introduction

1.1 Background

The Fire Safety Analysis (FSA) is a self-conducted audit of the safety features of a propane installation and an assessment of the means to minimize the potential for inadvertent propane releases from storage containers and during transfer operations. The assessment also includes an evaluation of the capabilities of local emergency response agencies as well as an analysis of potentially hazardous exposures from the installation to the neighborhood and from the surroundings to the LP-Gas facility.

Since 1976, NFPA 58, *Liquefied Petroleum Gas Code* (hereinafter referred to as the "code" or "NFPA 58") has required that a facility operator or owner conduct a FSA for propane facilities having ASME containers of aggregate storage greater than 4,000 gallons water capacity. The FSA requirement was changed in the 2001 edition to require a written FSA. The requirements for fire protection are indicated in the 2017 edition of NFPA 58 in §6.27, which addresses fire protection requirements for industrial plants, bulk plants and dispensing stations. Specifically §6.27.2 ("Planning") and §6.27.3("Protection of ASME Containers") require, in part, the following:

6.27.2.1 The planning for the response to incidents including the inadvertent release of LP-Gas, fire, or security breach shall be coordinated with local emergency response agencies.

6.27.2.2 Planning shall include consideration of the safety of emergency personnel, workers, and the public.

6.27.3.1 Fire protection shall be provided for installations with an aggregate water capacity of more than 4000 gal (15.2 m^3) and for ASME containers on roofs.

6.27.3.2 The modes of fire protection shall be specified in a written fire safety analysis for new installations, for existing installations that have an aggregate water capacity of more than 4000 gallons (15.2 m^3)and for ASME containers on roofs. Existing installations shall comply with this requirement within 2 years of the effective date of this code.

6.27.3.3 The fire safety analysis shall be submitted by the owner, operator, or their designee to the authority having jurisdiction and local emergency responders.

6.27.3.4 The fire safety analysis shall be updated when the storage capacity or transfer system is modified.

The FSA and required assessment of the installation provides several important benefits:

1) A structured assessment by which each facility can be evaluated for conformity of installed equipment with code requirements.

2) A means to evaluate the capability of systems and equipment installed to control and contain potential LP-Gas releases during day-to-day operations.

3) An approach to evaluate the informational needs of the facility, based on factors such as the type and frequency of transfer operations, size of the storage containers, location of the facility with respect to other buildings and the existing procedures and systems in place.

4) A means to describe product control and fire protection features which exceed the comprehensive requirements of NPFA 58[1].

5) A tool for facilitating a cooperative and effective dialogue with local emergency response agencies and authorities having jurisdiction.

1.2 Scope of the Manual

The manual addresses a number of subjects, including:

(1) A review of the product control measures required in the NFPA 58, "Liquefied Petroleum Gas Code"
(2) Local conditions of hazards within the facility site
(3) Exposures to and from other properties
(4) Effectiveness of local fire departments
(5) Effective control of leakage, fire and exposure
(6) Illustrative examples using four different sizes of typical LP-Gas facilities

This FSA manual is intended for use by propane plant owners or operators, consultants, authorities having jurisdiction (AHJs) and emergency response personnel. The manual addresses the process by which a FSA can be conducted for a LP-Gas facility containing one or more stationary ASME containers.

The FSA manual is designed to provide a guide for identifying the requirements in NFPA 58 and determining compliance with them. Section 6.27.3.5 of NFPA 58 provides that:

> The fire safety analysis shall be an evaluation of the total product control system, such as the emergency shutoff and internal valves equipped for remote closure and automatic shutoff using thermal (fire) actuation, pull away protection where installed, and the optional requirements of Section 6.28.

The philosophy of NFPA 58 is to minimize fires by minimizing the accidental release of propane if an incident should occur. Or put in simple terms, "no fuel, and no fire."

The manual **does not** address the following:

---

1 All reference, henceforth, to the "code" in this document should be construed as referring to NFPA 58, 2017 edition.

1. Marine terminals, refrigerated LP-Gas storage and the transportation of LP-gas by either rail tank cars or by cargo tank trucks. Marine terminals are governed by the OSHA Process Safety Management regulations and the US EPA Risk Management Plan regulations; refrigerated storage of LP-gas is a high-volume operation requiring special considerations; and, the transportation of LP-gas is addressed by Title 49 of the Code of Federal Regulations, *Transportation.*[i]
2. Storage of LP-Gas in salt domes and caverns.
3. Installations of ASME LP-gas containers on roofs of buildings. This type of installation, for which a fire safety analysis is required, is excluded from the scope of this manual primarily because of the rarity of such installations in the United States.
4. Cylinder filling operations at a dispensing facility, unless the storage threshold for LP-Gas has been exceeded, requiring an FSA to be prepared.
5. The use of facility employees performing as a "fire brigade."

The above facilities may be required to comply with other safety analysis requirements.

1.3 Need for a FSA Manual

Neither NFPA 58 nor the "Liquefied Petroleum Gas Code Handbook"[ii] provide detailed guidance on how to prepare or develop a written FSA. Since each industrial plant, bulk plant, or dispensing stationpresents unique physical and operational characteristics, the fire safety analysis is a tool used to assess the level of fire safety performance that a specific industrial plant, bulk plant or dispensing station can be expected to provide. This FSA will also provide essential information on the facility and its operation to the local authority having jurisdiction (AHJ) and local emergency response agency.

An informal survey was taken of AHJ's on the fire safety analyses used for existing and new plants in their jurisdictions (conducted by the author) at the time the first edition of this manual was being prepared. It indicated that there was no uniformity either in content, the details of information, or final assessment of the facility in the FSAs submitted. They ranged from a single page submission for a medium size bulk plant to very detailed assessment including risk assessment and management plan for a 30,000 gallon bulk storage facility. Without a guidance manual, potential confusion would almost certainly occur as each AHJ would be required to establish an individual set of criteria that would meet the FSA in their area. Thus, the need in the LP-Gas industry for assistance with the following tasks was clearly established.

1) Providing a FSA template that allows for consideration of different size installations
2) Establishing a uniform approach and defining common elements
3) Developing simplified checklists and an example-based methodology for completing the analysis
4) Utilizing technically-based guidance and support

The intent of this FSA manual is to provide an easy-to-use procedure for LP-gas facility owners or operators who are most familiar with the equipment technology and system operations and therefore qualified to complete the document. Knowledge of fire science and engineering

principles is not required for this document to be useable by an owner, operator or an AHJ, because those principles have already been factored into the assessment criteria contained within the FSA.

By utilizing the expertise of industry, engineering and fire service representatives in the development of the material to follow, this manual provides a comprehensive, uniform, objective approach that was designed to provide for the uniform and objective application of FSA requirements by the AHJs. Further, the joint input of the Propane Education & Research Council (PERC), National Propane Gas Association (NPGA), and the National Fire Protection Association (NFPA) provides additional assurance of the manual's depth, credibility and broad-based consensus.

This FSA manual has been developed based on the requirements of NFPA 58, 2017 edition. Using this manual to perform a FSA at a facility constructed to meet the requirements of prior editions of NFPA 58 or other state-specific codes may produce conflicts between actual facility construction and the checklists in this manual. The code or standard in effect at the time of construction of the facility should be used as the source of requirements to perform the FSA. Checklist items contained within this manual can be revised to indicate the appropriate code items required at the time of facility construction.

1.4 LP-Gas Safety Record and Risks

The LP-Gas industry has a long history of safe operations. With the requirement in the 1976 edition of NFPA 58 to retrofit LP-Gas plants with emergency shutoff valves (ESVs) in transfer lines, the safety of LP-Gas facilities was further improved.

The FSA provided in this manual, in addition to other safety programs currently enacted at any workplace, is intended to reduce or eliminate the risk of fatality or injury to both the plant employees and the public. In an effort to identify the level of risk a propane installation poses to the general public, as well as employees and emergency responders, the U.S. Department of Energy (DOE) instituted a study[iii] in 1981. Accident data from a variety of sources was analyzed, including: the US Department of Transportation hazardous material incident report database, reports of the National Transportation Safety Board, National Fire Protection Association, technical journals and other sources. Data analyzed for the period 1971 through 1979 addressed LP-Gas transportation and product releases from stationary storage facilities. The special focus of the study was the fatalities suffered by employees and the general public. The study concluded that a fatality to the general public as a direct result of an LPG transportation or storage incident involving the loss of product is very small and the risk (expressed in expected number of fatalities per year) is smaller than that from natural phenomena (lightning, tornadoes, objects falling from the sky, etc).

An analysis conducted by the National Fire Protection Association[iv] of LP-Gas fire damage and casualty data during the period between 1980 and 1999 also indicates that the LP-Gas storage facility operations in the US are very safe. The number of reported fires at LP-Gas bulk storage facilities remains small and has fallen since 1980, but substantial variation exists from year to year. During the five-year period from 1994 through 1998, an estimated 49 fires, on average,

were reported per year at LP-Gas bulk storage facilities. These fires caused an annual average of one civilian death, five civilian injuries and $754,000 in direct property damage. In 1999, an estimated 58 reported fires on these properties caused four civilian injuries and $722,000 in direct property damage. The 58 fires reported in 1999 accounted for .003% of all fires reported that year.

1.5 Organization of the FSA Manual

The manual has been organized to address the requirements outlined in the 2017 edition of NFPA 58, Sections 6.27 and 6.28.

Chapter 2 discusses the requirements of the 2017 edition of NFPA 58 in regard to product control requirements, and their evolution. The philosophy and the advantages of product control systems are discussed. Also included are the various appurtenances used in a typical LP-Gas facility. More detailed information on the types of valves, their functions and example photographs of various appurtenances are provided in Appendix B. Chapter 3 provides an overview of the FSA process including its principal elements.

The input of data into the FSA procedure begins with Chapter 4. In Chapter 4, basic information about the LP-Gas facility is input into appropriate tables and a decision is made (based on the data provided) as to the extent of the analysis that should be completed. The assessment of conformity with code requirements of the product control requirements for containers and in transfer piping is performed in Chapter 5. To aid this assessment a series of sketches of possible configurations of container appurtenances (satisfying 2017 code requirements) are provided. Note that several section references have been changed from the published edition of the 2017 edition due to the acceptance of Tentative Interim Amendment 14-3, which is reprinted with permission in Appendix C. When necessary, the year when specific equipment was required by the code is also indicated on the sketches to facilitate application of the Manual to facilities constructed to the requirements in previous editions of NFPA 58. The analysis of the local conditions of hazard is presented in Chapter 6, followed by the assessment in Chapter 7 of the hazard exposure to off-site properties and persons. Also, the potential exposure to LP-Gas installations from off-site activities is covered in Chapter 7.

The evaluation of the capabilities of the local emergency responder (usually the fire department) and the availability of water to fight in-plant fires and exposures are presented in Chapter 8. Summary of evaluations and actions that may need to be initiated for proposed LP-Gas facilities are presented in Chapter 9. The use of this manual in preparing a written FSA for a LP-Gas facility is demonstrated with examples of four different generic cases. Several different sizes of facilities are considered.

A set of blank forms required to perform a FSA is provided in Appendix A. The results of calculating the hazard distances for a set of credible LP-gas release scenarios are provided in Appendix B. Also provided in Appendix B are the thermodynamic properties of propane and the values of other parameters used in calculating the hazard distances.

[i] U. S. Code of Federal Regulations, Title 49, Transportation
[ii] Liquefied Petroleum Gas Handbook, Beach, 2017, NFPA, Quincy MA
[iii] LPG Land Transportation and Storage Safety, Department of Energy report No. DOE/EV/06020-TS 9/18/81"
[iv] Fires at LP-Gas Bulk Storage Plants Statistical Analysis, NFPA, 2003, Quincy, MA

CHAPTER 2

LP-Gas Storage Container Safety Features

The fundamental premise on which the requirements for LP-Gas facility safety specified in several recent editions of NFPA 58 is based is the following:
If product release can be either controlled or eliminated, safety is effectively addressed.

A product release creates the potential for the occurrence of a fire. Therefore, the focus of both NFPA 58 and the Fire Safety Analysis Manual is on the need to design systems (incorporating product controls) to ensure, to the extent possible with current technology and procedures, the elimination of the accidental release of LP-gas from storage or during transfer operations.

2.1 A Historical Perspective

In the late 1960's and the early 1970's there were a number of fires and BLEVEs (Boiling Liquid Expanding Vapor Explosions) of propane and other liquefied petroleum gases resulting from derailments of railcars carrying propane and other flammable liquefied gases. These incidents involved fire fighter fatalities and highlighted the need for safety improvements. As a result, the U. S. Department of Transportation (DOT) implemented new regulations for the tank cars used to transport propane and other liquefied flammable gases, and made them mandatory and retroactive in 1980. These improvements included:

- Head shields to reinforce the pressure vessel on the railcar
- "Shelf" couplers to reduce the potential for railcars to be uncoupled during a derailment
- Thermal protection to reduce the potential for the tank to experience a rise in temperature due to flame impingement

Since these improvements in rail car safety were made in the 1980's, there have been no fire fighter fatalities from any railroad tank car BLEVEs and the number of these incidents has been greatly reduced, to the authors' knowledge.

In 1973, product control requirements to prevent the uncontrolled release of LP-gas from storage containers consisted primarily of manually operated valves, backflow check valves and excess-flow check valves.

On July 3, 1973 a propane incident occurred in Kingman, Arizona involving a propane fire at a propane tank car unloading area in a propane bulk storage plant. Though the plant's equipment conformed to the requirements of NFPA 58 and other safety standards for flammable materials at that time, the incident resulted in the death of several fire fighters and one plant employee.

A direct result of this incident (and others that occurred at approximately the same time) was the addition of a new fire protection requirement in the 1976 edition of NFPA 58. The requirement stated that planning "for the effective measures for control of inadvertent LP-Gas release or fire" shall be done and coordinated with local emergency responders. In addition, the primary consideration of a fire safety analysis at that time was the use of water as a suppressing agent to control fires. The requirements today are very similar to those original requirements except in two areas.

- As of the 2001 edition, fire safety analyses are required to be written;
- The primary consideration in performing such an analysis has changed from the emphasis of using water for fire control to the emphasis of avoiding product release altogether using technology and training.

This modern approach takes advantage of the inherent safety present in a controlled environment such as a bulk plant, as well as the safety features of the most current product control hardware.

In early editions of NFPA 58, the primary consideration of water as the means to control a fire was based on the fact that at that time, there were few reliable ways to stop the flow of LP-gas after failures in the system and the need to apply water quickly to storage containers being impinged by flames was important.

Another significant change in the 1976 edition of NFPA 58 was the requirement for including an emergency shutoff valve (ESV) in the transfer lines used between stationary storage containers of over 4,000 gallons capacity and cargo tank vehicles. This revision was intended to prevent product release from storage containers in the event of a vehicle pulling away with its hoses still connected. All existing plants were required to comply with this requirement by the end of 1980. Since this retrofit program was completed, there has not been, to the knowledge of the authors, a pull-away accident involving an ESV installation that resulted in serious consequences.

The 1980's enjoyed a reduced number of propane incidents in the U. S., and the next major product control enhancement was the revision to introduce an optional requirement for internal tank valves in containers over 2,000 gallons in the 1992 edition of NFPA 58. These tank valve requirements included:

Vapor and Liquid Withdrawal Openings in Tanks

1. Positive shutoff valve in line with excess flow valve installed in the tank, or
2. Internal valve with integral excess flow shutoff capability

Vapor and Liquid Inlet Openings in Tanks

1. Positive shutoff valve in combination with either an excess flow valve or backflow check valve installed in the tank, or
2. Internal valve with integral excess flow valve, or
3. Internal valve with remote means of closure

These revisions were made to enhance the operational features of product control hardware. Internal valves are capable of being closed from a remote location (using a cable, pneumatic, or hydraulic device) and by thermal activation, which is accomplished using an element that melts when it is subjected to fairly moderate temperatures (in the 200°F - 250° F range).

The 2001 edition of NFPA 58 was further revised to require internal valves for liquid connections to containers over 4,000 gallons, with remote and thermal shutoff activation. This change was the result of the Committee desiring improved safety performance with this advanced hardware, due to the following incidents:

- **Sanford, NC**. A hose separation resulted in the loss of the contents of a transport vehicle (9700 gallons water capacity). The contents within the storage containers were also lost because of a failed check valve.
- **Albert City, Iowa**. An exposed liquid pipe installed in violation of the code between an 18,000 gallon water capacity storage container and a vaporizer was broken when a recreational vehicle accidentally drove over it. The leaking gas found a source of ignition and impinged on the container, resulting in a BLEVE.
- **Truth or Consequences, NM**. A small, parked truck rolled into a propane bulk storage plant, breaking plant piping. The resulting fire caused the failure of several cylinders.

These improvements in product control are considered critically important, and in addition to requiring them for all new installations after 2001, the requirements were made retroactive to all existing installations, allowing 10 years for the conversion. All existing containers over 4,000 gallons water capacity will be retrofit with an internal valve or similar protection on all liquid connections. Alternatively, the use of an emergency shutoff valve (ESV) as close to the container as practical is also allowed, in recognition that some containers cannot accommodate an internal valve without extensive modification. The ESV has the same remote and thermal activation closing features as an internal valve.

2.2 Current LP-Gas Storage Container Safety Features

As of the 2001 edition, NFPA 58 requirements for product release control include the provision for a number of different types of valves or appurtenances in the product storage containers, transfer piping network and at liquid transfer facility locations. Generally, code requirements for product control appurtenances on containers used in industrial plants and bulk plants, as well as dispensing stations, are more stringent than for residential and commercial use containers.

In the 2017 edition of NFPA 58, changes to the definitions of "Bulk Plant" and "Industrial Plant" clarified the intent of the NFPA Technical Committee on Liquefied Petroleum Gases by stating that each of those types of facilities utilize only containers greater than 4,000 gallons water capacity. Therefore, modifications were made to Chapter 5 of this manual to remove references to containers between 2,000 and 4,000 gallons water capacity. The manual does retain information on containers less than 4,000 gallons water capacity due to

the fact that some dispensing stations may be utilizing more than one container less than 4,000 gallons, but with an aggregate capacity greater than 4,000 gallons.

Unless product is being transferred, product control valves are normally in the closed position. However, some of the installations require an automatic shutoff feature when either a fire (or heat) is sensed or when other abnormal conditions occur. The product control valves include the following:

Positive shutoff valve: A shutoff valve that, in the closed position, does not allow the flow of product in either direction. [NFPA 58, 3.3.75.7]

Backflow check valve: This valve allows flow in one direction only and is used to allow a container to be filled while preventing product from flowing out of the container.

Excess-flow valve: A valve designed to close when the liquid or vapor passing through it exceeds a prescribed flow rate. [NFPA 58, 3.3.75.3]

Internal valve: A container primary shutoff valve that can be closed remotely, which incorporates an internal excess flow valve with the seat and seat disc located within the container so that they remain in place should external damage occur to the valve. [NFPA 58, 3.3.75.6]

Emergency shutoff valve: A shutoff valve incorporating thermal and manual means of closing that also provides for a remote means of closing. [NFPA 58, 3.3.75.2]

Hydrostatic pressure relief valve: A type of relief valve that is set to open and relieve pressure in a liquid hose or pipe segment between two shutoff valves when the pressure exceeds the setting of the valve.

Container pressure relief valve: A type of pressure relief device designed to open and then close to prevent excess internal fluid pressure in a container without releasing the entire contents of the container. The valve is located in the vapor space of the container.

Bulk storage installations incorporate several product release control appurtenances. This fire safety analysis manual outlines alternative schematics for the various facilities covered (4,000 gallons or less and greater than 4,000 gallons water capacity).

CHAPTER 3

Principal Elements of the Fire Safety Analysis

The principal elements of the Fire Safety Analysis (FSA) required by NFPA 58 (in §6.27, and container protection requirements in §6.27.3) are described in this chapter. This manual for performing the FSA addresses the following LP-Gas facility-related items:

1. Effectiveness of Product Control measures
2. Local conditions of hazard within the container site, including congestion within the site
3. Exposure to off-site properties and populations and the impact of neighboring industrial activity on the facility
4. Effectiveness of the local Fire Department that may respond to an emergency within the facility
5. Requirements for and availability of adequate water supply
6. Full compliance with Code requirements for existing LP-Gas facilities and corrective actions to be implemented for a proposed facility to address any deficiencies

The details of how each of the above items is evaluated in performing the FSA are indicated in Chapter 4 though Chapter 9. Shown below is a brief review of the various steps involved in conducting the FSA.

3.1 Important Steps in Conducting the Analysis

The development of a Fire Safety Analysis (FSA) involves a number of important steps. These steps are indicated in Table 3.1. Also shown in Table 3.1 are the chapters in this manual where the referenced analysis steps are discussed in detail.

Each set of FSA requirements is presented in one or more tables and fill-in forms. The tables provide either factual information or calculated results; the user obtains information from the tables for further analyses. The fill-in forms specify NFPA 58 requirements or other assessment parameters, and provide two columns, one with a "Yes" column heading and the other with a "No" heading. In some cases either schematic or pictorial representations are provided to clarify a requirement. The fill-in forms require some information input from the user, either checking a "Yes" column or a "No" column or writing a numerical value. Also provided are notes under each table or fill-in form, which explains conditions, if any, associated with the table or the form or how a calculation is performed for entering data into the form.

Appropriate explanations are provided in the text either preceding a form or after the form, if any action is necessary depending upon the values/contents in the forms. A blank copy of each form presented in Chapter 4 through Chapter 9 is provided in Appendix A. These can be reproduced and used for any number of LP-Gas facilities.

The FSA for a LP-Gas facility is conducted by systematically completing the forms in Chapter 4 through Chapter 9. The person completing the FSA must indicate a "Yes" or "No" in the appropriate column for each requirement, depending upon whether the LP-Gas facility fulfills the specific requirement. Any items, which may need to be undertaken to correct a deficiency in a proposed (as opposed to existing) LP-Gas facility are referred to in Chapter 9.

Once the FSA is complete, the forms together with information about the facility, can be filed to satisfy the "written" requirement of NFPA 58, §6.27.3.2 & 6.27.3.3. Any emergency planning for the facility is required to be coordinated with the local fire department or equivalent responding authority (§ 6.27.2.1).

3.2 Completing the FSA

Chapters 4 through 9 provide a framework with which the Fire Safety Analysis can be conducted to satisfy the requirements of NFPA 58. It is important to note the following in performing the analysis using the tables, fill-in forms and steps indicated in the following chapters.

1 All references to the "Code" in this manual are to the 2017 edition of the NFPA 58 "Liquefied Petroleum Gas Code."

2 If a LP-Gas facility was built to satisfy the requirements of an edition of NFPA 58 earlier than the 2017 edition, then you may obtain a copy of the appropriate edition of the Fire Safety Analysis Manual and use that resource for your evaluation. If you must use this manual and an appurtenance or other requirement is specified in one or more of the forms in this manual (developed based on the 2017 edition), and this requirement was not in the edition to which the facility was built, then it is recommended that the "Yes" and "No" column corresponding to the particular appurtenance or requirement be left blank or marked "NA," to signify the requirement is not applicable to the facility in question.

3 If the facility for which the analysis is being performed was constructed to satisfy the requirements of a previous edition of NFPA 58, it must still comply with all requirements that have been made applicable retroactively in later editions of the code, through the 2017 edition. Such retroactive provisions are indicated where they are applicable.

Table 3.1
Description of the Various Steps in Performing the FSA

Step #	FSA Steps	Chapter where described
1	Gather data on the volume of LP-Gas stored and other information pertinent to the facility.	Chapter 4
2	Perform simple calculations and determine whether the facility is subject to the requirements for developing an FSA.	
3	Evaluate the product control appurtenances and other safety features of the facility relative to the requirements of the NFPA 58 code.	Chapter 5
4	Assess the appurtenance requirements for containers of different capacities and compare them to the actual installation.	
5	Evaluate the requirements for valves on transfer piping and compare them to the valves provided in the facility.	
6	Assess conformance to the code of a Redundant and Fail-Safe Product Control System, if such a system is provided in the facility.	
7	Evaluate the code conformance of the Low Emission Transfer Equipment if installed in the facility.	
8	Analyze the protection measures against local conditions of hazard. That is, assess whether all requirements of the code for the physical protection of containers and transfer piping are implemented.	Chapter 6
9	Analyze the code requirements for the control of ignition sources and whether these requirements are complied with.	
10	Assess conformance to the code requirements for separation distances between (i) containers of different sizes and property lines and, (ii) LP-Gas transfer points and other exposures.	
11	Evaluate conformance to the code requirements for Special Protection Systems, if they are provided on containers in the facility.	
12	Evaluate the potential hazards to off-site populations and property from propane releases in the facility. This step includes selecting credible LP-Gas release scenarios and assessing the distance (and area) over which the hazard exists.	Chapter 7
13	Assess whether any off-site populations, especially people in institutional occupancies, are potentially subject to the LP-Gas release hazards	
14	Evaluate whether there exists a hazard from other industrial operations around the LP-Gas facility	
15	Evaluate the effectiveness of the local Fire Department, including the availability and capability of response personnel, training level, equipment and response time to an emergency in the facility.	Chapter 8
16	Evaluate the amount of water needed to cool containers exposed to a fire and the adequacy of the facility (or locally available) water supply.	
17	For a proposed facility, develop corrective actions to address deficiencies found.	Chapter 9 (Only applicable for proposed facilities)
18	Assess, based on specific criteria, the need to provide Redundant and Fail-Safe Product Control Systems.	
19	Assess, based on specific criteria, the need to provide Low Emission Transfer Systems.	
20	Assess when Special Protection Systems are needed	
21	Evaluate alternative approaches to using water in a special protection system	

CHAPTER 4

Facility Information

In this chapter basic information on the LP-Gas facility is recorded and a decision is made on whether the facility is required to have a completed Fire Safety Analysis (FSA) performed. If it is determined that a FSA is required, additional information on the facility is recorded.

4.1 Initial Data for the LP-Gas Facility

Complete Form 4.1 to provide basic information on the facility.

Form 4.1
Initial Data on the LP-Gas Facility

A	B	C
Item #	**Information Item**	**Data**
1	Name of the LP-Gas Facility Owner or Operator	Jesus Aguirre
2	Contact Name:	Jesus
3	Contact Telephone & Fax Numbers	1-760-578-4724
4	Contact Email Address	aguirres.propane@yahoo.com
5	Mailing Address, PO Box 2822 Indio CA 92202	Street 1:1338 Glendale Ave Street 2: City, State, Zip ; Thermal, CA 92274

4.2 Facility Storage Capacity and Other Details

Complete Form 4.2. Multiply Column B by its corresponding entry in Column C, write the answer in the corresponding cell in Column D, then sum all the entries in Column D and write it in Row 2, Column D. This number is the "Aggregate Water Capacity" of the facility.

Form 4.2
Facility Storage Capacity [1,2,3]

A	B	C	D
Item #	Individual Container Water Capacity (w.c.) (gallons)	Number of containers	Total Water Capacity (w.c.) of each container size (gallons)
1	500	X	0
	1,000	X	0
	2,000	X	0
	4,000	X	0
	10,000	X	0
	18,000	X	0
	30,000	1	30,000
	60,000	X	0
	Other:		
	Other:		
	Other:		
	Other:		
2	**Aggregate Water Capacity[4]**	1	30,000

Notes: **(1)** Column D = Column B x Column C.

(2) Parked bobtails, transports and tank cars should not be considered for aggregate capacity calculations.

(3) Do not consider containers that are not connected for use.

(4) For the purpose of this manual, "Aggregate Water Capacity" means any group of single ASME storage containers separated from each other by distances less than those stated in the aboveground containers column of Table 6.3.1.1.

If the aggregate water capacity of the LP-Gas facility is less than or equal to 4,000 gallon (w.c.), no further assessment is required.

YOU CAN STOP HERE.

If the aggregate water capacity of the facility is greater than 4,000 gallons, continue the analysis.

4.3 Additional Facility Information

Complete Form 4.3 below and record additional information on the facility.

Complete also the remainder of Fire Safety Analysis indicated in Chapter 5 through Chapter 8 (plus Chapter 9 for proposed facilities).

Form 4.3
Additional Information on the LP-Gas Facility

☐ Existing Facility built to NFPA 58 Edition 2017 ☐ Proposed Facility

a) Name of the Facility (if applicable) Aguirre Propane

b) Type of LP-Gas Facility ☐ Dispensing Station ☐ Industrial Plant X Bulk Plant

c) Facility is located in ☐ Rural Area ☐ Suburban Area City Commercial Zone
X City Industrial Zone

d) Facility neighbors§: ☐ Agri. fields ☐ Commercial Bldgs. ☐ Flammable Liquids Storage
(Check all that apply) ☐ Industrial Activity (metal fabrication, cutting and welding, etc)
☐ Manufacturing X Others (explain) Transmit ion Building

e) Geographic Location of Facility/Address: 1338 Glendale Ave, Thermal CA

f) Landmarks, if any: N/A

g) LP-Gas liquid supply by: ☐ Bobtail X Truck Transport ☐ Rail Tank Car
(Check all that apply) Pipeline

h) LP-Gas Distribution by: X Bobtail ☐ Truck Transport ☐ Vapor Piping
(Check all that apply) ☐ Liquid Piping ☐ Dispensing or Vehicle Liquid fueling

i) Number of Vehicle Entrances: X One ☐ Two ☐ More than two

j) Type of Access Roads to the Facility X Rural ☐ City or Town ☐ Highway
(One check per line) Entrance 1 ☐ Dirt road ☐ Gravel road X Paved
(One check per line) Entrance 2 ☐ Dirt road ☐ Gravel road ☐ Paved

k) Staff presence ☐ Not staffed X Only during transfer operations
☐ Staffed always (24/7) ☐ Only during business hours
☐ Other (Explain) _____

l) Location and distances to Assembly, Educational or Institutional Occupancies surrounding the facility, if any, within 250 ft from the facility boundary in the direction of the assets. N/A

m) Overview plot plan of the facility attached? X Yes ☐ No

§ All properties either abutting the LP-Gas facility or within 250 feet of the container or transfer point nearest to facility boundary.

CHAPTER 5

Analysis of Product Control Measures In Containers and Transfer Piping

5.1 Product Control Measures in Containers

NFPA 58 requires the installation of several product control safety devices both on containers and in transfer piping to minimize the accidental release of LP-Gas, either liquid or vapor. The requirements for product control equipment depend on the following:

- The size of individual containers,
- Whether the containers in a facility are individually filled or filled through a common liquid manifold,
- Whether the product is transferred from the storage container as a liquid or vapor (or both).

A facility may have LP-Gas containers of different sizes; it is therefore necessary to evaluate compliance with the code requirements on a container-by-container basis as well as on a facility basis.

In this chapter, the appurtenance requirements of the code are listed for LP-Gas containers of different sizes. A series of forms are provided which indicate the code-required product control hardware for container and facility piping. The forms also provide space to record the product control equipment actually installed on the containers as well as transfer piping at the facility. These forms must be completed as a part of this Fire Safety Analysis.

Note: Section numbers and table numbers have been changed significantly as a result of Tentative Interim Amendment TIA 14-3, shown in Appendix C.

Complete Forms 5.1 or 5.2 depending upon the size of the individual containers in the facility. Then, perform an analysis of the product control appurtenances for each container located in the facility.

Table 5.1
Container Size-Dependent Evaluations

If the LP-Gas facility contains individual containers in the volume range (gallons w.c.)			Perform the analysis specified in Section
Greater than	And Less than or equal to		
0	4,000	0	5.1.1
4,000	-	0	5.1.2

5.1.1 Individual Containers of Water Capacity less than or equal to 4,000 gallons

Containers of 4,000 gallons water capacity (w.c.) or less can be configured with product control appurtenances in a number of different ways. These are schematically illustrated in Figures 5-1A through Figure 5-1E. *Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes*

Complete the following steps using the schematics in Figure 5-1A through Figure 5-1E

1 Select the first container at the facility, which has a water capacity of 4,000 gallons or less. Enter this as container number 1 in Column A of Form 5.1, below.
2 Review each of the service configurations given in Figure 5-1A through Figure 5-1E. Select the schematic that most closely represents the configuration in the facility for this container. Enter the figure number of the configuration selected for this container in Column B.
3 Count the total number of "Yes" shown in this configuration. This represents the number of required appurtenances for the specific configuration. Enter this number in column C of Form 5.1.
4 Check "Yes" under each appurtenance that is actually installed on the container. If the appurtenance is not provided, then check "No."
5 Count the number of boxes checked "Yes." Enter this number in Column D of Form 5.1.
6 Repeat steps 1 through 5 for each container of 4,000 gallons water capacity or less at the facility.

Form 5.1

Compliance with Code Requirements for Appurtenances on Containers of 4,000 Gallons Water Capacity or Less

A	B	C	D	E
Container #	Service Configuration Sub Figure (in Figure 5-1)	Number of Product Control Appurtenances Required by NFPA 58 (applicable edition)	Number of Product Control Appurtenances Installed on the Container	NFPA 58 Section Reference (2017 edition)
1	n/a			5.7.4.1 Table 5.7.4.1(B) and 5.7.4.4
2	n/a			
3	n/a			
4	n/a			
5	n/a			
6	n/a			

If, in Form 5.1, any one of the numbers in column D is less than the number in Column C of the corresponding row, then these items must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

Figure 5-1
Schematic Representation of the NFPA 58 Requirements for Product Control Appurtenances on Containers of Water Capacity Less Than or Equal to 4,000 Gallons, with Different Service Configurations
(Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes)

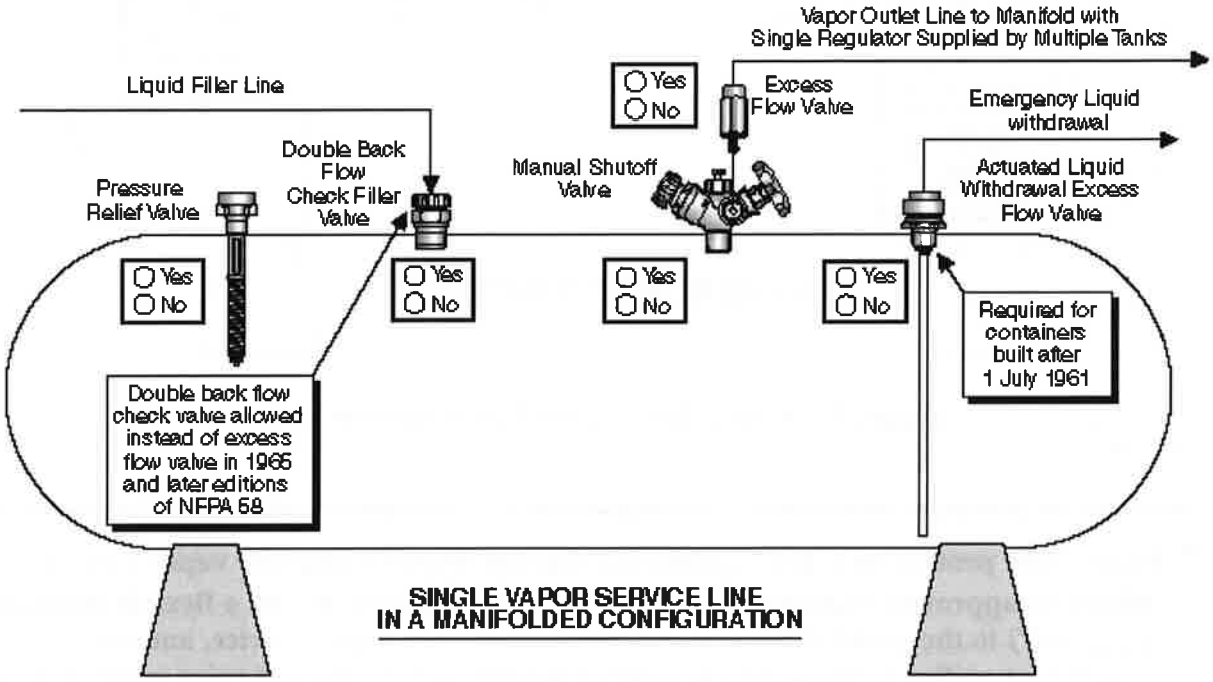


Figure 5-1A: Single Vapor Service Line in a Manifolded Configuration

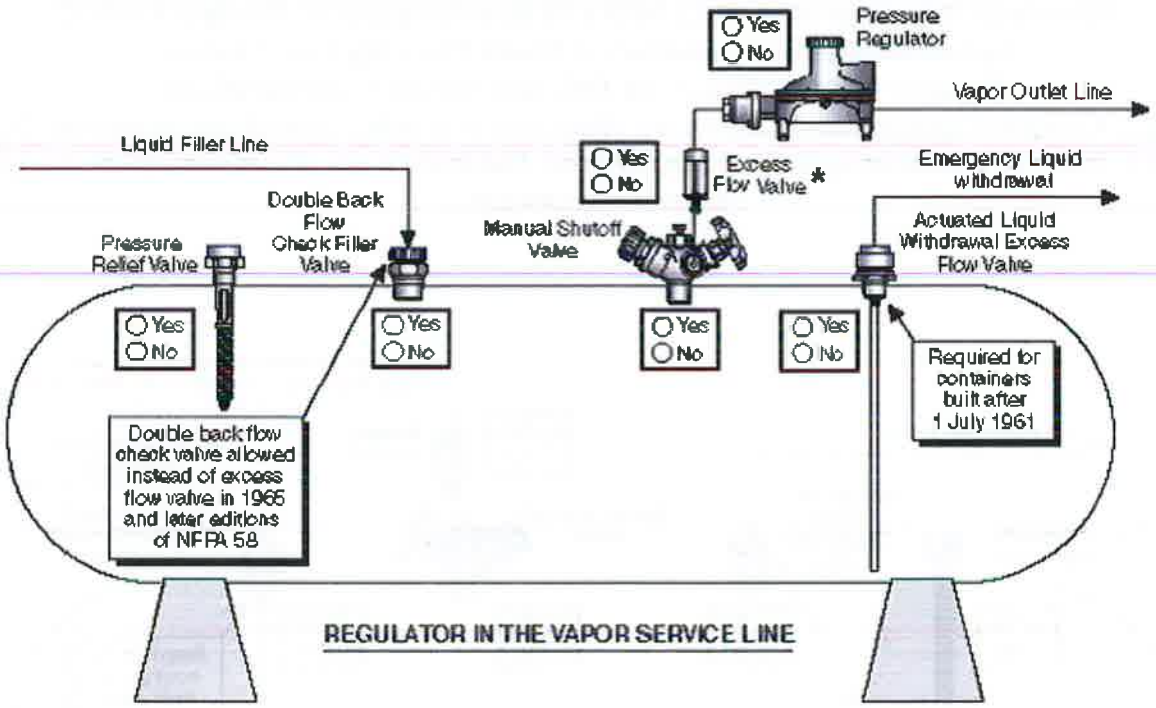
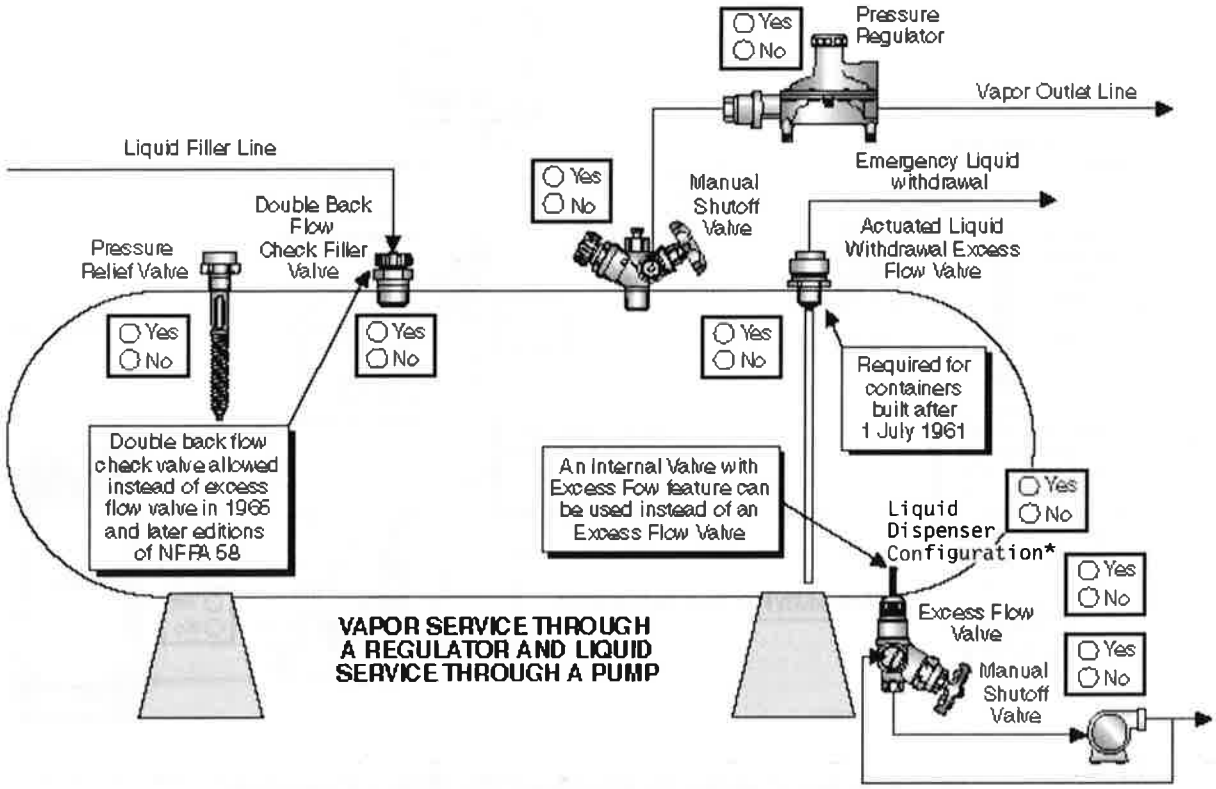


Figure 5-1B: Regulator in the Vapor Service Line

*** Excess-flow protection is not required for manual shutoff valves for vapor service where an approved regulator is directly attached or attached with a flexible connector (*"pig tail"*) to the outlet of the manual shutoff valve for vapor service, and the controlling orifice between the container contents and the shutoff valve outlet does not exceed 5/16 inch (8 mm) in diameter (5.7.4.1 (B)(8), NFPA 58).**



***For liquid dispenser configuration, see 6.25.3.8.**

Figure 5-1C: Container with Both Liquid and Vapor Service, Regulator in the Vapor Service Line.

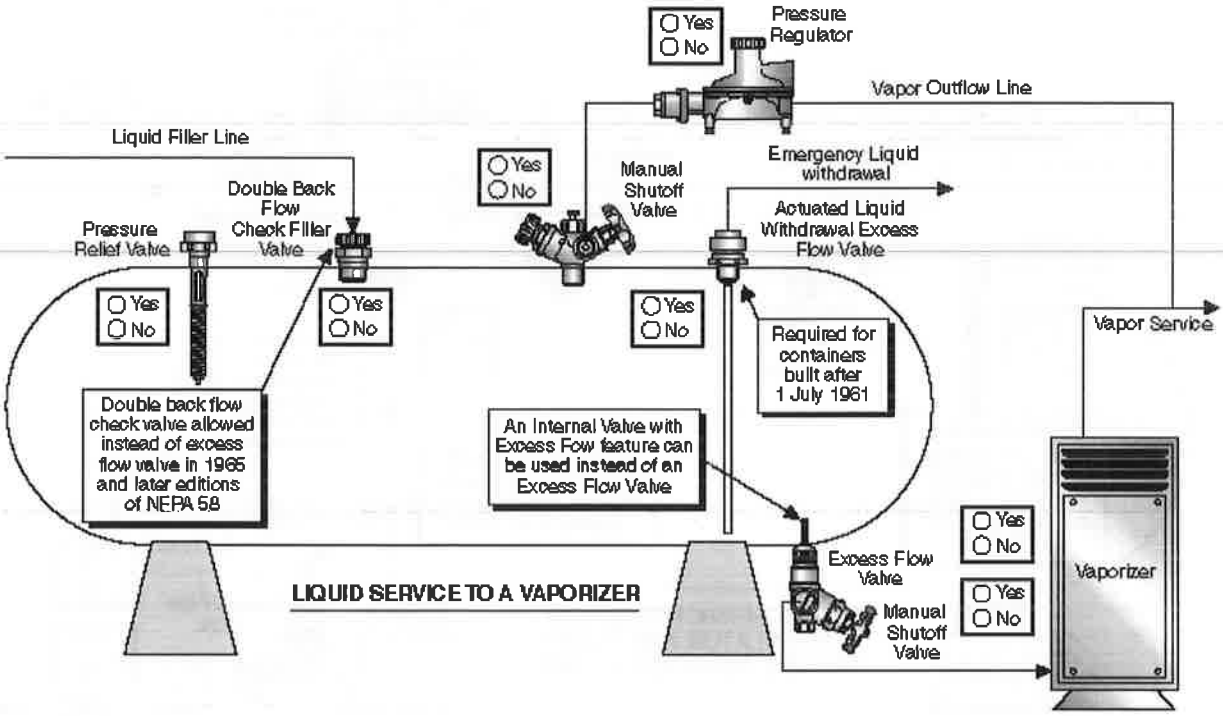
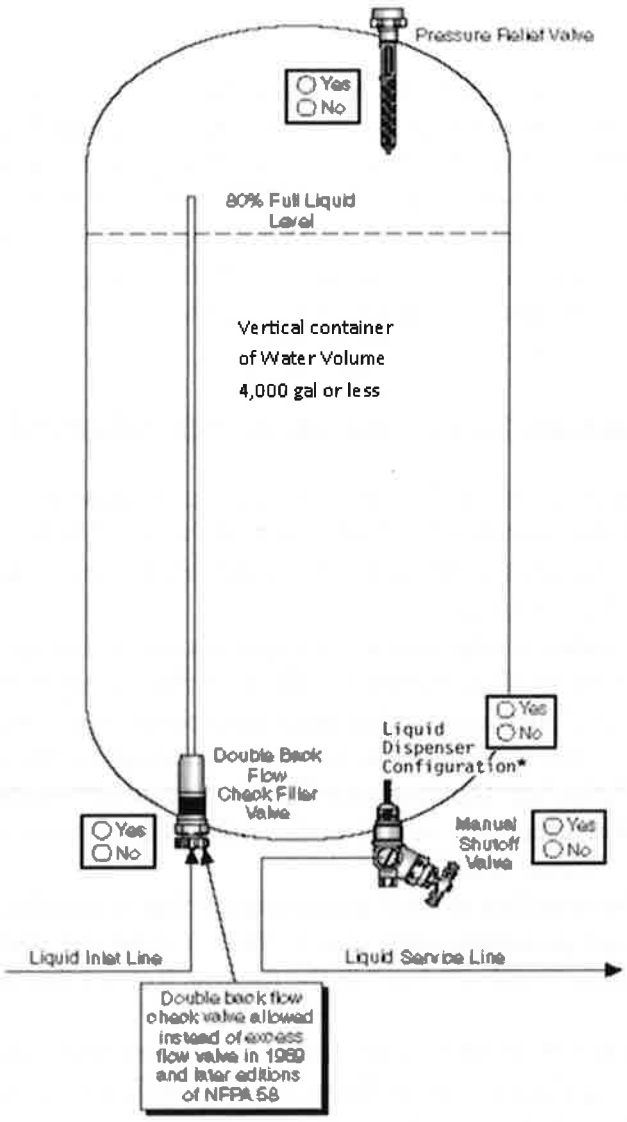


Figure 5-1D: Container Feeding Liquid to a Vaporizer.



***For liquid dispenser configuration, see 6.25.3.8.**

Figure 5-1E: Vertical Container for Liquid Service, 4,000 Gallon w.c. or Less.

5.1.2 Individual Containers Having a Water Capacity Greater than 4,000 Gallons

The compliance with the code requirements for appurtenances in this container size range must be evaluated for LP-Gas flow both into the container (vapor and liquid) and out of the container (vapor and liquid). In addition, note that there are retrofit requirements for existing containers without internal valves in liquid service that were to be completed by July 1, 2011. Several different appurtenance service configurations meet these requirements. These are indicated in Form 5.3. *Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes.*

Enter the information in Form 5.2 by following the steps indicated below

1 Select the first container in the facility having a water capacity greater than 4,000 gallons. Enter this as container number 1 in Column A of Form 5.2 below.
2 Complete each of the rows identified as the vapor inlet, vapor outlet, liquid inlet and liquid outlet service for this container.
3 Select the appurtenance configuration for vapor service which most closely corresponds to the design used in the facility. Figure 5-2 shows different vapor inlet configurations. Enter in column D the configuration number that corresponds to the design used in the facility.
4 Count all "Yes" in the schematic sketch corresponding to this configuration and which provide for vapor inlet into the container. This is the number of required appurtenances that should be provided according to the code. Enter this number in column E of the row corresponding to "Vapor Inlet."
5 Check "Yes" corresponding to each appurtenance that is installed on this container. If the appurtenance is not provided, then check "No". Count the total number of boxes with installed appurtenance marked "Yes" in the facility. Record this number in column F of the same row.
6 Repeat steps 3, 4 and 5 for each vapor outlet configuration (using Figure 5-3), liquid inlet configuration (using Figure 5-6) and liquid outlet configuration (using Figure 5-7).
7 Repeat steps 1 through 6 for each container of water capacity greater than 4,000 gallons located at the facility.

Form 5.2

Compliance with Code Requirements for Appurtenances on Containers Having a Water Capacity Greater Than 4,000 Gallons

A	B	C	D		E	F	G
Container #	LP-Gas inlet to and outlet from the container**		Enter Configur-ation Number		Total Number of Product Control Appurtenances: Required by NFPA 58 (applicable edition)	Total Number of Product Control Appurtenances: Installed on the container	NFPA 58 Section Reference (2017 edition)
1	Vapor	Inlet	5-2	2	2017	2	5.7.4.2, Table 5.7.4.2 and 5.7.4.3
		Outlet	5-3	2	2017	2	
	Liquid	Inlet	5-6	4	2017	4	
		Outlet	5-7	4	2017	4	
2	Vapor	Inlet	5-2		0	0	
		Outlet	5-3		0	0	
	Liquid	Inlet	5-6		0	0	
		Outlet	5-7		0	0	
3	Vapor	Inlet	5-2		0	0	
		Outlet	5-3		0	0	
	Liquid	Inlet	5-6		0	0	
		Outlet	5-7		0	0	
4	Vapor	Inlet	5-2		0	0	
		Outlet	5-3		0	0	
	Liquid	Inlet	5-6		0	0	
		Outlet	5-7		0	0	

** If the container does not provide an opening for the specific function listed, enter 0 (zero) in columns E and F corresponding to that row.

If in Form 5.2 any one of the numbers in column F is less than the number in Column E of the corresponding row, these items must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

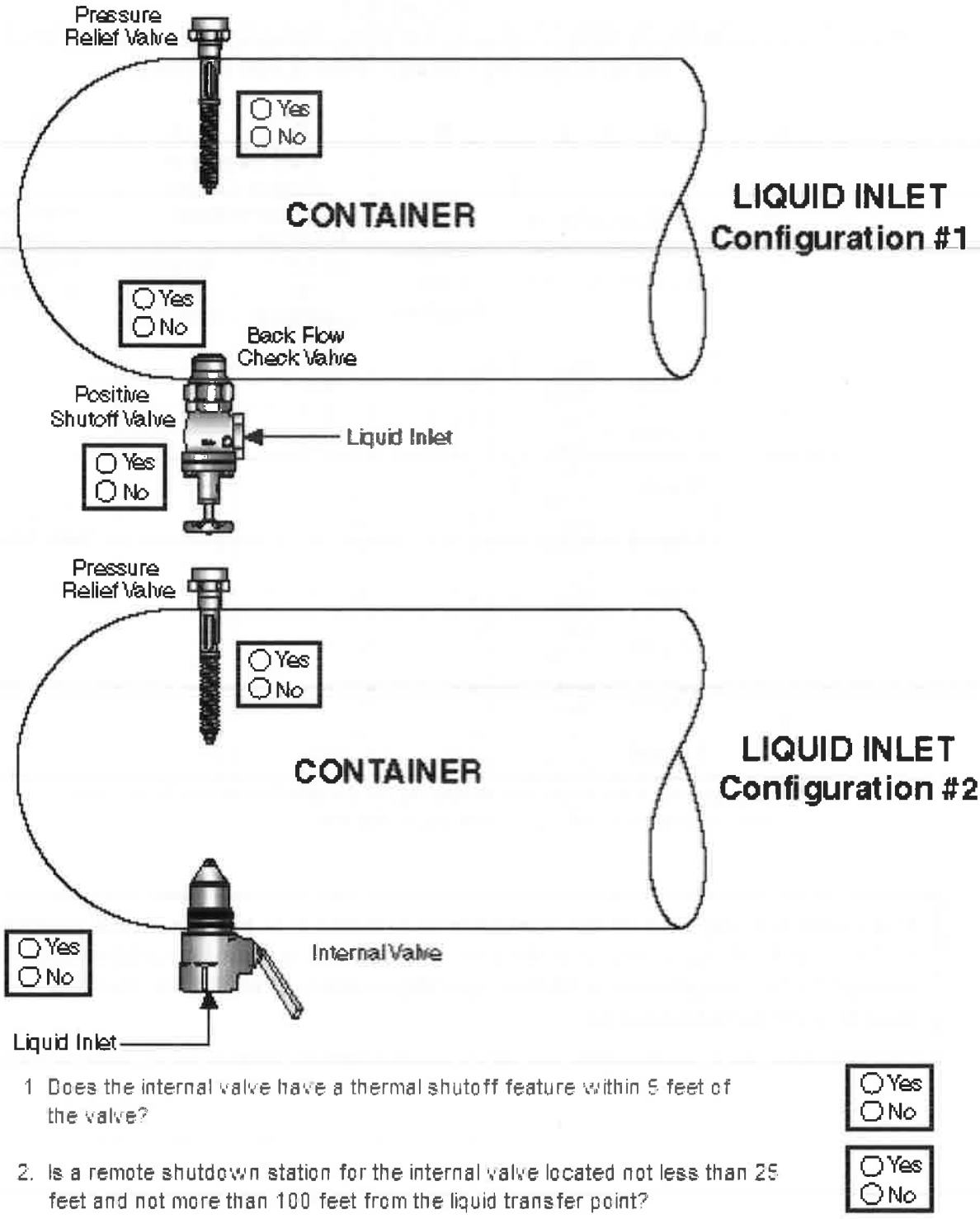
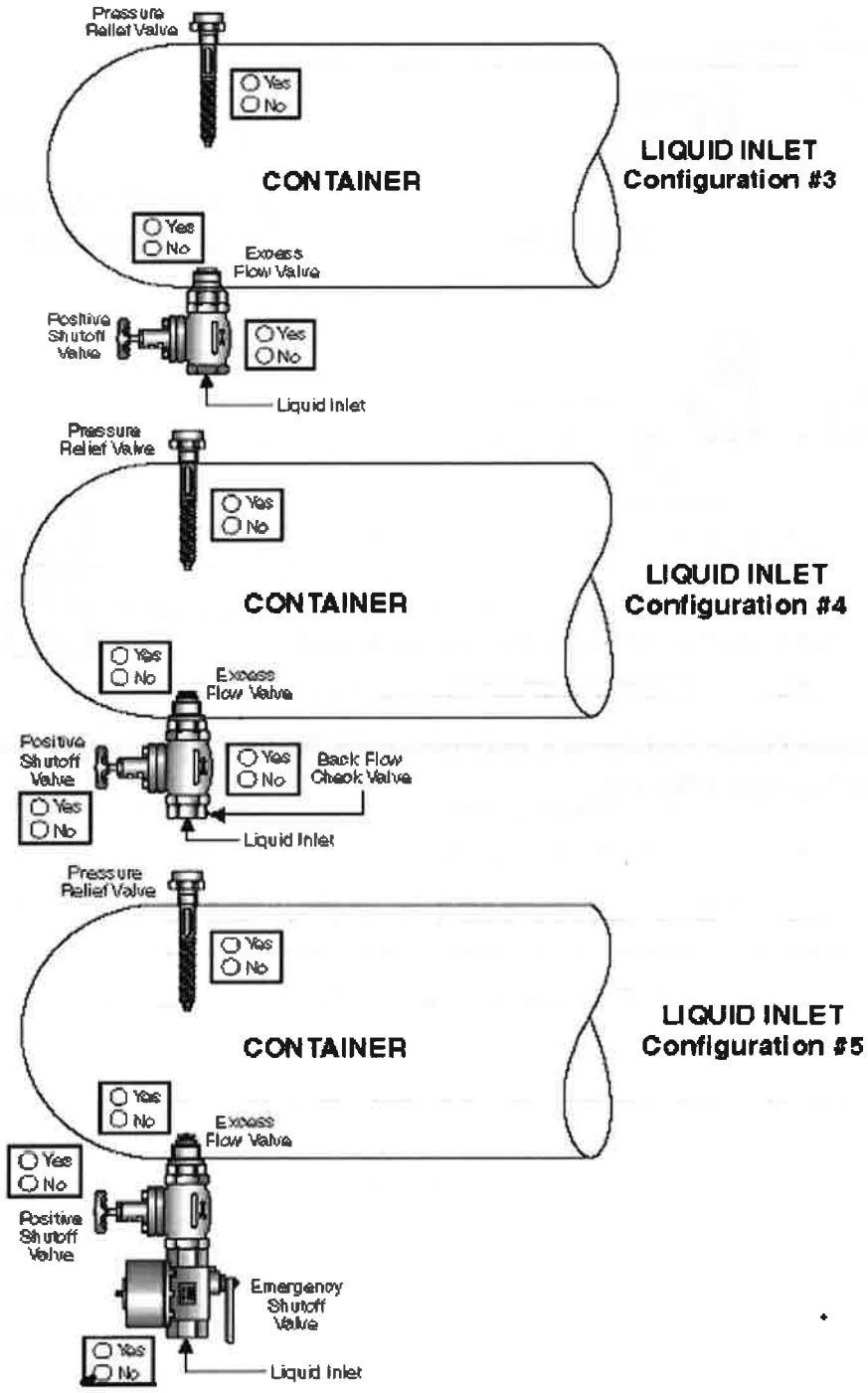


Figure 5-6A Liquid Inlet Valves on Containers With Water Capacity Greater Than 4,000 Gallons in New Installations

(NOTE: Prior to July 1, 2011 existing installations may utilize Configurations 3, 4 or 5 of Fig 5-6B, or either configuration in Figure 5-6A. After July 1, 2011, installations must comply with Configurations 4 or 5 below, or Configuration 1 or 2 in Figure 5-6A.)



Note: *The emergency shutoff valve in configuration #5 must be equipped for remote closure. This valve must be installed in the line upstream as close as practical to the positive shutoff valve/excess- flow valve combination.*

Figure 5-6B: Liquid Inlet Valves on Containers With Water Capacity Greater Than 4,000 Gallons in Existing Installations

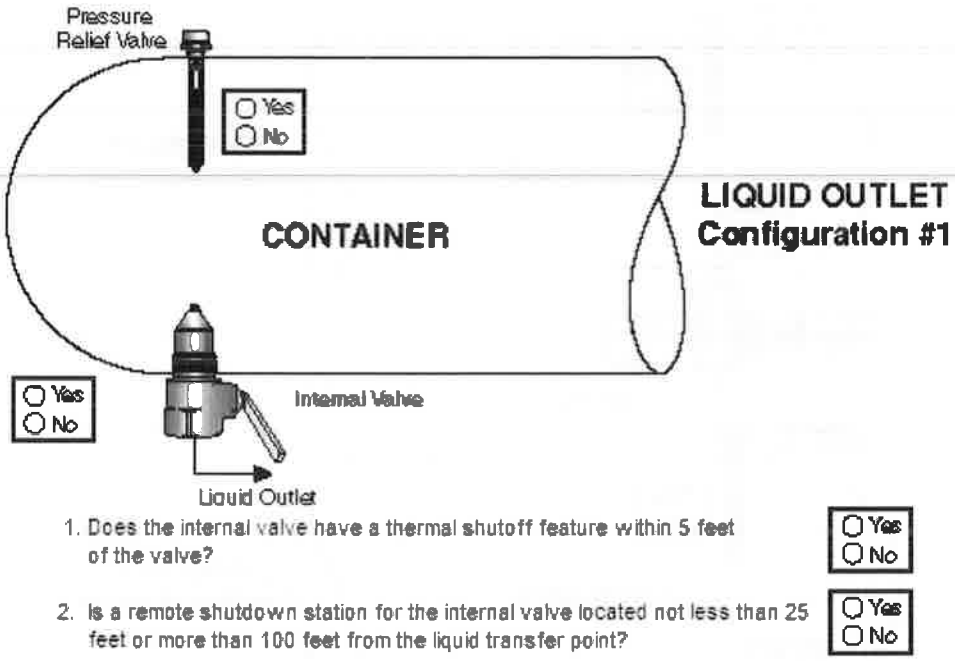
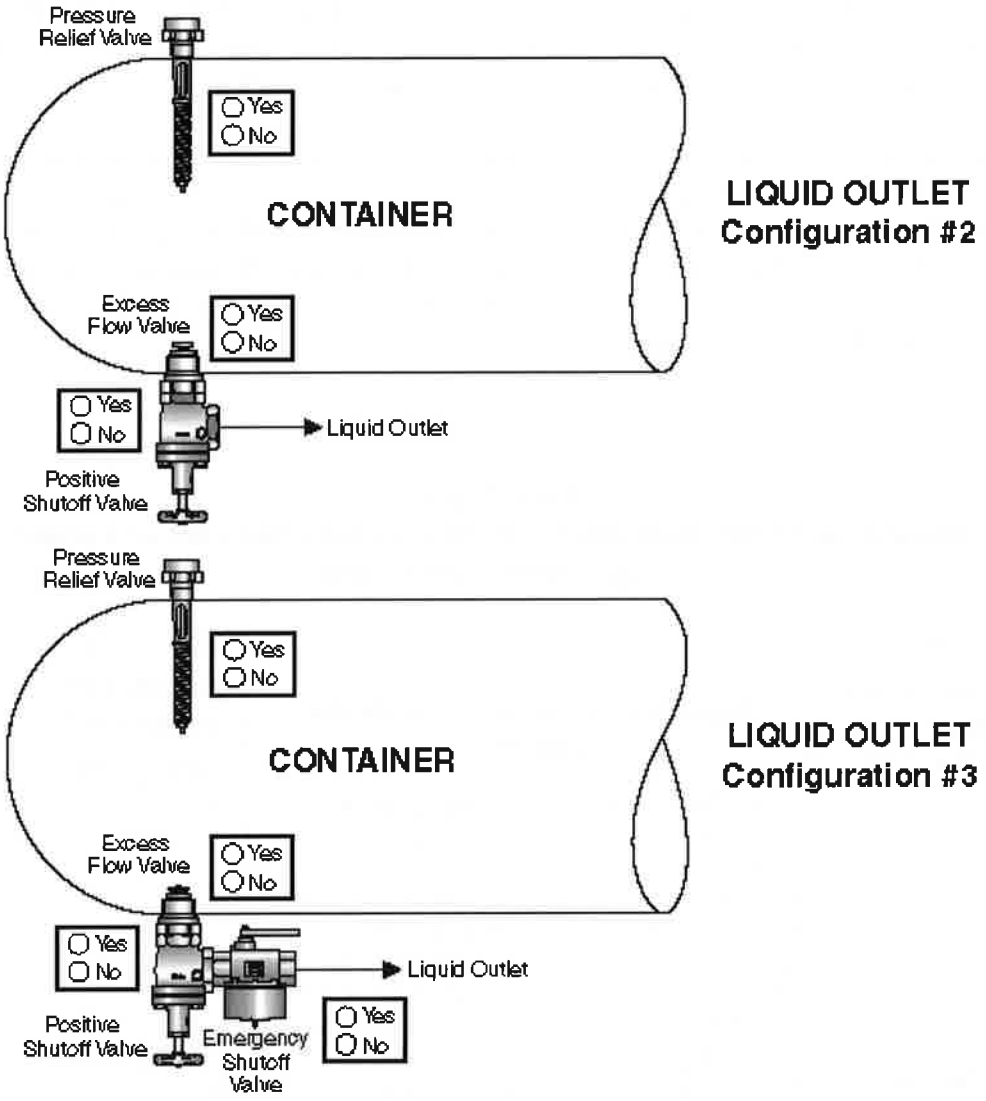


Figure 5-7A: Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in New Installations

(NOTE: Prior to July 1, 2011, existing installations may utilize Configurations 2 or 3 of Fig 5-7B or Configuration 1 in Figure 5-7A. After July 1, 2011, installations must comply with Configuration 3 in Figure 5-7B or Configuration 1 in Fig. 5-7A).



Note: *The emergency shutoff valve in configuration # 3 must be equipped for remote closure. This valve must be installed in the line downstream, as close as practical to the positive shutoff valve/excess-flow valve combination.*

Figure 5-7B: Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in Existing Installations

5.2 Product Control Measures in Transfer Piping

5.2.1 Manifolded and Remotely Filled Containers

The containers in some LP-Gas facilities, especially in bulk plants, may be remotely filled with an inlet manifold connected to one or more containers. The vapor withdrawal or liquid withdrawal from containers may also be through a common manifold. In such cases, there are several appurtenance requirements to control the potential release of product.

If the facility contains a liquid transfer line header (manifold) 1½-inch diameter or larger, and a pressure equalizing vapor line that is 1¼-inch diameter or larger, then continue with the analysis in this section by completing Form 5.3, Form 5.4 and Form 5.5. Otherwise, skip this section and go to section 5.3. *Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes.*

Form 5.3
Requirements for Transfer Lines of 1½-inch Diameter or Larger, Liquid-into-Containers

A	B	C	D	E	F
Item #	Appurtenance (Either No. 1 or No. 2)**	Appurtenance Provided with the Feature	Installed in the facility? Yes	Installed in the facility? No	NFPA 58 Section Reference (2017 edition)
1	Emergency shutoff valve (ESV) (Ref § 6.12)	Installed within 20 ft. of lineal pipe from the nearest end of the hose or swivel-type connections.	X		6.12.2
		Automatic shutoff through thermal (fire) actuation element with maximum melting point of 250 °F	X		6.12.6
		Temperature sensitive element (fusible link) installed within 5 ft from the nearest end of the hose or swivel type piping connected to liquid transfer line.	X		6.12.6
		Manually operated remote shutoff feature provided for ESV.	X		6.12.12.1
		Manual shutoff device provided at a remote location, not less than 25 ft., and not more than 100 ft. from the ESV in the path of egress.	X		6.12.12.2
		An ESV is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of size 1½ inch in diameter or larger on the other side.	X		6.12.5 and 6.19.2.6 (1)
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8

Form 5.3 (continued)

A	B	C	D	E	F

Item #	Appurtenance	Appurtenance Provided with the Feature	Installed in the facility?		NFPA 58 Section Reference (2017 edition)
			Yes	No	
2	Backflow check valve (BCK)**	Installed downstream of the hose or swivel-type connection	x		6.12.3
		BCK is designed for this specific application.	X		6.12.4
		A BCK is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1½ inch in diameter or larger on the other side.	X		6.12.5
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8
3	Debris Protection++	Liquid inlet piping is designed or equipped to prevent debris and foreign material from entering the system.	X		6.19.2.5
4	Emergency discharge control	Flow through facility hose used to transfer LP-Gas from non-metered cargo tank vehicle into containers will stop within 20 seconds of a complete hose separation without human intervention.	X		6.19.2.6 (3)

** In lieu of an emergency shutoff valve, the backflow check valve (BCK) is only permitted when flow is only into the container and shall have a metal-to-metal seat or a primary resilient seat with metal backup, not hinged with a combustible material (6.12.3, 6.12.4).

++ Retrofit required for existing facilities by July 1, 2011.

Form 5.4

Requirements for Transfer Lines of 1½-inch Diameter or Larger,

Liquid Withdrawal From Containers

A	B	C	D	E	F
Item #	**Appurtenance**	**Appurtenance Provided with the Feature**	**Installed in the facility?**		**NFPA 58 Section Reference (2017 Edition)**
			Yes	**No**	
1	Emergency shutoff valve (ESV) (Ref § 6.12)	Installed within 20 ft. of lineal pipe from the nearest end of the hose or swivel-type connections.	X		6.12.2
		Automatic shutoff through thermal (fire) actuation element with maximum melting point of 250 °F.	X		6.12.6
		Temperature sensitive element installed within 5 ft from the nearest end of the hose or swivel type piping connected to liquid transfer line.	X		6.12.6
		Manually operated remote shutoff feature provided for ESV.	X		6.12.12.1
		Manual shutoff device provided at a remote location, not less than 25 ft., and not more than 100 ft. from the ESV in the path of egress.	X		6.12.12.2
		An ESV is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1½ inch in diameter or larger on the other side.	X		6.12.5 and 6.19.2.6 (1)
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8
		Number of ESV's in liquid withdrawal service			

Note: If more than one ESV is installed in the facility, use one Form 5.4 for each ESV.

Form 5.5
Requirements for Vapor Transfer Lines 1¼-inch Diameter or Larger

A	B	C	D	E	F
Item #	Appurtenance	Appurtenance Provided with the Feature	Installed in the facility?		NFPA 58 Section Reference (2017 edition)
			Yes	No	
1	Emergency shutoff valve (ESV) (Ref § 6.12)	Installed within 20 ft. of lineal pipe from the nearest end of the hose or swivel-type connections.	X		6.12.2
		Automatic shutoff through thermal (fire) actuation element with maximum melting point of 250 °F	X		6.12.6
		Temperature sensitive element installed within 5 ft from the nearest end of the hose or swivel type piping connected to liquid transfer line.	X		6.12.6
		Manually operated remote shutoff feature provided for ESV.	X		6.12.12.1
		Manual shutoff device provided at a remote location, not less than 25 ft., and not more than 100 ft. from the ESV in the path of egress.	X		6.12.12.2
		An ESV is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1-1/4 inch in diameter or larger on the other side.	X		6.12.5 and 6.19.2.6 (1)
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8
2	Backflow check valve (BCK)**	Installed downstream of the hose or swivel-type connection	X		6.12.3
		BCK is designed for this specific application.	X		6.12.4
		A BCK is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1-1/4 inch in diameter or larger on the other side.	X		6.12.5
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8

** In lieu of an emergency shutoff valve, the backflow check valve (BCK) is only permitted when flow is only into the container and it shall have a metal-to-metal seat or a primary resilient seat with metal backup, not hinged with a combustible material (6.12.3, 6.12.4).

If a checkmark is made in the "No" column of any one of Form 5.3, Form 5.4 or Form 5.5, then these items must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

If the LP-Gas facility is designed using ALTERNATE PROVISIONS for the installation of ASME CONTAINERS, then continue the analysis below. Otherwise skip section 5.3 and go to Chapter 6.

5.3 Alternate Provisions for the Installation of ASME Containers

Facilities may be provided with redundant fail-safe product control measures (section 5.3.1) and incorporate equipment designed for low emissions during transfer operations (section 5.3.2). These types of (redundant and fail-safe) product control measures and low emission transfer equipment provide additional safety and qualify the facility for the following benefits:

- Reduced separation distances from adjacent properties, and
- Mitigation of the need for special protection requirements.

Note that the reduced separation distance applies only to underground and mounded containers 2,001 through 30,000 gallons where all the requirements of NFPA 58 Section 6.28 (summarized in Forms 5.6 and 5.7) are complied with.

5.3.1 ASME Container Appurtenances and Redundant Fail-Safe Product Control Systems

If the facility incorporates redundant, fail-safe equipment, complete Form 5.6 below. The evaluation will indicate whether the design of the facility complies with the requirements for redundant and fail-safe product control systems. If redundant, fail-safe equipment are not provided, skip this section.

Form 5.6
Evaluation of Redundant Fail-Safe Design

A	B		C	D	E	F
Item #	Description		Features	Installed in the facility? Yes	Installed in the facility? No	NFPA 58 Section Reference (2017 edition)
1	Container sizes for which the appurtenances are provided		Appurtenances and redundant fail-safe equipment are provided for <u>each</u> container of water capacity 2,001 gal. through 30,000 gal.	X		6.28.3 and 6.28.4
2	Liquid or vapor withdrawal (1-1/4 in. or larger)		Internal valve having internal excess-flow valve	X		6.28.3.1 and 6.28.3.2
			Positive shutoff valve installed as close as practical to the internal valve	X		6.28.3.4
3	Liquid or vapor inlet		Internal valve having internal excess-flow valve or backflow check valve	X		6.28.3.5
			Positive shutoff valve installed as close as possible to the internal valve or the back-flow check valve	X		6.28.3.5
4	Railcar transfer	Flow into or out of railroad tank car	Approved emergency shutoff valves installed in the transfer hose or the swivel-type piping at the tank car end	N/A	N/A	6.19.2.6 (1) and 6.28.4
		Flow only into railroad tank car	Approved emergency shutoff valve or backflow check valve installed in the transfer hose or the swivel-type piping at the tank car end	N/A	N/A	6.19.2.6 (2) and 6.28.4
5	Cargo tank transfer		Protection provided in accordance with 6.12	X		6.28.4.1
6	Automatic closure of all primary valves (IV & ESV) in an emergency		By thermal (Fire) actuation	X		6.28.4.2
			Actuated by a hose pull-away due to vehicle motion	X		6.28.4.2
7	Manually operated remote shutdown of IV and ESV		Remote shutdown station within 15 ft of the point of transfer	X		6.28.4.3 (A)
			Another remote shutdown station between 25 ft and 100 ft of the transfer point	X		6.28.4.3 (B)
			Shutdown stations will shut down electrical power supply to the transfer equipment and shut down all primary valves (Internal & Emergency Valves).	X		6.28.4.3
			Signs complying with the requirements of 6.28.4.3 (C) provided	X		6.28.4.3 (C)

Note: If the facility does not have a rail terminal, write the word NA in both the "Yes" column and the "No" column in item 4 of this Form in the railroad tank car row. Similar option is also available if there is no cargo tank vehicle transfer station.

If the LP-Gas facility is provided with LOW EMISSION TRANSFER EQUIPMENT, then continue the analysis below. Otherwise skip section 5.3.2 and go to Chapter 6.

5.3.2 Low Emission Transfer Equipment

If the facility is designed with low emission transfer hoses and associated equipment, complete Form 5.7 below. Compliance with Section 6.28.5 of NFPA 58 results in a 50% reduction in the separation distances between transfer points described in Table 6.5.2.1 and Section 6.25.4.3. If the facility does not have low emission transfer equipment engineered into the facility design, skip this section.

Form 5.7
Evaluation of Low Emission Transfer Equipment

A	B	C		D	E	F
Item #	Description	Features		Installed in the facility?		NFPA 58 Section Reference (2017 Edition)
				Yes	No	
1	Transfer into permanently mounted ASME containers on vehicles	Delivery nozzle and filler valve- Max. liquid release after transfer of 4 cm^3 (0.24 in^3).	Fixed maximum liquid level gage not used during transfer operations	X		6.28.5.3 (A) & (B)
2	Transfer into stationary ASME containers. delivery valve and nozzle combination	During product transfer or post transfer uncoupling of the hose, liquid product volume released to the atmosphere	Does not exceed 4 cm^3 (0.24 in^3) from a hose of nominal size 1 in or smaller	N/A	N/A	6.28.5.4 (A)
			Does not exceed 15 cm^3 (0.91 in^3) from a hose of nominal size larger than 1 in.	X		6.28.5.4 (B)
3	Transfer into stationary ASME containers maximum filling limit	Do containers of less than 2,001 gal (w.c.) have an overfilling prevention device or another approved device?		N/A	N/A	6.28.5.4 (F)
		Do containers 2,001 gal (w.c.) or greater have a float gage or other non-venting device?		X		6.28.5.4 (E)
4	Transfer into stationary ASME containers fixed maximum liquid level gage	Not used during routine transfer operations but used to calibrate other non-venting liquid level gages in the container		N/A	N/A	6.28.5.4 (C) & (D)

Note: 1) If the facility does not have a particular feature described in items 2 or 3, write "NA" in both the "Yes" and "No" columns corresponding to its row .

If separation distance reductions are intended, checkmarks made in the "No" column of either Form 5.6 or Form 5.7 must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

CHAPTER 6

Analysis of Local Conditions of Hazard

6.1 Physical Protection Measures

Protection should be provided for LP-gas facilities, systems and appurtenances against the risk of tampering and from the accidental collision of vehicles with containers and/or transfer lines. Requirements to prevent such tampering or accidents are specified in the code. Compliance requirements for the facility are indicated in Form 6.1. Complete all forms in this chapter. (**NOTE:** See NFPA 58 for complete requirements.)

Form 6.1
Evaluation of Physical Protection and Other Measures

A	B	C	D	E	F
#	Item	Features	Installed in the facility?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Lighting‡	Provide lighting for nighttime operations to illuminate storage containers, container being loaded, control valves, and other equipment	X		6.19.5
2	Vehicle impact protection	Protection against vehicular (traffic) impacts on containers, transfer piping and other appurtenances is designed and provided commensurate with the size of vehicles and type of traffic in the facility. (Example protection systems include but not limited to (1) Guard rails, (2) Steel bollards or crash posts, (3) Raised sidewalks.	X		6.6.1.2 and 6.9.3.10
3	Protection against corrosion	Provide protection against corrosion where piping is in contact with supports or corrosion causing substances.	X		6.9.3.11, 6.9.3.14, and 6.17
Complete only 4A or 4B					
4 A	Perimeter Fence	Is an industrial type or chain link fence of at least 6 ft high or equivalent protection provided to enclose (all around) container appurtenances, pumping equipment, loading and unloading and container filling facilities?	X		6.19.4.2
		Are at least two means of emergency egress (gates) from the enclosure provided? **NOTE: Write "N.A." (not applicable) if** (i) The area enclosed is less than 100 ft^2, or (ii) The point of transfer is within 3 ft of the gate, or containers are not filled within the enclosure	N/A	N/A	6.19.4.2 (A)
		Is a clearance of at least 3 feet all around to allow emergency access to the required means of egress provided?	X		6.19.4.2 (B)
	Guard Service	If a guard service is provided, does this service cover the LP-Gas plant and are the guard personnel provided with appropriate LP-Gas related training, per section 4.4 of NFPA 58?	N/A	N/A	6.19.4.3
4 B	Lock-in-Place devices	Are Lock-in-Place devices provided to prevent unauthorized use or operation of any container appurtenance, system valves, or equipment in lieu of the fence requirements above?	X		6.19.4.2 (C)

Note: Fill only items 1, 2, 3, and 4A or 4B. Indicate with "NA" when not filling the "Yes" or "No" column.
‡ Indicate with "NA" if the facility is not operated at night.

6.2 Ignition Sources and Control

The potential for the ignition of LP-Gas vapors released in a facility is reduced by eliminating as many ignition sources as possible, designing electrical equipment to reduce or eliminate sparking and ensuring that during transfer operations known ignition sources are turned off. The ignition source control involves both passive methods as well active methods. Form 6.2 is used to evaluate whether your facility satisfies the code requirements for ignition source control. (**NOTE:** See NFPA 58 for complete requirements.)

Form 6.2
Assessment of Sources of Ignition and Adjacent Combustible Materials

A	B	C	D	E
#	Sources of Ignition and Requirements Pertaining to Adjacent Combustible Materials	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
		Yes	No	
1	Are combustible materials not closer than 10 ft. from each container?	X		6.4.4.3
2	Is a distance at least 20 ft. provided between containers and tanks containing flammable liquids with flash point less than 200 °F (ex., gasoline, diesel)?	N/A	N/A	6.4.4.6
3	Are electrical equipment and wiring installed per Code requirements?	X		6.23.2
4	Is open flame equipment located and used according to Code?	X		6.23.3.1
5	Are ignition control procedures and requirements during liquid transfer operations complied with?	X		7.2.3.2
6	Is an approved, portable, dry chemical fire extinguisher of minimum capacity 18 Lbs. and having a B:C rating provided in the facility?	X		6.27.4.2
7	Is an approved, portable, dry chemical fire extinguisher of minimum capacity 18 Lbs. and having a B:C rating provided on each truck or trailer used to transport propane?	X		9.3.5 and 9.4.7
8	Is the prohibition on smoking within the facility premises strictly enforced?	X		7.2.3.2 (B) and 9.4.10

Note: Insert "NA" in both "Yes" and "No" columns of any items that are not applicable.

6.3 Separation Distances

6.3.1 Separation Distances between Container and Important Buildings, Other Properties and Transfer Points

The separation distance provisions in NFPA 58 are minimum requirements and are intended to buy time in an emergency and to implement appropriate response. The requirements are dependent upon the size of the container. Complete the appropriate section of Form 6.3. (**NOTE:** See NFPA 58 for complete requirements.)

Form 6.3

Separation Distances from Containers to Buildings, Property Lines that can be Built upon, Inter-container Distances, and Aboveground Flammable or Combustible Storage Tanks

A	B	C	D	E	F	G
#	Container Size Range in gal (W.C.)	Separation between a property line, important building or other property and the nearest container which is	Minimum Distance (ft)	Is the Facility compliant? Yes	Is the Facility compliant? No	NFPA 58 Section Reference (2017 Edition)
1	501 through 2,000	Aboveground	25	N/A	N/A	6.3.1, 6.3.2 and Table 6.3.1.1
		Underground or Mounded	10	N/A	N/A	
		Between containers	3	N/A	N/ A	
2	2,001 through 30,000	Aboveground	50	X		
		Underground or Mounded	50	N/A	N/A	
		Between containers	5	N/A	N/A	
3	30,001 through 70,000	Aboveground	75	N/A	N/A	
		Underground or Mounded	50			
		Between containers	¼ sum of diameters of adjacent containers	N/A	N/a	
4	70,001 through 90,000	Aboveground	100	N/A	N/A	
		Underground or Mounded	50	N/A	N/A	
		Between containers	¼ sum of diameters of adjacent containers	N/A	N/A	
5	All sizes greater than 125 gal	Separation distance between an aboveground LP-Gas container and an aboveground storage tank containing flammable or combustible liquids of flash points below 200 °F.	20	N/A	N/A	6.4.4.6 and 6.4.4.7

If the LP-Gas plant is provided with every one of the redundant and fail- safe product control-design equipment indicated in Form 5.6, then the minimum distance in column D of Form 6.3 can be reduced to 10 feet for underground and mounded containers of water capacity 2,001 gal to 30,000

Note: If any of the container sizes indicated in the above form are not present in the facility, enter "NA" in both Yes and No columns.

6.3.2 Separation Distances between Transfer Points and other Exposures

If the liquid transfer point is not on the container but is at a remote location complete Form 6.4. **Do not complete Form 6.4 when the filling is through a container valve.** (**NOTE:** See NFPA 58 for complete requirements.)

Form 6.4
Separation Distances between Points of Transfer and other Exposures

A	B		C	D	E	F	G
#	Type of Exposure within or outside the facility boundary		Check if exposure is present	Minimum Distance (ft)	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
					Yes	No	
1	Buildings, mobile homes, recreational vehicles, and modular homes with at least 1-hour fire-rated walls			10	X		
2	Buildings with other than at least 1-hour fire-rated walls			25	X		
3	Building wall openings or pits at or below the level of the point of transfer			25	X		
4	Line of adjoining property that can be built upon			25	X		
5	Outdoor places of public assembly, including school yards, athletic fields, and playgrounds			50	X		
6	Public ways, including public streets, highways, thoroughfares, and sidewalks	From points of transfer in LP-Gas dispensing stations and at vehicle fuel dispensers.		10	X		Section 6.5.2 and Table 6.5.2.1
		From other points of transfer		25	X		
7	Driveways			5	X		
8	Mainline railroad track centerlines			25	X		
9	Containers other than those being filled			10	X		
10	Flammable and Class II combustible liquid dispensers and the fill connections of non-stationary containers			10	X		
11	Flammable and Class II combustible liquid aboveground containers and filling connections of underground containers			20	X		
12	LP-Gas dispensing device located close to a Class I liquid dispensing device.			10	X		6.25.4.3

NOTE: Place a checkmark in column C against an exposure that is present in or around the facility. Fill columns E or F for only those rows for which there is a checkmark in column C.

If the facility contains low emission transfer equipment (i.e, all equipment identified in Form 5.7 are installed and are in working order), then the minimum separation distances in column D of Form 6.4 can be reduced to one half of the indicated values.

If the containers in the LP-Gas facility are provided with SPECIAL PROTECTION MEASURES, then continue the analysis below. Otherwise skip Forms 6.5 and 6.6 and go to Section 6.5. Also see Chapter 9.

6.4 Special Protection

In the event that a proposed installation is adjacent to a property containing extremely high combustible fuels and the location of the storage containers is such that exposure of the containers to a fire on the adjacent property would severely impact the integrity of the containers, special protection methods may be utilized to reduce the exposure hazard to the containers. Installed special protection systems must comply with section 6.27.5 of NFPA 58, which addresses both passive and active protection systems.

- Passive approaches include insulating the outside of the containers, mounding above grade or burying the container.
- Active special protection includes fixed water spray systems or placement of monitor nozzles at strategic locations with respect to the containers to be protected.

Complete form 6.5 to determine compliance of the installation with the code. Similarly, Form 6.6 indicates the requirements for active protection. This Form also should be completed as part of the fire safety analysis process.
(**NOTE:**. See NFPA 58 for complete requirements.)

Form 6.5
Special Protection Measures –Passive Systems

A	B	C	D		E
#	Special Protection Option	Question	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Container Insulation	Insulation provided on each of the containers?		X	6.27.5.1
		Insulation material complies with the requirements of NFPA 58?	NA	NA	6.27.5.1 and 6.27.5.2
2	Mounding of containers	Each container in the facility is mounded?	NA	NA	6.27.5.3
		Mounding complies with each requirement under section 6.6.6.3 of NFPA 58.	NA	NA	6.6.6.3 and 6.27.5.3
3	Burying of containers	Each container in the facility is buried?	NA	NA	6.27.5.4
		Buried containers comply with each requirement under section 6.6.6.1 of NFPA 58.	NA	NA	6.6.6.1 and 6.27.5.4

Form 6.6
Special Protection Measures –Active Systems

#	Special Protection Option	Question	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Water spray systems	Are fixed water spray systems, complying with NFPA 15[1] requirements, used for each container in the facility?		X	6.27.6.1
		Do fire responsive devices actuate water spray system automatically?		X	6.27.6.2
		Can the water spray systems be actuated manually also?		X	6.27.6.2
2	Monitor nozzle systems	Are the monitor nozzles located and arranged so that the water stream can wet the surfaces of all containers exposed to a fire?		X	6.27.6.3
		Can the water stream from a monitor nozzle reach and wet the entire surface of, at least, one half of a length from one end of each of the containers it is designed to protect? [1]		X	6.27.6.3
		Do fixed monitor nozzles comply with NFPA 15[2] requirements?		X	6.27.6.1
		Do fire responsive devices actuate the monitor nozzles?		X	6.27.6.2
		Can the monitor nozzles can be actuated manually also?		X	6.27.6.2

1. See discussion in Section 8.2
2. Refer to Chapter 8 for a discussion on NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*

6.5 Vehicular Protection

In the event that an installation is located where an immediate threat due to vehicular traffic is present, a barrier or other suitable protection may be necessary.

Form 6.7
Protection Against Vehicular Impact

#	System Protected	Is physical protection provided?		Type of physical protection installed	NFPA 58 Section Reference (2017 Edition)
		Yes	No		
1	Storage containers	X		Posts or Jersey barriers	6.6.1.2, 6.6.6.1(B), 6.6.6.1(C), 6.9.3.10, and 6.25.3.13
2	Transfer stations	X		Posts or Jersey Barriers	
3	Entryway into plant	X		Locked gate	

CHAPTER 7

Exposure To and From Other Properties, Population Density

7.1 Exposure to Off-Site Properties and Persons From In-Plant Propane Releases

Types of Propane Fires: A propane release inside the LP-Gas facility may affect adjacent properties and off-site populations if the release is of a sufficiently large size. An immediately ignited release will result in a local fire. Depending upon the characteristics of the release and ignition two types of local fires can occur, namely, a pool fire on any liquid pool of propane on the ground or a burning rising fireball.

If the released propane is not immediately ignited, then a dispersing cloud (or plume) of vapor will form. The cloud or plume will move in the direction of the wind. Because of the mixing of air with the dispersing propane, propane concentration decreases continuously both with downwind distance as well as in the crosswind direction. This cloud or plume can be ignited at any distance downwind by an ignition source when the concentration at the point of ignition is within the Lower Flammability Limit (LFL) to Upper Flammability Limit (UFL) range. For propane the range of flammable concentrations in air is between 2.15% and 9.6% by volume.

Ignition of a dispersing vapor cloud or plume may result in a flashback type of vapor fire. In extremely rare cases, and only when the physical conditions are conducive, with partial or full confinement of the propane-air mixture of proper concentration and its ignition, a vapor explosion can occur, resulting in a blast wave. If the dispersing cloud is not ignited it poses no hazard to the surrounding area.

Propane vapor at ambient pressure and temperature is heavier than air. Hence, any vapor released will tend to flow towards and accumulate in low-lying areas adjacent to the release location. If a building or other semi-confined area exists adjacent to the release location wherein the vapor can accumulate in the lower parts of the building, a potential explosion hazard will result.

Hazardous Effects of a Fire: The effect of a propane fire on an off-site property will depend on the type and material of construction of the structure and its distance from the fire and fire size. Similarly, the number of off-site persons adversely impacted by a fire inside a LP-Gas facility will also depend on, (in addition to the characteristics of the fire and the distance between the fire and the population) the type of population, the timeliness of notification, the effectiveness of the evacuation planning and implementation, etc.

Release Cases: In this manual, a number of mathematical models were developed for credible accident scenarios, to describe the effects of the release of propane inside LP-Gas facilities and its subsequent behavior. These models were used to calculate potential hazard areas for each scenario of release. Each potential release discussed has very low probability of occurrence. However, because of the flammability of propane, such releases may pose hazards. The hazard distance (to a

property outside the facility boundary or to off-site persons) from a propane release within the facility will depend on the size and duration of release, and the type of fire that occurs.

The calculated distance to which a hazard extends under each scenario of release and for each hazard behavior is indicated in Table 7.1.

To assess the hazards posed to offsite population from in-plant releases of propane it is necessary to:

1. Note the type of occupancies surrounding the facility, and
2. Describe in detail the characteristics and density of the population surrounding the facility.

To evaluate the impact on the surrounding population from an in-plant propane release, complete Form 7.2 using the results indicated in Table 7.1.

Table 7.1
Distances to Various Types of Propane Hazards Under Different Release Models**

Model #	Details of the Propane Release Model Releases from or due to		Vapor Dispersion Distance to LFL (ft)	Explosion Hazard Distance (ft)	Fire Ball Radiation Distance (ft)
1a	Bobtail hose failure. Release of the entire inventory in the hose, quickly.	1" ID x 150 ft hose length	250	110	50
1b		1" ID x 120 ft hose length	230	103	45
1c		1" ID x 75 ft hose length	190	90	40
2a	Release of the inventory in a transfer piping 1" x 30 ft @ 20 gpm for 10 min., due to failed excess flow valve.		135	120	25
2b	Release of the inventory in a transfer piping 2" x 30 ft @80 gpm for 10 mins.		230	252	48
2c	Release of the inventory in a transfer piping 2" x 80 ft. @ 70 gpm for 10 mins.		328	235	74
2d	Release of the inventory in a transfer piping 2.5" x 30 ft @80 gpm for 10 mins.		269	252	59
2e	Release of the inventory in a transfer piping 3" x 30 ft @100 gpm for 10 mins.		312	287	69
2f	Release of the inventory in a transfer piping 3" x 18 ft @100 gpm for 10 mins.		256	284	55
2g	Release of the inventory in a transfer piping 3" x 80 ft @100 gpm for 10 mins		455	284	106
2h	Release of inventory from transfer piping 4" x 30 ft. + 200 gpm for 10 minutes		407	410	89
3	Release from the container pressure relief valve		No ignitable vapor concentration at ground level		
4	Release from a 1" ID x 150 ft transfer piping to a vaporizer and reduced flow from a partially open excess flow valve @ 20 gpm for 10 min.		250	120	50
5	Leak from a corrosion hole in a transfer pipe at a back		110	120	5

	pressure of 130 psig (corresponding to 80 °F) for 60 min. Hole size is ¼" ID.			
6a	Release of the entire inventory in a 2" ID x 20 ft., transfer hose.	195	90	40
Model #	**Details of the Propane Release Model Releases from or due to**	**Vapor Dispersion Distance to LFL (ft)**	**Explosion Hazard Distance (ft)**	**Fire Ball Radiation Distance (ft)**
6b	Release of the entire inventory in a 2.5 inch dia. transfer hose x 16 ft. length	215	98	45
6c	Release of the entire inventory in a 3-inch dia. transfer hose x 12 ft. length	230	100	46
6d	Release of the entire inventory in a 1.25-inch diameter transfer hose x 20 ft. in length	138	66	27
7a	Transport hose blow down: Hose size 2" ID, 20 ft length release for 3min., from a Transport after the tank is filled.	25	30	<5
7b	Transport hose blow down: Hose size 2.5" ID, 16 ft length release for 3min., from a Transport after the tank is filled.	25	29	<5
7c	Transport hose blow down: Hose size 3" ID, 16 ft length release for 3min., from a Transport after the tank is filled.	31	36	<5

** Results from models described in Appendix B.

Form 7.1

Types of Occupancies[1] Near or Surrounding the LP-Gas Facility

Type of Occupancies	Model # from Table 7.1	Hazard Distance[2] (feet)	Is Occupancy located within the hazard distance from the Facility?	
			Yes	No
Assembly Occupancies (Places of worship, Libraries, Theaters and Auditoriums, Food or Drink Bars, Sports Stadiums, Amusement Parks, Transportation Centers, etc. with 50 or more people).				X
Institutional Occupancies (Elderly Persons Home or Nursing Home, Hospitals, Alcohol & Drug Rehabilitation Centers, Prisons)				X
Educational Occupancies (Elementary Schools, Day Care facilities, etc).				X

NOTES: (1) Different types of occupancies are defined in NFPA 5000

(2) Table 7.1 provides a number of scenarios that can result in propane release, and the resulting area exposed for different ignition mechanisms. Determine the scenarios that are applicable to the facility, for the quantities that can be released, and enter the greatest value from Table 7.1. Use the hose diameters and length that will be used at the facility if they differ from the ones in Table 7.1 and recalculate the hazard distances using a spreadsheet method that is available at npga.org. Some scenarios may not be applicable to an installation because of other mitigation measures implemented, such as a hose management procedure to minimize the possibility of hose failure.

7.2 Exposure to the Propane Facility From External Events

A large fire or an explosion occurring outside the plant boundary may have detrimental effects on the plant equipment, containers or electrical systems. The most likely scenario is that the LP-Gas plant equipment is affected by intense heat radiation from the external fire.
In order to assess the effects on in-plant personnel, equipment, containers and safety systems from exposure to off-site hazards it is necessary to:

1 Identify industrial or other operations surrounding the LP-Gas plant and also note the type of occupancies surrounding the plant;
2 Discuss with owners of facilities or operations surrounding the LP-Gas plant any potential detrimental effect due to their presence or operations upon the LP-Gas plant;
3 Implement suitable precautions and develop quick notification or other effective communication system protocol between the LP-Gas plant and its neighboring industrial plants, to minimize the potential detrimental effects on a proposed LP-Gas plant from surrounding operations.

The description of the LP-Gas plant surroundings was specified in Form 4.2. Form 7.2 should be completed as a part of the Fire Safety Analysis to note any outside hazards that may affect the integrity of the LP-gas system.

Form 7.2
Exposure to LP-Gas Facility from External Hazards

A	B	C	D
Item #	Type of Neighboring Operation	Hazard exists to the LP-Gas Facility	
		Yes	No
1	Petroleum and other hazardous material storage, wholesale dispensing, etc.	N/A	N/A
2	Metal cutting, welding, and metal fabrication	N/A	N/A
3	Industrial Manufacturing that can pose external hazards	N/A	N/A
4	Ports, rail yards and trans-shipment terminals handling flammable and explosive materials.	N/A	N/A
5	Other operations that may pose hazards (gasoline and other hazardous material dispensing stations, fertilizer storage, etc).	N/A	N/A

NOTE: If a particular activity indicated in column B does not exist, fill both "Yes" and "No" columns with "NA."

Where a "Yes" has been checked in either Form 7.1 or Form 7.2:
1) For an existing facility, communicate this information to local emergency responders for inclusion in their emergency planning.
2) For a proposed facility, implement the actions indicated in Chapter 9.

External Fire Effects on LPG Containers: An evaluation of the effects of thermal radiation from fires outside the facility on LP containers in the LPG plant was conducted to provide guidance to those using this manual. (This evaluation, the associated mathematical model and detailed results with and without the effects of wind have been published in a peer reviewed technical journal)[1]. The maximum temperature attained by the vapor-wetted wall of a propane container exposed to heat radiation from an external, non-impinging fire was calculated for various sizes of containers. The assumptions made in regard to the size and location of the external fire included the following:

- The fire used in the model was a highly radiative liquid hydrocarbon pool fire. The value assumed for the heat radiation emanating from this liquid pool fire was greater than that from fires occurring due to the burning of wooden buildings, tires, forest trees, and other flammable liquids such as oil fires, which burn with high degree of smoke production.

- A fire diameter of 100 ft (30.5 m) was used for duration of 30 minutes. This is a very large fire.

- The edge of the fire was located at distances to buildings required by Table 6.3.1.1 of NFPA 58 and consistent with the size of the container nearest to the plant boundary.

- Convective cooling of the heated surface and the effects of reflective paint on the containers were included.

- Bending of the fire plume towards the containers due to the effects of wind was also included.

The maximum temperatures calculated for the steel surface of the container in contact with vapor in different size containers were as follows:

Container Size Gal. (W.C.)	Maximum Temperature attained in 30 min exposure
1,000	660 °F
2,000	648 °F
4,000	507 °F
12,000	507 °F
18,000	437 °F
30,000	384 °F
60,000	340 °F

[1] Raj, P.K., "Exposure of a liquefied gas container to an external fire," Journal of Hazardous Materials, v122, Issues 1-2, p 37-49, June 2005.

The temperature at which the yield strength of steel of a propane tank begins to decrease is close to 800 °F. Based on this, there is no threat of propane tank failure from thermal radiation from an external fire occurring at the minimum separation distances specified in Table 6.3.1.1 of NFPA 58.

CHAPTER 8

Evaluation of Fire Services and Water Supply Requirements

In this chapter the procedure for evaluating the capability and resources of the local fire department (FD) that would respond to an emergency at the LP-Gas facility is discussed. This evaluation includes the training of FD personnel, availability of suitable fire apparatus and equipment, and determination of water requirements if such a system were to be installed at the facility.

8.1 Details of the Fire Service

Use Form 8.1 to record the relevant data on personnel and resources from the local FD or fire company that is responsible for the area where the LP-Gas facility is located. This is a good opportunity to establish a working relationship with the fire department as you will need their support as you go forward with this planning and evaluation process and they will need to understand the facility to provide maximum assistance should an incident occur at the facility.

Analyzing the data from Form 8.1: The designation of the fire fighters as career personnel or volunteers has no bearing on the expertise of the department. The purpose of items 4 and 5 in Form 8.1 is to help determine how fast the initial help might be available. Career fire fighters are in the station and available to respond. Volunteer fire fighters may have to come from home or their place of business. Career fire fighters can normally have a piece of fire apparatus responding within one minute of receiving the call, volunteers may take 4-5 minutes to reach the station before they can respond.

Item # 6 helps determine the level of skill of the fire fighters in the fire department. NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, defines the expertise required of a fire fighter to be qualified to Levels I and II. A Level I fire fighter can do general fire fighting tasks under close supervision and a Level II fire fighter can do those and more tasks under general supervision.

Item # 7A is critical to determining if an effective operation can be conducted. For fighting a fire, at least two fire fighters are required for each 125 gpm hose line used. In addition, an incident commander, a safety officer, additional supervisory officers (depending on the size of the incident), and an operator for each piece of fire apparatus that is being used (pumping or performing some other function) is required. Also required is a rapid intervention crew (RIC) of 2 fire fighters when the first firefighting crew is deployed into a hazardous area, with that team growing to 4 fire fighters when the second and subsequent crews enter the hazardous area. The role of the RIC is to perform a rescue of one or more fire fighters that may be injured during the operation.

Item # 7B and Item # 7C help determine the training and knowledge of the fire fighters in hazardous materials and the specific hazards of LP-Gas. NFPA 472 is *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.

Form 8.1

Data on the Responding Fire Department

A	B		C
Item #	**Data Item**		**Data Entry**
1	Name of the Fire Department (FD).		Imperial County Fire Department
2A	Name of the person in the FD assisting with the data acquisition.		Andrew Loper
2B	Position of the person in the FD assisting with the data acquisition.		Fire Prevention Specialist
3A	Date on which FD data was collected.		04-08-2022
3B	Name of the person collecting the data.		Andrew Loper
4	Number of fire fighters on duty at any time.		3
5	Average number of fire fighters available for response.		3
6A	Number of fire fighters qualified to	"Fire Fighter I" level.	
6B		"Fire Fighter II" level.	3
7A	Number of fire fighters who would:	Respond on the first alarm to the facility.	4
7B		Respond on the first alarm and who are qualified to the operations level requirements of NFPA 472 or similar local requirements	4
7C		Respond on the first alarm with specific knowledge and training on the properties of LP-Gas and LP-Gas fires.	N/A
8A	Number of fire apparatus that have the capability to deploy a 125 gpm hose line supplied by onboard water for at least 4 minutes, and, which:	Are in service in the department.	27
8B		Would respond on a first alarm.	1

Item # 8A and Item # 8B help determine the capability of fire apparatus that will or could respond to an incident. A 125 gpm hose line is a typical hose line used for firefighting where the fire fighters are expected to advance and maneuver the line while it is flowing.

Response time: Another important consideration of the effectiveness of the Fire Department to respond to an incident is the time it takes the FD to reach the LP-Gas facility. Many fire departments have multiple fire stations or use mutual aid fire companies from other communities to assist them so resources are coming from different locations. It is therefore important to determine the total time for not only the first arriving apparatus but for subsequently arriving apparatus dispatched on the first alarm as well. You will need to work with the fire department and gather this information as well.

Using Form 8.2, determine the time for all resources that would be dispatched on the first alarm to an emergency at the facility. Start by identifying and listing in column A the fire companies that would respond on a first alarm to an emergency. Then, for each company record the time it would take to receive and handle an alarm, for the company to turnout, and the time to respond. If the fire department does not have data that can help, some good averages to use are:

- **Alarm Receipt & Handling Time** - 1 minute for the fire department first receiving the alarm and 3 minutes for mutual aid fire departments,
- **Turnout Time** - 1 minute if the apparatus is staffed by career fire fighters and 4 minutes if the apparatus is staffed by volunteer fire fighters,
- **Travel Time** - 2 minutes for each mile the fire apparatus must travel in an urban/suburban setting and 1.5 minutes for each mile the fire apparatus must travel in a rural setting.

Total the times in columns B, C, and D for each company and enter the sum in Column E. This response time will give you an idea of how long it will take resources to reach the facility gate. Fire fighters must then determine the nature and severity of the emergency, determine how they are going to deal with the emergency, maybe establish a water supply from a hydrant or other source, and implement their attack. This can take anywhere from a couple of minutes to upwards of 30 minutes.

8.2 Water Needs and Availability

The requirements for water to cool a container exposed to a fire are indicated in NFPA 15. A flow rate of 0.25 gpm/ft^2 (10 liter/min/m^2) is specified as being adequate to cool a LP-Gas container exposed to a fire. Since a majority of the containers in the LP-Gas facilities have container penetration for liquid inflow or liquid outflow at only one end of the container and since any product leak occurring at one end and a subsequent fire will affect only the end zone of a container, it has been assumed that the container surface within only one half length of the container needs to be cooled for an effective prevention of damage to the container. Also, calculate the total volume of water required on the basis of a stream flow time of 10 minutes.

Based on these parameters and the surface area of various size ASME containers, the cooling water rate requirements for each container size are determined using Form 8.3. Complete Form **8.3** with information relevant to the facility. Start by identifying the largest container at the facility. Assume that a fire occurs at the end of that container where the appurtenances for

product inflow and outflow are located, and determine whether other containers are within 50 feet of this largest container.

Identify the largest container at the facility and all stationary containers within 50 feet of the largest container. Record in column F of Form 8.3 the largest container. Next, record in Column F the two containers that are within 50 feet of the largest, **and** which have the most surface area exposed to the end of the largest container at which the appurtenances are installed. These are the containers, which are most likely to be affected by a fire occurring at the appurtenances of the largest container. Multiply the number of containers recorded in Column F by the required water flow rate per container in Column E and enters the result in Column G. Sum the values in Column G and enter the sum in Cell 2a, Column G. Round this number up to the next multiple of 125 (i.e. 725 gpm would round up to 750 gpm). This is done because the application of water by the fire department is generally going to be in increments of 125 gpm. Enter that figure in Cell 2b, Column G.

You have now determined the application rate for cooling water that is necessary if the largest container is subjected to fire. Add 250 gpm (Cell 3, Column G) for use by fire fighters to protect personnel when approaching the container or its valves to control the flow of product. Sum the numbers in Cells 2b and 3 of Column G. Enter that number in Cell 4, Column G.

To determine the total volume of water required for a 10-minute application time, multiply the total water flow rate in Cell 4, Column G by 10 and enter that figure into Cell 4, Column H.

Form 8.2

Response Time data for the Fire Departments

A	B	C	D	E
Company or Department	Time in Minutes for			
	Alarm Receipt & Handling	Turnout	Travel	Total Time
ICFD Station 9	N/A	1.34	5.00	6.34

Note: Number in Column E = Sum of numbers from Columns B through D.

Form 8.3

Water Flow Rate and Total Water Volume Required to Cool Containers Exposed to a Fire

A	B	C	D	E	F	G	H
Item #	ASME Container Size (gallons)	Total Surface Area of each Container[1] (ft^2)	Surface Area of each container to be Cooled (ft^2)	Water flow rate required per container (gpm)	Number of containers of the size indicated[2]	Total Water flow rate required (gpm)	Total volume of water required for 10 min (gal)
1	500	86	43	10.8	0		
	1,000	172	86	21.5	0		
	2,000	290	145	36.3	0		
	4,000	374	187	46.8	0		
	6,500	570	285	71.3	0		
	9,200	790	395	98.8	0		
	12,000	990	495	123.8	0		
	18,000	1,160	580	145.0	0		
	30,000	1,610	805	201.3	1	203.1	
	45,000	2,366	1,183	295.8	0		
	60,000	3,090	1,545	386.3	0		
	90,000	4,600	2,300	575.0	0		
	Other Size						
2a	Calculated water flow rate for container protection					203.1	
2b	Water flow rate rounded up to nearest multiple of 125						
3	Water for fire fighter protection, if required					250	
4	Total water flow rate and volume					453.1	4531.00

Note: Column D = (1/2) x Column C Column E = 0.25 (gpm/ft^2) x Column D ;

Column G = Column F x Column E Column H = 10 x Column G

Line 2a, Column G and Column H are the sum of numbers in each row above line 2 of each column.

Line 4, Column G and Column H are the sum of numbers in rows 2b and 3.

[2] Consider only 3 containers for water supply evaluations even if the number of containers in a group is more than 3. See Section 8.2.

1 ASME container approximate dimensions

The total water requirement for the facility is indicated in item 4, column G (water flow rate) and column H (total water volume or quantity) of Form 8.3. If multiple groups of containers are present in the facility, repeat the calculations in Form 8.3 for each group of containers. The total water requirement for the facility is the largest value for any single group of containers.

Water Availability Evaluation

If a water system is installed, Form 8.3 calculates the total water requirement for a 10-minute duration. This time period allows for manual shutdown, rescue of any injured, and the possibility of dispersing unignited gas.

If there is a public or private water supply with hydrants available within 1000 feet of the container or containers on which water will be applied, determine the available flow rate from that system with 20 psi residual pressure. The water company may have flow test data or it may be necessary to conduct flow tests. If that flow rate is equal to or greater than the needed flow rate determined using Form 8.3, you can assume your water supply is adequate. If the hydrant flow rate is less than the needed flow rate, determine what other sources of water are available. Sources fall into two categories: water on fire apparatus responding to the incident, and water in rivers, ponds or lakes near the facility. Start by talking with the fire department about whether they have a tanker shuttle capability. Some departments have well-organized operations that can deliver 250 gpm or more on a continuous basis using tanker shuttles. This may be the only capability available or it may be a supplement to a weak hydrant system. Be sure to determine how long it would take to get the water shuttle established.

If there is a river, pond or lake in the area, the fire department may be capable of drafting from that water source and pumping water through hose lines to the facility. There are a number of things that need to be considered before relying on this type of water supply.

1. Can a fire apparatus get close enough to the water source to reach the water with the suction hose it carries (normally 20 feet) and not have the lift (distance from the surface of the water to the center of the pump) greater than 10 feet?
2. Is the water source available year round? Does it dry up in the summer or freeze in the winter? The strainer on the suction hose needs to be at least 2 feet below the surface of the water.
3. Is the water source of adequate size or flow to supply the water needed?
4. Does the fire department have the hose and pumping apparatus to relay the water from the source to the fire?
5. How long will it take to set up this relay?

These factors should be evaluated and discussed with the fire department before any decision is made to use such a supply. It might also be useful to have the fire department conduct an actual timed drill to deliver the needed water supply to the facility site using the normally responding complement of personnel and equipment.

Complete Form 8.4 to document the water supply that will be available to the facility site.

Form 8.4

Evaluation of Water Availability in or Near the LP-Gas Facility

A	B	C	D		
Item #	**Water from…**	**Available?**	**Quantitative information**		
1	Public supply or from another piped-in supply through one or more fire hydrants in or near the facility	X Yes ☐ No	Hydrant data	Distance from Container(s) on which water will be applied (feet)	Available water flow rate from all hydrants(1) (gpm)
			Hydrant 1	800	1250
			Hydrant 2	Aprox 1000	
			Hydrant 3	0	
2	A nearby static water source (stream, pond, lake, etc).	☐ Yes X No	Distance to water source = 0 Feet Time to set up relay = 0 min. Rate of delivery = 0 gpm		
3	Only through mobile water tanker shuttle.	☐ Yes X No	Time to set up shuttle = 0 min. Sustainable flow rate = 0 gpm		

(1) Obtain the available flow rate from the local municipal water authority or the entity that supplies water to the hydrant or conduct a test to determine total available flow rate.

Having the water available does not guarantee that the fire department has the resources to apply the water in a timely manner. Completed Form 8.2 will indicate how much time it will take for the fire department to have initial resources at the facility and how long before additional resources will be on-site. If the capability to apply cooling water within the first 10 minutes of initial fire exposure to the container is not present, extremely dangerous conditions could begin to develop. Note that it will take several minutes after the apparatus arrives at the facility gate before cooling water is actually applied to the containers and that hand held hose lines will be used with water supplied from the water tank on the apparatus. Even if hydrants are available, the staffing on the first arriving fire apparatus will probably not be sufficient to establish a water-supply from the hydrant. Depending on the hydrant system and the fire department's standard operating guidelines, it may be necessary to connect a pumper to the hydrant. If the distance is over 1000 ft. it may also be necessary to use hose from more than one fire apparatus to reach the hydrant and in some cases, to use intermediate pumpers in the hose line to boost the pressure.

Form 8.1 contains information on responding apparatus capable of applying 125 gpm for 4 minutes. This is adequate to begin operations for a single container of 30,000 gallons or less water capacity if no other adjacent containers are exposed to the fire. However, a continuous water supply then has to be established within that 4 minutes or other apparatus must be available with onboard water to continue the cooling until a continuous water supply is set up. A larger facility or multiple containers exposing each other is a different situation. In those cases, cooling water may need to be applied using larger hand held hose lines or ground monitors to achieve the reach necessary with the water stream. Both of these require considerably more water than may be supplied by 125 gpm hose lines. Unless a hydrant system with an adequate flow rate is readily available, the time needed to establish an adequate water supply from remote hydrants, a relay operation from a static water source, or a sustainable tanker shuttle operation will greatly exceed the initial 10 minutes of fire exposure to the container and dangerous conditions could begin to develop. For these facilities, a fixed water spray system is the only practical means by which adequate protection can be provided to installations consisting of multiple 30,000 gallon or larger containers.

Using the data you have gathered, it is recommended that you discuss with the fire department the resources available to protect the facility. This would include evaluating the knowledge and training of the fire fighters who would be arriving at the facility.

1) For an existing facility, communicate this information to local responders for inclusion in their emergency planning.

2) For a proposed new facility, refer to Chapter 9

CHAPTER 9

Evaluation Summary for a Proposed New LP-Gas Facility

In this chapter the results of analyses performed in Chapter 4 through Chapter 8 for a proposed (new) LP-Gas facility are summarized. If noncompliance with NFPA 58-2017 is found, the design must be altered to bring the proposed facility into compliance. In some cases, several alternative approaches for complying with the code are presented.

Complete Form 9.1, Form 9.2 and Form 9.3 (and if necessary, Form 9.4 and Form 9.5) and implement any necessary changes to the design to bring the new facility into compliance with the code.

Form 9.1
Analysis Summary on Product Control and Local Conditions of Hazard

A	B	C	D	E
Item #	**CHAPTER Title**	**Section & Title**	**Reference FORM #**	**Number of "No" checked**
1	Product Control Measures in Containers & Transfer Piping	5.1: Product Control in Containers	5.1 or 5.2	0
		5.2 Product Control in Transfer Piping	5.3	0
			5.4	0
			5.5	0.
			5.6	0
			5.7	0
2	Analysis of Local Conditions of Hazard	6.1 Physical Protection Measures	6.1	0
		6.2 Ignition Source Control	6.2	0
		6.3.1 Separation distances; Container and outside exposures	6.3	0
		6.3.2 Separation distances; Transfer points and outside exposures	6.4	0
		6.4 Special Protection Measures	6.5	0
			6.6	0

§ The number of "No" for Forms from Chapter 5 is the difference between the required number of appurtenances according to NFPA 58-2017, and a lesser number found to be actually installed on the container or the transfer piping.

If, in any row of column E ("No") of Form 9.1, the entry number is greater than zero, the proposed LP-Gas facility is not in compliance with the requirements of NFPA 58-2017 for product control appurtenances or other safety measures. The design of the proposed facility must be modified to conform to the code requirements. In addition, the following items should be noted.

- If there are any "No" checks in Form 6.3, then the separation distance requirements for containers are not satisfied. An option that may be considered is the reduction in separation distance to 10 feet for underground and mounded containers by providing "Redundant and Fail-Safe Product Control Measures." In this case, complete Form 9.4 below to ensure that each requirement of "Redundant and Fail-Safe Product Control Measures" is provided.

- If there are any "No" checks in Form 6.4, then the separation distance requirements for transfer points are not satisfied. In this case, relocate the transfer points so that the separation distances conform to the code requirements or provide the Low Emission Transfer Equipment. Complete Form 9.5 below and ensure that all requirements for Low Emission Transfer Equipment are fulfilled.

Form 9.2
Analysis Summary on Exposure from and to the LP-Gas Facility

A	B	C	D	E
Item #	**CHAPTER Title**	**Section & Title**	**Reference FORM #**	**Number of "Yes" checked**
1	Exposure to and from Other Properties	7.1 Exposure to off-site properties and persons from in-plant propane releases	7.1	0
		7.2 Exposure to propane facility from external events.	7.2	0

If the entry number in column E ("Yes"), Form 9.2 corresponding to Form 7.1 is greater than zero, consider one or more of the following design alternatives.

1 Consider moving the container or the transfer point to a different location, if possible and space exists, so that the property or the person is beyond the hazard distance.
2 Provide "Redundant and Fail-safe Product Control Measures". Complete Form 9.4 to ensure compliance.
3 Institute other technical measures such as installing gas and flame detectors (connected to facility shut down systems), sounding alarm outside facility premises, etc.
4 Institute administrative controls such as additional training for personnel, more frequent inspections of hoses and transfer piping, etc.

If the entry number in column E ("Yes"), Form 9.2 corresponding to Form 7.2 is greater than zero, consider one or more of the following design alternatives.

1 Implement procedures to monitor neighboring activity.
2 Install means in the adjacent plant to shut down the LP-Gas plant in case of an emergency in that plant.

Form 9.3
Analysis Summary on Fire Department Evaluations

A	B	C	D	E	F
Item #	**CHAPTER Title**	**Section & Title**	**Reference FORM #**	**Number "zeros" entered in Column C, Lines 6 through 8 of Form 8.1**	**Number of "Yes" checked in Column C of Form 8.4**
1	Fire department capability, adequacy of water supply and Emergency Planning	8.1 Data on the Fire Department	8.1	0	1
2		8.2 Fire response water needs and availability	8.4		1250

If the entry number in row 1, Column E of Form 9.3 is greater than zero, consider one or more of the following design alternatives.

1 Discuss with the local Fire Department the needs of the LP-Gas facility and the evaluation results on the capability and training inadequacies of the Department.

2 Consider developing a cadre of personnel within the LP-Gas facility to respond to emergencies.

3 Institute container special protection system based on active protection approaches or passive approaches. Complete Form 9.6 and Form 9.7 below.

If the entry number in row 2, Column F of Form 9.3 is equal to zero, consider one or more of the following design alternatives.

1 Provide special protection (other than water spray or monitor systems) to containers, satisfying the requirements of section 6.27.5 of NFPA 58, 2017 edition. Complete Form 9.6 to ensure compliance.

2 Consider implementing the various options indicated in Table 9.1.

Form 9.4
Redundant and Fail-Safe Design for Containers

A	B		C	D	E	F
Item #	Description		Features	Proposed for the facility?		NFPA 58 Section Reference (2017 Edition)
				Yes	No	
1	Container sizes for which the appurtenances are provided		Appurtenances and redundant fail-safe equipment are provided for each container of water capacity 2,001 gal through 30,000 gal	X		6.28.3 and 6.28.4
2	Liquid or vapor withdrawal (1-1/4 in. or larger)		Internal valve having internal excess flow valve	X		6.28.3.1 and 6.28.3.2
			Positive shutoff valve installed as close as possible to the internal valve	X		6.28.3.4
3	Liquid or vapor inlet		Internal valve having internal excess flow valve or Backflow check valve	X		6.28.3.5
			Positive Shutoff Valve installed as close as possible to the Internal Valve or the back flow check valve	X		6.28.3.5
4	Railcar transfer	Flow into or out of railroad tank car	Emergency shutoff valve installed in the transfer hose or the swivel-type piping at the tank car end.	N/A	N/A	6.19.2.6 (1) and 6.28.4.1
		Flow only into railroad tank car	Emergency shutoff valve or backflow check valve installed in the transfer hose or the swivel-type piping at the tank car end.	N/A	N/A	6.19.2.6 (2) and 6.28.4.1
5	Cargo tank transfer		Protection provided in accordance with 6.28.4.1	X		6.28.4.1
6	Automatic closure of all primary valves (IV & ESV) in an emergency		By thermal (Fire) actuation	X		6.28.4.2
			Actuated by a hose pull-away due to vehicle motion	X		6.28.4.2
7	Manually operated remote shutdown of IV and ESV		Remote shutdown station within 15 ft of the point of transfer?	X		6.28.4.3 (A)
			Another remote shutdown station between 25 ft and 100 ft of the transfer point?	X		6.28.4.3 (B)
			Shutdown stations will shut down electrical power supply to the transfer equipment and all primary valves (Internal and Emergency Valves)	X		6.28.4.3
			Signs complying with the requirements of 6.28.4.3 (C) provided?	X		6.28.4.3 (C)

Note: If your facility does not have a rail terminal, write the word NA in both the "Yes" column and the "No" column in item 4 of the form in the railroad tank car row. Similar option is also available if there is no cargo tank vehicle transfer station.

Form 9.5
Evaluation of Low Emission Transfer Equipment

A	B	C		D	E	F
Item #	**Description**	**Features**		**Proposed for the facility?**		**NFPA 58 Section Reference (2017 Edition)**
				Yes	**No**	
1	Transfer into permanently mounted ASME containers on vehicles	Delivery nozzle and filler valve-max. liquid release after transfer of 4 cm^3 (0.24 in^3).	Fixed maximum liquid level gage not used during transfer operations	X		6.28.5.3 (A) & (B)
2	Transfer into stationary ASME containers delivery valve and nozzle combination	During product transfer or post transfer uncoupling of the hose, liquid product volume released to the atmosphere	Does not exceed 4 cm^3 (0.24 in^3) from a hose of nominal size 1 in or smaller	N/A	N/A	6.28.5.4 (A)
			Does not exceed 15 cm^3 (0.91 in^3) from a hose of nominal size larger than 1 in.	X		6.28.5.4 (B)
3	Transfer into stationary ASME containers maximum filling limit	Do containers less than 2,001 gal (w.c.) have an overfilling prevention device or another approved device?		N/A	N/A	6.28.5.4 (F)
		Do containers 2,001 gal (w.c.) or greater have a float gage or other non-venting device?		X		6.28.5.4 (E)
4	Transfer into stationary ASME containers fixed maximum liquid level gage	Not used during routine transfer operations but may be used in calibrating other non-venting liquid level gauges in the container		X		6.28.5.4 (C) & (D)

Note: If the facility does not have a particular feature described in items 2 or 3, write "NA" in both the "Yes" and "No" columns corresponding to its row .

Form 9.6
Special Protection Measures – Passive Systems

A	B	C	D		E
Item #	Special Protection Option	Question	Proposed for the facility?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Container insulation	Insulation provided on each of the containers?		X	6.27.5.1
		Insulation material complies with the requirements of NFPA 58?	N/A	N/A	6.27.5.1 and 6.27.5.2
2	Mounding of containers	Each container in the facility is mounded?	N/A	N/A	6.27.5.3
		Mounding complies with each requirement under section 6.6.6.3 of NFPA 58.	N/A	N/A	6.6.6.3 and 6.27.5.3
3	Burying of containers	Each container in the facility is buried?	N/A	N/A	6.27.5.4
		Buried containers comply with each requirement under section 6.6.6.1 of NFPA 58.	N/A	N/A	6.6.6.1 and 6.27.5.4

Form 9.7
Special Protection Measures – Active Systems

Item #	Special Protection Option	Question	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Water spray systems	Are fixed water spray systems, complying with NFPA 15 requirements, used for each container in the facility?		X	6.27.6.1
		Do fire responsive devices actuate water spray system automatically?	N/A	N/A	6.27.6.2
		Can the water spray systems be actuated manually also?	N/A	N/A	6.27.6.2
2	Monitor nozzle systems	Are the monitor nozzles located and arranged so that the water stream can wet the surfaces of all containers exposed to a fire?	N/A	N/A	6.27.6.3
		Can the water stream from a monitor nozzle reach and wet the entire surface of, at least, one half of a length from one end of each of the containers it is designed to protect?	N/A	N/A	6.27.6.3
		Do fixed monitor nozzles comply with NFPA 15 requirements?	N/A	N/A	6.27.6.1
		Do fire responsive devices actuate the monitor nozzles?	N/A	N/A	6.27.6.2
		Can the monitor nozzles be actuated manually also?	N/A	N/A	6.27.6.2

Equivalent Protection to a Water Supply for Industrial and Bulk Facilities

In the case where water supply is not available in or near the LP-Gas facility, or is inadequate or it is prohibitively expensive to connect to a public or private water supply hydrant, alternative methods for providing protection should be considered. In lieu of providing a water supply, several alternatives are indicated in Table 9.1, which can offer an equivalency to a water supply system.

The intent of the controls identified in Table 9.1 is to maintain the entire system as a gas tight entity. These methods include reducing the service life of equipment, increasing the design pressure rating of the system beyond the requirements of NFPA 58, or providing early detection and isolation of the system to ensure product control. This list is not exhaustive and is not ranked in an order of priority.

Table 9.1
Suggested Alternative Methods for Industrial and Bulk Plants That Do Not Pose a Hazard But Lack a Water Supply

Item #	Possible options to implement when adequate water supply is not available
1	Reduce the service life of hoses.
2	Increase frequency of equipment inspection.
3	Establish a service life program for the maintenance of the container pressure relief devices. This could include the installation of a listed multiple port valve and certifying that the relief devices are properly set and maintained every 5 to 10 years.
4	Increase the design strength of the piping and fitting systems.
5	Install emergency shutoff valves in conjunction with container internal valves.
6	Install emergency shutoff valves downstream of transfer pump outlets and upstream of the vapor and liquid valves at the bulkhead.
7	Install pneumatic tubing along the facility boundary to serve as a perimeter fire detection system. This would provide protection of the facility against exposure fires.
8	Provide optical flame detection or linear heat detection, or a gas detection system connected to an isolation valve installed downstream of every liquid and vapor nozzle on the container. This system could also be monitored to send a signal to an alarm company that notifies the fire department of an event.
9	Increase the separation distances of internal facility exposures to the container. These exposures would include a site dumpster, idle or waste pallets and combustibles, and increasing the parking distances between the bobtails and transports in relation to the container.
10	Relocate overhead power lines away from all container and cylinder storage areas to protect against ignition in the event of a line dropping due to wind or power pole impact.
11	Eliminate all combustible vegetation within 30 feet of the LP-Gas container. This can be accomplished using gravel, or paving the site yard.
12	Install tanks using the mounding or burial method.

Interactive Appendix A
Fill-in Forms
(2017 Edition of NFPA 58)

This Appendix contains a set of forms copied from the different chapters in this manual. The form number corresponds to the respective forms in chapters 4 through 9; the first number digit represents the chapter number. Where the forms refer to a figure, it is understood that they refer to the figures shown in the main body of the manual.

How to Use the Forms in this Section
This document contains tables with fill-in blanks, or form fields, in which you enter information. These tables are made of cells, and the ones in which you may enter information contain gray shading.

The following types of form fields are included in this Appendix:

Regular Text: Accepts text, numbers, symbols, or spaces.

Number: Allows a number only. If you enter a letter into this field, it will change to a zero after you leave the field.

Calculation: Uses a formula to calculate numbers, such as the sum of two columns, which automatically appears in another column. Users cannot fill in or change this field, even though it contains gray shading. **Users must click in another number field to activate the calculations.**

Checkbox: Shows the selection state of an item. When the box is empty, or unchecked, click it to make an X appear. When the box is checked and contains an X, click the box to remove it. Examples: Unchecked: ☐ Checked: ☑

The form fields are already set up to accept only a certain type of input (numbers only or numbers and letters) and contain the formulas needed for automatically performing calculations. Users are not permitted to use the other fields in the forms (for example, change Item #s or values already in the form).

of the paragraphs referenced in NFPA 58, as they are sometimes revised and renumbered. No technically substantive changes have been made to the manual since the first edition was published.

The models used in the Fire Safety Analysis (FSA) Manual to determine the distances to hazards (presented in Table B-1 of the FSA Manual) are based on published models in the literature. These models have been published in government reports, journal articles[1,2], EPA-suggested procedures[3] and engineering monographs and books. The models used are considered conservative and have been simplified for the purposes of the FSA Manual.

---

1 A general reference on hazard distance assessment models is: Lees, F.P. (Editor), "*Loss Prevention in the Process Industries*," 2nd Edition, Vol 1, 2 & 3, Butterworth Heinemann Publishers, Oxford, England, 1996.

2 Raj, P.K.,*"Exposure of a liquefied gas container to an external fire*," Journal of Hazardous Materials, v 122, Issues 1-2, p 37-49, June 2005.

3 US EPA, "*Technical Guidance for Hazard Analysis*," Emergency Planning for Extremely Hazardous Substances, EPA/FEMA/DOT, December 1987.

Acknowledgments

This fifth edition of the Fire Safety Analysis (FSA) Manual, based on the 2017 edition of NFPA 58, is a continuation of the effort to fulfill a need for an easily used and simple aid for the members of propane industry to fulfill their obligations under NFPA 58 (2001, 2004, 2008, 2011 and 2017 editions) which require developing a written FSA. The project was funded by the Propane Education & Research Council through the National Propane Gas Association (NPGA). The National Fire Protection Association (NFPA) was the principal contractor for the first edition of the manual. Technology & Management Systems, Inc. (TMS) developed the technical analyses and several chapters of the first edition of the manual, as a subcontractor to NFPA.

Mr. Theodore C. Lemoff, Principal Gases Engineer, was the principal investigator at NFPA. Dr. Phani K. Raj was the principal investigator and analyst at TMS. Mr. Bruce Swiecicki, P.E., Senior Technical Advisor at NPGA, served as a staff technical reviewer.

In preparation for the first edition, NPGA assembled an Advisory Committee consisting of representatives from the propane industry, a Fire Department of a major city in the US and a Fire Protection Engineer. The Committee provided technical inputs and guidance to the project team on industry safety practices, types of information that an authority having jurisdiction and emergency responders would want to see in an FSA, an insight into the levels of understanding of various issues related to FSA in the industry, etc. The Advisory Committee set not only the direction of the project but made policy decisions related to the scope of the FSA manual. Except for the contractors, every member of the Advisory Committee had a vote and many decisions were made on the basis of a Committee vote. The Advisory Committee consisted of the following (voting) members.

12	Michael Merrill **(Chairman)**	Suburban Propane LP	Whippany, NJ
13	Mr. Greg Benton	Georgia Gas Distributors	Atlanta, GA
14	Mr. Billy Cox	O'Nealgas Inc.	Choudrant, LA
15	Mr. James Howe	Howe Engineers, Inc.	West Falmouth, MA
16	Mr. Jerry Lucas	Heritage Propane Partners, LP	Sallisaw, OK
17	Mr. Rob Scott	Scott & Associates	Kingsburg, CA
18	Mr. Cliff Slisz	Ferrellgas	Liberty, MO
19	Mr. Scott Stookey	City of Phoenix Fire Department	Phoenix, AZ
20	Mr. Ron Stover	Mutual Liquid Gas & Equipment	Gardena, CA
21	Mr. Robert Wallace	Dowdle Butane Gas Co Inc	Maryville, TN
22	Mr. Brent Wolcott	Ag Valley Coop	Edison, NE

Mr. Theodore Lemoff and Dr. Phani Raj participated in the deliberations of the meetings of the Advisory Committee as non-voting members.

About the Authors

Phani K. Raj, Ph.D.
Dr. Raj is the President of Technology & Management Systems, Inc. (TMS). He holds S.M. and Ph.D. degrees in Mechanical Engineering as well as an MBA degree.

He has over 30 years professional experience in conducting safety research and assessing risks in the storage, transportation, handling and utilization of hazardous materials, including energy fluids. His research has included the development of mathematical models to describe the accidental release behavior of chemicals and flammable materials. In addition, he has developed easy to follow safety guideline documents and hazard assessment manuals for a number of clients including the Federal Agencies and industrial clients.

Dr. Raj developed a number of models for the "Chemical Hazard Response Information System" (CHRIS), which the U.S. Coast Guard and the National Response Center use for assisting in case of hazardous material emergencies. He is the author of CHRIS Manual III "Hazard Assessment Handbook."

Since 1996 he has been a member of the NFPA's Technical Committee on Liquefied Petroleum Gases which writes NFPA 58, *Liquefied Petroleum Gas Code*. He was a member of the Committee Transportation of Hazardous Materials (of the National Research Council), and emeritus member of the Editorial Board of the Journal of Hazardous Materials. He has held the post of visiting lecturer at MIT and taught, in the Chemical Engineering Department, a graduate level course. He is the principal author of over 100 technical reports and over 40 technical papers.

Theodore C. Lemoff, PE
Mr. Lemoff is retired from the National Fire Protection Association (NFPA). While at NFPA, he served as the Principal Gases Engineer. He holds a Bachelor of Engineering degree in Chemical Engineering and is a registered professional engineer in Massachusetts.

He has over 40 years experience in the fire safety and the chemical industry, including 25 years at NFPA working in the flammable gases area. He served as the staff liaison and secretary to the NFPA Technical Committee on Liquefied Petroleum Gases, responsible for NFPA 58, and for other NFPA codes and standards on flammable gases.

Mr. Lemoff is a member of the American Institute of Chemical Engineers, the Society of Fire Protection Engineers, the Society of Gas Engineers, and the American Society of Plumbing Engineers.

Table of Contents

	Page #
Origin and Development of the Fire Safety Analysis Manual	(ii)
Acknowledgments	(iv)
About the authors	(v)
CHAPTER 1 Introduction	
1.1 Background	1-1
1.2 Scope of the Manual	1-2
1.3 Need for a FSA Manual	1-3
1.4 LP-Gas Safety Record and Risks	1-4
1.5 Organization of the FSA Manual	1-5
CHAPTER 2 LP-Gas Storage Container Safety Features	
2.1 A Historical Perspective	2-1
2.2 Current LP-Gas Storage Container Safety Features	2-3
CHAPTER 3 Principal Elements of Fire Safety Analysis	
3.1 Important Steps in Conducting the Analysis	3-1
3.2 Completing the FSA	3-2
CHAPTER 4 Facility Information	
4.1 Initial Data for the LP-Gas Facility	4-1
4.2 Facility Storage Capacity and Other Details	4-1
4.3 Additional Facility Information	4-2
CHAPTER 5 Analysis of Product Control Measures in Containers and Transfer Piping	
5.4 Product Control Measures in Containers	5-1
5.4.1 Individual Containers of Water Capacity less than or equal to 2,000 gallons	5-2
5.4.2 Individual Containers greater than 2,000 gallons water capacity and less than or equal to 4,000 gallons water capacity	5-8
A) Containers used in Residential and Commercial Facilities	5-8
B) Containers used in Bulk and Industrial Facilities	5-11
5.4.3 Individual Containers of Water Capacity greater than 4,000 gallons used in Bulk Plants and Industrial Plants	5-17
5.5 Product Control Measures in Transfer Piping	5-23
5.5.1 Manifolded and Remotely Filled Containers	5-23
5.6 Alternate Provisions for the Installation of ASME Containers	5-26
5.6.1 ASME Container Appurtenances and Redundant Fail-Safe Product Control Systems	5-26
5.6.2 Low Emission Transfer Equipment	5-28

CHAPTER 6 Analysis of Local Conditions of Hazard
6.6 Physical Protection Measures 6-1
6.7 Ignition Sources and Control 6-2
6.8 Separation Distances 6-3
6.8.1 Separation Distances between Container and Important Buildings, Other Properties and Transfer Points 6-3
6.8.2 Separation Distances between Transfer Points and other Exposures 6-4
6.9 Special Protection 6-5
6.10 Vehicular Protection 6-6

CHAPTER 7 Exposure to and from Other Properties, Population Density
7.3 Exposure to off-site properties and persons from in-plant propane releases 7-1
7.4 Exposure to Propane Plants From External Events 7-3

CHAPTER 8 Evaluation of Fire Services and Water Supply Requirements
8.3 Details of the Fire Service 8-1
8.4 Water Needs and Availability 8-3

CHAPTER 9 Evaluation Summary for a Proposed New LP-Gas Facility

CHAPTER 10 Fire Safety Analysis Examples
10.5 Illustrative Example # 1 10-2
10.6 Illustrative Example # 2 10-21
10.7 Illustrative Example # 3 10-39
10.8 Illustrative Example # 4 10-57

Glossary and Acronyms G-1

Appendix A: Fill-In Forms A-1

Appendix B: Results of Hazard Distance Calculations for Different LPG Release Scenarios B-1

Copyright 2015 Propane Education & Research Council. All rights reserved. Reproduction of this publication in other than its entirety is prohibited without permission in writing from the Propane Education & Research Council and the authors.

List of Forms

		Page #
Form 4.1	Initial Data on the LP-Gas Facility	4-1
Form 4.2	Facility Storage Capacity	4-2
Form 4.3	Additional Information on the LP-Gas Facility	4-3
Form 5.1	Compliance with Code Requirements for Appurtenances on Containers of 2,000 Gallons Water Capacity or Less	5-3
Form 5.2	Compliance with Code Requirements for Appurtenances on Containers of Water Capacity 2,001 Gallons Through 4,000 Gallons Used in Residences and Commercial Facilities	5-10
Form 5.3	Compliance with Code Requirements for Appurtenances on Containers of Water Capacity 2,001 Gallons Through 4,000 Gallons Used in Bulk Plants and Industrial Plants	5-12
Form 5.4	Compliance with Code Requirements for Appurtenances on Containers of Greater than 4,000 Gallons Water Capacity Used in Bulk Plants and Industrial Plants	5-18
Form 5.5	Requirements for Transfer Lines of 1½ inch Diameter or Larger, Liquid-into-Containers	5-23
Form 5.6	Requirements for Transfer Lines of 1½ inch Diameter or Larger, Liquid Withdrawal from Containers	5-24
Form 5.7	Requirements for Vapor Transfer Lines 1¼-inch Diameter or Larger	5-25
Form 5.8	Evaluation of Redundant Fail-Safe Design	5-26
Form 5.9	Evaluation of Low Emission Transfer Equipment	5-28
Form 6.1	Evaluation of Physical Protection and Other Measures	6-1
Form 6.2	Ignition Source Control Assessment	6-2
Form 6.3	Separation Distances between Containers and Buildings, Property Line, etc.	6-3
Form 6.4	Separation Distances between Points of Transfer and Other Exposures	6-4
Form 6.5	Special Protection Measures, Passive Systems	6-5
Form 6.6	Special Protection Measures, Active Systems	6-6
Form 6.7	Protection Against Vehicular Impact	6-6
Form 7.1	Types of Occupancies Near or Surrounding the LP-Gas Plant	7-3
Form 7.2	Exposure to LP-Gas Plant from External Hazards	7-4
Form 8.1	Data on the Responding Fire Department	8-2
Form 8.2	Response Time Data for the Fire Departments	8-4
Form 8.3	Water Flow Rate and Total Water Volume Required to Cool Containers Exposed to a Fire	8-5
Form 8.4	Evaluation of Water Availability in or Near the LP-Gas Facility	8-7
Form 9.1	Analysis Summary on Product Control and Local Conditions of Hazard	9-1
Form 9.2	Analysis Summary on Exposure From and to the LP-Gas Facility	9-2
Form 9.3	Analysis Summary on Fire Department Evaluations	9-3

Form 9.4	Redundant and Fail-Safe Design for Containers	9-5
Form 9.5	Low Emission Transfer Equipment	9-6
Form 9.6	Special Protection Measures –Passive Systems	9-7
Form 9.7	Special Protection Measures –Active Systems	9-7

List of Tables

Table 3.1	Description of the Various Steps in Performing the FSA	3-3
Table 5.1	Container Size Dependant Evaluations	5-1
Table 7.1	Distances to Various Types of Propane Hazards Under Different Release Models	7-2
Table 9.1	Suggested Alternative Methods for Industrial and Bulk Plants That Do Not Pose a Hazard But Lack a Water Supply	9-8
Table B-1	LPG Release Cases for Hazard Assessment	B-2
Table B-2	Distances to LFL Concentrations and Hazard Areas	B-4
Table B-3	Various Parameters and their Values Used in the Cases	B-6
Table B-4	Thermodynamic Properties of Propane	B-7
Table B-5	Calculation of the Mass Fraction of LPG and n-Butane	B-9

List of Figures

		Page #
Figure 5-1	Schematic Representation of the NFPA 58 Requirements for Product Control Appurtenances on Containers of Water Capacity Less Than or Equal to 2,000 Gallons, With Different Service Configurations	5-4
	Figure 5-1A: Single Vapor Service Line in a Manifolded Configuration	5-4
	Figure 5-1B: Regulator in the Vapor Service Line	5-5
	Figure 5-1C: Container with both Liquid and Vapor Service, Regulator in the Vapor Service Line	5-6
	Figure 5-1D: Container Feeding Liquid to a Vaporizer	5-7
	Figure 5-1E: Vertical Container for Liquid Service	5-8
Figure 5-2	Vapor Inlet Appurtenances on Containers of Water Capacity Greater Than 2,000 Gallons	5-13
Figure 5-3	Vapor Outlet Appurtenances on Containers of Water Capacity Greater Than 2,000 Gallons	5-14
Figure 5-4	Liquid Inlet Valves on Containers 2,001 through 4,000 Gallons Water Capacity	5-15
Figure 5-5	Liquid Outlet Valves on Containers 2,001 through 4,000 Gallons Water Capacity	5-16
Figure 5-6A	Liquid Inlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in New Bulk Plants and Industrial Plants	5-19
Figure 5-6B	Liquid Inlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in Existing Bulk Plants and Industrial Plants	5-20
Figure 5-7A	Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in New Bulk Plants and Industrial Plants	5-21
Figure 5-7B	Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in Existing Bulk Plants and Industrial Plants	5-22

CHAPTER 1

Introduction

1.1 Background

The Fire Safety Analysis (FSA) is a self-conducted audit of the safety features of a propane installation and an assessment of the means to minimize the potential for inadvertent propane releases from storage containers and during transfer operations. The assessment also includes an evaluation of the capabilities of local emergency response agencies as well as an analysis of potentially hazardous exposures from the installation to the neighborhood and from the surroundings to the LP-Gas facility.

Since 1976, NFPA 58, *Liquefied Petroleum Gas Code* (hereinafter referred to as the "code" or "NFPA 58") has required that a facility operator or owner conduct a FSA for propane facilities having ASME containers of aggregate storage greater than 4,000 gallons water capacity. The FSA requirement was changed in the 2001 edition to require a written FSA. The requirements for fire protection are indicated in the 2017 edition of NFPA 58 in §6.27, which addresses fire protection requirements for industrial plants, bulk plants and dispensing stations. Specifically §6.27.2 ("Planning") and §6.27.3("Protection of ASME Containers") require, in part, the following:

6.27.2.3 The planning for the response to incidents including the inadvertent release of LP-Gas, fire, or security breach shall be coordinated with local emergency response agencies.

6.27.2.4 Planning shall include consideration of the safety of emergency personnel, workers, and the public.

6.27.3.5 Fire protection shall be provided for installations with an aggregate water capacity of more than 4000 gal (15.2 m^3) and for ASME containers on roofs.

6.27.3.6 The modes of fire protection shall be specified in a written fire safety analysis for new installations, for existing installations that have an aggregate water capacity of more than 4000 gallons (15.2 m^3)and for ASME containers on roofs. Existing installations shall comply with this requirement within 2 years of the effective date of this code.

6.27.3.7 The fire safety analysis shall be submitted by the owner, operator, or their designee to the authority having jurisdiction and local emergency responders.

6.27.3.8 The fire safety analysis shall be updated when the storage capacity or transfer system is modified.

The FSA and required assessment of the installation provides several important benefits:

1) A structured assessment by which each facility can be evaluated for conformity of installed equipment with code requirements.

2) A means to evaluate the capability of systems and equipment installed to control and contain potential LP-Gas releases during day-to-day operations.

3) An approach to evaluate the informational needs of the facility, based on factors such as the type and frequency of transfer operations, size of the storage containers, location of the facility with respect to other buildings and the existing procedures and systems in place.

4) A means to describe product control and fire protection features which exceed the comprehensive requirements of NPFA 58[1].

5) A tool for facilitating a cooperative and effective dialogue with local emergency response agencies and authorities having jurisdiction.

1.6 Scope of the Manual

The manual addresses a number of subjects, including:

(1) A review of the product control measures required in the NFPA 58, "Liquefied Petroleum Gas Code"
(2) Local conditions of hazards within the facility site
(3) Exposures to and from other properties
(4) Effectiveness of local fire departments
(5) Effective control of leakage, fire and exposure
(6) Illustrative examples using four different sizes of typical LP-Gas facilities

This FSA manual is intended for use by propane plant owners or operators, consultants, authorities having jurisdiction (AHJs) and emergency response personnel. The manual addresses the process by which a FSA can be conducted for a LP-Gas facility containing one or more stationary ASME containers.

The FSA manual is designed to provide a guide for identifying the requirements in NFPA 58 and determining compliance with them. Section 6.27.3.5 of NFPA 58 provides that:

> The fire safety analysis shall be an evaluation of the total product control system, such as the emergency shutoff and internal valves equipped for remote closure and automatic shutoff using thermal (fire) actuation, pull away protection where installed, and the optional requirements of Section 6.28.

The philosophy of NFPA 58 is to minimize fires by minimizing the accidental release of propane if an incident should occur. Or put in simple terms, "no fuel, and no fire."

The manual **does not** address the following:

---

1 All reference, henceforth, to the "code" in this document should be construed as referring to NFPA 58, 2017 edition.

6. Marine terminals, refrigerated LP-Gas storage and the transportation of LP-gas by either rail tank cars or by cargo tank trucks. Marine terminals are governed by the OSHA Process Safety Management regulations and the US EPA Risk Management Plan regulations; refrigerated storage of LP-gas is a high-volume operation requiring special considerations; and, the transportation of LP-gas is addressed by Title 49 of the Code of Federal Regulations, *Transportation.*[i]
7. Storage of LP-Gas in salt domes and caverns.
8. Installations of ASME LP-gas containers on roofs of buildings. This type of installation, for which a fire safety analysis is required, is excluded from the scope of this manual primarily because of the rarity of such installations in the United States.
9. Cylinder filling operations at a dispensing facility, unless the storage threshold for LP-Gas has been exceeded, requiring an FSA to be prepared.
10. The use of facility employees performing as a "fire brigade."

The above facilities may be required to comply with other safety analysis requirements.

1.7 Need for a FSA Manual

Neither NFPA 58 nor the "Liquefied Petroleum Gas Code Handbook"[ii] provide detailed guidance on how to prepare or develop a written FSA. Since each industrial plant, bulk plant, or dispensing stationpresents unique physical and operational characteristics, the fire safety analysis is a tool used to assess the level of fire safety performance that a specific industrial plant, bulk plant or dispensing station can be expected to provide. This FSA will also provide essential information on the facility and its operation to the local authority having jurisdiction (AHJ) and local emergency response agency.

An informal survey was taken of AHJ's on the fire safety analyses used for existing and new plants in their jurisdictions (conducted by the author) at the time the first edition of this manual was being prepared. It indicated that there was no uniformity either in content, the details of information, or final assessment of the facility in the FSAs submitted. They ranged from a single page submission for a medium size bulk plant to very detailed assessment including risk assessment and management plan for a 30,000 gallon bulk storage facility. Without a guidance manual, potential confusion would almost certainly occur as each AHJ would be required to establish an individual set of criteria that would meet the FSA in their area. Thus, the need in the LP-Gas industry for assistance with the following tasks was clearly established.

5) Providing a FSA template that allows for consideration of different size installations
6) Establishing a uniform approach and defining common elements
7) Developing simplified checklists and an example-based methodology for completing the analysis
8) Utilizing technically-based guidance and support

The intent of this FSA manual is to provide an easy-to-use procedure for LP-gas facility owners or operators who are most familiar with the equipment technology and system operations and therefore qualified to complete the document. Knowledge of fire science and engineering

principles is not required for this document to be useable by an owner, operator or an AHJ, because those principles have already been factored into the assessment criteria contained within the FSA.

By utilizing the expertise of industry, engineering and fire service representatives in the development of the material to follow, this manual provides a comprehensive, uniform, objective approach that was designed to provide for the uniform and objective application of FSA requirements by the AHJs. Further, the joint input of the Propane Education & Research Council (PERC), National Propane Gas Association (NPGA), and the National Fire Protection Association (NFPA) provides additional assurance of the manual's depth, credibility and broad-based consensus.

This FSA manual has been developed based on the requirements of NFPA 58, 2017 edition. Using this manual to perform a FSA at a facility constructed to meet the requirements of prior editions of NFPA 58 or other state-specific codes may produce conflicts between actual facility construction and the checklists in this manual. The code or standard in effect at the time of construction of the facility should be used as the source of requirements to perform the FSA. Checklist items contained within this manual can be revised to indicate the appropriate code items required at the time of facility construction.

1.8 LP-Gas Safety Record and Risks

The LP-Gas industry has a long history of safe operations. With the requirement in the 1976 edition of NFPA 58 to retrofit LP-Gas plants with emergency shutoff valves (ESVs) in transfer lines, the safety of LP-Gas facilities was further improved.

The FSA provided in this manual, in addition to other safety programs currently enacted at any workplace, is intended to reduce or eliminate the risk of fatality or injury to both the plant employees and the public. In an effort to identify the level of risk a propane installation poses to the general public, as well as employees and emergency responders, the U.S. Department of Energy (DOE) instituted a study[iii] in 1981. Accident data from a variety of sources was analyzed, including: the US Department of Transportation hazardous material incident report database, reports of the National Transportation Safety Board, National Fire Protection Association, technical journals and other sources. Data analyzed for the period 1971 through 1979 addressed LP-Gas transportation and product releases from stationary storage facilities. The special focus of the study was the fatalities suffered by employees and the general public. The study concluded that a fatality to the general public as a direct result of an LPG transportation or storage incident involving the loss of product is very small and the risk (expressed in expected number of fatalities per year) is smaller than that from natural phenomena (lightning, tornadoes, objects falling from the sky, etc).

An analysis conducted by the National Fire Protection Association[iv] of LP-Gas fire damage and casualty data during the period between 1980 and 1999 also indicates that the LP-Gas storage facility operations in the US are very safe. The number of reported fires at LP-Gas bulk storage facilities remains small and has fallen since 1980, but substantial variation exists from year to year. During the five-year period from 1994 through 1998, an estimated 49 fires, on average,

were reported per year at LP-Gas bulk storage facilities. These fires caused an annual average of one civilian death, five civilian injuries and $754,000 in direct property damage. In 1999, an estimated 58 reported fires on these properties caused four civilian injuries and $722,000 in direct property damage. The 58 fires reported in 1999 accounted for .003% of all fires reported that year.

1.9 Organization of the FSA Manual

The manual has been organized to address the requirements outlined in the 2017 edition of NFPA 58, Sections 6.27 and 6.28.

Chapter 2 discusses the requirements of the 2017 edition of NFPA 58 in regard to product control requirements, and their evolution. The philosophy and the advantages of product control systems are discussed. Also included are the various appurtenances used in a typical LP-Gas facility. More detailed information on the types of valves, their functions and example photographs of various appurtenances are provided in Appendix B. Chapter 3 provides an overview of the FSA process including its principal elements.

The input of data into the FSA procedure begins with Chapter 4. In Chapter 4, basic information about the LP-Gas facility is input into appropriate tables and a decision is made (based on the data provided) as to the extent of the analysis that should be completed. The assessment of conformity with code requirements of the product control requirements for containers and in transfer piping is performed in Chapter 5. To aid this assessment a series of sketches of possible configurations of container appurtenances (satisfying 2017 code requirements) are provided. Note that several section references have been changed from the published edition of the 2017 edition due to the acceptance of Tentative Interim Amendment 14-3, which is reprinted with permission in Appendix C. When necessary, the year when specific equipment was required by the code is also indicated on the sketches to facilitate application of the Manual to facilities constructed to the requirements in previous editions of NFPA 58. The analysis of the local conditions of hazard is presented in Chapter 6, followed by the assessment in Chapter 7 of the hazard exposure to off-site properties and persons. Also, the potential exposure to LP-Gas installations from off-site activities is covered in Chapter 7.

The evaluation of the capabilities of the local emergency responder (usually the fire department) and the availability of water to fight in-plant fires and exposures are presented in Chapter 8. Summary of evaluations and actions that may need to be initiated for proposed LP-Gas facilities are presented in Chapter 9. The use of this manual in preparing a written FSA for a LP-Gas facility is demonstrated with examples of four different generic cases. Several different sizes of facilities are considered.

A set of blank forms required to perform a FSA is provided in Appendix A. The results of calculating the hazard distances for a set of credible LP-gas release scenarios are provided in Appendix B. Also provided in Appendix B are the thermodynamic properties of propane and the values of other parameters used in calculating the hazard distances.

[i] U. S. Code of Federal Regulations, Title 49, Transportation
[ii] Liquefied Petroleum Gas Handbook, Beach, 2017, NFPA, Quincy MA
[iii] LPG Land Transportation and Storage Safety, Department of Energy report No. DOE/EV/06020-TS 9/18/81"
[iv] Fires at LP-Gas Bulk Storage Plants Statistical Analysis, NFPA, 2003, Quincy, MA

CHAPTER 2

LP-Gas Storage Container Safety Features

The fundamental premise on which the requirements for LP-Gas facility safety specified in several recent editions of NFPA 58 is based is the following:
If product release can be either controlled or eliminated, safety is effectively addressed.

A product release creates the potential for the occurrence of a fire. Therefore, the focus of both NFPA 58 and the Fire Safety Analysis Manual is on the need to design systems (incorporating product controls) to ensure, to the extent possible with current technology and procedures, the elimination of the accidental release of LP-gas from storage or during transfer operations.

2.3 A Historical Perspective

In the late 1960's and the early 1970's there were a number of fires and BLEVEs (Boiling Liquid Expanding Vapor Explosions) of propane and other liquefied petroleum gases resulting from derailments of railcars carrying propane and other flammable liquefied gases. These incidents involved fire fighter fatalities and highlighted the need for safety improvements. As a result, the U. S. Department of Transportation (DOT) implemented new regulations for the tank cars used to transport propane and other liquefied flammable gases, and made them mandatory and retroactive in 1980. These improvements included:

- Head shields to reinforce the pressure vessel on the railcar
- "Shelf" couplers to reduce the potential for railcars to be uncoupled during a derailment
- Thermal protection to reduce the potential for the tank to experience a rise in temperature due to flame impingement

Since these improvements in rail car safety were made in the 1980's, there have been no fire fighter fatalities from any railroad tank car BLEVEs and the number of these incidents has been greatly reduced, to the authors' knowledge.

In 1973, product control requirements to prevent the uncontrolled release of LP-gas from storage containers consisted primarily of manually operated valves, backflow check valves and excess-flow check valves.

On July 3, 1973 a propane incident occurred in Kingman, Arizona involving a propane fire at a propane tank car unloading area in a propane bulk storage plant. Though the plant's equipment conformed to the requirements of NFPA 58 and other safety standards for flammable materials at that time, the incident resulted in the death of several fire fighters and one plant employee.

A direct result of this incident (and others that occurred at approximately the same time) was the addition of a new fire protection requirement in the 1976 edition of NFPA 58. The requirement stated that planning "for the effective measures for control of inadvertent LP-Gas release or fire" shall be done and coordinated with local emergency responders. In addition, the primary consideration of a fire safety analysis at that time was the use of water as a suppressing agent to control fires. The requirements today are very similar to those original requirements except in two areas.

- As of the 2001 edition, fire safety analyses are required to be written;
- The primary consideration in performing such an analysis has changed from the emphasis of using water for fire control to the emphasis of avoiding product release altogether using technology and training.

This modern approach takes advantage of the inherent safety present in a controlled environment such as a bulk plant, as well as the safety features of the most current product control hardware.

In early editions of NFPA 58, the primary consideration of water as the means to control a fire was based on the fact that at that time, there were few reliable ways to stop the flow of LP-gas after failures in the system and the need to apply water quickly to storage containers being impinged by flames was important.

Another significant change in the 1976 edition of NFPA 58 was the requirement for including an emergency shutoff valve (ESV) in the transfer lines used between stationary storage containers of over 4,000 gallons capacity and cargo tank vehicles. This revision was intended to prevent product release from storage containers in the event of a vehicle pulling away with its hoses still connected. All existing plants were required to comply with this requirement by the end of 1980. Since this retrofit program was completed, there has not been, to the knowledge of the authors, a pull-away accident involving an ESV installation that resulted in serious consequences.

The 1980's enjoyed a reduced number of propane incidents in the U. S., and the next major product control enhancement was the revision to introduce an optional requirement for internal tank valves in containers over 2,000 gallons in the 1992 edition of NFPA 58. These tank valve requirements included:

Vapor and Liquid Withdrawal Openings in Tanks

3. Positive shutoff valve in line with excess flow valve installed in the tank, or
4. Internal valve with integral excess flow shutoff capability

Vapor and Liquid Inlet Openings in Tanks

4. Positive shutoff valve in combination with either an excess flow valve or backflow check valve installed in the tank, or
5. Internal valve with integral excess flow valve, or
6. Internal valve with remote means of closure

These revisions were made to enhance the operational features of product control hardware. Internal valves are capable of being closed from a remote location (using a cable, pneumatic, or hydraulic device) and by thermal activation, which is accomplished using an element that melts when it is subjected to fairly moderate temperatures (in the 200°F - 250° F range).

The 2001 edition of NFPA 58 was further revised to require internal valves for liquid connections to containers over 4,000 gallons, with remote and thermal shutoff activation. This change was the result of the Committee desiring improved safety performance with this advanced hardware, due to the following incidents:

- **Sanford, NC**. A hose separation resulted in the loss of the contents of a transport vehicle (9700 gallons water capacity). The contents within the storage containers were also lost because of a failed check valve.
- **Albert City, Iowa**. An exposed liquid pipe installed in violation of the code between an 18,000 gallon water capacity storage container and a vaporizer was broken when a recreational vehicle accidentally drove over it. The leaking gas found a source of ignition and impinged on the container, resulting in a BLEVE.
- **Truth or Consequences, NM**. A small, parked truck rolled into a propane bulk storage plant, breaking plant piping. The resulting fire caused the failure of several cylinders.

These improvements in product control are considered critically important, and in addition to requiring them for all new installations after 2001, the requirements were made retroactive to all existing installations, allowing 10 years for the conversion. All existing containers over 4,000 gallons water capacity will be retrofit with an internal valve or similar protection on all liquid connections. Alternatively, the use of an emergency shutoff valve (ESV) as close to the container as practical is also allowed, in recognition that some containers cannot accommodate an internal valve without extensive modification. The ESV has the same remote and thermal activation closing features as an internal valve.

2.4 Current LP-Gas Storage Container Safety Features

As of the 2001 edition, NFPA 58 requirements for product release control include the provision for a number of different types of valves or appurtenances in the product storage containers, transfer piping network and at liquid transfer facility locations. Generally, code requirements for product control appurtenances on containers used in industrial plants and bulk plants, as well as dispensing stations, are more stringent than for residential and commercial use containers.

In the 2017 edition of NFPA 58, changes to the definitions of "Bulk Plant" and "Industrial Plant" clarified the intent of the NFPA Technical Committee on Liquefied Petroleum Gases by stating that each of those types of facilities utilize only containers greater than 4,000 gallons water capacity. Therefore, modifications were made to Chapter 5 of this manual to remove references to containers between 2,000 and 4,000 gallons water capacity. The manual does retain information on containers less than 4,000 gallons water capacity due to

the fact that some dispensing stations may be utilizing more than one container less than 4,000 gallons, but with an aggregate capacity greater than 4,000 gallons.

Unless product is being transferred, product control valves are normally in the closed position. However, some of the installations require an automatic shutoff feature when either a fire (or heat) is sensed or when other abnormal conditions occur. The product control valves include the following:

Positive shutoff valve: A shutoff valve that, in the closed position, does not allow the flow of product in either direction. [NFPA 58, 3.3.75.7]

Backflow check valve: This valve allows flow in one direction only and is used to allow a container to be filled while preventing product from flowing out of the container.

Excess-flow valve: A valve designed to close when the liquid or vapor passing through it exceeds a prescribed flow rate. [NFPA 58, 3.3.75.3]

Internal valve: A container primary shutoff valve that can be closed remotely, which incorporates an internal excess flow valve with the seat and seat disc located within the container so that they remain in place should external damage occur to the valve. [NFPA 58, 3.3.75.6]

Emergency shutoff valve: A shutoff valve incorporating thermal and manual means of closing that also provides for a remote means of closing. [NFPA 58, 3.3.75.2]

Hydrostatic pressure relief valve: A type of relief valve that is set to open and relieve pressure in a liquid hose or pipe segment between two shutoff valves when the pressure exceeds the setting of the valve.

Container pressure relief valve: A type of pressure relief device designed to open and then close to prevent excess internal fluid pressure in a container without releasing the entire contents of the container. The valve is located in the vapor space of the container.

Bulk storage installations incorporate several product release control appurtenances. This fire safety analysis manual outlines alternative schematics for the various facilities covered (4,000 gallons or less and greater than 4,000 gallons water capacity).

CHAPTER 3

Principal Elements of the Fire Safety Analysis

The principal elements of the Fire Safety Analysis (FSA) required by NFPA 58 (in §6.27, and container protection requirements in §6.27.3) are described in this chapter. This manual for performing the FSA addresses the following LP-Gas facility-related items:

7 Effectiveness of Product Control measures
8 Local conditions of hazard within the container site, including congestion within the site
9 Exposure to off-site properties and populations and the impact of neighboring industrial activity on the facility
10 Effectiveness of the local Fire Department that may respond to an emergency within the facility
11 Requirements for and availability of adequate water supply
12 Full compliance with Code requirements for existing LP-Gas facilities and corrective actions to be implemented for a proposed facility to address any deficiencies

The details of how each of the above items is evaluated in performing the FSA are indicated in Chapter 4 though Chapter 9. Shown below is a brief review of the various steps involved in conducting the FSA.

3.3 Important Steps in Conducting the Analysis

The development of a Fire Safety Analysis (FSA) involves a number of important steps. These steps are indicated in Table 3.1. Also shown in Table 3.1 are the chapters in this manual where the referenced analysis steps are discussed in detail.

Each set of FSA requirements is presented in one or more tables and fill-in forms. The tables provide either factual information or calculated results; the user obtains information from the tables for further analyses. The fill-in forms specify NFPA 58 requirements or other assessment parameters, and provide two columns, one with a "Yes" column heading and the other with a "No" heading. In some cases either schematic or pictorial representations are provided to clarify a requirement. The fill-in forms require some information input from the user, either checking a "Yes" column or a "No" column or writing a numerical value. Also provided are notes under each table or fill-in form, which explains conditions, if any, associated with the table or the form or how a calculation is performed for entering data into the form.

Appropriate explanations are provided in the text either preceding a form or after the form, if any action is necessary depending upon the values/contents in the forms. A blank copy of each form presented in Chapter 4 through Chapter 9 is provided in Appendix A. These can be reproduced and used for any number of LP-Gas facilities.

The FSA for a LP-Gas facility is conducted by systematically completing the forms in Chapter 4 through Chapter 9. The person completing the FSA must indicate a "Yes" or "No" in the appropriate column for each requirement, depending upon whether the LP-Gas facility fulfills the specific requirement. Any items, which may need to be undertaken to correct a deficiency in a proposed (as opposed to existing) LP-Gas facility are referred to in Chapter 9.

Once the FSA is complete, the forms together with information about the facility, can be filed to satisfy the "written" requirement of NFPA 58, §6.27.3.2 & 6.27.3.3. Any emergency planning for the facility is required to be coordinated with the local fire department or equivalent responding authority (§ 6.27.2.1).

3.4 Completing the FSA

Chapters 4 through 9 provide a framework with which the Fire Safety Analysis can be conducted to satisfy the requirements of NFPA 58. It is important to note the following in performing the analysis using the tables, fill-in forms and steps indicated in the following chapters.

4 All references to the "Code" in this manual are to the 2017 edition of the NFPA 58 "Liquefied Petroleum Gas Code."

5 If a LP-Gas facility was built to satisfy the requirements of an edition of NFPA 58 earlier than the 2017 edition, then you may obtain a copy of the appropriate edition of the Fire Safety Analysis Manual and use that resource for your evaluation. If you must use this manual and an appurtenance or other requirement is specified in one or more of the forms in this manual (developed based on the 2017 edition), and this requirement was not in the edition to which the facility was built, then it is recommended that the "Yes" and "No" column corresponding to the particular appurtenance or requirement be left blank or marked "NA," to signify the requirement is not applicable to the facility in question.

6 If the facility for which the analysis is being performed was constructed to satisfy the requirements of a previous edition of NFPA 58, it must still comply with all requirements that have been made applicable retroactively in later editions of the code, through the 2017 edition. Such retroactive provisions are indicated where they are applicable.

Table 3.1
Description of the Various Steps in Performing the FSA

Step #	FSA Steps	Chapter where described
1	Gather data on the volume of LP-Gas stored and other information pertinent to the facility.	Chapter 4
2	Perform simple calculations and determine whether the facility is subject to the requirements for developing an FSA.	
3	Evaluate the product control appurtenances and other safety features of the facility relative to the requirements of the NFPA 58 code.	Chapter 5
4	Assess the appurtenance requirements for containers of different capacities and compare them to the actual installation.	
5	Evaluate the requirements for valves on transfer piping and compare them to the valves provided in the facility.	
6	Assess conformance to the code of a Redundant and Fail-Safe Product Control System, if such a system is provided in the facility.	
7	Evaluate the code conformance of the Low Emission Transfer Equipment if installed in the facility.	
8	Analyze the protection measures against local conditions of hazard. That is, assess whether all requirements of the code for the physical protection of containers and transfer piping are implemented.	Chapter 6
9	Analyze the code requirements for the control of ignition sources and whether these requirements are complied with.	
10	Assess conformance to the code requirements for separation distances between (i) containers of different sizes and property lines and, (ii) LP-Gas transfer points and other exposures.	
11	Evaluate conformance to the code requirements for Special Protection Systems, if they are provided on containers in the facility.	
12	Evaluate the potential hazards to off-site populations and property from propane releases in the facility. This step includes selecting credible LP-Gas release scenarios and assessing the distance (and area) over which the hazard exists.	Chapter 7
13	Assess whether any off-site populations, especially people in institutional occupancies, are potentially subject to the LP-Gas release hazards	
14	Evaluate whether there exists a hazard from other industrial operations around the LP-Gas facility	
15	Evaluate the effectiveness of the local Fire Department, including the availability and capability of response personnel, training level, equipment and response time to an emergency in the facility.	Chapter 8
16	Evaluate the amount of water needed to cool containers exposed to a fire and the adequacy of the facility (or locally available) water supply.	
17	For a proposed facility, develop corrective actions to address deficiencies found.	Chapter 9 (Only applicable for proposed facilities)
18	Assess, based on specific criteria, the need to provide Redundant and Fail-Safe Product Control Systems.	
19	Assess, based on specific criteria, the need to provide Low Emission Transfer Systems.	
20	Assess when Special Protection Systems are needed	
21	Evaluate alternative approaches to using water in a special protection system	

CHAPTER 4

Facility Information

In this chapter basic information on the LP-Gas facility is recorded and a decision is made on whether the facility is required to have a completed Fire Safety Analysis (FSA) performed. If it is determined that a FSA is required, additional information on the facility is recorded.

4.4 Initial Data for the LP-Gas Facility

Complete Form 4.1 to provide basic information on the facility.

Form 4.1
Initial Data on the LP-Gas Facility

A	B	C
Item #	Information Item	Data
1	Name of the LP-Gas Facility Owner or Operator	Jesse Aguirre
2	Contact Name:	Jesse
3	Contact Telephone & Fax Numbers	1-760-578-4724
4	Contact Email Address	aguirres.propane@yahoo.com
5	Mailing Address, PO Box 2822 Indio CA 92202	Street 1:1338 Glendale Ave Street 2: City, State, Zip ; Thermal, CA 92274

4.5 Facility Storage Capacity and Other Details

Complete Form 4.2. Multiply Column B by its corresponding entry in Column C, write the answer in the corresponding cell in Column D, then sum all the entries in Column D and write it in Row 2, Column D. This number is the "Aggregate Water Capacity" of the facility.

Form 4.2
Facility Storage Capacity [1,2,3]

A	B	C	D
Item #	Individual Container Water Capacity (w.c.) (gallons)	Number of containers	Total Water Capacity (w.c.) of each container size (gallons)
1	500	X	0
	1,000	X	0
	2,000	X	0
	4,000	X	0
	10,000	X	0
	18,000	X	0
	30,000	1	30,000
	60,000	X	0
	Other:		
	Other:		
	Other:		
	Other:		
2	**Aggregate Water Capacity[4]**	1	30,000

Notes: **(1)** Column D = Column B x Column C.

(2) Parked bobtails, transports and tank cars should not be considered for aggregate capacity calculations.

(3) Do not consider containers that are not connected for use.

(4) For the purpose of this manual, "Aggregate Water Capacity" means any group of single ASME storage containers separated from each other by distances less than those stated in the aboveground containers column of Table 6.3.1.1.

If the aggregate water capacity of the LP-Gas facility is less than or equal to 4,000 gallon (w.c.), no further assessment is required.

YOU CAN STOP HERE.

If the aggregate water capacity of the facility is greater than 4,000 gallons, continue the analysis.

4.6 Additional Facility Information

Complete Form 4.3 below and record additional information on the facility.

Complete also the remainder of Fire Safety Analysis indicated in Chapter 5 through Chapter 8 (plus Chapter 9 for proposed facilities).

Form 4.3
Additional Information on the LP-Gas Facility

☐ Existing Facility built to NFPA 58 Edition 2017 ☐ Proposed Facility

g) Name of the Facility (if applicable) Aguirre Propane

h) Type of LP-Gas Facility ☐ Dispensing Station ☐ Industrial Plant X Bulk Plant

i) Facility is located in ☐ Rural Area ☐ Suburban Area X City Commercial Zone ☐ City Industrial Zone

j) Facility neighbors§: ☐ Agri. fields ☐ Commercial Bldgs. ☐ Flammable Liquids Storage
(Check all that apply) ☐ Industrial Activity (metal fabrication, cutting and welding, etc)
☐ Manufacturing X Others (explain) Transmit ion Building

k) Geographic Location of Facility/Address: 1338 Glendale Ave, Thermal CA

l) Landmarks, if any: N/A

g) LP-Gas liquid supply by: ☐ Bobtail X Truck Transport ☐ Rail Tank Car
(Check all that apply) Pipeline

h) LP-Gas Distribution by: X Bobtail ☐ Truck Transport ☐ Vapor Piping
(Check all that apply) ☐ Liquid Piping ☐ Dispensing or Vehicle Liquid fueling

ii) Number of Vehicle Entrances: X One ☐ Two ☐ More than two

j) Type of Access Roads to the Facility X Rural ☐ City or Town ☐ Highway
(One check per line) Entrance 1 ☐ Dirt road ☐ Gravel road X Paved
(One check per line) Entrance 2 ☐ Dirt road ☐ Gravel road ☐ Paved

k) Staff presence ☐ Not staffed X Only during transfer operations
☐ Staffed always (24/7) ☐ Only during business hours
☐ Other (Explain) _____

n) Location and distances to Assembly, Educational or Institutional Occupancies surrounding the facility, if any, within 250 ft from the facility boundary in the direction of the assets. N/A

o) Overview plot plan of the facility attached? X Yes ☐ No

§ All properties either abutting the LP-Gas facility or within 250 feet of the container or transfer point nearest to facility boundary.

CHAPTER 5

Analysis of Product Control Measures In Containers and Transfer Piping

5.2 Product Control Measures in Containers

NFPA 58 requires the installation of several product control safety devices both on containers and in transfer piping to minimize the accidental release of LP-Gas, either liquid or vapor. The requirements for product control equipment depend on the following:

- The size of individual containers,
- Whether the containers in a facility are individually filled or filled through a common liquid manifold,
- Whether the product is transferred from the storage container as a liquid or vapor (or both).

A facility may have LP-Gas containers of different sizes; it is therefore necessary to evaluate compliance with the code requirements on a container-by-container basis as well as on a facility basis.

In this chapter, the appurtenance requirements of the code are listed for LP-Gas containers of different sizes. A series of forms are provided which indicate the code-required product control hardware for container and facility piping. The forms also provide space to record the product control equipment actually installed on the containers as well as transfer piping at the facility. These forms must be completed as a part of this Fire Safety Analysis.

Note: Section numbers and table numbers have been changed significantly as a result of Tentative Interim Amendment TIA 14-3, shown in Appendix C.

Complete Forms 5.1 or 5.2 depending upon the size of the individual containers in the facility. Then, perform an analysis of the product control appurtenances for each container located in the facility.

Table 5.1
Container Size-Dependent Evaluations

If the LP-Gas facility contains individual containers in the volume range (gallons w.c.)			Perform the analysis specified in Section
Greater than	And Less than or equal to		
0	4,000	0	5.1.1
4,000	-	0	5.1.2

5.1.3 Individual Containers of Water Capacity less than or equal to 4,000 gallons

Containers of 4,000 gallons water capacity (w.c.) or less can be configured with product control appurtenances in a number of different ways. These are schematically illustrated in Figures 5-1A through Figure 5-1E. *Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes*

Complete the following steps using the schematics in Figure 5-1A through Figure 5-1E

1 Select the first container at the facility, which has a water capacity of 4,000 gallons or less. Enter this as container number 1 in Column A of Form 5.1, below.
2 Review each of the service configurations given in Figure 5-1A through Figure 5-1E. Select the schematic that most closely represents the configuration in the facility for this container. Enter the figure number of the configuration selected for this container in Column B.
3 Count the total number of "Yes" shown in this configuration. This represents the number of required appurtenances for the specific configuration. Enter this number in column C of Form 5.1.
4 Check "Yes" under each appurtenance that is actually installed on the container. If the appurtenance is not provided, then check "No."
5 Count the number of boxes checked "Yes." Enter this number in Column D of Form 5.1.
6 Repeat steps 1 through 5 for each container of 4,000 gallons water capacity or less at the facility.

Form 5.1

Compliance with Code Requirements for Appurtenances on Containers of 4,000 Gallons Water Capacity or Less

A	B	C	D	E
Container #	Service Configuration Sub Figure (in Figure 5-1)	Number of Product Control Appurtenances		NFPA 58 Section Reference (2017 edition)
		Required by NFPA 58 (applicable edition)	Installed on the Container	
1	n/a			5.7.4.1 Table 5.7.4.1(B) and 5.7.4.4
2	n/a			
3	n/a			
4	n/a			
5	n/a			
6	n/a			

If, in Form 5.1, any one of the numbers in column D is less than the number in Column C of the corresponding row, then these items must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

Figure 5-1
Schematic Representation of the NFPA 58 Requirements for Product Control Appurtenances on Containers of Water Capacity Less Than or Equal to 4,000 Gallons, with Different Service Configurations
(Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes)

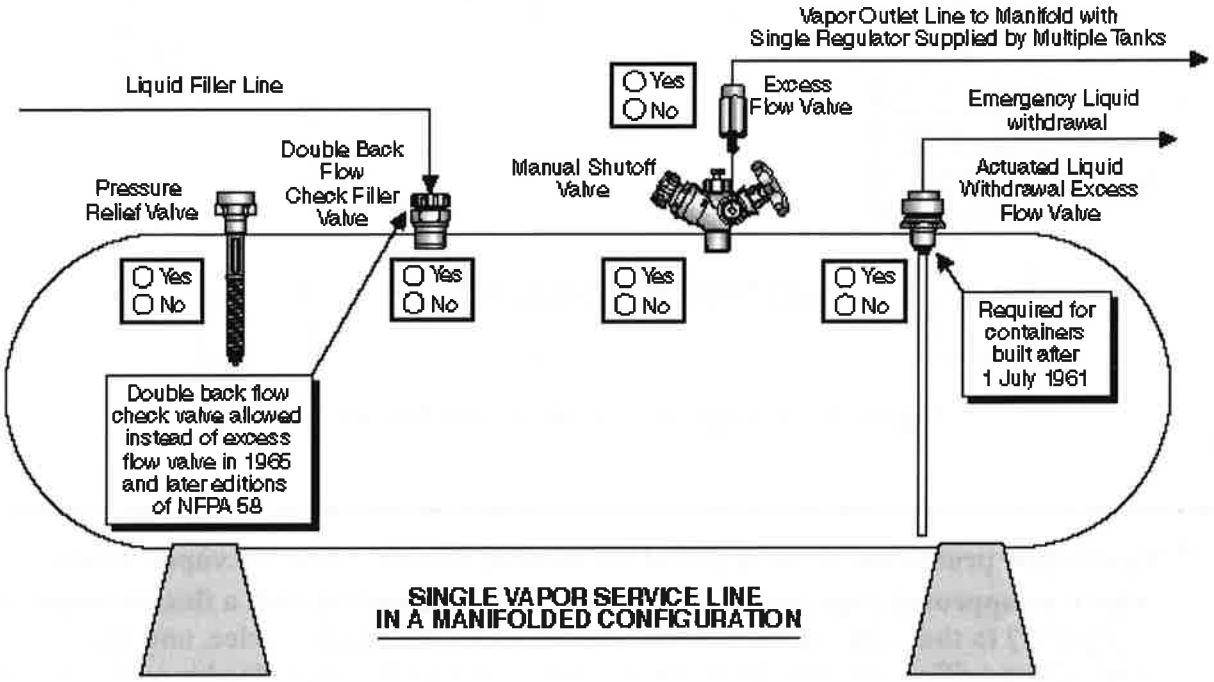


Figure 5-1A: Single Vapor Service Line in a Manifolded Configuration

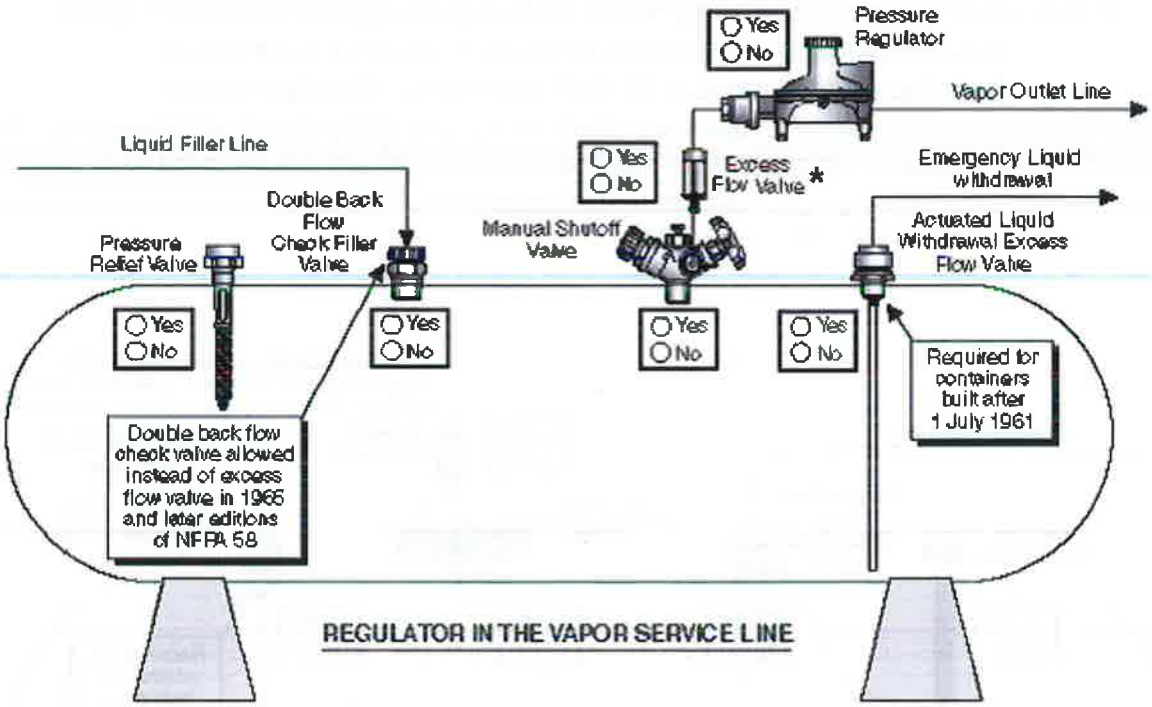
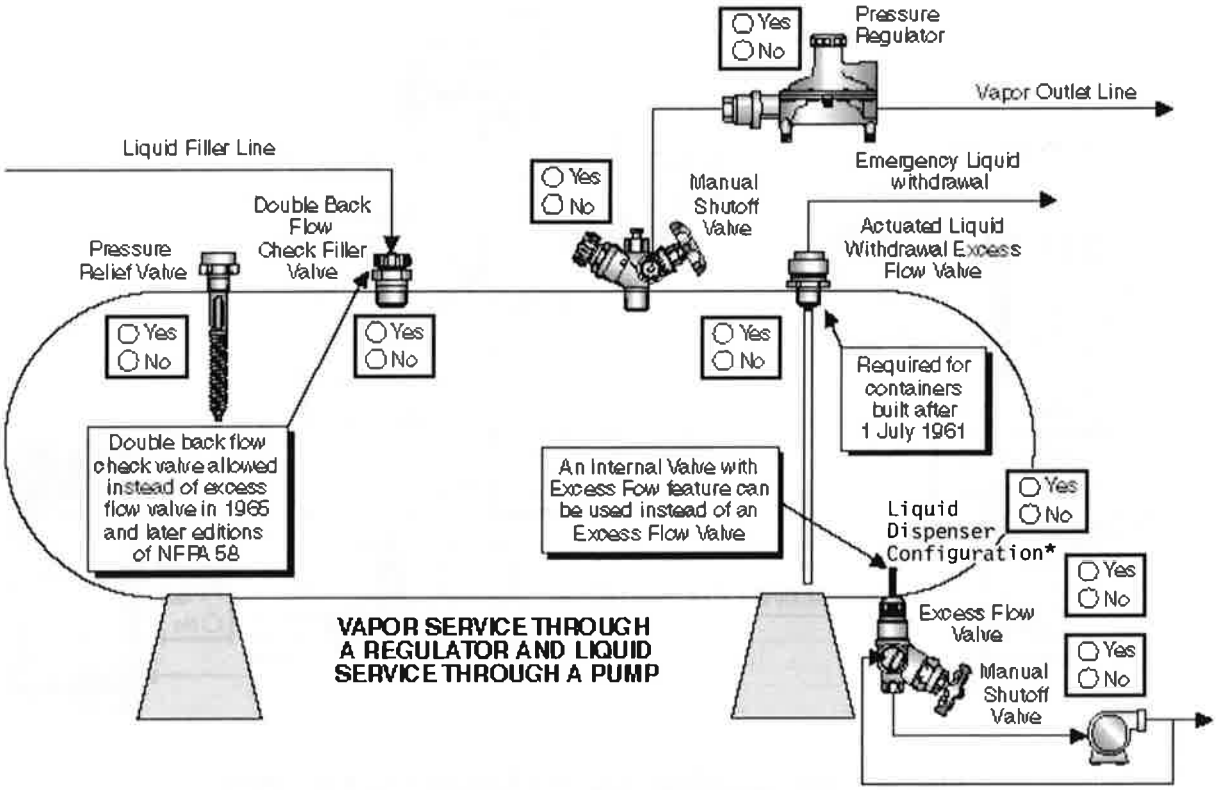


Figure 5-1B: Regulator in the Vapor Service Line

*** Excess-flow protection is not required for manual shutoff valves for vapor service where an approved regulator is directly attached or attached with a flexible connector (*"pig tail"*) to the outlet of the manual shutoff valve for vapor service, and the controlling orifice between the container contents and the shutoff valve outlet does not exceed 5/16 inch (8 mm) in diameter (5.7.4.1 (B)(8), NFPA 58).**



***For liquid dispenser configuration, see 6.25.3.8.**

Figure 5-1C: Container with Both Liquid and Vapor Service, Regulator in the Vapor Service Line.

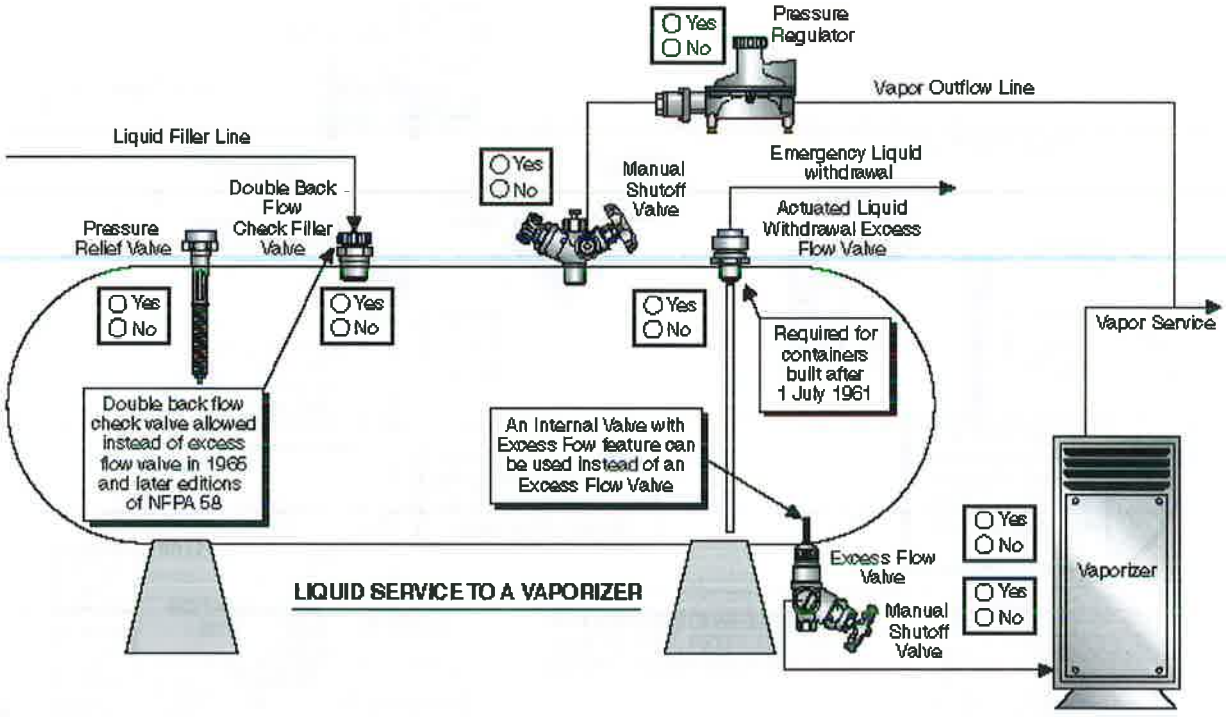
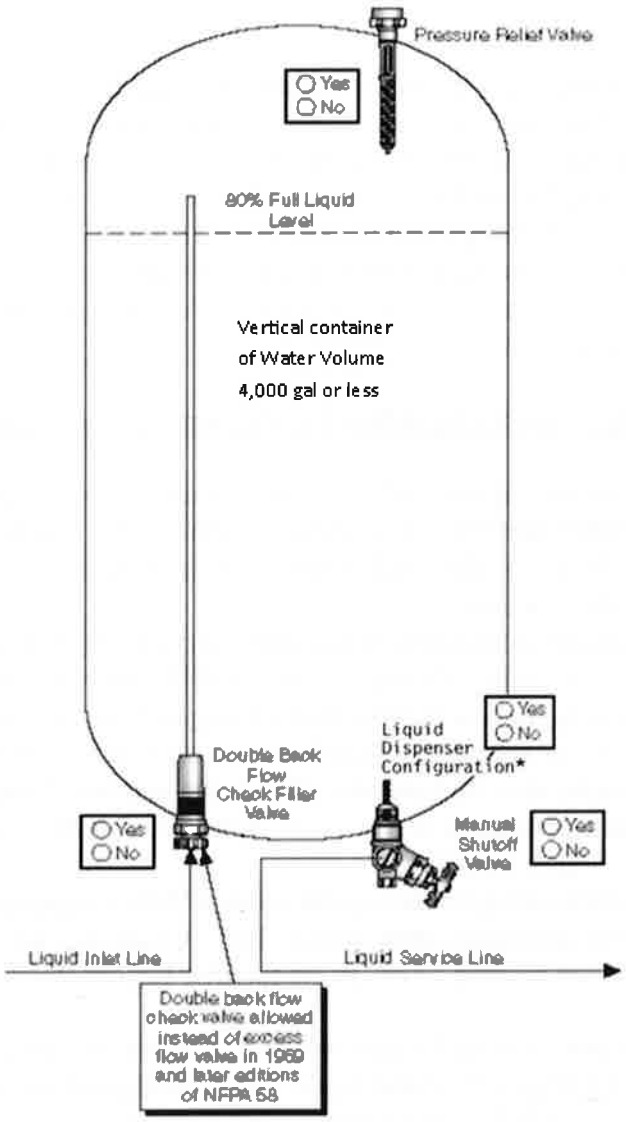


Figure 5-1D: Container Feeding Liquid to a Vaporizer.



***For liquid dispenser configuration, see 6.25.3.8.**

Figure 5-1E: Vertical Container for Liquid Service, 4,000 Gallon w.c. or Less.

5.1.4 Individual Containers Having a Water Capacity Greater than 4,000 Gallons

The compliance with the code requirements for appurtenances in this container size range must be evaluated for LP-Gas flow both into the container (vapor and liquid) and out of the container (vapor and liquid). In addition, note that there are retrofit requirements for existing containers without internal valves in liquid service that were to be completed by July 1, 2011. Several different appurtenance service configurations meet these requirements. These are indicated in Form 5.3. *Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes.*

Enter the information in Form 5.2 by following the steps indicated below

8 Select the first container in the facility having a water capacity greater than 4,000 gallons. Enter this as container number 1 in Column A of Form 5.2 below.
9 Complete each of the rows identified as the vapor inlet, vapor outlet, liquid inlet and liquid outlet service for this container.
10 Select the appurtenance configuration for vapor service which most closely corresponds to the design used in the facility. Figure 5-2 shows different vapor inlet configurations. Enter in column D the configuration number that corresponds to the design used in the facility.
11 Count all "Yes" in the schematic sketch corresponding to this configuration and which provide for vapor inlet into the container. This is the number of required appurtenances that should be provided according to the code. Enter this number in column E of the row corresponding to "Vapor Inlet."
12 Check "Yes" corresponding to each appurtenance that is installed on this container. If the appurtenance is not provided, then check "No". Count the total number of boxes with installed appurtenance marked "Yes" in the facility. Record this number in column F of the same row.
13 Repeat steps 3, 4 and 5 for each vapor outlet configuration (using Figure 5-3), liquid inlet configuration (using Figure 5-6) and liquid outlet configuration (using Figure 5-7).
14 Repeat steps 1 through 6 for each container of water capacity greater than 4,000 gallons located at the facility.

Form 5.2

Compliance with Code Requirements for Appurtenances on Containers Having a Water Capacity Greater Than 4,000 Gallons

A	B	C	D		E	F	G
Container #	LP-Gas inlet to and outlet from the container**		Enter Configur-ation Number		Total Number of Product Control Appurtenances: Required by NFPA 58 (applicable edition)	Total Number of Product Control Appurtenances: Installed on the container	NFPA 58 Section Reference (2017 edition)
1	Vapor	Inlet	5-2	2	2017	2	5.7.4.2, Table 5.7.4.2 and 5.7.4.3
		Outlet	5-3	2	2017	2	
	Liquid	Inlet	5-6	4	2017	4	
		Outlet	5-7	4	2017	4	
2	Vapor	Inlet	5-2		0	0	
		Outlet	5-3		0	0	
	Liquid	Inlet	5-6		0	0	
		Outlet	5-7		0	0	
3	Vapor	Inlet	5-2		0	0	
		Outlet	5-3		0	0	
	Liquid	Inlet	5-6		0	0	
		Outlet	5-7		0	0	
4	Vapor	Inlet	5-2		0	0	
		Outlet	5-3		0	0	
	Liquid	Inlet	5-6		0	0	
		Outlet	5-7		0	0	

** If the container does not provide an opening for the specific function listed, enter 0 (zero) in columns E and F corresponding to that row.

If in Form 5.2 any one of the numbers in column F is less than the number in Column E of the corresponding row, these items must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

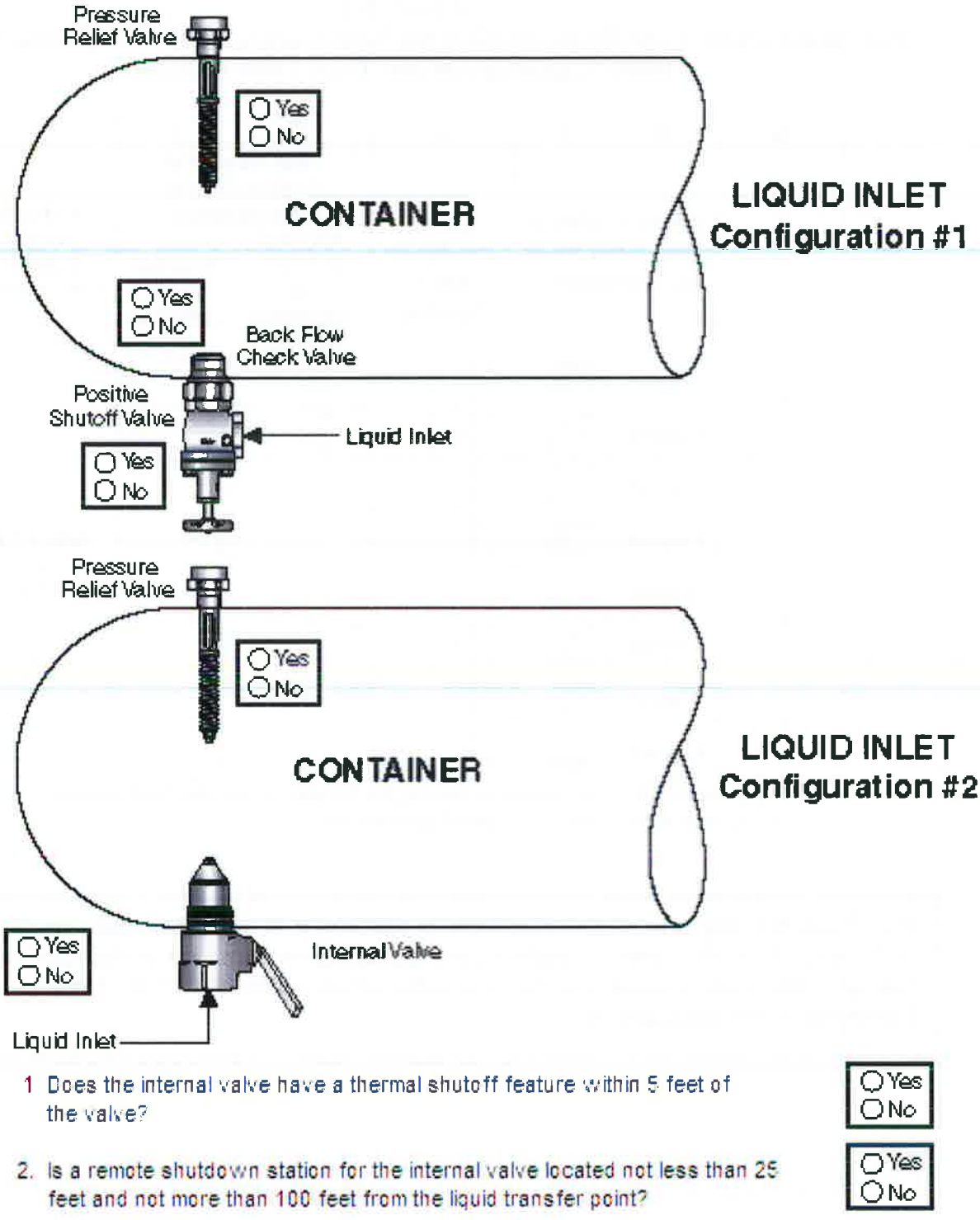
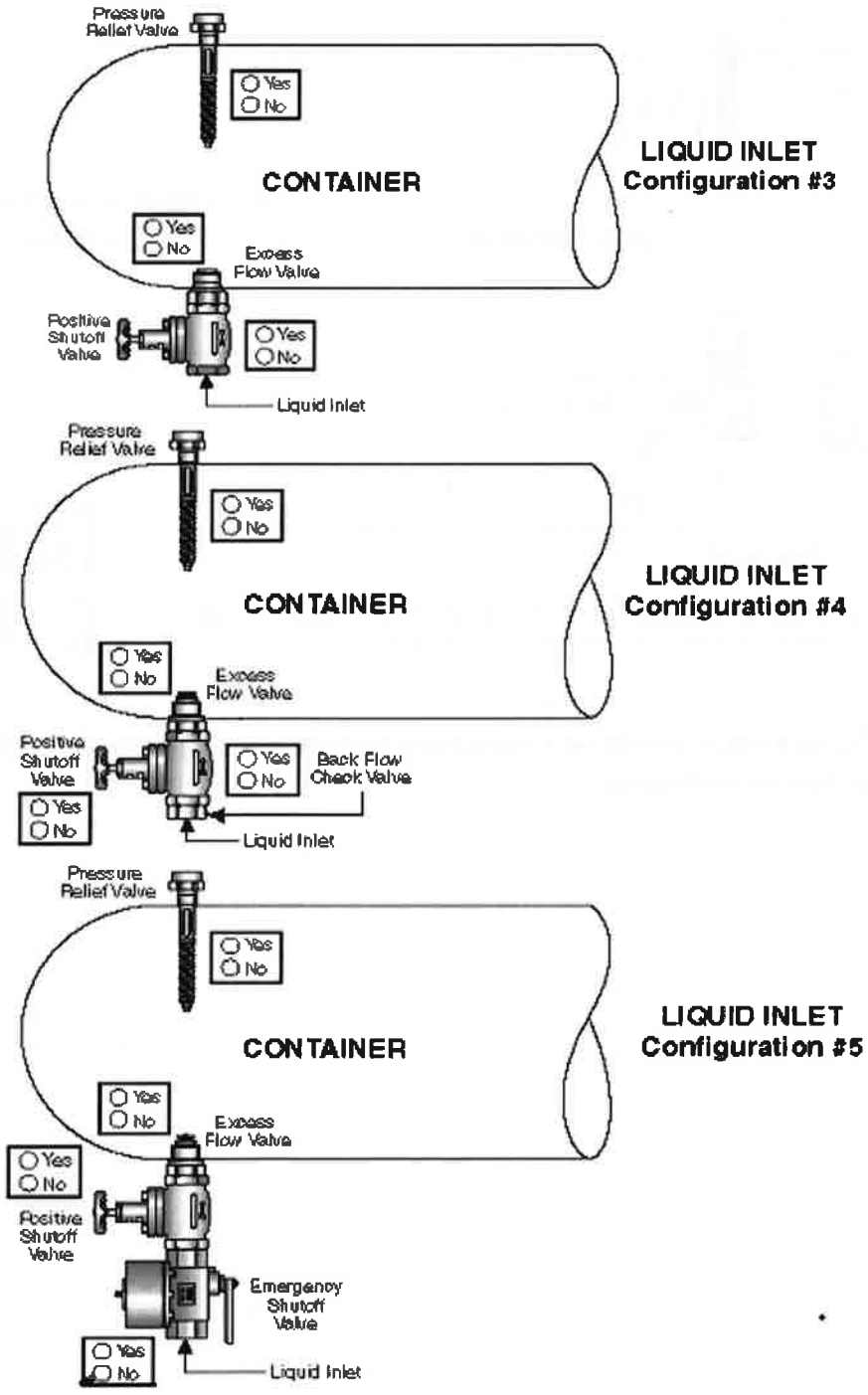


Figure 5-6A Liquid Inlet Valves on Containers With Water Capacity Greater Than 4,000 Gallons in New Installations

(NOTE: Prior to July 1, 2011 existing installations may utilize Configurations 3, 4 or 5 of Fig 5-6B, or either configuration in Figure 5-6A. After July 1, 2011, installations must comply with Configurations 4 or 5 below, or Configuration 1 or 2 in Figure 5-6A.)



Note: *The emergency shutoff valve in configuration #5 must be equipped for remote closure. This valve must be installed in the line upstream as close as practical to the positive shutoff valve/excess- flow valve combination.*

Figure 5-6B: Liquid Inlet Valves on Containers With Water Capacity Greater Than 4,000 Gallons in Existing Installations

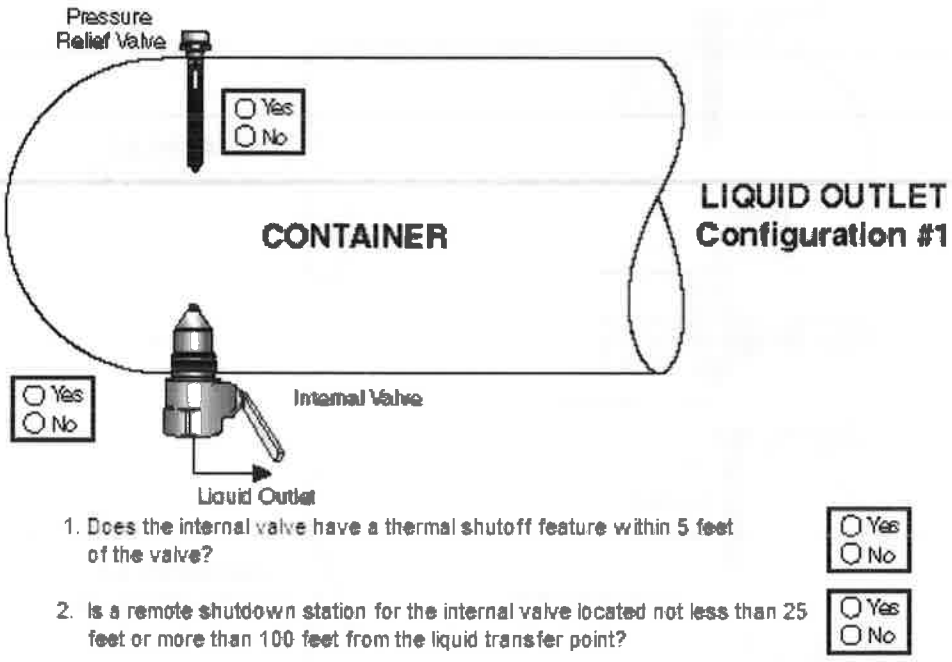
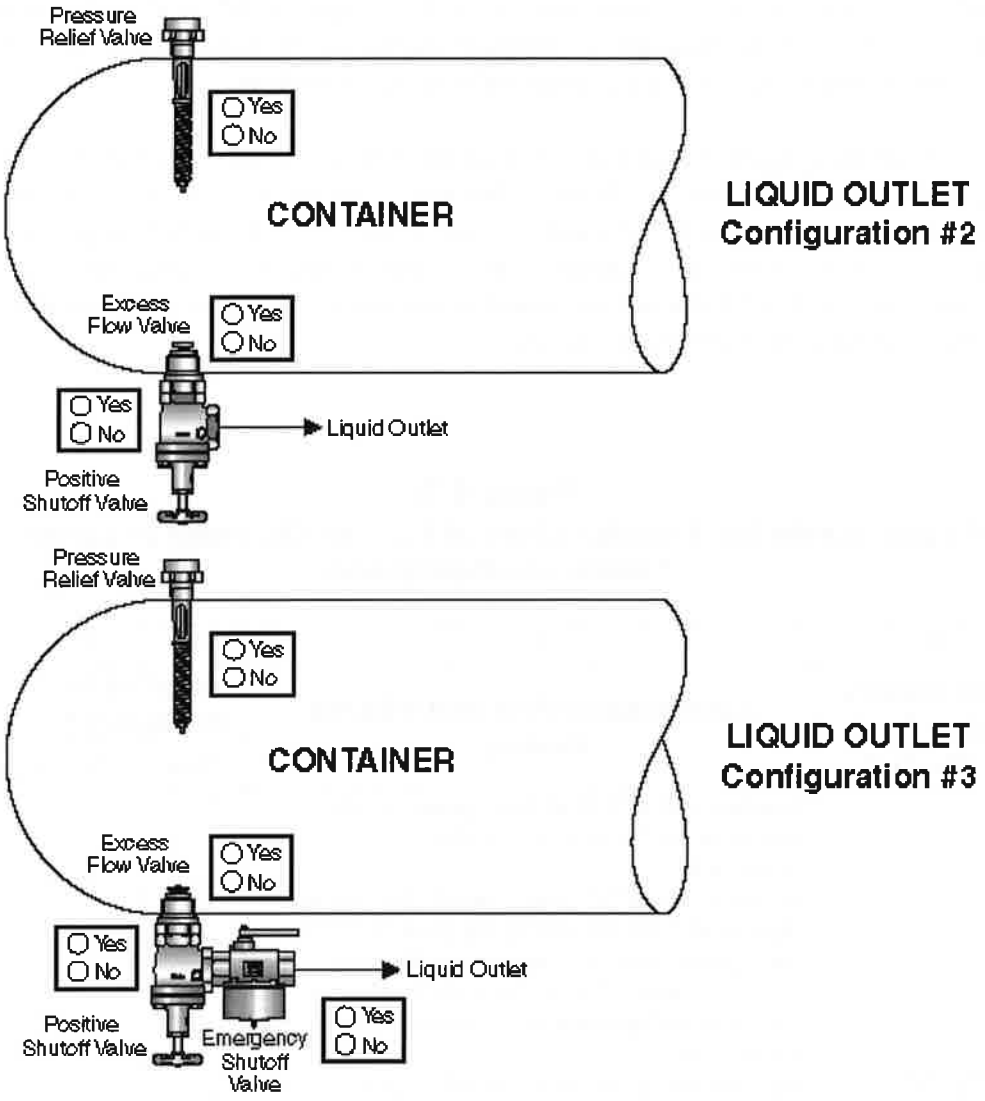


Figure 5-7A: Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in New Installations

(*NOTE: Prior to July 1, 2011, existing installations may utilize Configurations 2 or 3 of Fig 5-7B or Configuration 1 in Figure 5-7A. After July 1, 2011, installations must comply with Configuration 3 in Figure 5-7B or Configuration 1 in Fig. 5-7A*).



Note: *The emergency shutoff valve in configuration # 3 must be equipped for remote closure. This valve must be installed in the line downstream, as close as practical to the positive shutoff valve/excess- flow valve combination.*

Figure 5-7B: Liquid Outlet Valves on Containers with Water Capacity Greater Than 4,000 Gallons in Existing Installations

5.2 Product Control Measures in Transfer Piping

5.2.1 Manifolded and Remotely Filled Containers

The containers in some LP-Gas facilities, especially in bulk plants, may be remotely filled with an inlet manifold connected to one or more containers. The vapor withdrawal or liquid withdrawal from containers may also be through a common manifold. In such cases, there are several appurtenance requirements to control the potential release of product.

If the facility contains a liquid transfer line header (manifold) 1½-inch diameter or larger, and a pressure equalizing vapor line that is 1¼-inch diameter or larger, then continue with the analysis in this section by completing Form 5.3, Form 5.4 and Form 5.5. Otherwise, skip this section and go to section 5.3. *Note: Container appurtenances shown are illustrative of product control equipment only. See NFPA 58 for all container appurtenances required. Illustrations are not intended to be used for system design purposes.*

Form 5.3
Requirements for Transfer Lines of 1½-inch Diameter or Larger, Liquid-into-Containers

A	B	C	D	E	F
Item #	**Appurtenance (Either No. 1 or No. 2)****	**Appurtenance Provided with the Feature**	**Installed in the facility?**		**NFPA 58 Section Reference (2017 edition)**
			Yes	**No**	
1	Emergency shutoff valve (ESV) (Ref § 6.12)	Installed within 20 ft. of lineal pipe from the nearest end of the hose or swivel-type connections.	X		6.12.2
		Automatic shutoff through thermal (fire) actuation element with maximum melting point of 250 °F	X		6.12.6
		Temperature sensitive element (fusible link) installed within 5 ft from the nearest end of the hose or swivel type piping connected to liquid transfer line.	X		6.12.6
		Manually operated remote shutoff feature provided for ESV.	X		6.12.12.1
		Manual shutoff device provided at a remote location, not less than 25 ft., and not more than 100 ft. from the ESV in the path of egress.	X		6.12.12.2
		An ESV is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of size 1½ inch in diameter or larger on the other side.	X		6.12.5 and 6.19.2.6 (1)
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8

Form 5.3 (continued)

A	B	C	D	E	F

Item #	Appurtenance	Appurtenance Provided with the Feature	Installed in the facility?		NFPA 58 Section Reference (2017 edition)
			Yes	No	
2	Backflow check valve (BCK)**	Installed downstream of the hose or swivel-type connection	x		6.12.3
		BCK is designed for this specific application.	X		6.12.4
		A BCK is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1½ inch in diameter or larger on the other side.	X		6.12.5
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8
3	Debris Protection++	Liquid inlet piping is designed or equipped to prevent debris and foreign material from entering the system.	X		6.19.2.5
4	Emergency discharge control	Flow through facility hose used to transfer LP-Gas from non-metered cargo tank vehicle into containers will stop within 20 seconds of a complete hose separation without human intervention.	X		6.19.2.6 (3)

** In lieu of an emergency shutoff valve, the backflow check valve (BCK) is only permitted when flow is only into the container and shall have a metal-to-metal seat or a primary resilient seat with metal backup, not hinged with a combustible material (6.12.3, 6.12.4).

++ Retrofit required for existing facilities by July 1, 2011.

Liquid Withdrawal From Containers

A	B	C	D	E	F
Item #	**Appurtenance**	**Appurtenance Provided with the Feature**	**Installed in the facility?**		**NFPA 58 Section Reference (2017 Edition)**
			Yes	**No**	
1	Emergency shutoff valve (ESV) (Ref § 6.12)	Installed within 20 ft. of lineal pipe from the nearest end of the hose or swivel-type connections.	X		6.12.2
		Automatic shutoff through thermal (fire) actuation element with maximum melting point of 250 ºF.	X		6.12.6
		Temperature sensitive element installed within 5 ft from the nearest end of the hose or swivel type piping connected to liquid transfer line.	X		6.12.6
		Manually operated remote shutoff feature provided for ESV.	X		6.12.12.1
		Manual shutoff device provided at a remote location, not less than 25 ft., and not more than 100 ft. from the ESV in the path of egress.	X		6.12.12.2
		An ESV is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1½ inch in diameter or larger on the other side.	X		6.12.5 and 6.19.2.6 (1)
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8
		Number of ESV's in liquid withdrawal service			

Note: If more than one ESV is installed in the facility, use one Form 5.4 for each ESV.

Form 5.5
Requirements for Vapor Transfer Lines 1¼-inch Diameter or Larger

A	B	C	D	E	F
Item #	**Appurtenance**	**Appurtenance Provided with the Feature**	**Installed in the facility?**		**NFPA 58 Section Reference (2017 edition)**
			Yes	**No**	
1	Emergency shutoff valve (ESV) (Ref § 6.12)	Installed within 20 ft. of lineal pipe from the nearest end of the hose or swivel-type connections.	X		6.12.2
		Automatic shutoff through thermal (fire) actuation element with maximum melting point of 250 °F	X		6.12.6
		Temperature sensitive element installed within 5 ft from the nearest end of the hose or swivel type piping connected to liquid transfer line.	X		6.12.6
		Manually operated remote shutoff feature provided for ESV.	X		6.12.12.1
		Manual shutoff device provided at a remote location, not less than 25 ft., and not more than 100 ft. from the ESV in the path of egress.	X		6.12.12.2
		An ESV is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1-1/4 inch in diameter or larger on the other side.	X		6.12.5 and 6.19.2.6 (1)
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8
2	Backflow check valve (BCK)**	Installed downstream of the hose or swivel-type connection	X		6.12.3
		BCK is designed for this specific application.	X		6.12.4
		A BCK is installed on each leg of a multi leg piping each of which is connected to a hose or a swivel type connection on one side and to a header of 1-1/4 inch in diameter or larger on the other side.	X		6.12.5
		Breakaway protection is provided such that in any pull-away break will occur on the hose or swivel-type connection side while retaining intact the valves and piping on the plant side.	X		6.12.8

** In lieu of an emergency shutoff valve, the backflow check valve (BCK) is only permitted when flow is only into the container and it shall have a metal-to-metal seat or a primary resilient seat with metal backup, not hinged with a combustible material (6.12.3, 6.12.4).

If a checkmark is made in the "No" column of any one of Form 5.3, Form 5.4 or Form 5.5, then these items must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

If the LP-Gas facility is designed using ALTERNATE PROVISIONS for the installation of ASME CONTAINERS, then continue the analysis below. Otherwise skip section 5.3 and go to Chapter 6.

5.4 Alternate Provisions for the Installation of ASME Containers

Facilities may be provided with redundant fail-safe product control measures (section 5.3.1) and incorporate equipment designed for low emissions during transfer operations (section 5.3.2). These types of (redundant and fail-safe) product control measures and low emission transfer equipment provide additional safety and qualify the facility for the following benefits:

- Reduced separation distances from adjacent properties, and
- Mitigation of the need for special protection requirements.

Note that the reduced separation distance applies only to underground and mounded containers 2,001 through 30,000 gallons where all the requirements of NFPA 58 Section 6.28 (summarized in Forms 5.6 and 5.7) are complied with.

5.3.3 ASME Container Appurtenances and Redundant Fail-Safe Product Control Systems

If the facility incorporates redundant, fail-safe equipment, complete Form 5.6 below. The evaluation will indicate whether the design of the facility complies with the requirements for redundant and fail-safe product control systems. If redundant, fail-safe equipment are not provided, skip this section.

Form 5.6
Evaluation of Redundant Fail-Safe Design

A	B		C	D	E	F
Item #	Description		Features	Installed in the facility?		NFPA 58 Section Reference (2017 edition)
				Yes	No	
1	Container sizes for which the appurtenances are provided		Appurtenances and redundant fail-safe equipment are provided for each container of water capacity 2,001 gal. through 30,000 gal.	X		6.28.3 and 6.28.4
2	Liquid or vapor withdrawal (1-1/4 in. or larger)		Internal valve having internal excess-flow valve	X		6.28.3.1 and 6.28.3.2
			Positive shutoff valve installed as close as practical to the internal valve	X		6.28.3.4
3	Liquid or vapor inlet		Internal valve having internal excess-flow valve or backflow check valve	X		6.28.3.5
			Positive shutoff valve installed as close as possible to the internal valve or the back-flow check valve	X		6.28.3.5
4	Railcar transfer	Flow into or out of railroad tank car	Approved emergency shutoff valves installed in the transfer hose or the swivel-type piping at the tank car end	N/A	N/A	6.19.2.6 (1) and 6.28.4
		Flow only into railroad tank car	Approved emergency shutoff valve or backflow check valve installed in the transfer hose or the swivel-type piping at the tank car end	N/A	N/A	6.19.2.6 (2) and 6.28.4
5	Cargo tank transfer		Protection provided in accordance with 6.12	X		6.28.4.1
6	Automatic closure of all primary valves (IV & ESV) in an emergency		By thermal (Fire) actuation	X		6.28.4.2
			Actuated by a hose pull-away due to vehicle motion	X		6.28.4.2
7	Manually operated remote shutdown of IV and ESV		Remote shutdown station within 15 ft of the point of transfer	X		6.28.4.3 (A)
			Another remote shutdown station between 25 ft and 100 ft of the transfer point	X		6.28.4.3 (B)
			Shutdown stations will shut down electrical power supply to the transfer equipment and shut down all primary valves (Internal & Emergency Valves).	X		6.28.4.3
			Signs complying with the requirements of 6.28.4.3 (C) provided	X		6.28.4.3 (C)

Note: If the facility does not have a rail terminal, write the word NA in both the "Yes" column and the "No" column in item 4 of this Form in the railroad tank car row. Similar option is also available if there is no cargo tank vehicle transfer station.

If the LP-Gas facility is provided with LOW EMISSION TRANSFER EQUIPMENT, then continue the analysis below. Otherwise skip section 5.3.2 and go to Chapter 6.

5.3.4 Low Emission Transfer Equipment

If the facility is designed with low emission transfer hoses and associated equipment, complete Form 5.7 below. Compliance with Section 6.28.5 of NFPA 58 results in a 50% reduction in the separation distances between transfer points described in Table 6.5.2.1 and Section 6.25.4.3. If the facility does not have low emission transfer equipment engineered into the facility design, skip this section.

Form 5.7
Evaluation of Low Emission Transfer Equipment

A	B	C		D	E	F
Item #	Description	Features		Installed in the facility?		NFPA 58 Section Reference (2017 Edition)
				Yes	No	
1	Transfer into permanently mounted ASME containers on vehicles	Delivery nozzle and filler valve- Max. liquid release after transfer of 4 cm^3 (0.24 in^3).	Fixed maximum liquid level gage not used during transfer operations	X		6.28.5.3 (A) & (B)
2	Transfer into stationary ASME containers. delivery valve and nozzle combination	During product transfer or post transfer uncoupling of the hose, liquid product volume released to the atmosphere	Does not exceed 4 cm^3 (0.24 in^3) from a hose of nominal size 1 in or smaller	N/A	N/A	6.28.5.4 (A)
			Does not exceed 15 cm^3 (0.91 in^3) from a hose of nominal size larger than 1 in.	X		6.28.5.4 (B)
3	Transfer into stationary ASME containers maximum filling limit	Do containers of less than 2,001 gal (w.c.) have an overfilling prevention device or another approved device?		N/A	N/A	6.28.5.4 (F)
		Do containers 2,001 gal (w.c.) or greater have a float gage or other non-venting device?		X		6.28.5.4 (E)
4	Transfer into stationary ASME containers fixed maximum liquid level gage	Not used during routine transfer operations but used to calibrate other non-venting liquid level gages in the container		N/A	N/A	6.28.5.4 (C) & (D)

Note: 1) If the facility does not have a particular feature described in items 2 or 3, write "NA" in both the "Yes" and "No" columns corresponding to its row .

If separation distance reductions are intended, checkmarks made in the "No" column of either Form 5.6 or Form 5.7 must be addressed and brought into compliance with the specific edition of NFPA 58 that the facility was constructed to.

CHAPTER 6

Analysis of Local Conditions of Hazard

6.4 Physical Protection Measures

Protection should be provided for LP-gas facilities, systems and appurtenances against the risk of tampering and from the accidental collision of vehicles with containers and/or transfer lines. Requirements to prevent such tampering or accidents are specified in the code. Compliance requirements for the facility are indicated in Form 6.1. Complete all forms in this chapter. (**NOTE:** See NFPA 58 for complete requirements.)

Form 6.1
Evaluation of Physical Protection and Other Measures

A	B	C	D	E	F
#	Item	Features	Installed in the facility? Yes	Installed in the facility? No	NFPA 58 Section Reference (2017 Edition)
1	Lighting‡	Provide lighting for nighttime operations to illuminate storage containers, container being loaded, control valves, and other equipment	X		6.19.5
2	Vehicle impact protection	Protection against vehicular (traffic) impacts on containers, transfer piping and other appurtenances is designed and provided commensurate with the size of vehicles and type of traffic in the facility. (Example protection systems include but not limited to (1) Guard rails, (2) Steel bollards or crash posts, (3) Raised sidewalks.	X		6.6.1.2 and 6.9.3.10
3	Protection against corrosion	Provide protection against corrosion where piping is in contact with supports or corrosion causing substances.	X		6.9.3.11, 6.9.3.14, and 6.17
Complete only 4A or 4B					
4 A	Perimeter Fence	Is an industrial type or chain link fence of at least 6 ft high or equivalent protection provided to enclose (all around) container appurtenances, pumping equipment, loading and unloading and container filling facilities?	X		6.19.4.2
		Are at least two means of emergency egress (gates) from the enclosure provided? **NOTE: Write "N.A." (not applicable) if** (iii) The area enclosed is less than 100 ft^2, or (iv) The point of transfer is within 3 ft of the gate, or containers are not filled within the enclosure	N/A	N/A	6.19.4.2 (A)
		Is a clearance of at least 3 feet all around to allow emergency access to the required means of egress provided?	X		6.19.4.2 (B)
	Guard Service	If a guard service is provided, does this service cover the LP-Gas plant and are the guard personnel provided with appropriate LP-Gas related training, per section 4.4 of NFPA 58?	N/A	N/A	6.19.4.3
4 B	Lock-in-Place devices	Are Lock-in-Place devices provided to prevent unauthorized use or operation of any container appurtenance, system valves, or equipment in lieu of the fence requirements above?	X		6.19.4.2 (C)

Note: Fill only items 1, 2, 3, and 4A or 4B. Indicate with "NA" when not filling the "Yes" or "No" column.
‡ Indicate with "NA" if the facility is not operated at night.

6.5 Ignition Sources and Control

The potential for the ignition of LP-Gas vapors released in a facility is reduced by eliminating as many ignition sources as possible, designing electrical equipment to reduce or eliminate sparking and ensuring that during transfer operations known ignition sources are turned off. The ignition source control involves both passive methods as well active methods. Form 6.2 is used to evaluate whether your facility satisfies the code requirements for ignition source control. (**NOTE:** See NFPA 58 for complete requirements.)

Form 6.2
Assessment of Sources of Ignition and Adjacent Combustible Materials

A	B	C	D	E
#	Sources of Ignition and Requirements Pertaining to Adjacent Combustible Materials	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
		Yes	No	
1	Are combustible materials not closer than 10 ft. from each container?	X		6.4.4.3
2	Is a distance at least 20 ft. provided between containers and tanks containing flammable liquids with flash point less than 200 °F (ex., gasoline, diesel)?	N/A	N/A	6.4.4.6
3	Are electrical equipment and wiring installed per Code requirements?	X		6.23.2
4	Is open flame equipment located and used according to Code?	X		6.23.3.1
5	Are ignition control procedures and requirements during liquid transfer operations complied with?	X		7.2.3.2
6	Is an approved, portable, dry chemical fire extinguisher of minimum capacity 18 Lbs. and having a B:C rating provided in the facility?	X		6.27.4.2
7	Is an approved, portable, dry chemical fire extinguisher of minimum capacity 18 Lbs. and having a B:C rating provided on each truck or trailer used to transport propane?	X		9.3.5 and 9.4.7
8	Is the prohibition on smoking within the facility premises strictly enforced?	X		7.2.3.2 (B) and 9.4.10

Note: Insert "NA" in both "Yes" and "No" columns of any items that are not applicable.

6.6 Separation Distances

6.6.1 Separation Distances between Container and Important Buildings, Other Properties and Transfer Points

The separation distance provisions in NFPA 58 are minimum requirements and are intended to buy time in an emergency and to implement appropriate response. The requirements are dependent upon the size of the container. Complete the appropriate section of Form 6.3. (**NOTE:** See NFPA 58 for complete requirements.)

Form 6.3

Separation Distances from Containers to Buildings, Property Lines that can be Built upon, Inter-container Distances, and Aboveground Flammable or Combustible Storage Tanks

A	B	C	D	E	F	G
#	Container Size Range in gal (W.C.)	Separation between a property line, important building or other property and the nearest container which is	Minimum Distance (ft)	Is the Facility compliant? Yes	Is the Facility compliant? No	NFPA 58 Section Reference (2017 Edition)
1	501 through 2,000	Aboveground	25	N/A	N/A	6.3.1, 6.3.2 and Table 6.3.1.1
		Underground or Mounded	10	N/A	N/A	
		Between containers	3	N/A	N/ A	
2	2,001 through 30,000	Aboveground	50	X		
		Underground or Mounded	50	N/A	N/A	
		Between containers	5	N/A	N/A	
3	30,001 through 70,000	Aboveground	75	N/A	N/A	
		Underground or Mounded	50			
		Between containers	¼ sum of diameters of adjacent containers	N/A	N/a	
4	70,001 through 90,000	Aboveground	100	N/A	N/A	
		Underground or Mounded	50	N/A	N/A	
		Between containers	¼ sum of diameters of adjacent containers	N/A	N/A	
5	All sizes greater than 125 gal	Separation distance between an aboveground LP-Gas container and an aboveground storage tank containing flammable or combustible liquids of flash points below 200 °F.	20	N/A	N/A	6.4.4.6 and 6.4.4.7

If the LP-Gas plant is provided with every one of the redundant and fail- safe product control-design equipment indicated in Form 5.6, then the minimum distance in column D of Form 6.3 can be reduced to 10 feet for underground and mounded containers of water capacity 2,001 gal to 30,000

Note: If any of the container sizes indicated in the above form are not present in the facility, enter "NA" in both Yes and No columns.

6.6.2 Separation Distances between Transfer Points and other Exposures

If the liquid transfer point is not on the container but is at a remote location complete Form 6.4. **Do not complete Form 6.4 when the filling is through a container valve.**
(**NOTE:** See NFPA 58 for complete requirements.)

Form 6.4
Separation Distances between Points of Transfer and other Exposures

A	B		C	D	E	F	G
#	Type of Exposure within or outside the facility boundary		Check if exposure is present	Minimum Distance (ft)	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
					Yes	No	
1	Buildings, mobile homes, recreational vehicles, and modular homes with at least 1-hour fire-rated walls			10	X		
2	Buildings with other than at least 1-hour fire-rated walls			25	X		
3	Building wall openings or pits at or below the level of the point of transfer			25	X		
4	Line of adjoining property that can be built upon			25	X		
5	Outdoor places of public assembly, including school yards, athletic fields, and playgrounds			50	X		
6	Public ways, including public streets, highways, thoroughfares, and sidewalks	From points of transfer in LP-Gas dispensing stations and at vehicle fuel dispensers.		10	X		Section 6.5.2 and Table 6.5.2.1
		From other points of transfer		25	X		
7	Driveways			5	X		
8	Mainline railroad track centerlines			25	X		
9	Containers other than those being filled			10	X		
10	Flammable and Class II combustible liquid dispensers and the fill connections of non-stationary containers			10	X		
11	Flammable and Class II combustible liquid aboveground containers and filling connections of underground containers			20	X		
12	LP-Gas dispensing device located close to a Class I liquid dispensing device.			10	X		6.25.4.3

NOTE: Place a checkmark in column C against an exposure that is present in or around the facility. Fill columns E or F for only those rows for which there is a checkmark in column C.

If the facility contains low emission transfer equipment (i.e, all equipment identified in Form 5.7 are installed and are in working order), then the minimum separation distances in column D of Form 6.4 can be reduced to one half of the indicated values.

If the containers in the LP-Gas facility are provided with SPECIAL PROTECTION MEASURES, then continue the analysis below. Otherwise skip Forms 6.5 and 6.6 and go to Section 6.5. Also see Chapter 9.

6.6 Special Protection

In the event that a proposed installation is adjacent to a property containing extremely high combustible fuels and the location of the storage containers is such that exposure of the containers to a fire on the adjacent property would severely impact the integrity of the containers, special protection methods may be utilized to reduce the exposure hazard to the containers. Installed special protection systems must comply with section 6.27.5 of NFPA 58, which addresses both passive and active protection systems.

- Passive approaches include insulating the outside of the containers, mounding above grade or burying the container.
- Active special protection includes fixed water spray systems or placement of monitor nozzles at strategic locations with respect to the containers to be protected.

Complete form 6.5 to determine compliance of the installation with the code. Similarly, Form 6.6 indicates the requirements for active protection. This Form also should be completed as part of the fire safety analysis process.
(**NOTE:**. See NFPA 58 for complete requirements.)

Form 6.5
Special Protection Measures –Passive Systems

A	B	C	D		E
#	Special Protection Option	Question	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Container Insulation	Insulation provided on each of the containers?		X	6.27.5.1
		Insulation material complies with the requirements of NFPA 58?	NA	NA	6.27.5.1 and 6.27.5.2
2	Mounding of containers	Each container in the facility is mounded?	NA	NA	6.27.5.3
		Mounding complies with each requirement under section 6.6.6.3 of NFPA 58.	NA	NA	6.6.6.3 and 6.27.5.3
3	Burying of containers	Each container in the facility is buried?	NA	NA	6.27.5.4
		Buried containers comply with each requirement under section 6.6.6.1 of NFPA 58.	NA	NA	6.6.6.1 and 6.27.5.4

Form 6.6
Special Protection Measures –Active Systems

#	Special Protection Option	Question	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Water spray systems	Are fixed water spray systems, complying with NFPA 15[1] requirements, used for each container in the facility?		X	6.27.6.1
		Do fire responsive devices actuate water spray system automatically?		X	6.27.6.2
		Can the water spray systems be actuated manually also?		X	6.27.6.2
2	Monitor nozzle systems	Are the monitor nozzles located and arranged so that the water stream can wet the surfaces of all containers exposed to a fire?		X	6.27.6.3
		Can the water stream from a monitor nozzle reach and wet the entire surface of, at least, one half of a length from one end of each of the containers it is designed to protect? [1]		X	6.27.6.3
		Do fixed monitor nozzles comply with NFPA 15[2] requirements?		X	6.27.6.1
		Do fire responsive devices actuate the monitor nozzles?		X	6.27.6.2
		Can the monitor nozzles can be actuated manually also?		X	6.27.6.2

3. See discussion in Section 8.2
4. Refer to Chapter 8 for a discussion on NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*

6.7 Vehicular Protection

In the event that an installation is located where an immediate threat due to vehicular traffic is present, a barrier or other suitable protection may be necessary.

Form 6.7
Protection Against Vehicular Impact

#	System Protected	Is physical protection provided?		Type of physical protection installed	NFPA 58 Section Reference (2017 Edition)
		Yes	No		
1	Storage containers	X		Posts or Jersey barriers	6.6.1.2, 6.6.6.1(B), 6.6.6.1(C), 6.9.3.10, and 6.25.3.13
2	Transfer stations	X		Posts or Jersey Barriers	
3	Entryway into plant	X		Locked gate	

CHAPTER 7

Exposure To and From Other Properties, Population Density

7.3 Exposure to Off-Site Properties and Persons From In-Plant Propane Releases

Types of Propane Fires: A propane release inside the LP-Gas facility may affect adjacent properties and off-site populations if the release is of a sufficiently large size. An immediately ignited release will result in a local fire. Depending upon the characteristics of the release and ignition two types of local fires can occur, namely, a pool fire on any liquid pool of propane on the ground or a burning rising fireball.

If the released propane is not immediately ignited, then a dispersing cloud (or plume) of vapor will form. The cloud or plume will move in the direction of the wind. Because of the mixing of air with the dispersing propane, propane concentration decreases continuously both with downwind distance as well as in the crosswind direction. This cloud or plume can be ignited at any distance downwind by an ignition source when the concentration at the point of ignition is within the Lower Flammability Limit (LFL) to Upper Flammability Limit (UFL) range. For propane the range of flammable concentrations in air is between 2.15% and 9.6% by volume.

Ignition of a dispersing vapor cloud or plume may result in a flashback type of vapor fire. In extremely rare cases, and only when the physical conditions are conducive, with partial or full confinement of the propane-air mixture of proper concentration and its ignition, a vapor explosion can occur, resulting in a blast wave. If the dispersing cloud is not ignited it poses no hazard to the surrounding area.

Propane vapor at ambient pressure and temperature is heavier than air. Hence, any vapor released will tend to flow towards and accumulate in low-lying areas adjacent to the release location. If a building or other semi-confined area exists adjacent to the release location wherein the vapor can accumulate in the lower parts of the building, a potential explosion hazard will result.

Hazardous Effects of a Fire: The effect of a propane fire on an off-site property will depend on the type and material of construction of the structure and its distance from the fire and fire size. Similarly, the number of off-site persons adversely impacted by a fire inside a LP-Gas facility will also depend on, (in addition to the characteristics of the fire and the distance between the fire and the population) the type of population, the timeliness of notification, the effectiveness of the evacuation planning and implementation, etc.

Release Cases: In this manual, a number of mathematical models were developed for credible accident scenarios, to describe the effects of the release of propane inside LP-Gas facilities and its subsequent behavior. These models were used to calculate potential hazard areas for each scenario of release. Each potential release discussed has very low probability of occurrence. However, because of the flammability of propane, such releases may pose hazards. The hazard distance (to a

property outside the facility boundary or to off-site persons) from a propane release within the facility will depend on the size and duration of release, and the type of fire that occurs.

The calculated distance to which a hazard extends under each scenario of release and for each hazard behavior is indicated in Table 7.1.

To assess the hazards posed to offsite population from in-plant releases of propane it is necessary to:

1. Note the type of occupancies surrounding the facility, and
2. Describe in detail the characteristics and density of the population surrounding the facility.

To evaluate the impact on the surrounding population from an in-plant propane release, complete Form 7.2 using the results indicated in Table 7.1.

Table 7.1
Distances to Various Types of Propane Hazards Under Different Release Models**

Model #	Details of the Propane Release Model Releases from or due to		Vapor Dispersion Distance to LFL (ft)	Explosion Hazard Distance (ft)	Fire Ball Radiation Distance (ft)
1a	Bobtail hose failure. Release of the entire inventory in the hose, quickly.	1" ID x 150 ft hose length	250	110	50
1b		1" ID x 120 ft hose length	230	103	45
1c		1" ID x 75 ft hose length	190	90	40
2a	Release of the inventory in a transfer piping 1" x 30 ft @ 20 gpm for 10 min., due to failed excess flow valve.		135	120	25
2b	Release of the inventory in a transfer piping 2" x 30 ft @80 gpm for 10 mins.		230	252	48
2c	Release of the inventory in a transfer piping 2" x 80 ft. @ 70 gpm for 10 mins.		328	235	74
2d	Release of the inventory in a transfer piping 2.5" x 30 ft @80 gpm for 10 mins.		269	252	59
2e	Release of the inventory in a transfer piping 3" x 30 ft @100 gpm for 10 mins.		312	287	69
2f	Release of the inventory in a transfer piping 3" x 18 ft @100 gpm for 10 mins.		256	284	55
2g	Release of the inventory in a transfer piping 3" x 80 ft @100 gpm for 10 mins		455	284	106
2h	Release of inventory from transfer piping 4" x 30 ft. + 200 gpm for 10 minutes		407	410	89
3	Release from the container pressure relief valve		No ignitable vapor concentration at ground level		
4	Release from a 1" ID x 150 ft transfer piping to a vaporizer and reduced flow from a partially open excess flow valve @ 20 gpm for 10 min.		250	120	50
5	Leak from a corrosion hole in a transfer pipe at a back		110	120	5

	pressure of 130 psig (corresponding to 80 °F) for 60 min. Hole size is ¼" ID.			
6a	Release of the entire inventory in a 2" ID x 20 ft., transfer hose.	195	90	40
Model #	**Details of the Propane Release Model Releases from or due to**	**Vapor Dispersion Distance to LFL (ft)**	**Explosion Hazard Distance (ft)**	**Fire Ball Radiation Distance (ft)**
6b	Release of the entire inventory in a 2.5 inch dia. transfer hose x 16 ft. length	215	98	45
6c	Release of the entire inventory in a 3-inch dia. transfer hose x 12 ft. length	230	100	46
6d	Release of the entire inventory in a 1.25-inch diameter transfer hose x 20 ft. in length	138	66	27
7a	Transport hose blow down: Hose size 2" ID, 20 ft length release for 3min., from a Transport after the tank is filled.	25	30	<5
7b	Transport hose blow down: Hose size 2.5" ID, 16 ft length release for 3min., from a Transport after the tank is filled.	25	29	<5
7c	Transport hose blow down: Hose size 3" ID, 16 ft length release for 3min., from a Transport after the tank is filled.	31	36	<5

** Results from models described in Appendix B.

Form 7.1

Types of Occupancies[1] Near or Surrounding the LP-Gas Facility

Type of Occupancies	**Model # from Table 7.1**	**Hazard Distance[2] (feet)**	**Is Occupancy located within the hazard distance from the Facility?**	
			Yes	**No**
Assembly Occupancies (Places of worship, Libraries, Theaters and Auditoriums, Food or Drink Bars, Sports Stadiums, Amusement Parks, Transportation Centers, etc. with 50 or more people).				X
Institutional Occupancies (Elderly Persons Home or Nursing Home, Hospitals, Alcohol & Drug Rehabilitation Centers, Prisons)				X
Educational Occupancies (Elementary Schools, Day Care facilities, etc).				X

NOTES: (1) Different types of occupancies are defined in NFPA 5000

(2) Table 7.1 provides a number of scenarios that can result in propane release, and the resulting area exposed for different ignition mechanisms. Determine the scenarios that are applicable to the facility, for the quantities that can be released, and enter the greatest value from Table 7.1. Use the hose diameters and length that will be used at the facility if they differ from the ones in Table 7.1 and recalculate the hazard distances using a spreadsheet method that is available at npga.org. Some scenarios may not be applicable to an installation because of other mitigation measures implemented, such as a hose management procedure to minimize the possibility of hose failure.

7.4 Exposure to the Propane Facility From External Events

A large fire or an explosion occurring outside the plant boundary may have detrimental effects on the plant equipment, containers or electrical systems. The most likely scenario is that the LP-Gas plant equipment is affected by intense heat radiation from the external fire.
In order to assess the effects on in-plant personnel, equipment, containers and safety systems from exposure to off-site hazards it is necessary to:

4 Identify industrial or other operations surrounding the LP-Gas plant and also note the type of occupancies surrounding the plant;
5 Discuss with owners of facilities or operations surrounding the LP-Gas plant any potential detrimental effect due to their presence or operations upon the LP-Gas plant;
6 Implement suitable precautions and develop quick notification or other effective communication system protocol between the LP-Gas plant and its neighboring industrial plants, to minimize the potential detrimental effects on a proposed LP-Gas plant from surrounding operations.

The description of the LP-Gas plant surroundings was specified in Form 4.2. Form 7.2 should be completed as a part of the Fire Safety Analysis to note any outside hazards that may affect the integrity of the LP-gas system.

Form 7.2
Exposure to LP-Gas Facility from External Hazards

A	B	C	D
Item #	Type of Neighboring Operation	Hazard exists to the LP-Gas Facility	
		Yes	No
1	Petroleum and other hazardous material storage, wholesale dispensing, etc.	N/A	N/A
2	Metal cutting, welding, and metal fabrication	N/A	N/A
3	Industrial Manufacturing that can pose external hazards	N/A	N/A
4	Ports, rail yards and trans-shipment terminals handling flammable and explosive materials.	N/A	N/A
5	Other operations that may pose hazards (gasoline and other hazardous material dispensing stations, fertilizer storage, etc).	N/A	N/A

NOTE: If a particular activity indicated in column B does not exist, fill both "Yes" and "No" columns with "NA."

Where a "Yes" has been checked in either Form 7.1 or Form 7.2:
3) For an existing facility, communicate this information to local emergency responders for inclusion in their emergency planning.
4) For a proposed facility, implement the actions indicated in Chapter 9.

External Fire Effects on LPG Containers: An evaluation of the effects of thermal radiation from fires outside the facility on LP containers in the LPG plant was conducted to provide guidance to those using this manual. (This evaluation, the associated mathematical model and detailed results with and without the effects of wind have been published in a peer reviewed technical journal)[1]. The maximum temperature attained by the vapor-wetted wall of a propane container exposed to heat radiation from an external, non-impinging fire was calculated for various sizes of containers. The assumptions made in regard to the size and location of the external fire included the following:

- The fire used in the model was a highly radiative liquid hydrocarbon pool fire. The value assumed for the heat radiation emanating from this liquid pool fire was greater than that from fires occurring due to the burning of wooden buildings, tires, forest trees, and other flammable liquids such as oil fires, which burn with high degree of smoke production.

- A fire diameter of 100 ft (30.5 m) was used for duration of 30 minutes. This is a very large fire.

- The edge of the fire was located at distances to buildings required by Table 6.3.1.1 of NFPA 58 and consistent with the size of the container nearest to the plant boundary.

- Convective cooling of the heated surface and the effects of reflective paint on the containers were included.

- Bending of the fire plume towards the containers due to the effects of wind was also included.

The maximum temperatures calculated for the steel surface of the container in contact with vapor in different size containers were as follows:

Container Size Gal. (W.C.)	Maximum Temperature attained in 30 min exposure
1,000	660 °F
2,000	648 °F
4,000	507 °F
12,000	507 °F
18,000	437 °F
30,000	384 °F
60,000	340 °F

[1] Raj, P.K., "Exposure of a liquefied gas container to an external fire," Journal of Hazardous Materials, v122, Issues 1-2, p 37-49, June 2005.

The temperature at which the yield strength of steel of a propane tank begins to decrease is close to 800 ºF. Based on this, there is no threat of propane tank failure from thermal radiation from an external fire occurring at the minimum separation distances specified in Table 6.3.1.1 of NFPA 58.

CHAPTER 8

Evaluation of Fire Services and Water Supply Requirements

In this chapter the procedure for evaluating the capability and resources of the local fire department (FD) that would respond to an emergency at the LP-Gas facility is discussed. This evaluation includes the training of FD personnel, availability of suitable fire apparatus and equipment, and determination of water requirements if such a system were to be installed at the facility.

8.4 Details of the Fire Service

Use Form 8.1 to record the relevant data on personnel and resources from the local FD or fire company that is responsible for the area where the LP-Gas facility is located. This is a good opportunity to establish a working relationship with the fire department as you will need their support as you go forward with this planning and evaluation process and they will need to understand the facility to provide maximum assistance should an incident occur at the facility.

Analyzing the data from Form 8.1: The designation of the fire fighters as career personnel or volunteers has no bearing on the expertise of the department. The purpose of items 4 and 5 in Form 8.1 is to help determine how fast the initial help might be available. Career fire fighters are in the station and available to respond. Volunteer fire fighters may have to come from home or their place of business. Career fire fighters can normally have a piece of fire apparatus responding within one minute of receiving the call, volunteers may take 4-5 minutes to reach the station before they can respond.

Item # 6 helps determine the level of skill of the fire fighters in the fire department. NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, defines the expertise required of a fire fighter to be qualified to Levels I and II. A Level I fire fighter can do general fire fighting tasks under close supervision and a Level II fire fighter can do those and more tasks under general supervision.

Item # 7A is critical to determining if an effective operation can be conducted. For fighting a fire, at least two fire fighters are required for each 125 gpm hose line used. In addition, an incident commander, a safety officer, additional supervisory officers (depending on the size of the incident), and an operator for each piece of fire apparatus that is being used (pumping or performing some other function) is required. Also required is a rapid intervention crew (RIC) of 2 fire fighters when the first firefighting crew is deployed into a hazardous area, with that team growing to 4 fire fighters when the second and subsequent crews enter the hazardous area. The role of the RIC is to perform a rescue of one or more fire fighters that may be injured during the operation.

Item # 7B and Item # 7C help determine the training and knowledge of the fire fighters in hazardous materials and the specific hazards of LP-Gas. NFPA 472 is *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents*.

Form 8.1

Data on the Responding Fire Department

A	B		C
Item #	**Data Item**		**Data Entry**
1	Name of the Fire Department (FD).		Imperial County Fire Department
2A	Name of the person in the FD assisting with the data acquisition.		Andrew Loper
2B	Position of the person in the FD assisting with the data acquisition.		Fire Prevention Specialist
3A	Date on which FD data was collected.		04-08-2022
3B	Name of the person collecting the data.		Andrew Loper
4	Number of fire fighters on duty at any time.		3
5	Average number of fire fighters available for response.		3
6A	Number of fire fighters qualified to	"Fire Fighter I" level.	
6B		"Fire Fighter II" level.	3
7A	Number of fire fighters who would:	Respond on the first alarm to the facility.	4
7B		Respond on the first alarm and who are qualified to the operations level requirements of NFPA 472 or similar local requirements	4
7C		Respond on the first alarm with specific knowledge and training on the properties of LP-Gas and LP-Gas fires.	N/A
8A	Number of fire apparatus that have the capability to deploy a 125 gpm hose line supplied by onboard water for at least 4 minutes, and, which:	Are in service in the department.	27
8B		Would respond on a first alarm.	1

Item # 8A and Item # 8B help determine the capability of fire apparatus that will or could respond to an incident. A 125 gpm hose line is a typical hose line used for firefighting where the fire fighters are expected to advance and maneuver the line while it is flowing.

Response time: Another important consideration of the effectiveness of the Fire Department to respond to an incident is the time it takes the FD to reach the LP-Gas facility. Many fire departments have multiple fire stations or use mutual aid fire companies from other communities to assist them so resources are coming from different locations. It is therefore important to determine the total time for not only the first arriving apparatus but for subsequently arriving apparatus dispatched on the first alarm as well. You will need to work with the fire department and gather this information as well.

Using Form 8.2, determine the time for all resources that would be dispatched on the first alarm to an emergency at the facility. Start by identifying and listing in column A the fire companies that would respond on a first alarm to an emergency. Then, for each company record the time it would take to receive and handle an alarm, for the company to turnout, and the time to respond. If the fire department does not have data that can help, some good averages to use are:

- **Alarm Receipt & Handling Time** - 1 minute for the fire department first receiving the alarm and 3 minutes for mutual aid fire departments,
- **Turnout Time** - 1 minute if the apparatus is staffed by career fire fighters and 4 minutes if the apparatus is staffed by volunteer fire fighters,
- **Travel Time** - 2 minutes for each mile the fire apparatus must travel in an urban/suburban setting and 1.5 minutes for each mile the fire apparatus must travel in a rural setting.

Total the times in columns B, C, and D for each company and enter the sum in Column E. This response time will give you an idea of how long it will take resources to reach the facility gate. Fire fighters must then determine the nature and severity of the emergency, determine how they are going to deal with the emergency, maybe establish a water supply from a hydrant or other source, and implement their attack. This can take anywhere from a couple of minutes to upwards of 30 minutes.

8.5 Water Needs and Availability

The requirements for water to cool a container exposed to a fire are indicated in NFPA 15. A flow rate of 0.25 gpm/ft^2 (10 liter/min/m^2) is specified as being adequate to cool a LP-Gas container exposed to a fire. Since a majority of the containers in the LP-Gas facilities have container penetration for liquid inflow or liquid outflow at only one end of the container and since any product leak occurring at one end and a subsequent fire will affect only the end zone of a container, it has been assumed that the container surface within only one half length of the container needs to be cooled for an effective prevention of damage to the container. Also, calculate the total volume of water required on the basis of a stream flow time of 10 minutes.

Based on these parameters and the surface area of various size ASME containers, the cooling water rate requirements for each container size are determined using Form 8.3. Complete Form **8.6** with information relevant to the facility. Start by identifying the largest container at the facility. Assume that a fire occurs at the end of that container where the appurtenances for

product inflow and outflow are located, and determine whether other containers are within 50 feet of this largest container.

Identify the largest container at the facility and all stationary containers within 50 feet of the largest container. Record in column F of Form 8.3 the largest container. Next, record in Column F the two containers that are within 50 feet of the largest, **and** which have the most surface area exposed to the end of the largest container at which the appurtenances are installed. These are the containers, which are most likely to be affected by a fire occurring at the appurtenances of the largest container. Multiply the number of containers recorded in Column F by the required water flow rate per container in Column E and enters the result in Column G. Sum the values in Column G and enter the sum in Cell 2a, Column G. Round this number up to the next multiple of 125 (i.e. 725 gpm would round up to 750 gpm). This is done because the application of water by the fire department is generally going to be in increments of 125 gpm. Enter that figure in Cell 2b, Column G.

You have now determined the application rate for cooling water that is necessary if the largest container is subjected to fire. Add 250 gpm (Cell 3, Column G) for use by fire fighters to protect personnel when approaching the container or its valves to control the flow of product. Sum the numbers in Cells 2b and 3 of Column G. Enter that number in Cell 4, Column G.

To determine the total volume of water required for a 10-minute application time, multiply the total water flow rate in Cell 4, Column G by 10 and enter that figure into Cell 4, Column H.

Form 8.2

Response Time data for the Fire Departments

A	B	C	D	E
Company or Department	**Time in Minutes for**			
	Alarm Receipt & Handling	**Turnout**	**Travel**	**Total Time**
ICFD Station 9	N/A	1.34	5.00	6.34

Note: Number in Column E = Sum of numbers from Columns B through D.

Form 8.3

Water Flow Rate and Total Water Volume Required to Cool Containers Exposed to a Fire

A	B	C	D	E	F	G	H
Item #	ASME Container Size (gallons)	Total Surface Area of each Container[1] (ft^2)	Surface Area of each container to be Cooled (ft^2)	Water flow rate required per container (gpm)	Number of containers of the size indicated[2]	Total Water flow rate required (gpm)	Total volume of water required for 10 min (gal)
1	500	86	43	10.8	0		
	1,000	172	86	21.5	0		
	2,000	290	145	36.3	0		
	4,000	374	187	46.8	0		
	6,500	570	285	71.3	0		
	9,200	790	395	98.8	0		
	12,000	990	495	123.8	0		
	18,000	1,160	580	145.0	0		
	30,000	1,610	805	201.3	1	203.1	
	45,000	2,366	1,183	295.8	0		
	60,000	3,090	1,545	386.3	0		
	90,000	4,600	2,300	575.0	0		
	Other Size						
2a	Calculated water flow rate for container protection					203.1	
2b	Water flow rate rounded up to nearest multiple of 125						
3	Water for fire fighter protection, if required					250	
4	Total water flow rate and volume					453.1	4531.00

Note: Column D = (1/2) x Column C Column E = 0.25 (gpm/ft^2) x Column D ;

Column G = Column F x Column E Column H = 10 x Column G

Line 2a, Column G and Column H are the sum of numbers in each row above line 2 of each column.

Line 4, Column G and Column H are the sum of numbers in rows 2b and 3.

[2] Consider only 3 containers for water supply evaluations even if the number of containers in a group is more than 3. See Section 8.2.

1 ASME container approximate dimensions

The total water requirement for the facility is indicated in item 4, column G (water flow rate) and column H (total water volume or quantity) of Form 8.3. If multiple groups of containers are present in the facility, repeat the calculations in Form 8.3 for each group of containers. The total water requirement for the facility is the largest value for any single group of containers.

Water Availability Evaluation

If a water system is installed, Form 8.3 calculates the total water requirement for a 10-minute duration. This time period allows for manual shutdown, rescue of any injured, and the possibility of dispersing unignited gas.

If there is a public or private water supply with hydrants available within 1000 feet of the container or containers on which water will be applied, determine the available flow rate from that system with 20 psi residual pressure. The water company may have flow test data or it may be necessary to conduct flow tests. If that flow rate is equal to or greater than the needed flow rate determined using Form 8.3, you can assume your water supply is adequate. If the hydrant flow rate is less than the needed flow rate, determine what other sources of water are available. Sources fall into two categories: water on fire apparatus responding to the incident, and water in rivers, ponds or lakes near the facility. Start by talking with the fire department about whether they have a tanker shuttle capability. Some departments have well-organized operations that can deliver 250 gpm or more on a continuous basis using tanker shuttles. This may be the only capability available or it may be a supplement to a weak hydrant system. Be sure to determine how long it would take to get the water shuttle established.

If there is a river, pond or lake in the area, the fire department may be capable of drafting from that water source and pumping water through hose lines to the facility. There are a number of things that need to be considered before relying on this type of water supply.

6. Can a fire apparatus get close enough to the water source to reach the water with the suction hose it carries (normally 20 feet) and not have the lift (distance from the surface of the water to the center of the pump) greater than 10 feet?
7. Is the water source available year round? Does it dry up in the summer or freeze in the winter? The strainer on the suction hose needs to be at least 2 feet below the surface of the water.
8. Is the water source of adequate size or flow to supply the water needed?
9. Does the fire department have the hose and pumping apparatus to relay the water from the source to the fire?
10. How long will it take to set up this relay?

These factors should be evaluated and discussed with the fire department before any decision is made to use such a supply. It might also be useful to have the fire department conduct an actual timed drill to deliver the needed water supply to the facility site using the normally responding complement of personnel and equipment.

Complete Form 8.4 to document the water supply that will be available to the facility site.

Form 8.4

Evaluation of Water Availability in or Near the LP-Gas Facility

A	B	C	D		
Item #	**Water from...**	**Available?**	**Quantitative information**		
1	Public supply or from another piped-in supply through one or more fire hydrants in or near the facility	X Yes ☐ No	Hydrant data	Distance from Container(s) on which water will be applied (feet)	Available water flow rate from all hydrants(1) (gpm)
			Hydrant 1	800	1250
			Hydrant 2	Aprox 1000	
			Hydrant 3	0	
2	A nearby static water source (stream, pond, lake, etc).	☐ Yes X No	Distance to water source = 0 Feet Time to set up relay = 0 min. Rate of delivery = 0 gpm		
3	Only through mobile water tanker shuttle.	☐ Yes X No	Time to set up shuttle = 0 min. Sustainable flow rate = 0 gpm		

(1) Obtain the available flow rate from the local municipal water authority or the entity that supplies water to the hydrant or conduct a test to determine total available flow rate.

Having the water available does not guarantee that the fire department has the resources to apply the water in a timely manner. Completed Form 8.2 will indicate how much time it will take for the fire department to have initial resources at the facility and how long before additional resources will be on-site. If the capability to apply cooling water within the first 10 minutes of initial fire exposure to the container is not present, extremely dangerous conditions could begin to develop. Note that it will take several minutes after the apparatus arrives at the facility gate before cooling water is actually applied to the containers and that hand held hose lines will be used with water supplied from the water tank on the apparatus. Even if hydrants are available, the staffing on the first arriving fire apparatus will probably not be sufficient to establish a water-supply from the hydrant. Depending on the hydrant system and the fire department's standard operating guidelines, it may be necessary to connect a pumper to the hydrant. If the distance is over 1000 ft. it may also be necessary to use hose from more than one fire apparatus to reach the hydrant and in some cases, to use intermediate pumpers in the hose line to boost the pressure.

Form 8.1 contains information on responding apparatus capable of applying 125 gpm for 4 minutes. This is adequate to begin operations for a single container of 30,000 gallons or less water capacity if no other adjacent containers are exposed to the fire. However, a continuous water supply then has to be established within that 4 minutes or other apparatus must be available with onboard water to continue the cooling until a continuous water supply is set up. A larger facility or multiple containers exposing each other is a different situation. In those cases, cooling water may need to be applied using larger hand held hose lines or ground monitors to achieve the reach necessary with the water stream. Both of these require considerably more water than may be supplied by 125 gpm hose lines. Unless a hydrant system with an adequate flow rate is readily available, the time needed to establish an adequate water supply from remote hydrants, a relay operation from a static water source, or a sustainable tanker shuttle operation will greatly exceed the initial 10 minutes of fire exposure to the container and dangerous conditions could begin to develop. For these facilities, a fixed water spray system is the only practical means by which adequate protection can be provided to installations consisting of multiple 30,000 gallon or larger containers.

Using the data you have gathered, it is recommended that you discuss with the fire department the resources available to protect the facility. This would include evaluating the knowledge and training of the fire fighters who would be arriving at the facility.

1) For an existing facility, communicate this information to local responders for inclusion in their emergency planning.

2) For a proposed new facility, refer to Chapter 9

CHAPTER 9

Evaluation Summary for a Proposed New LP-Gas Facility

In this chapter the results of analyses performed in Chapter 4 through Chapter 8 for a proposed (new) LP-Gas facility are summarized. If noncompliance with NFPA 58-2017 is found, the design must be altered to bring the proposed facility into compliance. In some cases, several alternative approaches for complying with the code are presented.

Complete Form 9.1, Form 9.2 and Form 9.3 (and if necessary, Form 9.4 and Form 9.5) and implement any necessary changes to the design to bring the new facility into compliance with the code.

Form 9.1
Analysis Summary on Product Control and Local Conditions of Hazard

A	B	C	D	E
Item #	**CHAPTER Title**	**Section & Title**	**Reference FORM #**	**Number of "No" checked**
1	Product Control Measures in Containers & Transfer Piping	5.1: Product Control in Containers	5.1 or 5.2	0
		5.2 Product Control in Transfer Piping	5.3	0
			5.4	0
			5.5	0
			5.6	0
			5.7	0
2	Analysis of Local Conditions of Hazard	6.1 Physical Protection Measures	6.1	0
		6.2 Ignition Source Control	6.2	0
		6.3.1 Separation distances; Container and outside exposures	6.3	0
		6.3.2 Separation distances; Transfer points and outside exposures	6.4	0
		6.4 Special Protection Measures	6.5	0
			6.6	0

§ The number of "No" for Forms from Chapter 5 is the difference between the required number of appurtenances according to NFPA 58-2017, and a lesser number found to be actually installed on the container or the transfer piping.

If, in any row of column E ("No") of Form 9.1, the entry number is greater than zero, the proposed LP-Gas facility is not in compliance with the requirements of NFPA 58-2017 for product control appurtenances or other safety measures. The design of the proposed facility must be modified to conform to the code requirements. In addition, the following items should be noted.

- If there are any "No" checks in Form 6.3, then the separation distance requirements for containers are not satisfied. An option that may be considered is the reduction in separation distance to 10 feet for underground and mounded containers by providing "Redundant and Fail-Safe Product Control Measures." In this case, complete Form 9.4 below to ensure that each requirement of "Redundant and Fail-Safe Product Control Measures" is provided.

- If there are any "No" checks in Form 6.4, then the separation distance requirements for transfer points are not satisfied. In this case, relocate the transfer points so that the separation distances conform to the code requirements or provide the Low Emission Transfer Equipment. Complete Form 9.5 below and ensure that all requirements for Low Emission Transfer Equipment are fulfilled.

Form 9.2
Analysis Summary on Exposure from and to the LP-Gas Facility

A	B	C	D	E
Item #	**CHAPTER Title**	**Section & Title**	**Reference FORM #**	**Number of "Yes" checked**
1	Exposure to and from Other Properties	7.1 Exposure to off-site properties and persons from in-plant propane releases	7.1	0
		7.2 Exposure to propane facility from external events.	7.2	0

If the entry number in column E ("Yes"), Form 9.2 corresponding to Form 7.1 is greater than zero, consider one or more of the following design alternatives.

5 Consider moving the container or the transfer point to a different location, if possible and space exists, so that the property or the person is beyond the hazard distance.
6 Provide "Redundant and Fail-safe Product Control Measures". Complete Form 9.4 to ensure compliance.
7 Institute other technical measures such as installing gas and flame detectors (connected to facility shut down systems), sounding alarm outside facility premises, etc.
8 Institute administrative controls such as additional training for personnel, more frequent inspections of hoses and transfer piping, etc.

If the entry number in column E ("Yes"), Form 9.2 corresponding to Form 7.2 is greater than zero, consider one or more of the following design alternatives.

3 Implement procedures to monitor neighboring activity.
4 Install means in the adjacent plant to shut down the LP-Gas plant in case of an emergency in that plant.

Form 9.3
Analysis Summary on Fire Department Evaluations

A	B	C	D	E	F
Item #	**CHAPTER Title**	**Section & Title**	**Reference FORM #**	**Number "zeros" entered in Column C, Lines 6 through 8 of Form 8.1**	**Number of "Yes" checked in Column C of Form 8.4**
1	Fire department capability, adequacy of water supply and Emergency Planning	8.1 Data on the Fire Department	8.1	0	1
2		8.2 Fire response water needs and availability	8.4		1250

If the entry number in row 1, Column E of Form 9.3 is greater than zero, consider one or more of the following design alternatives.

4 Discuss with the local Fire Department the needs of the LP-Gas facility and the evaluation results on the capability and training inadequacies of the Department.

5 Consider developing a cadre of personnel within the LP-Gas facility to respond to emergencies.

6 Institute container special protection system based on active protection approaches or passive approaches. Complete Form 9.6 and Form 9.7 below.

If the entry number in row 2, Column F of Form 9.3 is equal to zero, consider one or more of the following design alternatives.

1 Provide special protection (other than water spray or monitor systems) to containers, satisfying the requirements of section 6.27.5 of NFPA 58, 2017 edition. Complete Form 9.6 to ensure compliance.

2 Consider implementing the various options indicated in Table 9.1.

Form 9.4
Redundant and Fail-Safe Design for Containers

A	B		C	D	E	F
Item #	Description		Features	Proposed for the facility?		NFPA 58 Section Reference (2017 Edition)
				Yes	No	
1	Container sizes for which the appurtenances are provided		Appurtenances and redundant fail-safe equipment are provided for each container of water capacity 2,001 gal through 30,000 gal	X		6.28.3 and 6.28.4
2	Liquid or vapor withdrawal (1-1/4 in. or larger)		Internal valve having internal excess flow valve	X		6.28.3.1 and 6.28.3.2
			Positive shutoff valve installed as close as possible to the internal valve	X		6.28.3.4
3	Liquid or vapor inlet		Internal valve having internal excess flow valve or Backflow check valve	X		6.28.3.5
			Positive Shutoff Valve installed as close as possible to the Internal Valve or the back flow check valve	X		6.28.3.5
4	Railcar transfer	Flow into or out of railroad tank car	Emergency shutoff valve installed in the transfer hose or the swivel-type piping at the tank car end.	N/A	N/A	6.19.2.6 (1) and 6.28.4.1
		Flow only into railroad tank car	Emergency shutoff valve or backflow check valve installed in the transfer hose or the swivel-type piping at the tank car end.	N/A	N/A	6.19.2.6 (2) and 6.28.4.1
5	Cargo tank transfer		Protection provided in accordance with 6.28.4.1	X		6.28.4.1
6	Automatic closure of all primary valves (IV & ESV) in an emergency		By thermal (Fire) actuation	X		6.28.4.2
			Actuated by a hose pull-away due to vehicle motion	X		6.28.4.2
7	Manually operated remote shutdown of IV and ESV		Remote shutdown station within 15 ft of the point of transfer?	X		6.28.4.3 (A)
			Another remote shutdown station between 25 ft and 100 ft of the transfer point?	X		6.28.4.3 (B)
			Shutdown stations will shut down electrical power supply to the transfer equipment and all primary valves (Internal and Emergency Valves)	X		6.28.4.3
			Signs complying with the requirements of 6.28.4.3 (C) provided?	X		6.28.4.3 (C)

Note: If your facility does not have a rail terminal, write the word NA in both the "Yes" column and the "No" column in item 4 of the form in the railroad tank car row. Similar option is also available if there is no cargo tank vehicle transfer station.

Form 9.5
Evaluation of Low Emission Transfer Equipment

A	B	C		D	E	F
Item #	**Description**	**Features**		**Proposed for the facility?**		**NFPA 58 Section Reference (2017 Edition)**
				Yes	**No**	
1	Transfer into permanently mounted ASME containers on vehicles	Delivery nozzle and filler valve-max. liquid release after transfer of 4 cm^3 (0.24 in^3).	Fixed maximum liquid level gage not used during transfer operations	X		6.28.5.3 (A) & (B)
2	Transfer into stationary ASME containers delivery valve and nozzle combination	During product transfer or post transfer uncoupling of the hose, liquid product volume released to the atmosphere	Does not exceed 4 cm^3 (0.24 in^3) from a hose of nominal size 1 in or smaller	N/A	N/A	6.28.5.4 (A)
			Does not exceed 15 cm^3 (0.91 in^3) from a hose of nominal size larger than 1 in.	X		6.28.5.4 (B)
3	Transfer into stationary ASME containers maximum filling limit	Do containers less than 2,001 gal (w.c.) have an overfilling prevention device or another approved device?		N/A	N/A	6.28.5.4 (F)
		Do containers 2,001 gal (w.c.) or greater have a float gage or other non-venting device?		X		6.28.5.4 (E)
4	Transfer into stationary ASME containers fixed maximum liquid level gage	Not used during routine transfer operations but may be used in calibrating other non-venting liquid level gauges in the container		X		6.28.5.4 (C) & (D)

Note: If the facility does not have a particular feature described in items 2 or 3, write "NA" in both the "Yes" and "No" columns corresponding to its row .

Form 9.6
Special Protection Measures – Passive Systems

A	B	C	D		E
Item #	Special Protection Option	Question	Proposed for the facility?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Container insulation	Insulation provided on each of the containers?		X	6.27.5.1
		Insulation material complies with the requirements of NFPA 58?	N/A	N/A	6.27.5.1 and 6.27.5.2
2	Mounding of containers	Each container in the facility is mounded?	N/A	N/A	6.27.5.3
		Mounding complies with each requirement under section 6.6.6.3 of NFPA 58.	N/A	N/A	6.6.6.3 and 6.27.5.3
3	Burying of containers	Each container in the facility is buried?	N/A	N/A	6.27.5.4
		Buried containers comply with each requirement under section 6.6.6.1 of NFPA 58.	N/A	N/A	6.6.6.1 and 6.27.5.4

Form 9.7
Special Protection Measures – Active Systems

Item #	Special Protection Option	Question	Is the Facility compliant?		NFPA 58 Section Reference (2017 Edition)
			Yes	No	
1	Water spray systems	Are fixed water spray systems, complying with NFPA 15 requirements, used for each container in the facility?		X	6.27.6.1
		Do fire responsive devices actuate water spray system automatically?	N/A	N/A	6.27.6.2
		Can the water spray systems be actuated manually also?	N/A	N/A	6.27.6.2
2	Monitor nozzle systems	Are the monitor nozzles located and arranged so that the water stream can wet the surfaces of all containers exposed to a fire?	N/A	N/A	6.27.6.3
		Can the water stream from a monitor nozzle reach and wet the entire surface of, at least, one half of a length from one end of each of the containers it is designed to protect?	N/A	N/A	6.27.6.3
		Do fixed monitor nozzles comply with NFPA 15 requirements?	N/A	N/A	6.27.6.1
		Do fire responsive devices actuate the monitor nozzles?	N/A	N/A	6.27.6.2
		Can the monitor nozzles be actuated manually also?	N/A	N/A	6.27.6.2

Equivalent Protection to a Water Supply for Industrial and Bulk Facilities

In the case where water supply is not available in or near the LP-Gas facility, or is inadequate or it is prohibitively expensive to connect to a public or private water supply hydrant, alternative methods for providing protection should be considered. In lieu of providing a water supply, several alternatives are indicated in Table 9.1, which can offer an equivalency to a water supply system.

The intent of the controls identified in Table 9.1 is to maintain the entire system as a gas tight entity. These methods include reducing the service life of equipment, increasing the design pressure rating of the system beyond the requirements of NFPA 58, or providing early detection and isolation of the system to ensure product control. This list is not exhaustive and is not ranked in an order of priority.

Table 9.1

Suggested Alternative Methods for Industrial and Bulk Plants That Do Not Pose a Hazard But Lack a Water Supply

Item #	Possible options to implement when adequate water supply is not available
1	Reduce the service life of hoses.
2	Increase frequency of equipment inspection.
3	Establish a service life program for the maintenance of the container pressure relief devices. This could include the installation of a listed multiple port valve and certifying that the relief devices are properly set and maintained every 5 to 10 years.
4	Increase the design strength of the piping and fitting systems.
5	Install emergency shutoff valves in conjunction with container internal valves.
6	Install emergency shutoff valves downstream of transfer pump outlets and upstream of the vapor and liquid valves at the bulkhead.
7	Install pneumatic tubing along the facility boundary to serve as a perimeter fire detection system. This would provide protection of the facility against exposure fires.
8	Provide optical flame detection or linear heat detection, or a gas detection system connected to an isolation valve installed downstream of every liquid and vapor nozzle on the container. This system could also be monitored to send a signal to an alarm company that notifies the fire department of an event.
9	Increase the separation distances of internal facility exposures to the container. These exposures would include a site dumpster, idle or waste pallets and combustibles, and increasing the parking distances between the bobtails and transports in relation to the container.
10	Relocate overhead power lines away from all container and cylinder storage areas to protect against ignition in the event of a line dropping due to wind or power pole impact.
11	Eliminate all combustible vegetation within 30 feet of the LP-Gas container. This can be accomplished using gravel, or paving the site yard.
12	Install tanks using the mounding or burial method.

Initial Data on the LP-Gas Facility

APPLICATION

CONDITIONAL USE PERMIT

I.C. PLANNING & DEVELOPMENT SERVICES DEPT.
801 Main Street, El Centro, CA 92243 (760) 482-4236

- APPLICANT MUST COMPLETE ALL NUMBERED (black) SPACES – Please type or print -

1. PROPERTY OWNER'S NAME: Jesus and Liliana Aguirre (Aguirre's Propane LLC)		EMAIL ADDRESS: aguirres.propane@yahoo.com	
2. MAILING ADDRESS (Street / P O Box, City, State): P.O Box 2822 Indio, CA	ZIP CODE: 92202	PHONE NUMBER: (760) 578-4724	
3. APPLICANT'S NAME: Jesus and Liliana Aguirre (Aguirre's Propane LLC)		EMAIL ADDRESS: aguirres.propane@yahoo.com	
4. MAILING ADDRESS (Street / P O Box, City, State): P.O Box 2822 Indio, CA	ZIP CODE: 92202	PHONE NUMBER: (760) 578-4724	
4. ENGINEER'S NAME: Vang Chang	CA. LICENSE NO.: 248449	EMAIL ADDRESS: Vang@meeder.com	
5. MAILING ADDRESS (Street / P O Box, City, State): 3495 S. Maple Ave Fresno, CA	ZIP CODE: 93725	PHONE NUMBER: (800) 448-6817	

6. ASSESSOR'S PARCEL NO.: 014-031-005-000	SIZE OF PROPERTY (in acres or square foot): 1.05 Acres	ZONING (existing): M-1
7. PROPERTY (site) ADDRESS: 1338 Glendale Ave		
8. GENERAL LOCATION (i.e. city, town, cross street): Thermal		
9. LEGAL DESCRIPTION: Lot 7 Block 07 Tract 570 FM 5 28		

PLEASE PROVIDE CLEAR & CONCISE INFORMATION (ATTACH SEPARATE SHEET IF NEEDED)

10. DESCRIBE PROPOSED USE OF PROPERTY (list and describe in detail):	LPG Bulk Plant: storage and distribution of LPG Gas for commercial business purposes, (see attachment).
11. DESCRIBE CURRENT USE OF PROPERTY	Vacant land
12. DESCRIBE PROPOSED SEWER SYSTEM	N/A
13. DESCRIBE PROPOSED WATER SYSTEM	N/A
14. DESCRIBE PROPOSED FIRE PROTECTION SYSTEM	Local Fire hydrant per fire safety analysis
15. IS PROPOSED USE A BUSINESS? ☒ Yes ☐ No	IF YES, HOW MANY EMPLOYEES WILL BE AT THIS SITE? Two (2) during transfer operation only

I / WE THE LEGAL OWNER (S) OF THE ABOVE PROPERTY CERTIFY THAT THE INFORMATION SHOWN OR STATED HEREIN IS TRUE AND CORRECT.

Jesus Aguirre — Print Name — 10-5-2022 — Date
Signature

Liliana Aguirre — Print Name — 10-5-2022 — Date
Signature

REQUIRED SUPPORT DOCUMENTS

A. SITE PLAN
B. FEE
C. OTHER
D. OTHER

APPLICATION RECEIVED BY:	[signature]	DATE: 10/10/22	REVIEW / APPROVAL BY OTHER DEPT'S required.
APPLICATION DEEMED COMPLETE BY:		DATE:	☐ P. W.
APPLICATION REJECTED BY:		DATE:	☐ E. H. S.
TENTATIVE HEARING BY:		DATE:	☐ A. P. C. D.
FINAL ACTION: ☐ APPROVED ☐ DENIED		DATE:	☐ O. E. S. ☐ ☐

CUP # 22-0021 / LS 22-0035

Jesus & Liliana Aguirre (Aguirre's Propane, LLC)

Project Description

Location: 1338 Glendale Avenue, Salton City, CA 92274

APN: 014-031-005-000

Lot Size: 1.05 AC

Zone: M-1 (Light Industrial)

Description:

We, Jesus and Liliana Aguirre (Aguirre's Propane, LLC) propose the construction and operation of a (30) thirty thousand Liquefied Petroleum Gas (LPG) bulk plant on the addressed site listed above to store and distribute Liquid Propane Gas for commercial business purposes.

Our company is expecting to receive a bulk delivery of Liquid Propane Gas on an annual average once every two weeks. Liquid Propane Gas will be stored in a (30) thirty thousand gallon Propane Gas tank on the proposed site with guard posts around it. The LPG property will be fenced all around with chain link fence. We will receive bulk delivery of Liquefied Petroleum Gas (LPG) to refill company's bobtail trucks of 2300 and 2600 gallon capacity for dispensing fuel (LPG) to company customer's residences and business locations. The company will be using two bobtail trucks for business operations.

Aguirre's Propane, LLC will NOT be dispensing fuel (LPG) to the public at this location therefore there will be no public access at this location. The refilling operations of company's bobtail trucks will be twice a week on an average annual basis. The refilling procedures should take approximately two (2) hours from 7am to 9am on Monday, Wednesday, or Friday. There shall be two company personnel during the refilling of company's bobtail trucks.

We will be using Service Road and Glendale Avenue on their routes and travels to the LPG bulk plant. Aguirre's Propane, LLC plans on continuing providing service to our current service area throughout the Coachella Valley and grow our business operations in the Salton City and surrounding communities.

Jesus Aguirre & Liliana Aguirre

(Aguirre's Propane, LLC)

RECEIVED
OCT 10 2022
IMPERIAL C
PLANNING & DEVELOPMENT SERVICES

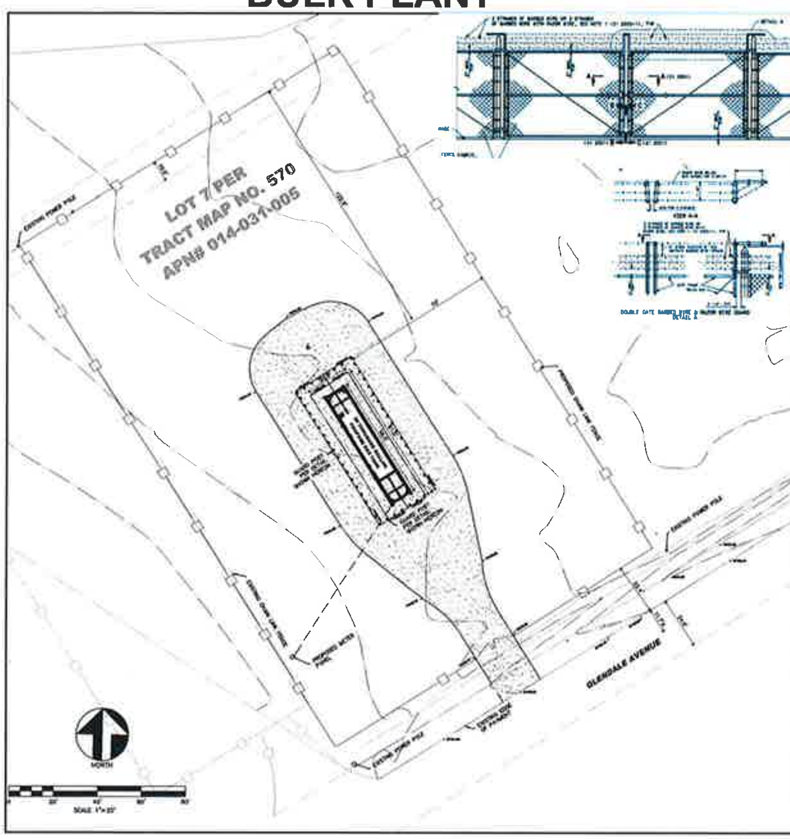
GRADING NOTES

FIRE HYDRANT LOCATION:

BASIS OF BEARINGS
CENTERLINE OF GLENDALE AVENUE BEING N37°34'00"E PER TRACT NO 570, FILED IN THE COUNTY OF IMPERIAL

IN THE COUNTY OF IMPERIAL, STATE OF CALIFORNIA

BULK PLANT



PROJECT:
LOT 7 PER TRACT NO. 570
APN:014-031-005
1338 GLENDALE AVENUE
THERMAL, CA. 92274
760-578-4724

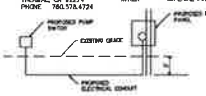
FEMA FLOOD ZONE:
FLOOD ZONE: ZONE X
PANEL: 06025C0336C
DATE: 9/28/2008
ZONE DEFINITION: ZONE X, AREA OF MINIMAL FLOOD HAZARD

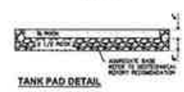
CIVIL ENGINEER
JESUS CERVANTES
83346 LONE STAR ROAD
MECCA, CA. 92254
PHONE: 760.550.4233
EMAIL:INFO@CERZA.BIZ

OWNER:
JESUS AGUIRRE
1338 GLENDALE AVENUE
THERMAL, CA 92274
PHONE 760.578.4724

EARTHWORK CALCULATION
(CONTRACTOR IS RESPONSIBLE FOR COMPUTING HIS OWN QUANTITIES FOR BIDDING PURPOSES)
RAW CUT: XX C.Y.
RAW FILL: 60 C.Y.

UTILITIES
ELECTRIC IMPERIAL IRRIGATION DISTRICT
WATER IMPERIAL IRRIGATION DISTRICT





TANK PAD DETAIL

GUARD POST DETAIL

LEGEND
- PROPOSED STORM DRAIN
- PROPERTY LINE
- SWALE
- PROPOSED ELEVATION
- PROPOSED BLOCK WALL
- EXISTING BLOCK WALL
- PROPOSED GRAVEL
- EXISTING CONCRETE
- EXISTING CONTOUR
- EXISTING SEWER LINE
- EXISTING WATER LINE
- EXISTING ELECTRIC BOX
- EXISTING TELECOMMUNICATIONS BOX
- EXISTING CHAIN LINK FENCE
- EXISTING SEWER MANHOLE
- EXISTING SIGN POST
- EXISTING WATER VALVE
- EXISTING TELEVISION RISER
- PROPOSED WATER METER
- PROPOSED GUARD POST

ABBREVIATIONS
RH – RETAINED HEIGHT
HP – HIGH POINT
FG – FINISHED GRADE
FF – FINISHED FLOOR
FS – FINISHED SURFACE
PAD – PAD ELEVATION
TC – TOP OF CURB
FL – FLOWLINE
TW – TOP OF WALL
TF – TOP OF FOOTING
DF – DEEPENED FOOTING
TP – TOP OF PAVEMENT
GB – GRADE BREAK
TG – TOP OF GRATE
INV – INVERT ELEVATION
BSL – BUILDING SETBACK LINE
TAC – TOP OF ASPHALT CURB
NG – NATURAL GRADE
TMH – TOP OF MANHOLE

DIG ALERT
UNDERGROUND SERVICE ALERT

NO.	REVISION	DATE	APPR

BENCH MARK: ELEV.
DESCRIPTION:
BEING THE SOUTH WEST CORNER OF UTILITY CONCRETE PAD LOCATED 8' SOUTH WEST FROM THE NORTH WEST CORNER OF LOT 7 PER TRACT NO. 570

APPROVED BY
DATE:
DIRECTOR OF ENGINEERING/PUBLIC WORKS

SEAL

PREPARED BY:
JESUS CERVANTES, PE DATE: 08/23/2022

JESUS CERVANTES
83346 LONE STAR ROAD
INDIO, CA. 92203
DATE PREPARED: 08/23/2022
EMAIL: INFO@CERZA.BIZ
TELEPHONE # (760)550-4233

SITE PLAN/GRADING PLAN FOR GLENDALE AVENUE
LOT 7, PER TRACT NO. 570

SHEET 1 OF 1 SHEETS