Attachment Item 1





HAZARDOUS MATERIALS COMMODITY FLOW STUDY WITH SPECIAL FOCUS ON SEA LEVEL RISE AND FLOOD RISK CONTRA COSTA COUNTY CALIFORNIA

Contra Costa Health Services Hazardous Materials Programs Tait Environmental Services, Inc.

August 2019

Primarily prepared and edited by

Tait Environmental Services, Inc. In Cooperation with the Contra Costa Health Services Hazardous Materials Programs

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Hazardous Materials Commodities Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019 Contra Costa Health Services, Hazardous Materials P

Contra Costa Health Services, Hazardous Materials Programs TAIT Environmental Services, Inc.

1.0 Introduction

The project consisted of the completion of an initial Hazardous Materials Commodities Flow Study (Flow Study), the results of which were utilized to prepare a Community Risk Assessment for Hazardous Materials (CRA) for Contra Costa Health Services, Hazardous Materials Programs (CCHSHMP). The project was restricted to the coastal areas of the Contra Costa County in areas affected by rising iddes.

1.1 Project Objectives

The proposed overall structure for the completion of the project covered two (2) distinct areas of focus. An initial Flow Study was completed, and the results of the Flow Study were utilized by opepare a CRA for the coastal areas of Contra Costa County. The objective of the Flow Study portion of this project was to determine the potential effects/consequences of a Chamical spill on critical and vulnerable populations and facilities in the coastal cities of Contra Costa County. The primary focus of the Flow Study was to look at this with respect to rail county where the rail lines may be susceptible to rising ides and flooding risks from changes of hazardous chemicals were being transported through the County helped to determine what types of hazardous chemicals were being transported through the County via rail. Three chemicals of noncell (COS) were determined from the railroad data, and these chemicals (ammonia/anhydrous ammonia, propane, and sulfuric acid) were used in the plume analysis in the CRA portion of this report.

Utilization of this information allowed for the study to focus on and determine a series of vulnerable points ("pinch points"), primarily along the rail lines. Additional information used to locate the pinch points consisted of a review potential flooding due to rising tides, with information available from the Adapting to Rising Tides Program, locations of critical facilities and vulnerable populations, areas of high probability of liquefaction resulting from earthquakes, and specific arterial roads that could be affected by disruption of rail transport of hazardous materials. Once specific pinch points were located, a comprehensive CRA was performed to assess worst-case scenarios related to a COCs incident at these locations. The infrastructure.

The objective of the CRA portion of the project was to utilize the data obtained from the Flow Study to determine the potential impacts of a hazardous materials accident/incident to the most vulnerable populations and critical facilities (vulnerability zones) within the hazardous materials transportation corridors in Contra Costa County. The data from the Flow Study and the CRA were somewhat overlapping and have been combined herein within a single comprehensive report with conclusions regarding projected trends in the transportation of hazardous materials through the county relative to projected sea level rise and flood risk, as well as provide guidance to the CCHSHMP and Region II LEPC with respect to equipment accidentifinicident/disaster within coastal Contra Costa County.

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Project Background 7

In November 2016, a two-year project sponsored by San Francisco Bay Conservation and Development Commission titled Adapting to Rising Titles (ART) was completed. The ART Program conducted a climate adaptation planning effort in Contra Costa County, which built understanding of projected risk due to sea level rise and developed planning objectives for the diverse challenges and opportunities presented by adapting to sea level rise in the County. This project included areas of the county that interface with the San Francisco Bay, which include areas extending from Richmond to Bay Point.

be impacted by sea level risefflooding and how that can increase our risk for hazardous materials incidents that can affect the health and safety of our community. Understanding how transportation disruptions can impact the County-wide system will benefit hazardous materials emergency response planning and overall shoreline planning as the actions from the ART After the completion of the initial Contra Costa County Adapting to Rising Tides program, it understanding on how major hazardous materials transportation, such as our rail system, can was clear that the County must act to identify risks that exist within the shoreline, specifically in regard to hazardous materials. This project, titled Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk, was needed to foster a greater project are implemented.

resources. CCHSHMP is currently participating in the Bay Area Wide Adapting to Rising Trides program, as a hazardous materials representative, along with Michael Kent the Hazardous Materials Ombudsman, as well as the East Contra Costa County program, which is slated to This project will interface with the overall goals of the County's Hazardous Materials Programs. The CAER (Community Awareness Emergency Response) organization will be engaged to obtain collaboration with our Industry partners in the County to get needed input and data regarding their current transportation contingency planning for flooding. This also will maximize the benefit of the project as well as maximize cooperation with needed conclude at the end of 2019. With the conclusion of these additional ART programs, all areas of Contra Costa County will be addressed. Data from these additional programs, while not fully completed at the time of the Flow Study competition, have been utilized as part of the

disruption of transportation due to sea level rise/flooding as predicted by the Adapting to Rising Tides program. Identifying these issues will help the County to better address and plan Goals of the project include identifying risks from hazardous materials release due to possible for hazardous materials releases in order to protect and promote health, safety, and wellbeing of Contra Costa residents. The final project report will be published and made available for hazardous materials emergency planning as well as the Bay Area wide Adapting to Rising Tides program and other applicable transportation related planning.

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Historical Information

Background historical information used in preparing both the Flow Study and CRA portions of this project was obtained from the following sources:

- Hazardous Materials Transportation Study for Contra Costa County, 2005; and Highway flow study data from Marin and Solano Counties.

Hazardous Materials Transportation Study 2005 2.1

A Hazardous Materials Transportation Study was performed on the County in 2004 and 2005. The reference for the study is as follows:

of Health Services, Environmental Health Investigations Branch, 2005, Hazardous Contra Costa Health Services, Hazardous Materials Programs and California Department Materials Transportation Study for Contra Costa County, CA, 71 p. The study was a two-part investigation, which included a railroad transportation survey, and a highway transportation survey. Details of these surveys are outlined in the sections below.

2.1.1 Railroad Data

Two railroads are the primary transportation railroads in Contra Costa County, Union Pacific Railroad (UP), and Burlington Northern and Santa Fe Railway (BNSF). Railway data from UP covered the period from January through December 2004, and the data from BNSF covered the period from April 1, 2004 through March 31, 2005. Most of the hazardous materials loads were carried on the following rail segments:

- 9
- Martinez-Davis Martinez-Tracy 0
- Oakland-Martinez

0

- BNSF
- Richmond-Port Chicago Port Chicago-Pittsburg 0
 - Pittsburg-Stockton

The data covering the maximum loads via any Contra Costa rail shipment is contained in Table 14 of the study, and is listed under the Standard Transportation Commodity Code (STCC), which is specific to rail transportation, and is shown below.

Table 14: Hazardous Materials by STCC number – Maximum Loads - any Contra Costa Rail Segment *

					8.0
STCC#	Description	Loads	STCC#	Description	Loads
4950130	FAK-HAZARDOUS MATERIALS	10773	4910102	ALCOHOLIC REVERAGES	7.2
4905752	PETROLEUM CASES, LIQUEFIED	5639	4901110	CARTRIDGES FOR WEAPONS	12
4950150	FAK-HAZARDOUS MATERIALS	3797	\$807273	VINYL ACETATE STARILIZED	89
6909152	ALCOHOLS, N.O.S.	2950	4935635	2-(2-AMINOFTHOXY) ETHANOL	6
4930040	SULFURIC ACID	2320	4832376	BISULFITES AC. SOLN, N.O.S.	88
4901907	CARTRIDGES FOR WEAPONS	1570	4914251	PAINT	8
(920523	CHLORINE	850	4908177	GASOLINE	2
4905423	BUTANE	796	4936653	CORROSIVE LIQUIDS, N.O.S.	0.5
4961605	ELEVATED TRMP LIQUID-N.O.S	362	4910535	FLAMMABLE LIQUIDS, N.O.S.	25
4901271	PROJECTALES	747	4905417	LIQUEFIED PETROLEUM GAS	1
4935240	SODICM HYDROXIDE SOLUTION	701	4930248	PHOSPHORIC ACIB, LIQUID	629
4905421	PROPANE	663	49-4256	PETROLEUM DISTILLATES-N.O.S.	69
4930228	HYDROCHLORIC ACID	634	4936558	BATTERIES, WET, FILLED WITH AGID	69
4904509	CARBON DIOXIDE - REFRIG, LIQUID	347	4959184	PICOLINES	9
4909230	WETHANOL	345	4B2-59B	PI-ENOL, MOLTEN	48
4909105	ETHYL ALCOHOL	322	49:8335	HYDROGEN PEROXIDE, STABILIZED	8
1930042	SULFURIC ACID: SPENT	307	4812295	FLAMMABLE LIQUIDS: N.O.S.	9
4932342	FERRIC CHLORIDE, SOLUTION	263	4930028	FLUOROSILICIO ACID	44
4902423	CHARGES, PROPELLING, FOR CANNON	238	4930039	SULFURICACID	45
1907265	STYRENE MONOMER-INHIBITED	183	4950110	FAM-HAZARDOUS MATERIALS	42
4912219	BUTYL ACRYLATES, STABILIZED	12.5	4902539	ROCKET MOTORS	=
4901223	BOMBS	174	4909209	*SOPRUMANDL	Q.
1904210	AMMONIA- ANHYDROUS	17.3	4930223	NITRIC ACID	40
1980107	ENV. HAZ, SUBSTANCES, SOLID N.O.S.	171	4950168	MIXED LOADS MILTARY IMPEDIMENTA	109
4907250	METHYL METHACRYLATE, STABIL.	156	4902147	AMMUNITION ILLUMINATING	2 5
1810560	WASTE FLAMMABLE LIQUIDS N.D.S.	345	4907213	DICYCLOPENTADIENE	3 5
1901174	ROCKETS	132	4909363	ALCOHOLS-N.O.S.	1
6007419	WASTE FLAMMABLE LIQ., TOXIC, N.O.S.	420	4915473	COMBUSTIBLE LIQUIDINGS.	8 8
(908255	PENTANES	117	4921956	PESTICIDES LIQUID, TOXIC, FLAM	65
4930047	PHOSPHORIC ACID, LICUID	118	483002#	HYDROGEN FLUORIDE, ANHYDROUS	7
4905433	ISOBUTANE	121	4910258	PETROLEUM DISTILLATES, N.O.S.	8
4905704	BUTADIENES, STABILIZED	112	4920508	SULFUR DICKIDE	33
1908381	METHANOL	96	4916408	CALCIUM CARBIDE	90
1909159	ETHYL ALCOHOL	<u>F</u> B	4936545	CORROSIVE SOLIDS, N.O.S	2 2
1905424	BUTANE	96	4915389	COMBUSTIBLE LIGHTON O.S.	2 2
1904503	ARGON- REFRIGERATED LICIUD	75	4932329	FERROUS CHLORIDE, SOLUTION	
4831461	CORROSIVE SOLID, ACIDIC, INDRG	8	4935601	AMINES, L'OUID, CORROSIVE, N.O.S.	8
6901560	CHARGES, DEMOLITION	. es	4860132	HAZARDGUS WASTE, LIGUIDIN D.S.	25
1906105	ACETONE	96	4915185	COMBUSTIBLE L'OUID,N.O.S	24
196014B	ELEVATED TEMP, LYQUID- N.O.S.	19	4920518	METHYL BROWNS	
					24

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Table 14, continued

		il in the
STCC#	STCC # Description	Load
4921414	CHLOROPICRIN	23
4908420	ACRYLONITRILE-INHIBITED	22
4903170	CARTRIDGES FOR WEAPONS	2
4921575	TOLUENE DIISCCYANATE	20
490917B	PICOLINES	20
4916311	ANMONIUM NITRATE	2
4901801	AMMUNITION, ILLUMINATING	83
4908183	HEXANES	\$
4936540	CORROSIVE LIQUIDS, N.O.S.	19
4901833	FUSES, DETONATING	2
4905428	BUTYLENE	10
4018761	OXIDIZING SOLID, ALO.S.	18

CORROSIVE LIQUID, BASIC, INORGANIC,

ACRYLAMIDE

POLYMERIC BEADS, EXPANDABLE ENGINES, INTERNAL COMBUSTION

PETROLEUM DISTILLATES, N.O.S. HYDROGEN PEROXIDE, AO. SOLN

STCC# 4912798 PETROLEUM DISTILLATEB- N.O.S. WASTE SODIUM HYDROXIDE SOLUTION

COMBUSTIBLE LIQUID.N.O.S. ACETIC ACID SOLUTION

81 81 F

ISOBUTANE BUTYLENE

CHARGES, PROPELLING, FOR GANNON

4935568 493568 494114 494114 496118 490339 4906382 4836240 4914108

17	5 12	16	16	18	16	50	±	¥	7	61	13	13	t)	12	12	ç
ETHANOL FLAMMABLE LIQUIDS, CORROSIVE, N.O.S.	GASOLINE (AMATION GASOLINE, LEADED	METHANOL	ADHEBIVES	FUMIGATED UNIT	LIGUID	TETRAHYDROFURAN	AMMUNITION, SMOKE	FIREWORKS	DICHLOROPROPENES	PENTAFLUOROETHANE	ETHYL METHYL KETONE	FLAMMABLE LIQUIDS, N.O.S.	MATERIAL NOT CLASSIFIABLE	CARTRIDGES FOR WEAPONS	PROPYLENE	FLAMMANIST INTROC NO.
4910240	4508178	4908390	4912604	4951102		4908285	4902132	6903520	4909255	4904318	4909243	4910185	4989999	4901811	4905784	6908219

458719 FLAMMABLE LIDUDS, N.O.S. 57GC—Standford Temperprization Commodity Cade (specific to rail transportation).
Was loads—The meximum number of leads for each material (each STCC code) carried on any one rail segment in Contra County over a 12 month period (2004-2005). Note: This method avoids duplicate counting of loads in Contra County over a 12 month period (2004-2005). Note: This method avoids duplicate counting of loads for any county in the other (a common occurrence) but probably underestimates the total number of loads transported in the county is a year.

Note: Material descriptions were provided by the raitroads as the 'one-liners' shown above. In some cases worded descriptions are the same although the STCC codes are different. These are different types of the generic material(s) that could not be described on one text line. More information on STCC codes is available at URL: https://www.aiceiroads.com/index_isp (click on "product codes").

In addition to the above total shipping data for hazardous materials via the railroad in this study, information concerning "Toxic by Inhalation" Rail Hazardous Materials, is contained within Table 16 of the survey. Those data are shown below.

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Table 16: "Toxic by Inhalation" Rail Hazardous Materials

492023 1017 4904210 1005 492053 1075 492058 1079 492058 1062 4921414 1580 4921405 1295 4921405 1397 4920346 1955 4921475 2810	850 4904210 1005 Ammonia, Adviydrous 34 4904210 1005 Ammonia, Adviydrous 32 4904210 1005 Ammonia, Adviydrous 32 49050024 1052 Pythropen Flexoride, Adviydrous 24 4920024 1052 Pythropen Flexoride, Adviydrous 24 492032 1095 Mohry Browide 25 491632 1295 Trichhoropicin 2 491632 1295 Trichhoropicin 2 491632 1295 Trichhoropicin 2 491632 1295 Trichhoropicin 2 491632 1295 Trichhoropicin 1 491632 1295 Trichhoropicin 1 491632 1295 Trichhoropicin 1 492036 1395 Advinium Phosphide 1 492034 1992 Trithorochiorellydron, Inhibited 1 4921475 2810 Toxic Liquids, Organic, N.O.S. 1 70xic by Mn8880n [Tith] - 2004 Emerimenty Bessenses Cultural Approximation 1 10xic Liquids, Organic, N.O.S. 1 70xic by Mn8880n [Tith] - 2004 Emerimenty Bessenses Cultural Approximation 1 10xic Liquids, Organic, N.O.S. 1 70xic by Mn8880n [Tith] - 2004 Emerimenty Bessenses Cultural Approximation 1 10xic Liquids, Organic College, Carlotte College, Carlotte College, Carlotte College, Carlotte Carlott	### 200.00 100.00	Any Kau			
4904210 1005 4904210 1005 4904210 1005 490024 1052 492068 1079 492068 1052 492140 1580 4920989 1955 4920989 1955 4920989 1955 4920989 1955	850 4920223 1017 Choories 34 4904210 1005 Americal, Advigorus 35 4900210 1005 Americal, Advigorus 36 4920508 1072 Sulfur Dioxide 37 4920508 1072 Sulfur Dioxide 38 4920508 1062 Methy Brondet 39 4920508 1062 Methy Brondet 30 492140 1062 Methy Brondet 31 492163 1295 Trichlocosisne 32 492105 1595 Dimethy Sulfate 33 492059 1595 Liquifed Gas, Toxic, N.O.S. 492050 1692 Trithocochinomiphiside 34 492036 1692 Trithocochinomiphiside 36 492145 2810 Toxic Liquids, Organic, N.O.S. 31 4820345 2810 Toxic Liquids, Organic, N.O.S. 32 100cb Liquids, Organic, N.O.S. 33 100cb Liquids, Organic, N.O.S. 34 100cb Liquids, Organic, N.O.S. 35 100cb Liquids, Organic, N.O.S. 36 100cb Liquids, Organic, N.O.S. 36 100cb Liquids, Organic, N.O.S.	850 482023 1017 Chlorine 34 4804210 1005 Ammonia, Anhydrous 34 4804210 1005 Ammonia, Anhydrous 34 480024 1052 hydropen Fuordie, Anhydrous 24 482056 1079 Sulfur Dioxide 23 4921414 1580 Chloropicin 3 4916323 1285 Trichhoroslane 4 4916323 1285 Trichhoroslane 2 4821405 1585 Dimebry Sulfate 2 4821405 1585 Dimebry Sulfate 4 820269 1955 Liquified Gas, Toxich Chloropicin 1 4821475 2810 Toxich Liquified • A821475 2810 T	OBUMUNT	2000	* NO	TIM Materials
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1955 1397 1082 2810	2 4920369 1955 Liquified Gas, Toxic, N.O.S. 1 491535 1397 Alumirum Prospinide 1 4920346 1982 Tiffucrochlorethydros, Inititiaed 1 4921475 2810 Toxic Liquids, Organic, N.O.S. 1 492555, Sayl Toxic Liquids, Organic, N.O.S. 1 7006 by Intelsion (TIHI ¹ - 2004 Emerinary Bessenses Cuidana, 1007	2 4920369 1955 Liquified Ges, Toxic, N.O.S. 1 4918305 1397 Aluminum Phosphide 1 4920369 1982 Trifluorochiorethylone, inhibite 1 4921475 2810 Toxic Liquids, Organic, N.O.S. 1 4928275 2810 Toxic Liquids, Organic, N.O.S. 1 Application (TIMP) - 2004 Emergency Response Guidebook (Timp)	CA)	4921405	1595	Dimethyl Sulfate
1397 1082 2810	1 4916305 1397 Aluminum Phosphide 4920346 1082 Trifluorochloroethyloroe inhibited 4921475 2810 Totol Liquids, Organic, N.O.S. 1 4925275 2810 Totol Liquids, Grganic, N.O.S. 1 700c by Inheliston (TIHY - 2004 Enversion Culdered Contacts of the contact of the conta	4916305 1397 Aluminum Phosphide 482036 1082 Trifluorochloroethylone, inhibite 4821475 2810 Toolo Livelia Organic, N.O.S. 1 4925275 2810 Toolo Livelia Organic, N.O.S. 1 Toolo Phylliabison (TIII) - 2004 Emergency Response Guidebook (I	8	4920369	1955	Liquified Ges. Toxic. N.O.S.
1082 2810	1 4920346 1082 Trifluonochloroethylone, inhibited 4821475 2810 Totlo Liquids, Organic, N.O.S. 1 4925275 2810 Totlo Liquids, Organic, N.O.S. 1 Totlo Disk Liquids, Organic, N.O.S. 1 Totlo Disk Liquids, Organic, N.O.S. 2004 Finantines Reseases Guidales (1904)	4820346 1082 Trifluorochloroethylone, inhibite 4821472 2810 Toole Liquids, Organic, N.O.S. Toole by Inhibite 70016 Liquids, Organic, N.O.S. Toole by Inhibite 70016 Liquids, Organic, N.O.S. Hake Inner ann. 73 70016 Liquids (Viginic, N.O.S. Hake Inner, Ann. 73 70016 Liquids (Viginic, Viginic, N.O.S. Hake Inner, Ann. 73 70016 Liquids (Viginic, N.O.S. Hake Inner, Ann. 73 70016 Liquids (Vi	-	4916305	1397	Akminum Phosohide *
2810	1 4821475 2810 Toxlo Liquids, Organic, N.O.S. 492275 2810 Toxlo Liquids, Organic, N.O.S. 170x6 by Mihalabon (THI)* – 2004 Emeranna Beatones, Guidales et progressiones and Control of the	1 4921475 2810 Toxic Liquids, Organic, N.O.S. 1 4925275 2810 Toxic Liquids, Organic, N.O.S. Toxic by Inhalabon (TIII) - 2004 Emergency Response Guidebook (TARA	-	4920346	1082	Trifluorochloroethylene inhibited
	1 4925275 2810 Toxic Liquids, Organic N.O.S. Toxic by Inhelesion (TIH) = 2004 Ememers Resented Colleges (2004)	Toxic by inhalation (TIH) - 2810 Toxic Liquids, Organic, N.O.S. "Max loads and managency Response Guidebook (-	4921475	2810	Toxic Liquids, Ornanic, N.O.S.
1 4925275 2810 Toxic Liquids Organic N.O.S.	Toxic by Inhelation (TIH)" - 2004 Ememancy Recovered Childrens (1707)	Toxic by Inhelation (TIH) - 2004 Emergency Response Guidebook (-	4925275	2810	Toxic Liquids Organic N.O.S.
2. "Max loads - any rail segment". The maximum humber of loads of the meterial		on any rail segment in Contra Costa County over a 12 month passed (2004, 2005)	n any rail segme	ant in Contra	Costa Co	unity over a 12 month paged (2004, 2008)

to the offirer (a common occurrence) but probe to construct the tall segurant of feeds transported in the county in a year.

3. FIGC #5. Standerd Transportation as year.

4. UN #5. United Nations corresponding four-digit hazardous material runber.

5. * *Dangerous weller-backfor material - produces toxic gas on contact with water 6. NO & Energiancy Response Guidebook (DOT, 2004).

6. N.O.S. - *not otherwise specified.

Additional railroad data are contained within the 2005 report.

2.1.2 Highway Data

Highway placard survey data was collected for the 2005 report from both the fall of 2004 and summer of 2005. The data were collected from the following survey locations:

- Highway 580-Richmond/San Rafael toll bridge plaza;
 Highway 160-Antioch toll bridge plaza;
 Highway 4-Oakley Street intersection;
 Highway 680-Walnut Creek weigh station;
 Highway 80-Carquinez toll bridge plaza;
 Highway 4-Pritsburg train Bay Area Repid Transit (BART) station; and
 Highway 580-Livermore weigh station.

Data from the highway placard survey is compiled in the report in various tables. Table 4 shows all of the United Nations (UN) chemical identification numbers from all data from the highway placard survey and is shown below.

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Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Countra Costa Country, California August 2019

TAIT Environmental Services, Inc.

Table 4: All UN Numbers Recorded from Hazardous Material Trucks during Entire Survey * UN Nathers!

number			
1203	Gasoline	1.094	33 02
3257	Elevated temp. liquid, nos	336	40.00
1075	Liquified petroleum gas, e.g., propane, butane.	27.6	24.01
1993	Combustible liquid, nos	25.6	3 6
2448	Sulfur, molten	189	200 5
1791	Hypochlarite solution	31,	9 6
2167	Carbon dioxide, refrig liguid	25	00.0
1977	Nitropen, refrie, liquid	\$ \$	3.66
1824	Sodium hydroxide solution	3 6	3.10
3264	Corrosive liquid, acidic, inorganic nos	5 5 7	189
1073	Oxygen, refrig. liquid	16	1 74
1987	Alcohols, nos	40	1 24
1830	Sulfurle acid	35	100
3082	Environ, hazardous fiquid or haz, waste, liquid nos	32	66.0
1263	Paint/related material	28	0.83
1951	Argon, refrig. fiquid	25	0.78
2672	Ammonia/ammonium hydroxide solution	25	0.78
2693	Bisuifites, aqueous solution	53	0.71
1789	Hydrochloric acid	2	0.65
1863	Fuel, aviation	2	0.85
No ID	(UN number not identified)	50	0.62
3077	Environ, hazardous solid or haz, waste, solid, nos	55	0.47
1760	Corrosive liquid, nos	14	0.43
2552	Ferric chloride solution	=	2
1017	Chlorine	10	2
3266	Corrosive Aquid, basic, inorganic nos	9 2	0.31
1005	Ammonia, anhydrous		0.28
1049	Hydrogen	07	0.28
1805	Phosphoric acid	89	0.25
2031	Nitrio acid	60	0.25
2796	Battery fluid, suffuric acid	00	0.25
1046	Helium	_	0.22
1568	Resin solution	7	0.22
24.26	Ammonium nitrate, hot concentrated solution	7	0.22
326/	Corrosive liquid, basic, organic, nos	7	0.22
DI MEN	("corrosive" placard)	7	0.22
1080	Accelera		

		•	3
1701	Xylyl bromide	ç	0.16
1778	Fhrorosilicic acid	10	0.16
2209	Formaldehyde solutions	s	0.16
2683	Ammonium suffide solution	¥5	0.16
2191	Suffuryl fluoride	4	0.12
2348	Butyl acrylate(s)	4	0.12
3065	Alcoholic beverages	Q	0.12
1030	Diffuoroethane	n	0.09
1079	Sulfur dioxide	rò	0.09
1170	Ethanol	6	0.09
1219	Isopropanol	6	0.09
1287	Rubbar solution	e	0.09
	Caustic potash / potassium hydrox:de solution	က	0.09
3265	Corrosive Irquid, acidic, organic, nos	m	0.09
1172	Ethylene glycol monoethyl ether acetate	8	90.0
1230	Methanol	2	0.06
1267	Petroleum crade oil	2	0.08
1269	Petroleum distillates/products, nos	2	0.06
1270	Petroleum oil	2	90.0
1276	n-Propyl acotate	2	0.06
1307	Xylenes	7	0.06
1328	Hexamethylenetetramine	N	90.0
1719	Caustic alkali liquid, nos	8	0.08
1731	Antimony pentachloride, solution	8	0.06
1790	Hydrofluoric acid	2	0.06
1942	Ammonium nitrate	2	0.06
	Liquified natural gas or methane, refrig. liquid	8	90.0
1999	Asphalt or liquid tars	8	90.0
3109	Organic peroxide type F, liquid	2	0.08
3190	Self-heating solid, Inorganic, nos	8	90.0
partial ID	("miscellaneous" placard)	8	80
1072	Охудел	←	0.03
1193	Methyl ethyl ketone	-	0.03
1197	Extracts, flavoring, liquid		0 03
1202	Fuel oil, a.g, diese!	-	0.03
1234	Methylal	*	200
1264	Parattehyde	· -	200
1284	Toluene		200
	:		000

Hazardous Materiais Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Courta Costa County, California August 2019

TAIT Environmental Services, Inc.

1746 Total	40.40			
Troludines Troludines Beron trichloride Beron trichloride Troludines edid, nucid Julturic acid, furning Julturic acid, furning Julturic acid, furning Julturic acid, furning Acid studge Soda lime Chlorite solution Tropan Tropa		ACBIOLISTIC	*-	0.03
Boron titchloride ornosive solid, nos ornosive solid, nos ornosive solid, nos ornosive solid, iquald Hultin solid, spent maylidane chlorida Acid studge Sod studge Acid studge Acid studge Forgens Fropens Fropens Annonium solid, toxic, nos a monorner, stabilized herre discognante n-Ethydraline Franchism Fropens	1708	Totuldines	-	0.03
ornosive solid. noa hobulfront each, finuld huffr, each, furning huffr, each, spent hazylidene chhoride Acid studge Soda line Chlorie solution Fropene Acid studge Chlorie solution Propene Acid studge Acid studg	1741	Boron trichloride	-	0.03
ulturic acid, fiquid ulturic acid, furning ulturic acid, furning ulturic acid, furning ulturic acid, furning Sorial lime Sorial lime Sorial lime Sorial lime Sorial lime Fropene Propene Propene Rabie liquid, toxic, nos a monorener, stabilized Herre discoyanate In-Ethylaruline Propene Indicator or acid liquid In-Ethylaruline Propene Propene Propene Indicator or acid liquid Indicator or acid liquid, nos Indicator liquid, nos	1759	Corrosive solid, nos	-	0.03
ulfurfa acid, furning ulfurfa acid, furning ulfurfa acid, spert Arcid studge Arcid studge Soda lime Chlorite solution Irogen, reffg, liquid Propen Togen, reffg, liquid Togen, reffg, liquid, ros Togen, reffg, ros Togen, reffg, ros Togen, reffg, reff, reffg, reffg, reffg, reffg, reff, reff	1803	Phenolsulfonic acid, liquid	1	0.03
Acid subda spent Acid sepert Acid subda sepert Acid subda Acid subda Acid subda Acid subda Sodis lime Acid subda solution Iropen, refig. liquid Acid subda sub sovide, rose a monorner, stabilized Iropen, refig. liquid sovide, rose a monorner stabilized Iropen and Sodia subda sub sovide, rose a monorner stabilized Iropen and subda	1831	Sulfuric acid, furning	+	0.03
And studge And studge Sods lime Chlorine edution Irogen, refrg, liquid Propens anable liquid, toxic, nore and its control in the control in t	1832	Sulfuric acid, spent	-	0.03
Acid studge Chorie selution Chorie selution Chorie selution Tropen refré, liquid Propene nable liquid, toxic, nos a monomer, stabilized Herre discocyanate Propint P-Ethylaniline Altorinaled bixinenyls Estrandamine P-Ethylaniline Altorinaled bixinenyls Estrandamine P-Ethylaniline Altorinaled bixinenyls Estrandamine Altorinaled bixinenyls Estrandamine Altorinale divitionyls Service stabilities Service stabilities Altoric oracishve, flammable Altoric oracishve, flammable Altoric oracishve, nos a solid, self-heating, nos solidical plaquid, nos mmaslie* placeral)	1886	benzylidene chloride	¢-	0.03
Sods lime Chlorine solution Irogen, reffg, liquid Trogen, reffg, liquid Irogen, reffg, liquid Irogen, reffg, liquid Irogen, reffg, liquid Irogen, reffg liquid Ivera discognaria Ive Ethylariline Intronlum Iluoride Iss, wet, filled with exist Ses, wet, filled with exist Ses, wet, filled with exist Ses vet, filled with exist Ses vet, filled with exist Ses vet, filled with text Ses vet, set heating, nos Ses vet	1906	Acid studge	-	0.03
Chlorie solution Ingen, reffg, liquid Propen Propen Ingligations, core Independent of the property of the property of the propenting of the property of the pr	1807	Sods lime	-	0.03
Irogen, refrig, liquid Propiens Propien	1908	Chlorite solution	-	0.03
Propens nable liquid, toxic, nors nable liquid, toxic, nors norse and an incompanie of a monomer, stabilized ner discognante n-Ethydraline 1-Ethydraline 1-Ethydraline 1-Ethydraline 1-Ethydraline 1-Ethydraline 1-Incompanie 1-In	1966	Hydrogen, refrig. liquid	-	0.03
andhe liquid, toxic, nos a monoroner, stabilizad a monoroner, stabilizad a monoroner, stabilizad 1 most de licocyanate 1 most de licocyanate 1 most de licocyanate 1 monoroner 2 monoroner 2 monoroner 2 monoroner 3 monoroner 3 monoroner 3 monoroner 4 monoroner 4 monoroner 4 monoroner 5 monoroner 6 monoroner 6 monoroner 7 monoroner 7 monoroner 8 monoroner 8 monoroner 9 monoroner 1 mo	1978	Propens	-	0.03
learne discoyanate la use oxide, refrigilized la transcoyanate la coxide, refrigilized la transcoyanate la coxide, refrigilized la transcherolized la transcherolized la coxide	1982	Flammable liquid, toxic, nos	-	0.03
luene discocyanate us oxide, refing liquid the Ethylaraline the Ethylaraline the Ethanoleanine the Alachyl choride the Alachyl choride the Alachyl choride the Alachyl corrostive, flammable sa, wet, filled with exid sonous/toxic fiquid the Alachyl corrostive, flammable solution be fiquid corrosive, nos solid, self-heating, nos figizing liquid, nos figizing liquid, nos minnable* pleserat)	2055	Styrene monomer, stabilized	7	0.03
us oxide, refrig liquid P-Ethylaniline Thylandad biphenyts Ethandiamine Yalleyu chloride Turnonium fluoride Bis liquid, corrostive, itammable Sa, wei, filled with acid Sa, wei, filled with acid Sa, wei, filled with acid Taki oxorostive filled with akeli Sonoushoxic fiquid Tadium pentoxide Solution Judica judica corrostive, nos Solution So	2078	Toluene disocyanate	+	0.03
n-Ethylaniline Ethandinel bichenyls Ethandinine Ethandinine Ethandinine Tranchium fluoride Ss. wet, filled with akeli Ssonoushoxid fiquid hadium pentoxide 1, soxio or sodium hydrosulfide 1, soxio or socio	2201	Nitrous oxide, refrig liquid	-	0.03
Pilotinaled biphenyls Ethanofamine Yalenyl chloride Timonium fluoride Ss. wet, filled with acid Ssonous/faxic fiquid Taddin perthoxide Tad	2272	n-Ethylaniline	-	0.03
Ethanofamine Valeny chloride Tunconium fluoride Tunconium fluoride Sas, Wet, filled with edici Sas, wet, filled with edici Sonous/loxic fiquid Sonous/loxic fiquid Sonous/loxic fiquid Sonous/loxic fiquid Sonous/loxic fiquid Solution Tuncon readium hydrosulfide Solution Tule fiquid correstve, nos Solid; solid; self-heating, nos Solid; fiquid, nos Solid; solid; self-heating, nos Solid; self-heating, nos Solid; solid; self-heating, nos Solid; solid; self-heating, nos	2315	Polychlorinated biphenyls	-	0.03
Valeryi chleride Thronthum iluvique Thronthum iluvique Sas, Wet, filled with secid Sas, wet, filled with selesi Sonous/toxic fiquid Taledium pentoxicle Taledium pentoxicle Solution Toxic or sedium hydrosulfide Solution Toxic or sedit-beating, nos Talering ilquid, nos	2491	Ethanolamine	-	0.03
as liquid, connesive, flammable se liquid, connesive, flammable se week filled with eacid sev, week filled with elkeli sonous/hoxic fiquid nadium pentoxide solution ble liquid connesive, nos solid, self-heating, nos solid, self-heating, nos stidizing liquid, nos mitteal waste, nos mitmable* plesered)	2502	Valeryl chloride	1	0.03
as, flquid, conrostve, flarmable ss, wet, filled with acid ss, wet, filled with acid if a sonous/box/e flquid hadium pentoxide 1, soxio or acodium hydrosulfide 1, so	2505	Ammanium fluoride	-	0.03
es, wet, filled with acid se, wet, filled with acid sonous/box/c figual andium pentoxide fraginal pentoxide solution solution solution solution solid self-healing, nos fidizing liquid, nos fidizing liquid, nos fiquid, nos	2734	Alkyl/poly/amines, liquid, comostve, flammable	-	0.03
rs, wet, filled with alkali schous/fixcle fiqual finalium pentoxide fixch and fixed corrosive, nos solution solution solution solution fiqual corrosive, nos fidzing liqualic, nos	2794	Batteries, wet, filled with acid	*~	0.03
sonous/lexic fiquid nadium pentoxide 1 1. toxic or sodium hydrosufide solution be fiquid correstve, nos solid, set/heating, nos fidizing fiquid, nos matical waste, nos mmable* plecerd)	2795	Batteries, wet, filled with gikeli	-	0.03
radium pentoxide 1, toxo co sodium hydrosulfide solution ble liquid corrosive, nos solid, self-heating, nos solid, self-heating, nos tidizing liquid, nos tidica waste, nos timmable* plecerd.)	2810	Polsonous/lexic fiquid	-	0.03
4, toxic or sedium hydrosufide solution by a solution be lidered corrosive, nos solid, self-heating, nos solid, self-heating, nos tidizing liquid, nos tidizing liquid, nos redical waste, nos mimable plecard)	2862	Vanadium pentoxide	-	0.03
ble liquid corresive, nos solici self-heating, nos idizing liquid, nos idizing liquid, nos carbons, liquid, nos mmable plecard)	2922	Corrosive liquid, toxic or sodium hydrosuffide	-	0.03
s solid, self-heating, nos tidizing liquid, nos tidizing liquid, nos tidizing waste, nos transchons, liquid, nos mmeble plecard)	2924	Flammable liquid corrosive, nos	٠	5
idizing liquid, nos tdicat waste, nos corbons, fiquid, nos	3095	Corrosive solid, self-heating, nos	٠.	3 6
waste, nos reactions, liquid, nos mmable' plecard)	3139	Oxidizing limid nos	. ,	200
carbons, fiquid, nos	3291	Merical state and	- ,	0.03
mmable placerd)	3295	Hydrocarbons liquid	- ,	0.03
(Dischard Signature)	Dartial ID	College of the colleg	_	0.03
ALICANO ALICAN	All enthier loc	(namerical precent)	-	0.03

"All survey locations, all times
"nos – not otherwise specified
Frequency is for UN tumbers (bulk loads), rather than trucks. (Some trucks carry more
than one load/UN number.)

Additional tables from the 2005 report show the most common UN numbers from the highway placard survey (Table 5), the frequency of hazardous materials worded placards (Table 6), and the "Toxic by Inhalation" trucked materials (Table 12). These three (3) tables are reproduced below.

Table 5: Comparison of Most Common UN numbers from Fall 2004 and Summer 2005 Truck Surveys*

Hazardous Material	number	ZOOM SOOM	Summer 2005
Gasoline	1203	35%	27%**
ot liquid	3257	12%	15%
Liquified petroleum gases	1075	%9	
Moften sulfur	2448	1%	2%
Combustible liquid nos (diesel)	1993	%8	5%
Hypochorite solution	1791	5%	4%
Carbon dioxide, rafngerated liquid	2187	28	%
Sodium hydroxide	1824	3%	4%
Nitrogen, refrigerated fiquid	1977	3%	4%
uid, inorganic, nos	3264	%	2%
Oxygen, refrigerated invid	1073	2%	%
total		84%	82%

"Same counting locations (Figure 1 locations 3-5: Hwy 680, Hwy 80, Hwy 4 BART), day of line week (Monday, Wednesday, Thursday) and hours (8:06-11:00am) "Shaliscially degrificent difference between fall and surmer truck frequencies for this chamical for 20,0215, Chi aquer et sist for difference) nos = not otherwise specified

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019
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Table 6: Frequency of Hazardous Material Worded Placards* for All Trucks Counted in Fall 2004 and Summer 2005 Surveys

Hazard Type	division	Frequency	Percent
Flammatsle/Combustible			
08363	2.3	8	-
Spings	3	174	14
SORds	4.1.4.2	4) ya
partial identification	1000	17	
Inhalation Hazard			No.
gases, polsons	2.3.6.1	58	٧
Polson (except inhalation)	0		
Oxidizer	0,0,0	2	N
oxidizing substances	5.1	E	4
organic peroxides	5.2	a	-
Nonflammable gases	-		• [
oxygen	2.2	23	e
other nonflammable gases	2.2	216	27
Other hazardous materials			The same of the sa
explosives	4	-	0
dangerous when wet	4.3	7	-
radioactive	_	N	0
corrosive	8	159	22
miscellaneous	6	6	-
snoie6usp	٥	52	1
Missing identification		18	2
TOTAL		800	400

"Worded placands signify smaller leads than placands with a UN number.
"A which containing norbule packaging, with levo or more types of hazardous materials may use one "dangerous" placand if each materials may use one "dangerous" placand if each materials hood weight less than 2,255 lise.

Table 12: "Toxic by inhalation" (TIH) Trucked Materials

		Ī								
Organica (Marian)	TIH Materials	Chlorine	Ammonia, anhydrous	Sulfury fluoride	Sulfur dioxide	Boron trichloride	Suffure acid, fumino	Poisonous/Toxic liquid)" - 2004 Emergenc	
	#ND	1017	1006	2191	1079	1741	1831	2810	ilation (TIH)" OT, 2004)	
Total	Loads	9	ďn	4	6	-	-		Toxic by Inhalation (TIH Guldebook (DOT, 2004)	

Additional highway placard data are contained in the 2005 report.

2

2.2 Highway Flow Study Data from Marin and Solano Counties

Hazardous Materials Commodity Flow Study reports were prepared for the Marin County Department of Public Works in September 2014, and for the Solano County Department of Resource Management, Environmental Health Division in May 2016. Both the Marin County and Solano County agracies were contacted to request the use of the highway placard data from those reports as it applies to the current Contra Costa County Flow Study. The relevant data includes highway transportation of hazardous materials at the locations where it enters Contra Costa County. The data from Marin and Solano County are detailed in the following sections.

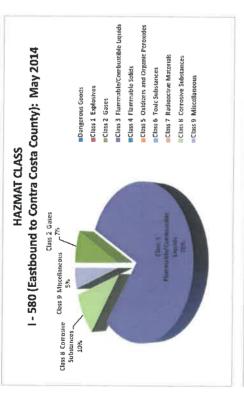
2.2.1 Marin County Flow Study Data 2014

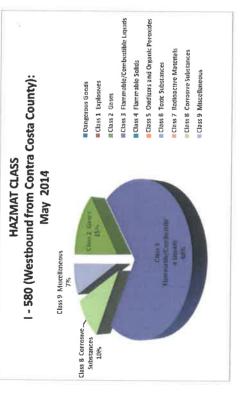
Highway placard survey data from the Marin County Flow Study was obtained for Interstate-580 where it flows in both north and south directions through the Richmond-San Rafael Bridge. The results of that study are presented below.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Counts Costa County, California August 2019

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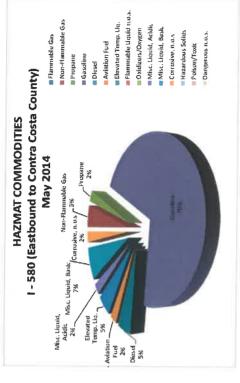
			May 2014	
	Discount		A POOR SOLL	
Surrey Location	Chass	Piacard No.	Common Name	No. of
1.580 (Testbound: Incound to Contra Costa County via Richmond-San Rafael Bridge)				Name of the last
	2.1	1073	1075 Propers	
	2.2	11/14	N/A Non Flammable Gas	
	in	1203	12C3 Gesoline	20
	293	1863	1863 Aviation Fuei	
	pty	1993	\$999 Diesel Fuet	24
	60	1760	1750 Corrosive Ligare n.p.s.	
	10	1790	1792 Hypechlerin Solutions	
	60	2582	2582 Ferric Chlorida	0.5
	80	2824	1814 Pozastium Hydroxide	0.5
	80	1824	1824 Sodium Hydroxide	
	6		3257 Elevated Temperature Liquid	
	Subserval Placanded Trucks			48
	Subtocui Trucks	Subtoom Trucks Not Pincarried		200
	TOTAL TRUCKS			738
1580 (Westbound: outbound from Contra Costa County via Richmond-San Rachael Bridge)				
	2.2	2002	1075 Presents	
	2.2	21.67	21.67 Certeon Dioxide	
	2.1	N/A	M/A Flarmrable Gas	Ī
	2.2	M/A	N/A Non Flammable Qus	
	(fe)	1209	1203 Gasoline	36
	80	1863	1863 Avlation Frael	
	0%	1993	1993 Diesel Fivet	
	90	1791	1791 Hypochterita Solutions	
	6)	1826	1214 Sodium Hydranide	
	GJ	N/A	Corroaitva	6
	en en		2257 Elekated Temperature Liquid	
	Sulmonal Macambed Tracks			419
	Subtotal Tracks Not Placarded	Not Placarded		\$46
	TOTAL TRUCKS			*
All Sites	Subsersi Placarded Trucks	ad Trucks		-
	Subtotal Tracks Not Placanded	Not Placanded		1000

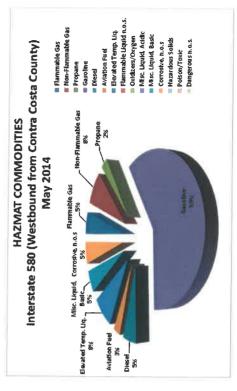




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2.2.2 Solano County Flow Study Data 2016

Highway placard survey data from the Marin County Flow Study was obtained for Interstate 580 where it flows in both directions through the following points:

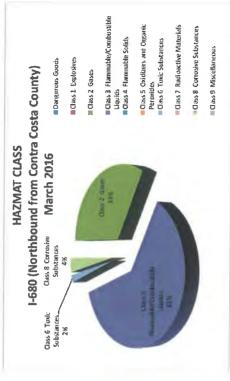
- Interstate 80 at the Carquinez Bridge
 Interstate 680 at the Benicia-Martinez Bridge

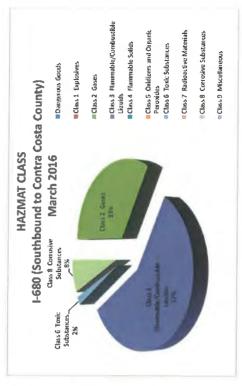
The results of that study are presented below.

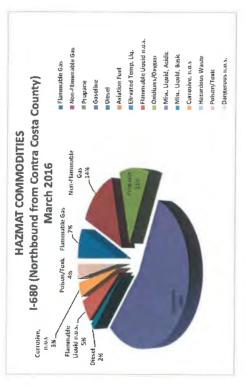
		LACARD SOUVE	SOCIAINO COUNTI: BISHWAT PLACARD SURVET DATA COMPILATION TABLE	
			March 2016	
Survey Coration	Placend	Placand No.	Common Name	No. of Towice
L680 Northbound: outboand from Contra Costa County via Benecia-Marcinez Bridge			740100 100100	and a
	2.1	N/A	Flammable Ges	
	2.2	N/A	Men Hammable Gas	6
	2.3	2002	Coal Ges	1
	2.1	2075	Propers	9
	2.2	12977	Dovid Moregan	6
	2.2	2457	Carbon Dioxide	2
	m	1203	Garofine	31
	101	1961	Alcohof, n.a.s.	2
	3	1992	Flammable Ugada, toxic, n.o.s.	-
	ni	1993	Diesel Fuel	
	6.1	1897	Perchipopethylene/Tetrachiprethylene	-
	8	M/A	Cornosive	2
	Subhotal Pla	Subtotal Placanded Trucks		25
	Subtotal Tru	Substated Trucks Not Placanded		591
	TOTAL TRUK	103		548
LEBD Southhound: Inhound to Contra Costs County via Beneda-Mardinez Bridge				
	2.2	MA	Planymable Gas	3
	2.2	MA	Non Flammable Gas	un.
	2.2	1073	Osygen, refrigerated liquid	3
	2.1	1075	Propans	*
	2.2	2157	Carbon Dioxide	2
	2.1	1049	Hydrogen, compressed	1
	*	1203	Gasoline	27
	3	1259	Petroleum Distillatus	**
	6.1	2510	Foods, Inquiett, organis, n.o.s.	
	80	MA	Correctiva	2
	6	1824	Sodium Hydrasids	44
	100	3264	Corrosive Liquid, acidic, morganic, n.o.s.	64
	Subtotal Pia	Subtotal Placarded Trucks		75
	Subtotal Tru	Subtotal Trucks Not Placaeded		683
	TOTAL TIRUCIES	22		5E2

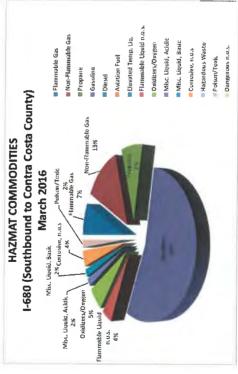
Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Corbra Costa County, California August 2019

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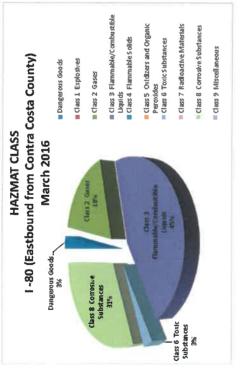


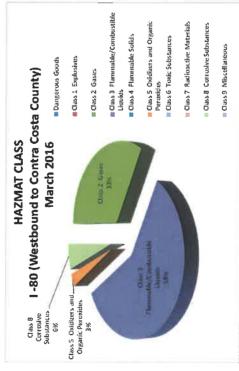


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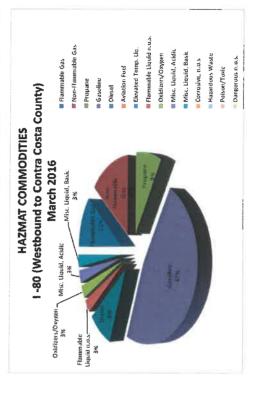
Palectroin Palectroin Palectroin Palectroin Palectroin Palectroin Clear Palectroin Palectroin Clear Palectroin		- Contraction		The state of the s	
Pilicard				March 2016	
Bridge 2.1 NAA N	Survey Location	Plecard	Placard No.	Corramon Name	No. of Trecks
2.2 % WAA 2.2 2.2 % WAA 2.2 2.2 £2066 2.3 £2066 2.3 £2066 2.3 £2066 2.3 £2066 2.4 £2066 2.5	1-80 Eastbound: outbound from Contra Costa County vid Carquinez Bridge				L
2.2 1/4/A 2.2 1.066 2.1 1.066 2.1 1.066 2.2 1.066 2.2 1.066 2.2 1.066 2.3 1.0075 3 1.0075 3 1.0075 3 1.0075 2 1.0076 2 1		21	NA	Flarmostile Gas	
2.2 10666 2.1 10707 2.2 1087 2.1 10707 2.2 1087 2.2 1087 2.3 11855 6.1 1 1070 6.1 1 1070 6.1 1 1070 6.1 1 1070 6.1 1 1070 6.1 107		2.2	N/A	Mon Frammable Ges	
2.1 2075 2.2 2087 2.2 2087 2.3 2087 2.3 2087 2.1 1087 2.1 1087 2.1 1087 2.2 2083 2.2 2083 2.2 2083 2.2 2083 2.2 2083 2.2 2087 2.2 2087 2.2 2087 2.2 2087 2.2 2087 2.3 2087 2.3 2087 2.3 2088 2.3		22	3000	Pitrogen, conteressed	-
2.2 2.1877 2.3 15873 2.3 15873 2.3 15873 2.4 15873 2.5 15873 2.5 15873 2.5 15873 2.7 1		2.1	1075	Propera	
2 3 1203 2 3 1203 2 5 1203 2 6 14 166 2 6 1 1774 2 6 1 1777 2 1 1777 2 1 1777 2 2 1203 2 1 1777 2 2 1203 2 1 1777 2 2 1203 2 1 1777 2 2 1203 2 1 1777 2 2 1203 2 1 1777 2 2 1203 2 1 1777 2 2 1203 2 1 1777 2 2 1203 3 1 1777 5 1000		2.2	2187	Carthon Dioxide	116
2.3 1887 2.4 1887 2.5 1887 2.6 1.4 1887 2.6 2.4 2369 2.7 1778 2.6 2.4 2369 2.7 1778 2.7 1887		en.	1733	Gaeolina	12
6.1 N/A E. 17794 E. 17797 E. 1779		ex	1507	Alambol, R.O.S.	44
6.1 N/A 8. N/A 8. N/A 8. 12724 8. 12724 8. 12724 8. 12727 8. 1260-2 10. N/A		e)	1988	Diesel Fuel	4
E		1.9	N/A.	Polson	+4
E 1724		60	N/A	Cornoidys	4
E		NO.	1724	Asymptonomane, stabilitad	-4
E 1275		90	1778	Pkonsilicie Aciel	vel
E		2	1751	Hypothierts Solution	v-l
E 2695		80	1824	Sodken Hydroxide	*4
100 100		445	2693	Besuffice	m
N/A N/A		2	3260	Corroshe solid, addic, interparite, n.o.s.	-4
Submoted Production Tradical Product Control C		N/A	N/A	Dangerout	4
TOTAL WALCOS TOTAL WALCOS 2.1 N/A 2.2 S/273 2.2 S/273 2.2 S/273 2.2 S/273 2.2 S/273 2.2 S/273 2.3 S/273 3.3 S/273		Sufficient Place	arded Trucks		票
1947AL MOUGOS		Substant Pro-	ales Work Phacambad		986
2.1 N/A 2.2 N/A 2.2 N/A 2.2 N/A 2.2 2.675 2.2 2.675 2.2 2.675 2.2 2.677 2.2 2.677 3.2 2.675 4.2 2.675 5.2 2.677 5.2 2.677 6.2 2.677 7.2 2.677 8.2 2.678 9.2		TOTAL INDIC	9		1054
2.1 N/A 2.2 N/A 2.1 N/A 2.2 N/A 2.2 SST7 2.2 SST7 2.2 SST7 2.2 SST7 2.3 SST7 2.3 SST7 2.4 SST7 2.5 SST7 2.5 SST7 2.6 SST7 2.7 SST7 2.6 SST7 2.7 SST	-80 Westbound: Inhound to Contra Casta County vio Campulnez Bridge				L
2.2 N/A 2.1 S075 2.2 S075 2.2 S077 2.2 S077 2.2 S077 2.2 S077 2.3 S077 2.3 S077 2.3 S077 2.3 S077 2.4 S077 2.5		2.1	NVA	Flarresidde Gas	*
2.2 5973 2.2 5973 2.2 5973 2.2 5977 2.2 5977 2.3 7777 2.3 7.1263 2.3 7.1263 2.3 7.1263 2.3 7.1263 2.3 7.1263 2.3 7.1263 2.3 7.1263 2.4 7.1263 2.5 7.1263 2		2.2	WA	Mon Plemmable Ges	
2.2 5973 2.2 5977 2.2 2187 2.2 2187 2.3 1268 2.3		2.1	3075	Proparie	en
2.2 \$1577 2.2 \$1577 3.3 \$1.058 3.3 \$1.058 2.3 \$1.058 2.3 \$1.058 2.4 \$1.0		2	2573	Oxorodifluoromethane and chloropentalfuorethane	
2.2 2.1877 2.3 1.2059		2.2	2577	Uquid Himegan	7
2 1209 2 1209 2 1208 2 1208 5.1 2405 6 1 1772 6 60000000 Photorodol Transito TOPAN, MOUNTON FORMARIA Transito More Pricanceled TOPAN, MOUNTON FORMARIA TRANSIC Selectoral Prescribed Transics FORMARIA TRANSICS Selectoral Prescribed Transics FORMARIA TRANSICS Selectoral Prescribed Transics Selectoral Prescribed Transics Reserved Transics More Publicatived		2.2	2187	Certon Dioxide	
2 2.588 2 2.993 2 1.098 2 1.00		ni ni	1203	Gasoline	2
# 2 2053		m	1268	Petroleum Distillans	-
5.1 24/55		Pri	1993	Dieset	m
6 15793 6 15800 1 15793 6 15800 1 1580		5.1	2426	Ammondum nitrate, topole	**
Subtracted Tracts Subtracted Tracts Subtracts Tracts Subtracts Tracts Subtracts Tracts TVTAL TRUCKS Subtracts Subtracts Tracts Subtracts Tracts Subtracts Tracts Subtracts Tracts Subtracts Subtract		10)	1751	Hypoditarite Solution	н
		109	1830	Suffuric Acid with more than \$1% acid	1
		Subscript Plac	arded Trucks		M
		Subhotal Truc	to Not Placarded		930
		TOYAL TRUCK	ש		雅
Subtrotal Tracks Not Placarded	6 Str	Sobtotal Plec	arded Trucks		185
AND TOTAL TO AND A		Substate Truc	far Not Placarded		21.00
TOTAL INDIAN		TOTAL TRUCK	100		1000





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Flammable Liquid n.o.s. # Non-Flammable Gas Elevated Temp. Uq. Misc. Uquid, Acidic Oxidizers/Oxygen Misc. Uquid, Basic Hazardous Waste Dangerous n.o.s. Corrosive, n.o.s a Flammable Gas Aviation Fuel Poison/Toxic # Propane Gasoline Diese 1-80 (Eastbound from Contra Costa County) ion-Flammable Gas HAZMAT COMMODITIES 13% March 2016 Flammable Gas Flammable Liquid n.o.s. 5% Polson/Toxk_ Dangerous n.o.s. Misc. Liquid, Basic 5%



3.0 Commodity Flow Study

The data for the commodities Flow Study was obtained from the UP and BNSF Railroads and from industry chemical data. Data from hazardous materials transport via pipeline are included in this section. Historical data concerning rail, roadway, and pipeline hazardous materials incidents is also contained in this section. Utilization of Google Earth and Google Maps for base maps to portray the various data occur throughout this section and the remainder of the report.

3.1 Railroad Data

Railroad commodity data was obtained and managed by CCHSHMP from both UP and BNSF from the years 2016-2018. Obtained data is used solely for and by a bona fide emergency planning and response organization for the expressed burpose of emergency and contingency planning. All Sensitive Security Information was managed as such by CCHSHMP and detailed information regarding obtained rail data is not included as part of this report.

The following collection of data provides a comprehensive overview of the total rail traffic through Contra Costa County during the years analyzed. Charts in the following sections summarize the overall data with respect to the following:

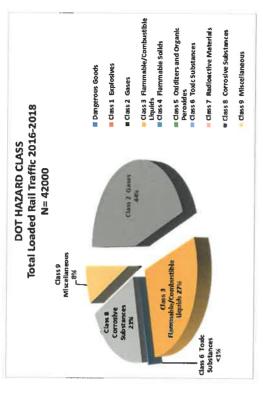
- Total loaded rail traffic;
- Loaded intermodal rail traffic; and
- High movement of materials and materials of concern.

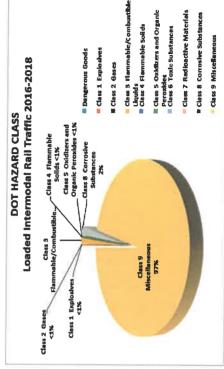
The Total loaded rail traffic consisted primarily of gases, flammable and combustible liquids, and corrosive substances, with lesser amounts of toxic substances and miscellaneous hazardous materials.

Loaded intermodal rail traffic was predominantly miscellaneous hazardous materials with less than 3% explosives, gases, flammable/combustible liquids, flammable solids, oxidizers and organic peroxides, and corrosive substances.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019

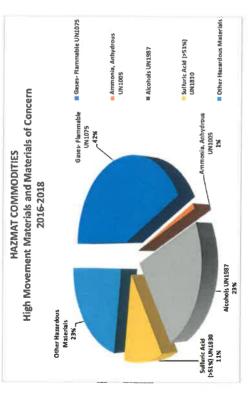
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Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk August 2019 TAIT Environmental Services, Inc. Contra Costa County, California

Based on the data, it was determined that the major materials of concern were Propane (UN1075), Sulfuric Acid (UN1830), and Anhydrous Ammonia (UN1005).



3.2 Industry Chemical Data

by both the Hazardous Materials Commission and the Contra Costa County Board of Supervisors, a gap in understanding of the impacts of hazardous materials transportation was identified. CAER believes that this Flow Study will help to fill the gap in understanding and address planning needs for sea level rise and flooding issues that are predicted to occur in The mission of CAER is to actively enhance public health and safety. CAER leadership believes this Flow Study supports this mission and identifies emerging threats in our community. Following the results of the Adapting to Rising Tides program, which is supported CCHSHMP gained support from the Community Awareness Emergency Response (CAER) group as an emergency response agency and as a leader in community health and safety. the San Francisco Bay Area.

of CAER. This questionnaire addressed hazardous materials transported to and from the facilities, approximate volumes, issues with flooding and other disruptions, as well as alternative arrangements made to ship hazardous materials. The hope was to gain a better CAER holds representation from a majority of the large industrial facilities located in Contra Costa County. In order to further validate and identify chemicals of concerns, as determined from railroad data, an Industry Questionnaire was developed and distributed to the members

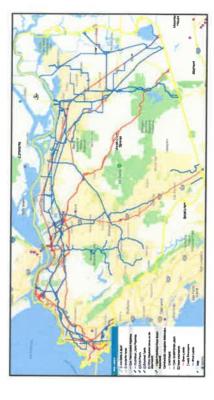
Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019

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understanding of what impacts would be possible directly relating from industry due to a disruption of rail transportation. Unfortunately, the results of the Industry Questionnaire were not obtained as part of this project.

3.3 Pipeline Data

website of the National Pipeline Mapping System (NPMS) at https://www.npms.phmsa.dot.gov/. A map showing the pipelines in Contra Costa County is shown below. Most of the pipelines in the County are located in the coastal areas, and in Information concerning underground pipelines in Costa Mesa County was obtained from the many locations, they are co-located with the railroad lines.



gas transmission lines in these areas are shown in the following sections. Details concerning the hazardous liquid pipelines are contained in Appendix A. The numbers on the hazardous Due to the large number of pipelines in the County, the coastal part of the County was subdivided into four (4) areas. Detailed maps showing the hazardous liquid pipelines and liquid pipeline maps refer to the detailed pipeline data listed in Appendix A. Maps showing the gas transmission lines are also shown, but the various pipelines have not been detailed. The primary constituent of the gas transmission lines is natural gas.

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3.3.1 Richmond Area Pipeline Data

The gas transmission pipelines and hazardous liquid pipelines for the Richmond area are shown in the following maps. Details for the hazardous liquid pipelines are contained in Appendix A-1.

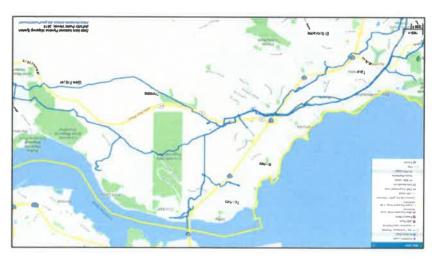




Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Courts Costa County, California August 2019
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3.3.2 Crockett Area Pipeline Data

The gas transmission pipelines and hazardous liquid pipelines for the Crockett area are shown in the following maps. Details for the hazardous liquid pipelines are contained in Appendix A-2.



CET CONTROL CO

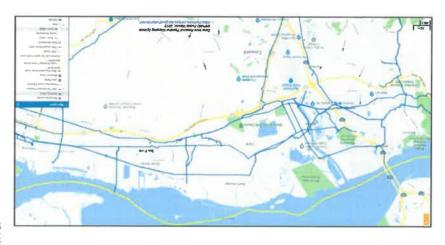
31

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019

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3.3.3 Martinez Area Pipeline Data

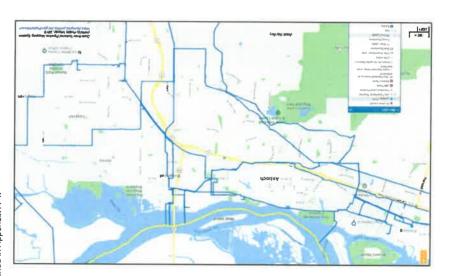
The gas transmission pipelines and hazardous liquid pipelines for the Martinez area shown in the following maps. Details for the hazardous liquid pipelines are contained in Appendix A-3.





3.3.4 Pittsburg-Antioch Area Pipeline Data

The gas transmission pipelines and hazardous liquid pipelines for the Pittsburg-Antioch area are shown in the following maps. Details for the hazardous liquid pipelines are contained in Appendix A-4.





Hazardous Materials Incidents

sources, generally publicly available resources. Hazardous Materials incident data were available for rail and roadway transportation through the County. In addition, pipeline incidents involving both hazardous liquids and gases in the Coastal areas of the County are Data involving hazardous materials transportation incidents were reviewed from available also discussed.

3.4.1 Railroad Incidents

Data concerning hazardous materials incidents involving the railroads in Contra Costa County were obtained from the following sources:

Federal Railroad Administration, on line at https://fragis.fra.dot.gov/gisfrasafety/

https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/AccidentByStateRailroa fine 6 Safety Analysis, ₽ Office Federal Railroad Administration,

ъ http://www.mapreport.com/na/west/ba/news/citysubtopics/contra_costa_countv-dline 5 Timeline, Accident Railroad County Costa Contra

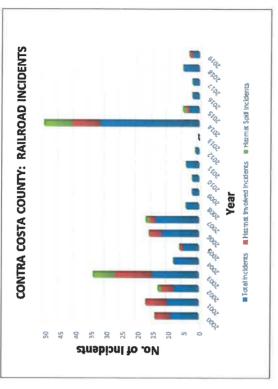
addition, information was utilized from California Office of Emergency Services (CalOES), as well as various on-line news articles related to rail incidents. Rail incident data from 2000 through 2019 were used for this report. It should be noted that some of the rail incidents may include release of hazardous materials from other than a rail car, particularly in the event of a train accident with a vehicle carrying hazardous materials. These have not been differentiated in the data.

Three general categories were reviewed and they are as follows:

- Total number of railroad incidents (140); Number of railroad incidents where hazardous materials were involved (46); and
 - Number of railroad incidents where hazardous materials were spilled (19).

A summary table of the railroad incidents in Contra Costa County over the period of 2000 through 2019 is as follows.

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A large number of rail incidents, including a somewhat higher percentage of rail incidents involving hazardous materials occurred between 2000 and 2007, with a major spike in 2014. With the exception of the number of incidents in 2014, the number of incidents in the last 10 years has generally declined from the early 2000s. Chemicals involved in the railroad incidents are listed in the following chart. Three of these chemicals, anhydrous ammonia, propane, and sulfuric acid were used as the chemicals of concern for plume analysis in the CRA portion of this report.

	Number of
in Incidents	Incidents
Anhydrous Ammonia	-
Propane	-
Sulfuric Acid	2
Hydrochloric Acid	-
Diesel/Gasoline	9
Ethanol	7
Oils/Studge	e
Herbicide	-
Powdered Aluminum	-
Bleach	2
Total	19

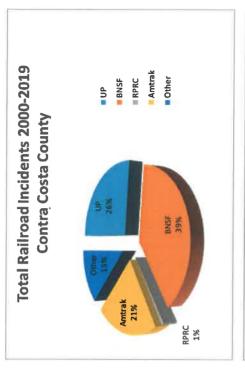
Each of the above three general categories was further subdivided into the following subcategories:

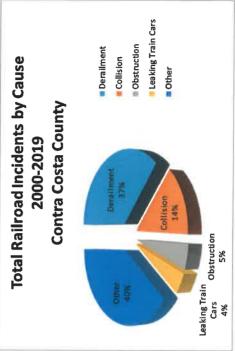
- Number of incidents by railroad company; Number of incidents by cause of incident; and Number of incidents by city.

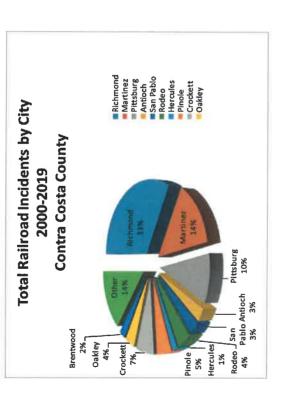
The total number of incidents (140), both hazardous and non-hazardous, occurring on the railroads in Contra Costa County from the period from 2000 through 2019 are illustrated in the following charts.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Courta Costa County, California August 2019

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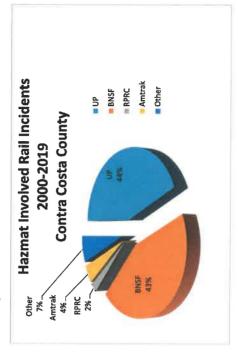


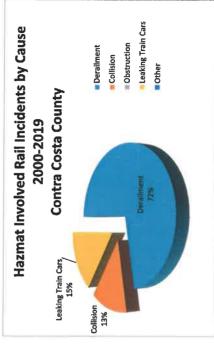


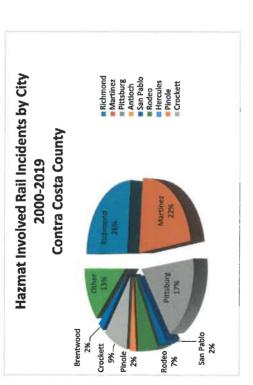


Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019
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The number of railroad incidents involving hazardous materials (46 incidents) occurring in Contra Costa County from the period from 2000 through 2019 are illustrated in the following charts.

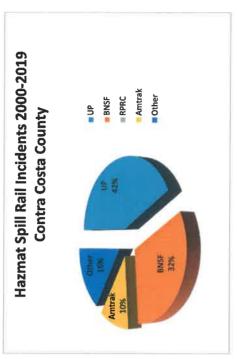


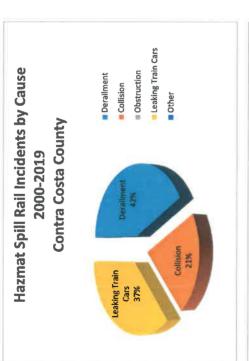


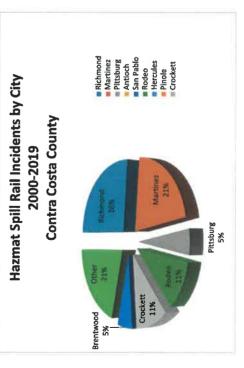


Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019
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The number of railroad incidents resulting in hazardous materials spills (19 incidents) occurring in Contra Costa County from the period from 2000 through 2019 are illustrated in the following charts.







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A review of the above data indicates the following trends:

- Major cause of total rail incidents is derailment;
 Major causes of hazardous materials spill incidents are derailment, leaking train cars, and collision;
 Both UP and BNSF lines contained the major portion of the total rail incidents,
 - as these are the major rail lines in the area;
- UP had a higher percentage of hazardous materials spill incidents than BNSF;
- Total rall incidents were located primarily in the cities of Richmond, Martinez, Pittsburg, Rodeo, and Crockett; and. Hazardous materials spill incidents were located primarily in Richmond, Martinez, Rodeo, and Crockett.
 - 3.4.2 Highway Incidents

Data concerning hazardous materials incidents involving the highway and roadways in Contra Costa County were obtained from the following sources:

California Highway Patrol (CHP).

line ы Materials, https://portal.phmsa.dot.gov/analyticsSOAP/saw.dll?Dashboard. Hazardous Mart Data PHMSA

aţ

The California Highway Patrol provided general data for the years 2016 through 2018.

	Hazaı	Hazardous Materials	als
CHP DATA	Cour	Count of collisions	SI
	Fatal	unini	000
Collision Year			
2016	30	308	37
2017	on	287	37
2018	7	278	45
TOTALS	92	874	120

Data from PHMSA were obtained for the years 2010 through 2019. Many of the hazardous materials incidents in the PHMSA data involved small quantities of released materials. The data are summarized in the following table.

42

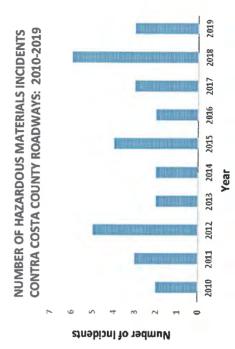
Inoident Street Address	200	Date	Carrier	Chemical Name	#CI NO	Hazmak Class	Quantity Released (gathers)	Vehicle Type	Cause of Release
801 Albas Pload	Cam Padio	8/25/2010	Unter Parcel Service,	Perceun Clethales	1268	17	Ü	NA	Packaging salue
801 Albas Mosed	ODEG WES	7717/2000	Unter Parcel Senios, ans.	Represent	1218	"	0.26418	HA	Hanum Bror
Cast Bay NUD	E Sorbarile	87262091	Quarty Carriers, inc.	Caustic Boda	15201	80	0.016128	Cargo Yark Motor Versole	Haman Sinor
SC Albus Road	Authoria	15/26/2011	United Parcel Cervice,	Chaudons	1,888	80	0.25418	Non-bull	Human Error
hirom	Personny	122 12011	Cushy Carters, Inc.	Sodem Hypothorile, Solution	1573	60	8	Cargo Taris Motor Verice	Handin Bron
IN Lovendys Rossi	Sales of the Sales	221/2012	duality Carteins, Inc.	Hypothorie Schalons with 16% or more	1750	60	95	Cargo Tars Mess Versce	N/A
m Saut Rathony	Crother	312/2012	Company, Inc.	Combuside Lique N.O.S.	1981	m	14	Cargo Tant Meter Vehicle	Human Strot
at Bay MUD	E consrte	511/2012	Outry Camers, Inc.	Causto Soca	1624	40	90,000,00	Cargo Tark Antor Verice	Plantan Empr
Cheston	Richmong	628/2012	OZI Services, Inc.	Enancement or Enanciament Soldions	2491	100	10	Cargo Taris familia Vehicle	Haman Smor
ritrown	Persons	11/2/2012	Outrity Camers, Inc.	Hypotracrae Scallings	Ē	100	8.0005	Cargo Taris latera Venicle	Haman Bror
140 Carat Sive.	Rahmons	\$202013	Outh Cartes, inc.	Sodum Hydradde, Southern	1620	6 0	8	Cargo Taris Mater Vehicle	Phonan error
Ci Lovertépe Rosci	brand	7,01,2013	duam camen, mo.	Partment Doubt. N.O.S.	1993	-	8	Cargo Tarit fester velnde	Haman error
SECURIOR TODA	Property	93020M	Outing Cambers, Inc.	Hypothorae Soutions	E.		NSA	Cargo Tank Motor Vehicle	Haman Snor
IBD1 Albus Permit	Can Poble	102/105	UnterPared Senior, Inc.	Makhas, Safety	1951	23	¥9.	more.	NKA MKA
11 Science Wife,	Marrier	1/31/2018	WAS West, LLC	Gardina	1203	6	郑	Camp Tark salogy Vertice	Ventosan Coast or Accident Demaye
25 Emolecine Averue	Postmone	4/23/2013	Carters, ire.	Solum Hypochecke, Solden	1871	10	0.03125	Carpo Taris Motor Vehicle	Delenoratori or Aging
Minoun	Admon	42773018	Cuarty Caroline, Inc.	Bisultes, Aqueous Solutions, N.O.S.	2693	40	0.007812	Cargo Tank Motor Vestore	Deterloration or Aging
601 Adia Road	-102:455	7122015	Unter Parcel Service, Inc.	Comolee Ligator, N.O.S.	1760	10)	0.09375	Non-Bulk	Human Street
601 Albis Road	com Page	VEZD'6	Unfert Parcel Service, Inc.	Corrosive Ligad, Acidlo, Françania, N.O.S.	3254	10	-	Non-Butt.	Preparation for Transportation
SECT ASSES TORS	San Page	61/3221/6	Unter Farbi Sanda,	Corrosive Liquid, Basic, Progante, N.O.S.	9922	600	0.1876	Non-Bulk	Human Bror
60% Albu Rond	Open Page	8/16/2017	United Partel Service, int.	Aaroscis, Paramable	1980	2	0.16826	Non-Gulk	Pradequee Preparation for Transportation
4600 Norte Canyon Yourd	Carrenton	\$102/9/6	United Parosi DerAdos.	Acetore	0604	n	0.007812	Noneus	Haman Error
and crympta Drive	ánota:	TINGERET	Ouring Carriers, Fro.	Sodem Hydratide, Solution	1000	10)	n	Cargo Tark Stote Vehicle	Pageston for Preparation for Transporation
6D1 Attac Read	Car Date	Chill Patrice	United Parties Sentice,	Agreement of the Base	i		20000		

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Coura Costa County, California August 2019

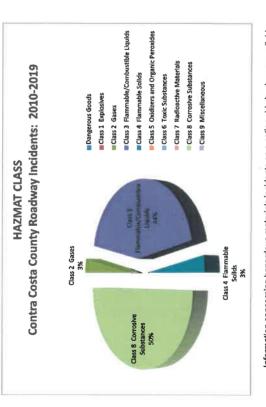
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troident Bineet Address	Clfy	Date	Carrier	Chemical Name	POI NO	Hazenat Class	Quantity Referend	Vehicle Type	Cause of Release
SEDT Alba Mosd	San Patro	1/16/2018	United Parcel Senios,	Pyportionie Solutions	1731	n	0.1676	Non-Bulk	Deciped
15011 Albe Pond	Can Patho	917/2018	United Parcel Service, Inc.	Plantnatile Uspale, N.O.B.	1983	n	-	Non-Bus	Abradon
FECH ARINE Pload	Dan Publo	1,06/2018	United Parted Service, Inc.	Hears	1206	in	0.66046	Novelik	Haman Stror
1601 Albe Road	Char Pablo	15/16/2018	Unter Partie Service, Inc.	Carrostve Ligadi. Addito. Prarganto, N.O.S.	3354	63	0.0223438	Non-Bulk	Conveyer or Material Handing Epitement Mahar
1901 Albas Pond	San Patto	11/16/2018	United Parcel Service, Inc.	Compane Ligate, Acido, Prorgante, Al.O.S.	3254	9	0.007813	Non-Bulk	Conveyer or Makenia Handing Equationer Menas
4500 Norra Canyon Toad	Carl Tomon	144/2019	Unter Parcel Service, Inc.	Acitone	POSO	60	6.039963	Noseur	рефац
ABDO North Carayon Posed	Can Ramon	3/21/2019	United Parton Service, the.	Planted Liquid, N.O.S.	1953	0	92900	Non-But	Propagation for Transportation
Reprovid Poly, & San Function Public Ave.	Adrend	27212019	27212019 Umar, 810.	Sodun Bleuffe, Schlich	2665	4	8	Cango Tara Motor Venicle	Human Error

Based on the data shown above, the incident rate per year (2019 not yet completed) is shown in the following chart.



Several different hazardous materials classes are represented in the releases as shown in the following chart.



Information concerning hazardous materials incidents on a nationwide basis was available from the following publications:

U.S. Department of Transportation, Bureau of Transportation Statistics, March 15, 2018, Facts and Figures 2017.

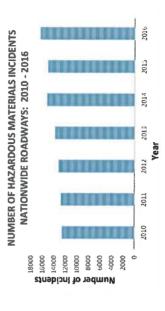
U.S. Department of Transportation, Bureau of Transportation Statistics, January 1, 2015, Facts and Figures 2015.

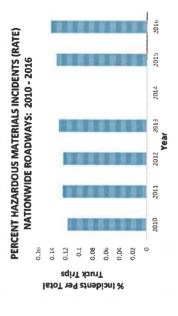
Information from the Bureau of Transportation Statistics (BTS) included data concerning total truck trips and total truck hazardous materials incidents for the years from 2010 through 2016. The information is summarized in the following table and charts.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019

TAIT Environmental Services, Inc.

_		-	_	~	~	***	~	۳
2010-2016	Hazardous Materials Trucking Incidents as of Total Truck Tentio	0,1175%	0.1247%	0.1244%	0,1319%	NA	0.1350%	
icking incidents:	Hazardous Materials Trucking Incidents	12,651	12,812	13.255	13.882	15.284	15,120	
ardous Materials Tru	Truck Traffic as % of Total Highway Traffic	4.3	4.1	4.2	4.1	N/A	4.2	
Nationwide Haza	Total Truck Traffic Trips on Highways	10,770,054	10,270,693	10,659,380	10,597,356	N/A	11,203,184	*** ***
	Year	2010	100	2012	2013	2014	2015	





The above data indicate that throughout the period from 2010 through 2016, the number of nationwide incidents resulting from highway transportation of hazardous materials cargo has increased from 2010 through 2016. In addition, the rate of the hazardous materials incidents has also increased. In general, the number of hazardous materials incidents occurs in about 12 to 14 times per 10,000 total truck trips. These numbers can be extrapolated to Contra Costa County, although there may be an increase in the frequency/rate of the incidents due to the following:

- High traffic volumes in a heavily populated urban area;
- Increased frequency of transportation of hazardous materials along arterial roadways; and
 - Increased number of incidents because of flooding due to rising tides.

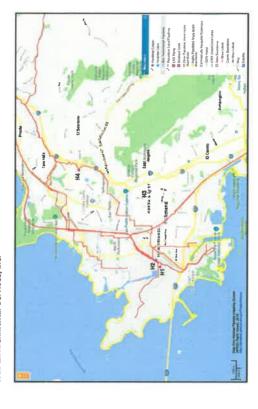
3.4.2 Pipeline Incidents

Release incidents can occur along pipelines that can endanger populations located adjacent to the pipelines, as well as those in downstream areas from the pipelines. This is particularly true with the natural gas pipelines, and was evidenced in the 2010 San Burno PG&E natural gas pipeline explosion and fires. In order to mitigate any negative results due to a release incident along the pipelines, Contra Costa County should coordinate with the pipeline operators to immediately isolate the affected lines. Isolation will ensure that a minimal amount of the population is affected by the incident. In addition, evacuation procedures should be in place to quickly and efficiently remove the affected populations from the areas impacted by the incident.

Most of the data available from the National Pipeline Mapping System (NPMS) at https://www.npms.dot.gov/ covered releases from hazardous liquid pipelines with frew releases listed from the gas transmission lines. Maps showing the locations of the pipeline incidents in the coastal area of Contra Costa County and accompanying details of the incidents are shown below for the Richmond, Crockett, Martinez, and Pittsburg-Antioch areas.

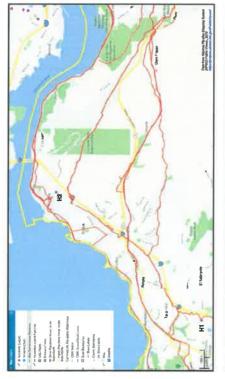
Hazardous liquid pipeline data for the Richmond area are shown in the following map and table. There was no information available for gas transmission line incidents in the Richmond area.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019
TAIT Environmental Services, Inc.



Location Data Pipeline Operator Commodity Released Location Locati			Richmo	Richmond Area: Hezardous Liquid Pipeline Incident Data	ne Incide	nt Darta	
Gesoline 4.0 Refred and/or Petroleum Products 58.9 Gesolind/deal 4.0 All and/or Petroleum Products 4.0	Location		Pipeline Operator	Commodity Released	(bole)	Recovered	Cause
Refined and/or Petroleum Products 55.9 Gesoline/diseal 4.0 Albertine 11.0 Refined and/or Petroleum Products 2.1	E	8002/22/9	d'i'ddd5	Gesoline	4.0		Corrosion
Gesolina/desal	142	1/12/2015	St-pp_LP	Refined and/or Petroleum Products	58.8		Material/west equipment faktre
84 9/17/2014 Phillips 68 Pleatine: 11.C Refined and/or Patroleum Products 2-1 2-1	E P	12/7/2002	SFPP_LP	Gasoline/d/asel	4.0	0.0	Material/weid/equipment fallure
The state of the s	Ŧ	9/17/2014	Phillips 68 Pipeline, LLC	Refined and/or Petroleum Products	2.1	2.1	Material/weidiequipment feature

Hazardous liquid pipeline data for the Crockett area are shown in the following map and table. There was no information available for gas transmission line incidents in the Crockett area.

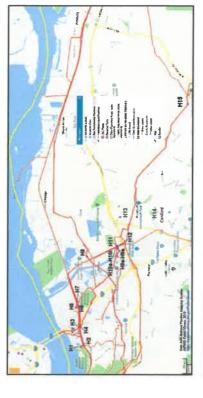


ğ	Location Date	Pipeline Operator	Commodity Released	(bble)	Loss Recovered (bols) (bbis)	Cause
	9/17/2014	W17/2014 Philips 66 Pipeline, LLC	Refined end/or Petroleum Products	121	2.1	Meterial/weld/equipment failur
	6/21/2004	\$21/2004 Nuster Terminals Operations	Refined and/or Petroleum Products	37.0	37.0	Incorrect Coeration

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Coura Costa County, California August 2019

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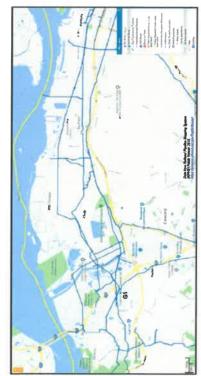
Hazardous liquid pipeline data for the Martinez area are shown in the following map and table. Information was also available for gas transmission line incidents in the Martinez area.



Location	Oate	Pipeline Operator	Commodity Released	(abls)	Recovered (bbis)	CRUSO
÷	7/3/2012	Shell Pipeline Co., LP	Refined and/or Petroleum Products	13.0	13.0	Material/weid/engisment failure
- 24	12/15/2015	Shell Pipeline Co., LP	Refined andfor Petroleum Products	0.95	0.48	Incorrect Operation
ç	117/2004	SEPP, LP	Jet Fuel JP-8	299.0	203.0	Excavation Dampoe
Ŧ	6/24/2008	Pacific Attentic Terminals, LLC	Hydrolest Water/Oil Mixture	9.0	0.0	Material West Chemistre of faiture
*	9/18/2007	Pacific Attantic Terminals, LLC	Gesoline/Reformate	168.0	123.0	Incorrect Operation
148	4/5/2016	Tesoro Logistics Operations	Refined and/or Petroleum Products	H)	1.5	Incorrect Operation
14.	11/5/2009	Pleins Marketing, LP	Diesel	4.0	0.0	Corrosion
H8	4/19/2019	Chevron Pipeline Co.	Refined and/or Petroleum Products	18.6	15,5	Material/weld/equipment failure
HSta	6/8/2013	SFPP.LP	Refined and/or Petroleum Products	7.	1.4	Motorial/wold/equipment failure
460	12/9/2014	dTddd\$	Refined and/or Petroleum Products	10.0	0.01	All Other Causes
490	6/21/2014	B#PP,LP	Refined and/or Petroleum Products	7.2	7.0	Incorrect Operation
494	9/14/2014	dT'ddd\$	Refined and/or Petroleum Products	12.8	12.8	Incorrect Operation
46e	0/21/2018	SKPPLP	Refined and/or Petroleum Products	0.4	0.4	Material/weld/eg.soment failure
1108	11/20/2017	dT ddysi	Refined and/or Petroleum Products	0.35	0.35	Material/weld/equipment (allune
1100	0/28/2004		Gesoline/Distillate Mixture	3.0	0.0	Moterial weld inquipment (alline
410c	5/30/2003	d'i dayS	Gasoine	1.43	0,71	Incorrect Operation
1100	4/30/2008	Bitpp LP	Gastoline	0.77	77.0	Material/weld/equapment fallure
H10e	3:29/2003	SFPPLP	Turbine Fuel	0.48	00:0	Material webble comment failure
101		dT'ddsS	Turbine Fuel	0.48	DO:0	Incorrect Operation
H16g	4/14/2003	all ddats	Transmix	725.0	485.0	Corresion
H10h	3/23/2016	dTddsS	Refined and/or Petroleum Products	2.19	2.19	Corrosion
1011	4/1/2013	dTdds5	Gasoline	530.0	486.0	Material west to a green fallune
411	4/21/2002	aT ddys	Diesef	13.0	0.0	Incorrect Operation
412	1/8/2002	athp, LP	Gasoline	4.0	0.0	All Other Causes
413	6/14/2002	SFPP,LP	Gasoline/Diesel	3.0	0.0	Material/weld/equipment failure
H14	714/2002	Equitor Pipeline Co., LLC	Crude Oil	0.24	000	Moterial/weld/equipment failure
His	11/7/2011	Conoco Philips	Crude Oil	45.0	0.0	Corresion

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk cordra Costa County, California August 2019

TAIT Environmental Services, Inc.



Ocation Date Pineline Character Commodity Balasand			
	Loss Rec (bbis) R	Recovered (bbls)	Cause

Hazardous liquid pipeline data for the Pittsburg-Antioch area are shown in the following map and table. There was no information available for gas transmission line incidents in the Pittsburg-Antioch area.

1	F./-	The second control of the control of
	Conspir	
NE	Production (1
		por l
	a Antioch	am nas
		Description of the Party of the
	Yangi I	a de la companya de l

		Pittsburg-Ant	Pittaburg-Antioch Area: Hazardous Liquid Pipeline incident Data	line Incide	nrt Date	
Location	Darks	Pipeline Operator	Commodity Released	(opto)	Loss Recovered (bbis) (bbis)	Cause
Ŧ	8/5/2018	d1 dd35	Rollined and/or Patoleum Products	72.0	72.0	Meteral/watchen decreen falure
H2	1022/2018	Stab Lb	Refined widor Petroleum Products	12.02	12.02	Mohamasweld-equipment faluro
						Annual Control of the

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk FAIT Environmental Services, Inc. Contra Costa County, California

Community Risk Assessment for Hazardous Materials 4.0

analysis and determination of pinch points will be aided by available data from the Adapting to Rising tides program. The CRA presented herein will allow for first responders to plan the incident response in advance of the incident, and to provide additional information toward the planning areas of the County during a release incident. In addition, the Flow Study data aided in the determination of the pinch points or the locations most susceptible to a hazardous materials This Community Risk Assessment for Hazardous Materials (CRA) is developed to further refine and define the areas of increased risk within the coastal area of Contra Costa County that are vulnerable to a significant hazardous materials release from railroad, roadway, or pipeline incident. Data from the Flow Study outlined above in Section 3 of this report was used to aid in the identification of major toxic chemicals or COCs that could present a danger to vulnerable incident as well as vulnerable populations and critical facilities affected by an incident. This needs of Contra Costa County. Potential hazardous materials incidents within Contra Costa County can be generally classified as follows:

- Spill or Release: Exposure to toxic vapors, gases, liquids, and solids, requiring County residents and business to undertake protective actions, such as evacuation or shelter-in-Secondary risk to the environment is possible including contamination of subsurface drinking water sources, soil contamination, and danger to the health of wildlife.
- <u>Fire</u>: Toxic chemicals may be produced when hazardous materials bum creating inhalation and skin adsorption issues from toxic clouds and plumes, and it may require County residents and business to undertake protective actions such as evacuation or shelter in place. Fires related to hazardous materials tend to be focused around industrial areas and transportation corridors.
- Explosion: Explosions can occur with fires at hazardous materials sites, and represent a physical hazards as well as a chemical hazard. As with fires related to hazardous Boiling Liquid Expanding Vapor Explosions (BLEVEs and may also pose an immediate materials, explosions tend to occur in industrial areas and along transportation corridors. threat to County residents and businesses.

The following are examples of the critical facilities that could be impacted by a hazardous materials incident:

- City, County, State, and Federal Buildings, including public safety and public works buildings;
 - Fire Stations;
- Hospitals, Emergency Care, and other Medical Facilities;
 - Nursing and Convalescent Homes;
- Community Centers and Shelters; and
 - Colleges, Schools, and Preschools.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California TAIT Environmental Services, Inc. Other general assets that could be affected by a hazardous materials incident are:

- Vulnerable Populations: and
 - Residential Building Stock.

Vulnerable populations are often present in close proximity to major transportation corridors. Many of these areas are relatively high-density residential areas, and from a demographic standpoint, they tend to be lower-income areas.

The scope of work for the completion of the CRA was focused on the following areas:

- Hazardous materials producers/users/transporters located within the coastal areas of Contra Costa County;
 - Transportation routes of hazardous materials along the UP and BNSF Railroads in the coastal and near-coastal areas of Contra Costa County;
- Evaluation and determination of the five (5) pinch points based on the locations where a hazardous incident is more likely to occur and the effects on critical facilities and vulnerable populations is at higher risk;
 - Land use in high-risk areas (commercial, industrial, residential);
 - Demographics;
- Utilization of CalARP data for Contra Costa County,
- Incorporation of ALOHA/CAMEO/MARPLOT data and ERG data into the CRA for highrisk areas:
- Potential impacts in high-risk areas; and
- Evaluation of the vulnerability of specific areas.

Determination of Pinch Points

Five pinch points were determined during this study for extended analysis in the event that a hazardous materials incident/accident occurred at these locations. The pinch points were ocated as follows:

I-580 at Meade Street Richmond Parkway South of MacDonald Avenue Richmond #1: Richmond #2:

Shell Avenue and Marina Vista Avenue Martinez #3:

Nichols Road North of Port Chicago Highway Bay Point #4:

The locations of the 5 pinch points are shown on the map below.



The determination of the pinch points was dependent in part on the following parameters, which were used to perform the CRA:

- Rising Tides data and areas most susceptible to rising tides and sea level rise;
- California Healthy Places Index indicating vulnerable populations;
 - Liquefaction Susceptibility data;
 - Location of CalARP Facilities;

 - Locations of Critical Facilities;
- Chemicals of Concern;
 - Weather data;
- Railroad Locations; and

Critical Arterial Road Locations.

These parameters are described in detail in the following sections and are tabulated in the various parts of Section 5 of this report

4.1.1 Rising Tides Data

A critical aspect of the determination of pinch points is an analysis of flooding due to rising tides and sea level rise, including king tides and storm surges. These critical aspects will be summarized in this section based on the data available from the following sources: Contra Costa County ART Project, March 14, 2017, Adapting to Rising Tides: Contra Costa County Assessment and Adaption Project, 188 p.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Levei Rise and Flood Risk Contra Costa County, California TAIT Environmental Services, Inc. August 2019

Adapting to Rising Tides Bay Shoreline Flood Explorer, 2019, San Francisco Bay Conservation and Development Commission's Adapting to Rising Tides Program, on line at https://explorer.adaptingtorisingtides.org/home. Adapting to Rising Tides East Contra Costa Shoreline Flood Explorer, 2019, San Francisco Bay Conservation and Development Commission's Adapting to Rising Tides

ransportation of goods, including hazardous chemicals, as well as commuters, and the Flooding due to rising tides and sea level rise can have a significant impact on the ground ability of first responders to respond to emergency situations. Impacted transportation routes include railroads, roadways, and pipelines.

Ralifoad (UP) operates along the shoreline area of the County from Richmond to past I-680 through Martinez, where it is directed easterly toward Pittsburg, and then Richmond Pacific Railroad Company (RPRC) leases about 11 miles of UP track in the from Richmond along the coast to Pinole where it heads inland to Martinez where it joins Two major rail lines are located in the coastal areas of Contra Costa County. Union Pacific southeasterly toward Tracy. Burlington Northern and Santa Fe Railroad (BNSF) operates BNSF is directed easterly toward Pittsburg, and then on to Stockton. western part of Richmond. The UP rail line is also used by passenger/commuter trains. the UP line.

The effect of rising tides on the rail lines can be summarized as follows:

- Rail lines located along the shorelines serve as a first line of defense against inland flooding, also known as ad hoc flood protection;
- of goods through Contra Costa County, particularly alternate transportation along Disruption of rail line transportation can have significant impacts on the movement
- In the event of flooding, the stability of the rail lines in some areas (ballast and track bed materials) may be at risk of becoming structurally unsound;
- Groundwater table rise due to climate change could also result in the instability of the rail lines due to the potential damage to track bed and ballast materials; and
- Certain areas of the rail lines are in areas at risk of high to very high liquefaction in the event of an earthquake.

the East County ART was not available at the time of the completion of the Flow Study. This is shown in the following chart which is noted as Table 29 in the Contra Costa County ART Project document referenced above and is reproduced below. the coastal floodplain and the tidal creeks and channels. The information contained in the In Contra Costa County, a total of 14 miles of rail is within the 100-year floodplain, including ART report includes only the area of the County from Richmond to Bay Point. Data from

able 29. Miles of rall ti	able 29. Miles of rail that could be exposed to sea level rise.	ea level r	me.				
	Miles in the Current	Miles e	pesod	o Sea Lo	posed to Sea Level Rise		
Nas Owins	100-year Floodplain	÷	2	ę,	-4	,	.9
BNSF	2	7	0	01	4	2	7
Union Pacific	6	(P)	9	4	12	90	22
Unknown	2	2	65	4	rč.	60	10
Total	14	7	5	5	20	31	40

of the County, 27.5 miles are within the 100-year floodplain, and 16.3 miles are potentially exposed to sea level rise. All 3 Interstate highways (I-580, I-80, and I-680) in the County carry high volumes of truck raffic throughout the area. The miles of roadways located within the current 100-year floodplain is shown in the following chart which is noted as Table 31 in the Contra Costa County ART Project document referenced above and is Roadways utilized in the transportation of hazardous chemicals in the coastal areas of arterial roads, and major collector roads. Of the roadways evaluated in the coastal area Contra Costa County consist of Interstate highways, freeways or expressways, principal reproduced below.

Table 31. Roadways in the current 100-year floodplane and roadways that could be exposed to sea level rise.

:	Total miles in	Miles in the	Miles	esodxe	d to Sea	Miles exposed to Sea Level Rise	Rise	
lype of Koad*	project area	current 100- year Flood	-	N	'n	4	വ്	ůa
Interstate	7.22	3.3	6,	1.3	4.	1.3 1.4 1.4 1.6	9.	2.2
Freeway or Expressway	33.7	2.2	0.1	0.1	0.1	£.	3.5	3.5
Principal Arterial	20.3	2.1	0.0	0.1	0.1	0.1	0.2	0.2
Major Collector	124.9	19.9	0.8	73	1.1 1.4 1.9	1.9	6.9	10.4
*Note: there are no minor arterials in the project area	terials in the proj	ect area						

Table 32 from the same document shows the local streets and roads at risk of current or future flooding and is reproduced below.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019 TAIT Environmental Services, Inc.

Table 32, Local streets and roads at risk of current or future flooding

Streets and Roads at Risk of Flooding

Bayylew Avenue and South 51st Street between E.	
Monigomery Avenue and L580	
Hercules	Pinole
Railroad Avenue at Santa Fe	Orleans Drive
Bayfront Boulevard	Railroad Avenue
Sanderfing Drive	Tement Avenue
Martinoz	Unincorporated County Areas
Embarcadero Street	San Pablo Avenue, Parr Boulevard and Garden
Joe DIMaggio Drive	Tract Road (North Richmond)
North Court Street	San Pablo Avenue (Bayview-Montalvin)
Marina Vista Avenue between Pine Street and	San Pabio and Parker Avenue (Rodeo)
Alhambra Avenue	Dowrello Drive, Loring Avenue and Rolph Avenue
Alhambra Avenue from HWY 4 to Marina Vista	(Crockett)
Avenue, including adjacent local streets	Canyon Lake Drive (Port Costa)
Pine Street at Escobar, and between Pacheco	Waterfront Road (from Martinez to Bay Point)
Boulevard and Green	Solano and Monsanto Way
Waterfront Road near I-680 to the county line	Main Street (Bay Point)
Service Road and Waterbird Way	
"this is by no means exhaustive.	

1

ocal streets around Wildcat Creek and San Pablo Glant Road and Brookside Drive and numerous San Pablo Avenue at San Pablo Creek

Creek

Carlson Boulevard and Jacizzi Street between the

county fine and Central Avenue

Santa Clara Avenue at Yosemite Avenue San Mateo Street at Belmont Avenue

Rydin Road at Central Avenue

Richmond Parkway Castro Street Pierce Street

Rumrill Boulevard

23" Street

As with the railroads, portions of the freeways are susceptible to damage due to sea level rise or an elevation of the groundwater table. Also, in the event of disruption of transportation of commercial goods along the rail lines, significant stress will be placed on the roadways to move cargo and people through the area. Numerous pipelines carry hazardous chemicals through the coastal areas of Contra Costa County. According to the Contra Costa County ART Project document, approximately pipelines carry 11% of transported goods, primarly liquid petroleum products through the County. Many of the pipelines are collocated with the rail lines, and issues due to rising tides and sea level rise could equally affect the pipelines, resulting in major chemical spills from the pipelines.

Using the Adapting to Rising Tides Bay Shoreline Flood Explorer, the project compiled data for three different scenarios:

- 12-Inch Sea Level Rise, Equivalent to King Tide with no Sea Level Rise; 24-inch Sea Level Rise, Equivalent to 5-Year Storm Surge with no Sea Level Rise; and
- 36-Inch Sea Level Rise, Equivalent to 50-Year Storm Surge with no Sea Level

The above flooding scenarios were chosen due to various factors including likelihood of that flood event occurring. 12-Inch Sea Level Rise, for example, is equivalent to a King Tide, which is the highest predicted high tide of the year. A 5-Year Storm Surge has a one-In-five chance (20% chance) of occurring on any given year, and a 50-Year Storm Surge has a Surge has a 2% chance.

Also, sea level rise probability predictions were considered. According to the State of California Sea Level Rise Guidance 2018 Update, sea level rise in the San Francisco area is predicted to be between six (6) to 10 inches by 2030 and 13 to 23 inches by 2050.

		A Albert		of the party	the topy of the topy of	4.304	
		MEDIAM	LIMIT	LINEAY WANGE	1 18-20 0848165	1 14-30 cetables 1 14-300 cHaries	
		50% probability sca-level rise meets or exceeds	Sea-f	SGN probability sea-level risa Al between	5% pribability sea-level rise meets or exceeds	D. 5% probability see-level rise meets or exceeds.	
				Love Bilak Amerikan		Proditom - High Malt Averation	Extreme stot, Avarston
hand seemed with	ATTEN .	0.4	0.3	0.5	9'0	0.8	1:0
	78.00	9.0	9.0	0.8	1:0	1.3	1.8
	1050	6.0	9.0	3.1	1.4	1.9	2.7
a continue.	1000	3.0	9.0	- 13	1.6	2.4	
(d) restrictions	2000	11	9.0	10	83	2.6	Q.
Per ARRESTAGES	1076	979	8.0	15	6:2	3.1	
th reviews	1836	47	1.0	1.9	2.4	3.5	5.2
o company	3946	1.3	6.0	1.3	2.3	0.10	
distribution of	H	1.7	1.2	- 2.4	3.0	4.5	9.9
180553466	386	1,4	10	. 21	2.8	4.7	
d) restrones	il.	23	176	2,9	3.6	5.6	8.3
of delicery	7788	1.6	1.0	2.4	ru ro	5.7	
th resistance	1992	2,5	91	10 × 10	4.4	6.9	10.2

ter/ftp/pdf/agenda items/20180314/Item3 Exhibit-For more information regarding probabilistic prediction, please see:

no Sea Level Rise will be used in the Chemical Plume analysis section of this report For purposes of the CRA, only the 12-inch Sea Level Rise, equivalent to a King Tide with (Section 5). These three scenarios for Richmond and Martinez areas of Contra Costa County are shown in the following three maps. Detailed maps covering the 12-inch Sea Level Rise,

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equivalent to a King Tide with no Sea level Rise will be provided with the various pinch point locations discussed in Section 5.

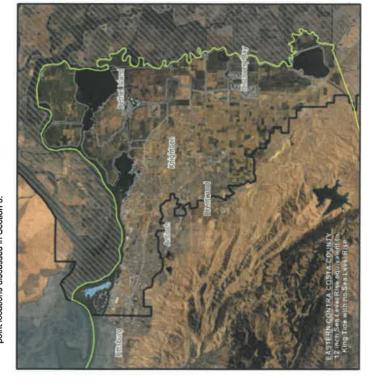






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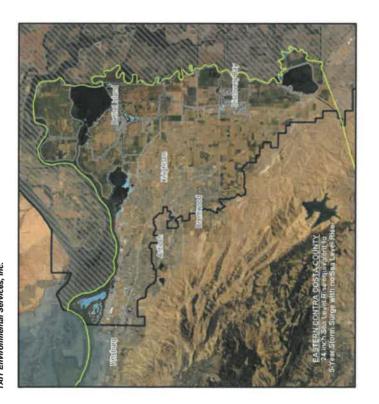
These three scenarios for the eastem portion of Contra Costa County were obtained from the Adapting to Rising Tides Eastem Contra Costa Shoreline Flood Explorer, and they are compiled in the following three maps. Detailed maps covering the 12-inch Sea Level Rise, equivalent to a King Tide with no Sea level Rise will be provided with the various pinch point locations discussed in Section 5.



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4.1.2 California Healthy Places Index

The California Healthy Places Index (HPI) was used as an aid to determine more vulnerable populations for the CRA, including areas of lower income residential development. The HPI is available on line at https://map.healthyplacesindex.org/. The HPI indicators were developed using the following data:

- Economic;
- Education;
- Transportation;
- Social:
- Clean Environment;
 - Housing; and
- Healthcare Access.

The HPI indicators are supported by a number of Decision Support Layers as follows:

- Health Outcomes;
- Health Risk Behaviors;
- Climate Change-Exposures;
- Climate Change-Social Vulnerability;
 - Climate Change-Adaptive Capacity;
 - Other Indices of Disadvantage;
- Other Decision Support Layers; and Race/Ethnicity.

Based on the above data, each area is given a percentile score which fall within the following parameters from "less" to "more" healthy conditions as follows:

- 0-25 (least);

 - 25-50; 50-75; or
- 75-100 (most).

A generalized map of Contra Costa County is shown below. Detailed maps will be provided with the various pinch point locations.

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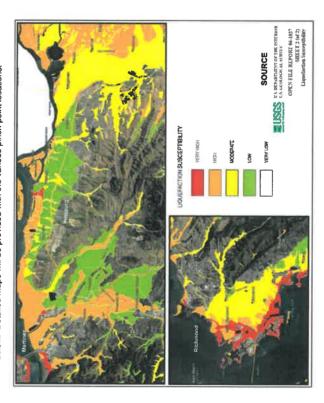
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4.1.3 Liquefaction Susceptibility

located in the coastal areas of Contra Costa County. Liquefaction occurs where saturated sand and slit assume the characteristics of a liquid during an intense shaking during an earthquake. These areas are considered to be vulnerable to disruption of rail and road traffic, as a result of an incident during an earthquake. Information on liquefaction susceptibility in Contra Costa County was obtained from the US. Geological Survey on generalized map of high to very high liquefaction susceptibility in the County is shown Large areas of high to very high susceptibility to liquefaction during a seismic event are below. Detailed maps will be provided with the various pinch point locations. line data at https



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4.1.4 CalARP Facilities

determination of the pinch points, as hazardous chemical from some of the CalARP sites were transported through the area along the railroads and roadways. Some of the CalARP facilities are considered to be critical operating facilities, as they include water treatment Contra Costa Health Services provides an on-line listing of sites that are part of the Locations of CalARP facilities aided in the and energy generation /transfer facilities, as well as large economic centers. (CalARP) Prevention Release Accidental California

shipping routes, including other rail lines, arterial roadways, and ports will be subjected to In the event of rall incident resulting from derailment or other cause due to rising tides and subsequent flooding, major rail transport of manufactured goods, including hazardous materials via rail may be seriously disrupted for unspecified periods of time. Alternate increased volumes of traffic, potentially resulting in increased transportation-related incidents along all transportation lines. Currently, a Hazardous Materials Commodity Flow Study is being undertaken for 11 California deep water ports, including the Port of Richmond by Dr. George Lane of the Center for Catastrophic Risk Management of the University of California at Berkeley. This study is being funded by CalOES, and the results are separate from this project.

A map locating the CalARP facilities in the coastal areas of Contra Costa County is shown



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4.1.5 Critical Facilities and Vulnerable Populations

The locations of critical facilities were used as an aid in determining the locations of the pinch points. Critical facilities located in the coastal areas of Contra Costa County can be summarized as follows:

- City, County, Federal Buildings
 - City Hall
 - Civic Centers 0000
- City Administrative Buildings Local Police Departments
 - 0 0
- Public Libraries Public Works County Administrative Buildings
 - Sheriff Departments 000
 - Animal Shelters
- Fire Stations
- Hospitals and Emergency Medical Care Hospitals 0
- Clinics
- Urgent Care

Surgical Services

o

- Nursing and Convalescent Homes
 - Nursing Homes Residential Care o
- Assisted Living Centers
- Community Centers/Shelters
- o Community Centers o Rescue Missions
 - Homeless Shelters
- Schools
- Colleges
 High Schools
 Middle Schools
- Elementary Schools 0
 - Specialty Schools

Many of these facilities are relevant to other hazards than the release of hazardous materials. As a result, and for the purposes of this CRA, critical facilities will refer to facilities that may contain vulnerable or essential emergency populations that will require mitigation/evacuation in the event of a hazardous materials release. Preschools

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is contained in Appendix B. Maps showing the critical facilities listed above are contained in the following pages. A list of these critical facilities, which are located within one to two miles of the pinch points

The locations of critical facilities in relation to the identified pinch points was of primary concern. Other factors including location of railroads and arterial roadways, liquefaction potential, rising tides issues, and California Healthy Places also played a cumulative role in the determination of each of the pinch points.

Hæzardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019 TAIT Environmental Services, Inc. Pinch Point Richmond #1 is located along a major north-south rail corridor in the city of Richmond. Most of the cirtical facilities for Pinch Point Richmond #1 are located east of the pinch point, which is equivalent to the prevailing downwind direction. Much of this area is in commercial and residential land use. Most of the area west and southwest of the pinch point is industrial.



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Pinch Point Richmond #2 is located along a major north-south rail corridor and rail siding in the city of Richmond. Most of the cirtical facilities for Pinch Point Richmond #2 are located east of the pinch point, which is equivalent to the prevailing downwind direction. Much of this area is in commercial and residential land use. Downtown Richmond is located directly east of the pinch point. Most of the area west of the pinch point is industrial.



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located southwest and south of the pinch point. Much of the area southwest of the pinch point is in commercial and residential land use and downtown Matinez is located in this direction. Most of the area to the south of the pinch point is residential. Industrial areas, including oil refineries, are located east of the pinch point, which is equivalent to the downwind direction. Industrial areas are also located north and west of the pinch point. Pinch Point Martinez #3 is located along the major UP rail line entering the Martinez area from the coast to the west. Most of the cirtical facilities for Pinch Point Martinez #3 are



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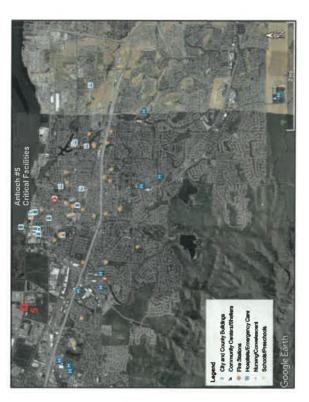
Pinch Point Bay Point #4 is located at the intersection of the major UP and BNSF rail lines heading east from Martinez. Most of the cirtical facilities for Pinch Point Bay Point #4 are located east-southeast of the pinch point. The major portion of the cities of Bay Point and Pittsburg, including the commercial, residentia, I and downtown areas of these cities. These cities are partially downwind of the prevaiing wind direction. The area directly west of the pinch point are primarily industrial and natural coastal areas.



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cirtical facilities for Pinch Point Antioch #5 are located east and east-southeast (downwind) of the pinch point and includes a major portion of the city of Antioch, including the Pinch Point Antioch #5 is along the BNSF rail heading east from Martinez. Most of the commercial, residential, and downtown areas of the city. The area surrounding the pinch point are primarily industrial and natural coastal areas.



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4.1.6 Chemicals of Concern

Based on the Flow Study from the railroads, it was determined that the following 3 chemicals of concern would be used in the CRA portion of this study to cover worst-case scenario situations at the pinch points in the event of a hazardous materials incident/accident:

.

- Ammonia/anhydrous ammonia: highly toxic;
 Propane: highly explosive and commonly transported along the railroads in Contra Costa County; and
 - Sulfuric acid: commonly transported along the railroads in Contra Costa County.

These chemicals are discussed in detail in subsequent sections of this report.

4.1.7 Background Weather Data

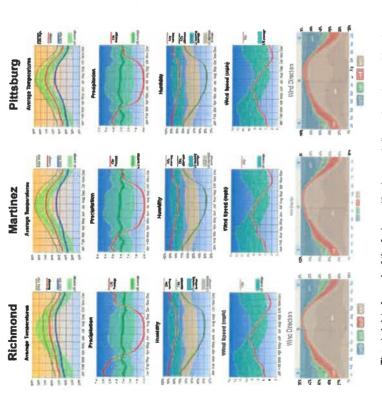
Background weather data for use in the plume diagrams were obtained from the following

- Weather data for the city of Martinez was obtained from http://www.city-data.com/
 Detailed wind data were obtained from https://weatherspark.com/

Weather for the coastal regions of Contra Costa County was available for several cities within the County. For the most part, weather patterns for the coastal cities are very similar, as shown by the weather data below. This information was used as the basis of the weather patterns for this study. Wind direction is a critical component of toxic plume analysis, as it determines the direction which the plume will travel over the land surface.

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CONTRA COSTA COUNTY CITY WEATHER PATTERNS



representative of the coastal area of Contra Costa County as a whole. Based on the wind data, the major wind directions for the County are from the west during the period from The wind data for each of the 3 above cities is very similar and can be considered as February through November, and from the north from November through February.

Based on the weather data above, it was determined that in that the major wind direction from the west occurred throughout most of the year. As a result, the plume analysis utilized in this report will cover an incident occurring in July.

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4.1.8 Railroads

Railroads in Contra Costa County primarily of the following railroad lines:

- Union Pacific Railroad (UP);
- Burlington Northern and Santa Fe Railroad (BNSF); Richmond Pacific Railroad Company (RPRC); and
- Bay Area Rapid Transit (BART).

Detailed information on the railroads in Contra Costa County can be obtained from the following source:

U.S. Department of Transportation, Federal Railroad Administration, on line https://fragis.fra.dot.gov/gisfrasafety/ A generalized map showing the rail lines and freight stations for Contra Costa County was compiled from the above source and is shown below.



where it is directed easterly toward Pittsburg, and then southeasterly toward Tracy. BNSF operates from Richmond along the coast to Pinole where it heads inland to Martinez where it joins the UP line. BNSF is directed easterly toward Pittsburg, and then on to Stockton. RPRC leases about 11 miles of UP track in the western part of Richmond. The UP rail line Two major rail lines are located in the coastal areas of Contra Costa County. UP operates along the shoreline area of the County from Richmond to past I-680 through Martinez, is also used by passenger/commuter trains.

coastal areas. Portions of the rail lines are located in areas of 12-inch (and greater) sea level rise, as well as in some areas of high to very high liquefaction which could be caused by earthquake events. Rail lines in these areas could become compromised, resulting in Many of the rail lines are co-located with underground pipelines, particularly along the

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potential hazardous materials incidents due to derailment or other causes. In addition, disruption of commercial rail traffic could result in significant increases in commodity flow along major arterial roadways and highways throughout the coastal areas of Contra Costa County, it is also important to more that the rail lines that act as ad hor flood protection could result in more significant flooding in surrounding areas due to overboping effects.

Each of the pinch points discussed in the CRA are located along or adjacent to railroad lines. These locations are considered to be higher risk, due to one or more factors discussed above in Sections 4.1.1 through 4.1.7.

4.1.9 Roadways

As discussed above in Section 4.1.8, disruption of commercial rail traffic could result in increased commodity flow via trucks along various arterial roads and highways in the vicinity of the pinch points. This also results in a higher risk of a hazardous materials incident occurring along the roadways. In addition, inundation of the areas of the pinch points by water, due to rising tides or disruption of rail traffic due to seismic events could also affect the ability to move commercial goods via roadways.

In consideration of transporting hazardous materials via rall, primarily within rail tanker cars, it should be noted that one tanker car can generally contrain 2 to 3 times the amount of commodity than one tanker truck. This will put significant pressure on trucking commodities through neighborhoods of vulnerable populations and critical facilities. It is also possible that highway transport may not be a viable option in areas of flooding, as the roadways themselves may also be closed.

Any increase in trucking of hazardous materials though vulnerable neighborhoods will increase the potential for hazardous materials incidents to occur. Due to the stress placed on the roadways, and the potential for less-than-ideal road conditions during flooding activities, the increase in highway related hazardous materials transportation incidents may be additionally increased.

Based on the comparison of the amount of trucks that would be required to transport specific hazardous materials, such as sulfuric acid, which would normally be transported by rail would be dependent on the amount of rail cars that would be disrupted on a time-dependent basis. Unless, materials can be transported on still-operating rail lines or through the ports, then the additional stress in highway transport will be significant. In the event of a large rail incident scenario, a major disruption of commerce through the Courty could result in a cessation of manufacturing operations for an unspecified amount of time.

The major arterial roads and highways, which could be subject to increased truck traffic, including increased hazardous materials transport for each of the pinch points are as follows:

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ARTERIAL RO	ARTERIAL ROADS AND HIGHWAYS
PINCH POINT LOCATION	ARTERIAL ROADS AND HIGHWAYS
	0854
Dichmond	Carison Blvd.
A A PLOUDEN	Potrero Ave.
	Regatta Blvd.
	1-590
	Richmond Parkway
Richmond #2	Barrett Ave.
	McDonald Ave.
	W. Ohio Ave.
	1-690
	Marina Vista Ave
Martinez £3	Shell Ave
	Pacheco Blvd
	CA-4
	CA-4
Bay Point #4	Kinney Blvd.
	Port Chicago Highway
Section 1	CA-4
200000	W. 10th Street

4.2 Release Plume Analysis

Plume diagrams for release of hazardous materials from the pinch points are contained in this section. The plume diagrams are determined using the CAMEO suite of programs created by the U.S. Environmental Protection Agency (EPA). The CAMEO suite consists of CAMEO chemicals, ALOHA plume modeling through various release scenarios, and MARPLOT, which assists in plotting the information onto various map bases, such as Google Earth.

The plume diagrams are utilized in determining the extent of threat zones based on the release of a particular chemical. Three threat zones are mapped for each chemical release:

- Red zone: Highest threat level
- Orange Zone: Moderate threat level
 - Yellow Zone: Low threat level

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The following information was also utilized in the preparation of the plume maps:

- Assumed weather conditions at the time of release;
 - Identity and amount of chemical released:
- The amount of the chemical entering the vapor phase (air);
 - Location of the release; and
- Time and date of release.

4.2.1 Background Plume Analysis Parameters

The following information was obtained from the National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration guidelines concerning Levels of Concern (LOCs), which are available on line at:

https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/chemical-spills/resources/levels-concem.html

A Toxic LOC will determine what level (threshold concentration) of inhalation exposure to a chemical would be injurious if inhaled over a defined length of time (exposure duration). In general, the lower the Toxic LOC value, the more toxic the substance is by inhalation.

ALOHA (Areal Locations of Hazardous Atmospheres) is used for emergency response or planning situations to assess the threat posed to the general public by a chemical release. ALOHA utilizes public exposure guidelines to predict how members of the general public would be affected if they are exposed to a particular hazardous chemical in an emergency response scenario.

ALOHA preferentially uses Acute Exposure Guideline Levels (AEGLs), as they are considered to be the best public exposure Toxic LOCs. As of mid-2016, AEGLs had been finalized for about 175 chemicals. ALOHA uses only the AEGL values for a 60-minute exposure duration.

AEGLs are subdivided into 3 tiers which correspond to specific health effects. The AEGL tiers and their corresponding threat levels are as follows:

- AEGL-3: Red Threat Zone Level
- AEGL-2: Orange Threat Zone Level
- AEGL-1: Valide I lifeat zone Level
 AEGL-1: Yellow Threat Zone Level

A more detailed discussion of the AEGLs is copied from the NOAA data at <a href="https://iresponse.restoration.noaa.gov/oil-and-chemical-spills/chemical-spill

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What are AEGLs? , top

AEGLS estimate the concentrations at which most people—including sensitive individuals such as old, safe, very young people—will beign to experience health effects if they are exposed to a hazardous chemical for a specific length of time duration). For a given exposure duration, a chemical may have up to three AEGL values, each of which corresponds to a specific ter of leading effects.

AEGL-3

AEGL-2

AEGL-1

CONCENTRATION

The three AEGs thers are defined as follows:

- AEGL-3 is the alrhome concentration, expressed as parts per million (ppm) or milligrams per cubic meter (mg/m³), of a substance above witch it a predicted that the general population, including susceptible Individuals, could experience ille-threatening health effects or leath.
- AE6L-2 is the altorine conventration eleginessed as ppm or mg/m³/ of a substance above which it is predicted that the general population, including susceptible infolholdasis, color experience irreversible or chart serious, long-lesting adverse health effects or an irripaired ability to escape.
- AEGL-1 is the airborne concentration (expressed as ppm or mg/m³) of a substance above which it is predicted that the general population, including susceptible individuals, could experience

opoblositon, Includiog susceptible Includuale, codolé experience notable discomfort, Intatibon, or cetabla asymptomatic nonsensory effects. However, the effects are not disabiling and are traitent and reversible upon ressation of exposures. All three tiers (AEGL-1, AEGL-2, and AEGL-3) are developed for five exposure periods; 10 minutes, 30 minutes, 60 minutes, 60 minutes, 4 hours, and 8 hours. The table below shows how the chlorine AEGL values vary with exposure duration.

Final AEGLs for chlorine (in parts per million)

	10 minutes	30 minutes	60 minutes	4 hours	8 hour
AEGL-1	0.50	05'0	0.50	0.50	0.50
AEGL-2	2.8	2.8	2.0	1.0	0.71
AFGL-3	20	28	20	10	7.1

Typically, the AEGi, values will be different for each exposure duration (such as the AEGI, 3 values in the table above). This is because the physical effects are pulsalizedly related to doose (that it's contentration over exposure duration). However, it some cases, the AEGI values will be the same for all durations. This siluation totally occurs at the AEGI. Fletted (say that back above), because it is a threshold for non-diability generates aronne effects for example, whether people will be able to smell the chemical) depend only on concentration—not on the length of time people are exposed.

4.2.2 Chemicals of Concern for Plume Analysis

Based on the information contained in the Flow Study, the 3 most common chemicals defined as an inhalation hazard that were observed travelling through Contra Costa County via rail and highway that were of major concern from a release incident standpoint were anhydrous ammonia (UN ID #1006, STCC ID #4904210, propane (UN 12#1075, STCC ID #2912111), and sulfunc Acid (UN ID #1830, STCC ID #291314). In the event of a release of these chemicals, isolation and protective distances from the release point will need to be employed as outlined in the 2016 Emergency Response.

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Guide (ERG), which was published by the U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA).

Data from the ERG concerning isolation and protective distances for anhydrous ammonia is shown below:

		TORCE SHEAL IN	1	ML HE	CUTION	1000	Horse	THE RE	trok per	3300	-			
			Ferm	and last	SALALL SPILL	SPILLS wheek in	-	State	Foma	- 24	LARGE	LARGE SPLLS	and Jaco	š
0.5	1	MANE OF BATTERIAL	800	Mary Mary	1.3	Dec 1	TECT Prevales	2 L	ISOLAT Self Once	wš J		Dead of the	RCT Wellster	24
188	19 19	American, crispional Artispical american	ă R	Son (1928) Gilby (01 rd 82 he sales	10	Pi d	2	B1 m3		t	Į ž	Pube in taken		
88	10.10	Boso Monde Rote Monde, corpresed	8	1001	100	1.0 Em 1.0	8.7 ten	30m (100 ft) 0.18m (0.18m) 0.7 tm (0.14m) 400m.	40cm 172	4000	25 km	225m (LLnsi 435m (300m)	10.00	120.05
22	25	Carbon mancada Carbon mancada, ecopressio	R	1000 ison	0.0	Q13m 0.1ml 0.25m 0.1ml	U.2 tes	910	200 m (8001))		1236	107 ang	4.1 Jon	4.13m (1.3ml)
1017	1017 126	Otom	8	80th (2054) 033m 62 ml 115m 87 me	0.33m	822 mg	1 7 500	87.00		ĺ	Refer	Refer to table 3		

		First	FINEBOLATE				The	PROPERTY.	TECT para	one Dose	Their PROTECT pyryone Doerwind therig				
						8	AND					MIC.	Mont		
				150				10a	141	1325		122	Filtra Fi	124	111
	TRANSPORT	-	- Sec.	ă ·	I	H.	Ĭ	E	Make	Æ	Ī	9		M	Medi
	CCNTANER	UNIO	UNTOOS Aamonia, anhydrous: Large Splits	onia, a	mhydra	2	ob adu	Be Be							
	Minim	88	(2000)	Pa ye	(1.1)	5	(3.0)	10	8	62	2.7	273	0.10	1,3	16 18
	Highmy meli med av milne	180	10300	65	(8.8)	92	(4.4)	2.6	10.20	12	10.00	3	(4.8)	90	88
	Applicational menustrals	2	(300)	93	(8.2)	93	(0.2)	60	17 S.	2	and a	3	(21)	6.3	(8.2)
	Modelets areast optimizers	R	(100)	0.3	(6.2)	9.2	(6.1)	0.1	(8.1)	9	100	3	(42)	20	(11)
	TRANSPORT	UNIO	UN1017 Chlorine; Large Spiffe	rime: La	orge Sp	#									
	Pulled or	190	(2005)	670	(6.2)	25	48.89	91) M	273	2	(14)	5	(87.0)	6.7	100
	Hipbony best treat or trafer	80	(cacco	3.8	(3.0)	80	(P.T)	62	11.00	97	tr.	3.0	0.0	2	(2.5)
	Integris for optiviers	R	(2000)	64	(1.2)	5	(9.0)	10	(81.0)	88	5.5	2	(1/8)	2	實施
n	Section and cylinders are sincle servicement	2	(100)	5	(1.1)	8	(0.0)	100	15.43	22	6.0	2	60.00	90	8.

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AEGLs for ammonia, propane, and sulfuric acid as determined by the NOAA are as follows.

Ammonia 7664-41-7 (Final)

	10 min	30 min	60 min	4 hr	# co
mdd					
AEGL 1	30	30	30	30	30
AEGL 2	220	220	160	110	110
AEGL 3	2,700	1,600	1,100	550	380

Propane 74-98-6 (Final)

	10 min	30 min	60 min	4 14	# e
E dd					
AEGL 1	10,000*	°266,8	5,500*	5,500*	5,500*
AEGL 2	e e	e •	4 6	:	:
AEGL 3	0 11 11	ī	i	:	:

Lower Explosive Limit (LEL) = 23,000 ppm

*==10%LEL,*** ==50% LEL,**** =>100% LEL

*=266L2-1.0 min/30 min/50 min/50 min/50 min/4 h/8 hr =*** 13,000 ppm

*AEG1.2-1.0 min/30 min/50 min/5

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	Sulf	Sulfuric acid 7	7664-93-9 (Interim)	(Interin)	
	10 mln	30 min	e0 min	#	į
mg(m³)	(mg/m³) 11/30/06				
AEGL 1	0.20 mg/m³	0.20 mg/m ⁵	0.20 mg/m ³	0.20 mg/m³	0.20 mg/m³
AEGL 2	8.Tmg/m³	8.7 mg/m³	8.T mg/m³	8.7 mg/m³	6.7 mg/m³
AEGL 3	270 mg/m³	200 mg/m³	160 mg/m³	110 mg/m³	93 mg/m³

NOTE THAT VALUES ARE IN mg/m³, NOT ppm.

IMPORTANT NOTE: Interim AEGIs are established following review and consideration by the National Advisory Committee for AEGIS (WAC/AEGI) of public comments on Proposed AEGIs, Interim AEGIs are available for use by organizations while availing HRC/NAS per review and publication of Final AEGIs. Changae to Interim AEGIs are available Support Bocuments may occur prior to publication of Final AEGI use available under any about the available through the available through AEGI use available interim rechnical Support Document for the chemical may be subject to change. (Purther information is available through AEGI Process).

4.2.3 Basis for Plume Analysis

The plume analysis diagrams contained in Section 4 are based on the following parameters:

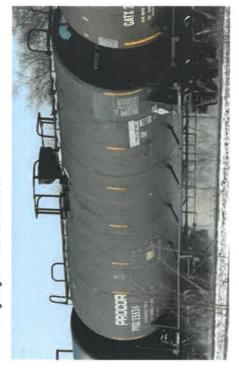
- Weather Conditions: Both January and July data represent 2 separate endpoints
 of weather conditions in Contra Costa County, and the following weather
 parameters are included in the analysis:
 - Differing wind directions
 - o Wind speed
- Temperature extremes. (The average high temperatures for January and July are used in the analysis)
 - Cloud cover
- COCs: Utilization of ammonia/anhydrous ammonia, propane, and sulfuric acid as the COCs.
- Worst-Case Scenario: Assumption that a worst-case scenario situation where a
 maximum amount of the COCs from railroad tanker car are released to the
 environment. By utilizing the worst-case scenario default situation, the plume
 analysis diagrams will allow for a more significant area of impact than may be
 encountered in a realistic scenario.

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4.3 Ammonia Gas Summary

The release scenarios outlined above in Section 4.2 are considered to be a worst-case scenario in the case of a rail tank car holding 34,397 gallons of ammonia that has ruptured due to derailment due to flooding along the railroad or other cause. This has resulted in the release of a toxic cloud of iquefied ammonia from the pressurized tanks directly to the atmosphere. The ammonia quickly combines with moisture in the air, vaporizes, and forms a toxic cloud migrating downwind from the source.



Information concerning the characteristics of ammonia and anhydrous ammonia and the migration of an ammonia gas cloud is well represented in the literature, and the general information summarized here was obtained from the following references:

Centers for Disease Control and Prevention (CDC), Ammonia Solution (UN3319): Ammonia, Anhydrous (UN1005): Lung Damaging Agent, on line at https://www.cdc.gov/niosh/ersidob/ennergencyresponsecard 29750013.html.

United States Department of Labor, 2018, Ammonia Retrigeration Emergency Response, on line at https://www.osha.gov/SLTG/etools/ammonia_refrigeration/emergency/index.html.

United States Department of Labor, 2018, Ammonia Refrigeration Properties of Ammonia, on line at https://www.osha.gov/SLTC/etools/ammonia refrigeration/ammonia/index.html.

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Illinois Fertilizer and Chemical Association, 2018, Fertilizer's Role in Agriculture, on line at https://www.ifca.com/media/files/27 3.pdf

늄 Transcaer, Section 4, Anhydrous Ammonia Response, on line https://www.transcaer.com/docs/AATour/Transcaer.Ammonia Training 2011Respons IG rev14.pdf. ₩ <u>li</u> 5 Sheet, Data Safety Ammonia https://www.airgas.com/msds/001003.pdf. 2018, 15, Airgas, February

States. It is used in manufacturing, refrigeration, and as an agricultural fertilizer, and is common in household chemicals. Ammonia can be absorbed into the body by inhalation, mixes with air it forms an explosive mixture. Although anhydrous ammonia is classified by the U.S. Department of Transportation (USDOT) as nonflammable, ammonia vapor is when ammonia comes in contact with water. Ammonia is extremely corrosive, and when it Ammonia/anhydrous ammonia is one of the highest production chemicals in the United ingestion, and by skin and eye contact. A poisonous and visible vapor cloud is produced flammable at concentrations of 15% to 28% by volume of air.

The odor threshold for ammonia is between 5 and 50 parts per million (ppm) of air, and the permissible exposure limit (PEL) is 50 ppm over an 8-hour time period. The USDOT summarizes the properties of ammonia as follows:

Summary of properties:

Boiling Point	-28°F
Weight per gallon of liquid at -28°F	5.69 pounds
Weight per gallon of liquid at 60°F	5.15 pounds
Specific gravity of the liquid (water=1)	0.619
Specific gravity of the gas (air=1)	0.588
Flammable limits in air	16-25%
Ignition temperature	1204°F
Vapor pressure at 0°F	16 psi
Vapor pressure at 68°F	110 psi
Vapor pressure at 100°F	198 psi
One cubic foot of liquid at 60°F expands to	850 cubic foot of gas

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Ammonia can be absorbed into the body by inhalation, ingestion, and by skin and eye contact. According to the CDC exposure to dangerous concentrations of ammonia may result in the following symptoms:

- Rapid eye irritation and burning sensation, and possible severe corrosive eye injury; Upon ingestion, nausea, vomiting abdominal pain and corrosive burns to the mouth,
- esophagus, and stomach; Skin inflammation, including blistering, tissue death, and deep penetrating burns; and

 - Exposure to liquefied ammonia gas may lead to severe frostbite and burns.

Characteristics of ammonia/anhydrous ammonia are contained on an Airgas Safety Data Sheet (Appendix C).

by trucks, or truck cargo tankers. Each truck cargo and carry 20 tons of ammonia. Ammonia can be transported in pressurized rail cars containing 80 tons of ammonia. The majority of ammonia is transported by rail. Fixed facilities that use ammonia for refrigeration purposes Ammonia is generally transported via highway in high-pressure nurse tanks on trallers pulled may contain pressurized tanks of ammonia. Ammonia gas is lighter than air, and when it comes in contact with moisture in the air, it will form an ammonia fog. Once it forms a fog, however, the fog is heavier than air and is likely to remain low to the ground. This fog or cloud is white in color. The ammonia fog can travel along the ground aided by wind in the direction of the prevailing wind. Higher temperatures will cause the ammonia cloud to move and disperse more rapidly than colder temperatures.



Emergency response to an ammonia release is covered in detail in the above-referenced CDC document and is summarized below: Red Zone: (generally corresponds to Red Zone of ALOHA plume designation): Personal Protective Equipment (PPE) in Level A or Level B should be used. In this zone, the exposure to chemical hazards, is above IDLH or greater than AEGL-2.

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- Yellow Zone (generally corresponds to Orange Zone of ALOHA plume designation): PPE in Level C, with canister-type gas mask for ammonia levels in air above AEGL-2, and particulate cartridge/filter combination or a continuous flow respirator for ammonia levels in air above AEGL-1.
- Green Zone (Generally corresponds to Yellow Zone of ALOHA plume designation): Level D when exposure limit is less than AEGL-1.

In addition, the CDC recommends the following initial isolation and protective action distances:

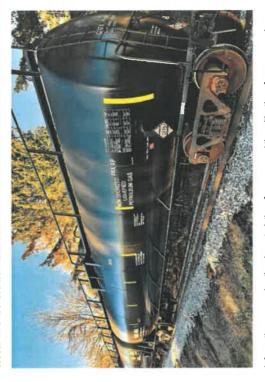
- When UN 1005 (anhydrous, Ilquefied), UN 2073 (35% to 50%), or UN 3318 (> 50%) is involved in a tank, rail car, or tank truck fire:
- Isolate it for 1 mi (1600 m) in all directions; also, consider initial evacuation for 1 mi (1600 m) in all directions.
- When UN 1005 (anhydrous, liquefied) or UN 3318 (> 50%) is involved in small spills (involving the release of approximately 52.83 gallons (200 liters) or less):

 First isolate in all directions: 100 ft (30 m).
- 0
- Then protect persons downwind during the day: 0.1 mi (0.1 km). Then protect persons downwind during the night: 0.1 mi (0.1 km). 0
- When UN 1005 (anhydrous, liquefied) or UN 3318 (> 50%) is involved in large spills (involving quantities greater than 52.83 gallons (200 liters)):
 - First isolate in all directions: 200 ft (60 m). 0
- Then protect persons downwind during the day: 0.4~mi (0.6~km). Then protect persons downwind during the night: 1.4~mi (2.2~km). 0

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Propane Summary 4.4

The release scenarios outlined above in Section 4.2 are considered to be a worst-case scenario in the case of a rail tank car holding 34,397 gallons of liquefied petroleum gas (propane) that has ruptured due to derailment due to flooding along the railroad or other cause. This has resulted in the release of the contents of the tank car to the environment.



Information concerning the characteristics of propane and the mitigation of a propane release incident are summarized here, and the data were obtained from the following references:

Alternative Fuels Data Center, Propane Production and Distribution, U.S. Department of Energy, 2019, on line at https://afdc.energy.gov/fuels/propane_production.html

at https://www.linde-<u>li</u> 6 gas.com/en/products and supply/gases fuel/propane.html 2019, Propane, Linde, Industrial Gases,

U.S. Energy Information Administration, Petroleum and Other Liquids, 2019, on line at https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=esm_eplipa_rail_nusnus mbbl&f=a,

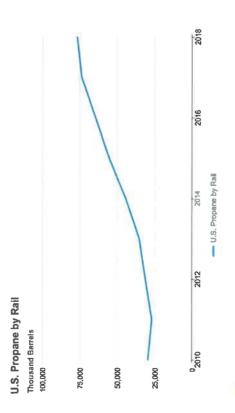
aţ <u>ii</u> 5 Propane, Sheet, https://www.ferrellgas.com/media/66083/sds propane 12 18.pdf. Data Safety 2018, Ferrellgas (Blue Rhino),

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U. S. Department of Transportation, 2016 Emergency Response Guidebook.

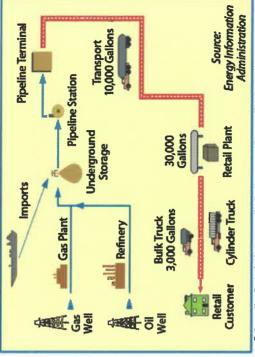
liquid components recovered during natural gas processing. Propane is a colorless, highly flammable liquefied gas and is one of the main components of liquid petroleum gas (LPG). Propane is used as a vehicle fuel, as well as for industrial and domestic heating. It is also a Propane is a by-product of natural gas processing and crude oil refining and is produced from specialty gas employed as a refrigerant and an aerosol propellant. Propane production has increased over the last several years, and shipments by rail attained more than 75,000 thousand barrels in 2018 as shown below in the U.S. Energy Information Administration data:



eia Source U.S. Energy Into

A typical propane distribution route from producer to consumer is contained in the Alternative Fuels Data Center information, and is shown as follows:

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Schematic of a typical propane distribution route (Source: EIA (https://www.eia.gov/))

Propane is heavier than air and is identified under United Nations (UN) Guide in the Department of Transport Emergency Response Guidebook (ERG) as No. 1075. The details concerning transportation information from the Ferrellgas (Blue Rhino) Safety Data Sheet (SDS) are shown below:

UN Homewar, 100 or 1 Commonstration (DCT).
Transport hazard classifier 2.2.
Transport hazard classifier 2.2.
Transport hazard classifier 2.2.
Environmental lezarate: The product does not meet the DOTI/ANI/INDOI/IND cities of a matrix political:
Environmental lezarate: The product does not meet the DOTI/ANI/INDOI/IND cities of a matrix political:
Environmental lezarate: The product does not practicate matrix. The product of the number shown as thought as the adversaried for the product of the number of matrix of many groups proporty reported in the number of matrix of many groups in the number of many groups and many groups in the number of many groups

The railroad Standard Transportation Commodity Code (STCC) for propane is 2912111.

The summary of the physical properties of 93% sulfuric acid is reproduced from the Ferrellgas SDS and is as follows:

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Confra Costa County, California August 2019 TAIT Environmental Services, Inc. Fight People: - 156 ° F. 1, 108 ° C.

Physical Form: Lycefed Gas

That Medino: Tag Cross Cap (TCD), ASTM 256

Physical Form: Lycefed Gas

That Medino: Tag Cross Cap (TCD), ASTM 256

partie f oddom soldes)

Pertuant Resident Annie (198 ° A. 2. ° C.

Pertuant Confliction (F. 197 ° C.

Pertuant Con

Propane is biodegradable, and will readily evaporate into the environment. Inhalation of propane in minor amounts is not considered toxic; however, large amounts of propane in the air can displace oxygen and act as an asphyxiant. Skin absorption and ingestion of propane is not anticipated, although contact with propane in the liquid phase may result in frostbite.

Propane is highly flammable and explosive, and spillages of large quantities of liquid propane will vaporize to propane gas. Propane vapors can travel considerable distances. An ignition source may cause propane to ignile, flash back, and explode. Propane explosions can result in Bolling Liquid Expanding Vapor Explosion (BLEVE). The U.S. Department of Transport Emergency Response Guidebook (ERG) has determined general evacuation distances to be undertaken in the event of propane-induced BLEVE, and they are outlined below.

WARANG: The data given are approximate and should only be used with enhane cauthor. These times can vary from situation to abusifion.
LPG britis have been known to BLPKE within minutes. Therefore, never risk file based on these times.

								TOTAL PRINTERS INCH											
Capacity		Distrolor	*	Length	4	E	Propers	Medicans throp to fidure for agreem	Agramacy Dringling	-	Pribat	Energency response determ	A SECOND	Minimum evecualism distance	100 and 100 an	Preferred evenualism districts	100	Cooling water Sow rate) welce
Cont	(Out ons) Mesors	Pars (F	(Feet)	Central	(Feet)	The same	(Foot) talepoor (Parents)	Minutes	Minutes	Heles	(Pred)		Meters (Peet)		Meters (Peet)	Meters	(Tage)	Ureshin	(Feet) Litreshin USpatinin
(28.4)	-	50	8	1.5	(8.9)	9	3		-	9	Ē	8	(582)	草	(202)	202	(1007)	948	19
(Sept.)	_	6.69	8	45	(4.8)	2	(60%)	+	S	=	â	2	(582)	*	(100)	8	(Hath)	1812	R
(828)		E 0	(3.2)	•	8	9	(MY)	16	=	R	2	£	(364)	417	(1388)	2	(2736)	828	14
(1961)		20	85	4.9	(14.1)	1800	(SEC)	w	R	ĸ	315	ğ	(489)	88	(1720)	1080	(3446)	1	3
(E113)	_	10	(H.3)	2	8	9034	(3648)	-	n	\$	£	Ē	(1.19	198	(2100)	1929	(194.1)	1	22
(SA12)	_	2.1	(6.6)	42	(%)	0000	(18-600)	-	77	D)	[202]	30	(010)	858	CHOCK	1862	(same)	1691	120
		27	(8.8)	11.8	(H.7)	16800	(37/97)	p.	R	11	(202)	308	(1001)	1	(a779)	ō022	(72.15)	100	512
(2,1862)		2.75	8	13.7	•	22800	(172310)	-	40	20.	(6116)	8	(1257)	168	(T)	2200	(7218)	2710	£
(Manual)		22	Clores.	17.2	(88.4)	28000	(West) other	6	29	*	(974)	487	(MM)	<u>SE</u>	(120)	90/2	(1215)	100	838

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4.5 Sulfuric Acid Summary

The release scenarios outlined above in Section 4.2 are considered to be a worst-case scenario in the case of a rail tank car holding 13,350 gallons of 93% sulfuric acid that has ruptured, and a release of the contents of the tank car to the environment has occurred following a derailment due to flooding along the railroad or other cause.



Information concerning the characteristics of 93% sulfuric acid and the mitigation of a spill are summarized here, and the data were obtained from the following references:

Sulfuric Acid, The Essential Chemical Industry-online, 2019, on line at http://www.essentialchemicalindustry.org/chemicals/sulfuric-acid.html.

Columbus Chemical Industries, Inc., January 22, 2015, Sulfuric Acid, 93% PC, Safety Data Sheet, on Interest/www.columbuschemical.com/MSDS/SDS/Sulfuric%20Acid,%2093%25%20PC%205655_pd

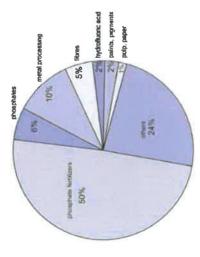
J. R. Simplot, July 28, 2017, Sulfuric Acid 93% Safety Data Sheet, on line at http://act.simplot.com/datasheets/1/6020.ndf

Deerpoint Group, Inc., Material Safety Data Sheet, Sulfuric Acid 93%, on line https://assets.greenbook.net/M122570.pdf

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U. S. Department of Transportation, 2016 Emergency Response Guidebook.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Cortra Costa County, California August 2019 TAIT Environmental Services, Inc. Sulfuric acid is one of the most important compounds manufactured by the chemical industry and is used to make hundreds of other compounds needed by other industries. Sulfuric acid is used widely in the manufacture of phosphoric acid in the fertilizer industry, as well as in the metal processing industry. Annual production of sulfuric acid in the United States is 37,000,000 metric tornes. Uses of sulfuric acid are shown in the following diagram, which was reproduced from the Essential Chemistry on-line, is as follows:



Sulfuric acid is a highly corrosive material, and is identified under United Nations (UN) Guide in the Department of Transport Emergency Response Guidebook (ERG) as No. 1830. The details from the J.R. Simplot Safety Data Sheet (SDS) are shown below:

Department of Transportation (DOT)

In accordance with DOT

Transport document description

UN-No.(DOT)

Proper Shipping Name (DOT) Class (DOT)

Packing group (DOT) Hazard labels (DOT)

: UN1830 Suffuric acid, 8, II : UN1830

: Sulfuric acid

: 8 - Class 8 - Corrosive material 49 CFR 173.136

: II - Medium Danger : 8 - Corrosive



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The railroad Standard Transportation Commodity Code (STCC) for sulfuric acid is 4930040.

The summary of the physical properties of 93% sulfuric acid is reproduced from the Columbus Chemical SDS and is as follows:

Appearance (physical state, color, etc.)	Clear, colorless liquid.
Odor	Odorless.
Odor threshold	Not Available
Hd	Not Available
Melting point/freezing point	Not Available
finitial boiling point and boiling range	Not Available
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upperflower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Density	1.8350 (water ≈ 1)
Solubility (ies)	Soluble in water.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

Sulfuric acid is not considered to be harmful to aquatic organisms or to cause long-term effects to the environment. However, exposure to sulfuric acid can cause skin and eye burns, is destructive to the tissues of the upper respiratory tract if inhaled, and is harmful, and may be fatal, if ingested. The American Conference of Governmental Industrial Hygienists (ACGIH) and the Occupational Health and Safety Administration (OSHA) data for 93% sulfuric acid, as noted in the J. R. Simplot SDS is as follows:

Staffunic April 95%		
ACGIH	ACGIH TWA (mg/m²)	0.2
ACGIN	ACSIH TWA (ppm)	D,0498 ppm
OSHA	OSHA PEL (TWA) (mg/tn/)	T.
OSHA	OSHA PEL (TWA) (ppm)	0.25

Spill cleanup of large spills of sulfuric acid should be undertaken by isolating the spill area with diking materials, including isolation from waterways. The acid can be treated with soda ash or lime, although neutralization will resolve a release of heat. Sulfuric acid is not flammable, but can be highly reactive with combustible materials.

Suffuric acid spills are not considered as toxic, but can form a gray cloud. If sulfuric acid is mixed with water, it reacts vigorously forming an exothermic reaction. A vapor cloud of sulfuric acid can mix with water or water vapor to form a white cloud, which, based on the specific gravity is heavier than air.

Evacuation guidelines are contained with the ERG, and the isolation distance in the event that a fire is involved is ½ mile in all directions. The response guidelines in the ERG are shown below. Although there is no stated isolation distance in the event of a suifuric acid spill, or a

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk Contra Costa County, California August 2019 TAIT Environmental Services, Inc. spill into water, the ERG guidelines with respect to fire should be used as a basis for evacuation and mitigation.



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Chemical Plume Analysis 5.0

probable scenario with respect to a major release of the COCs within Contra Costa County. As ALOHA data input requires a date input, the arbitrary date of July 18 is used. This section contains plume analysis for Toxic LOCs for the COCs ammonia, propane, and sulfuric acid based on the input of specific parameters, as outlined above in Section 4.2.2. As noted above, these parameters have been determined to illustrate a worst-case scenario and/or

The plume diagrams produced using the ALOHA modeling program for the 5 determined pinch points located within coastal area of Contra Costa County, and they are described in the following sections. In each section, the basis of the ALOHA plume maps are presented with the following summary data:

- Text Summary: the text summary describes the parameters under which the plume data Site Data which has been input specifically for the location.
 Chemical Data for the consideration.
- Chemical Data for the specific chemical (in this case chlorine or ammonia), including AEGL-1, AEGL-2 and AEGL-3 (60 minutes), other specific chemical characteristics, and the "Immediately Dangerous to Life and Health (IDLH) concentration. Atmospherio Data derived from the weather data for Contra Costa County for July.
 - The prevailing wind direction for 10 months of the year (February through November) is from the west, and this direction will be used in the ALOHA modeling.

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- Source Strength, including quantity spilled/released into the atmosphere and conditions under which it was released.
 - Threat Zone, which defines the red, orange, and yellow threat zones.

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- Toxic Threat Zone: This is a schematic of the plume size and shape with a summary of the threat zone.
- Release Rate: This is a graph of the data contained in the text portion under Source Strength.
- Plume Diagram: The plume diagram is superimposed on a Google Earth base. The 3 threat zones (red, orange, and yellow) are shown, as are the critical facilities receptors.

Site-specific parameters were applied to the plume modeling mapping discussed for each of the 5 pinch points in Sections 5.1 through 5.5. <u>Ammonia/Anhydrous Ammonia</u>: ALOHA model plume mapping of an ammonia/anhydrous ammonia (UN ID# 1005) release is shown in the plume maps. Some of the major parameters used in plume development include:

- Incident occurs in mid-July with an internal tank temperature of 85°F;
 - Wind is from the west at nine (9) miles per hour;
 - Size of railroad tank care is 34,397 gallons;
 - Tank diameter of 10.66 feet; and

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The rupture in the tank car is a 10-inch diameter hole located near the bottom of the tank gä. .

Detailed parameters are contained in Appendix C. Critical facilities within the plume are also shown on the maps.

following maps. The first map in each section shows the extent of a propane plume release. The second map shows the area affected in the event that the tank car explodes in a BLEVE scenario. Some of the major parameters used in plume development include: Propane: ALOHA model plume mapping for a propane (UN ID# 1075) release is shown in the

- Incident occurs in mid-July with an air temperature of 85°F;
 - Wind is from the west at 9 miles per hour;
- Size of railroad tank care is 34,397 gallons;
 - Tank diameter of 10.66 feet; and
- The rupture in the tank car is a 10-inch diameter hole located near the bottom of the tank

Detailed parameters are contained in Appendix C. Critical facilities within the plume are also shown on the maps.

water vapor to form a white cloud, it is heavier than air. The mixing of sulfuric acid with water results in a highly exothermic reaction. A rail spill of sulfuric acid due to derailment caused by a flooding event is a realistic scenario in the coastal areas of Contra Costa County. Sulfuric acid can be neutralized with soda ash or lime. Sulfuric Acid: Sulfuric acid is not considered a toxic material that will create a toxic vapor plume during a release. Nevertheless, it but can form a gray cloud, and when this cloud mixes with

Evacuation guidelines are contained with the ERG, and the isolation distance in the event that a fire is involved is % mile in all directions. Although there is no stated isolation distance in the event of a sulfuric acid spill, or a spill into water, the ERG guidelines with respect to fire should be used as a basis for evacuation and mitigation.

Some of the major parameters used development of the isolation distance map for sulfuric acid at each of the 5 pinch points are as follows:

- Incident occurs in mid-July with an internal tank temperature of 85°F;
 - Size of railroad tank care is 13,350 gallons;
 - Tank diameter of eight (8) feet; and
- The rupture in the tank car is a 10-inch diameter hole located near the bottom of the tank

Critical facilities within the plume are also shown on the maps.

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Pinch Point - Richmond #1 5.1

will result from an incident with a rail tank car holding 34,397 gallons of the ammonia/anhydrous armmonia (worst-case scenario), a rail tank car holding 34,397 gallons of At the Richmond #1 pinch point, it will be assumed that the hazardous materials spill of a COC propane as LPG (worst-case scenario), and 13,350 gallons of sulfuric acid (worst-case The individual details are contained in the sections below. Criteria used in the identification of the pinch point are summarized in the table below. Maps showing some of the criteria used in the determination of the pinch point are shown following

	KICHMOND PINCH POINT #1 CRITERIA	
CRITERIA	DESCRIPTION	COMMENTS
Location	F580 at Meade Street	
Elevation (feet above mel)	8	Above 12" rising tide
Letitude	37.919638	
Longitude	-122.332671	
Railroada	SP (pinch point)	Perch point along major call line
	RPRC (pinch point and west)	Phich point along major rail line
	1560	
Meritanes & Arterial Courts	Carlson Bivd.	
	Potrero Ave.	
	Regulas BWd.	
Phpelines	Gas and hazardous liquid at pinch point along UP and RPRC line	Co-located with rail thes at purch point
Moarby Colotto Facilities	Dreisbach Enterprises, Messer	
and the same of th	Safeway Benerage Plant	
	N-inclustrial/residential (low to moderate income)	Writerable population
Girmamdina Land Tha	E-residential (fow to moderate income)	Vulnerable population
	S-industrial	
	W-trickustrial	
	25-50 (at phoch point and to east; 27.4 percentile)	Walnestole population
Healthy Places Index	0-25 (north of pinch point)	
	50-75 (west and south of pinch point)	
Wind Direction (from)	West (Feb-Nov); North (Nov-Feb)	
Rising Tides 12"	South of pinch point	
Liquefaction (thigh to very high)	South, southeast, and west of pinch point	

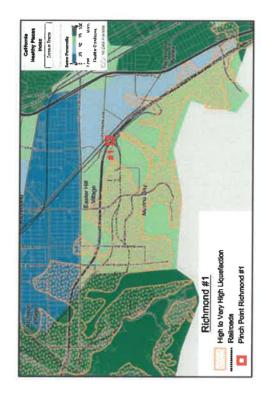
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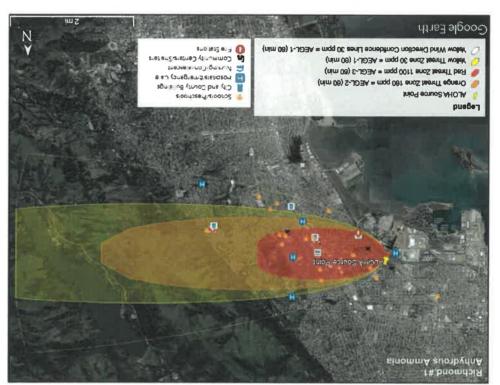


5.1.1 Scenario 1: Ammonia

ALOHA model plume mapping at Plnch Point Richmond #1 for an ammonia/anhydrous ammonia (UN 1D# 1005) release is shown in the following map. The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone is approximately 2 miles long and up to a mile wide and covers a significant portion of the residential and commercial areas of east Richmond and El Centio. Although the prevaling wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are also residential and commercial. Much of the area to the south is either industrial or part of San Francisco Bay.

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5.1.2 Scenario 2: Propane

ALOHA model plume mapping at Pinch Point Richmond #1 for propane (UN ID# 1075)

release is shown in the following maps. The first map shows the extent of a propane plume release. The second map shows the area affected in the event that the tank car explodes in a BLEVE scenario.

The propane plume is approximately 1 mile long and up to ½ mile wide. The Red Threat Zone is approximately ½ mile long and up to ¼ mile wide. The entire plume covers a portion of the residential area of east Richmond and El Cerrito. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place a limited area southeast and south at risk from propane incident release. Areas to the southeast are also residential. Much of the area to the

The second map shows the propane BLEVE scenario. In this scenario the area affected is known as the Thermal Radiation Threat Zone and is approximately ½ mile from the source, and the Red Threat Zone extends approximately ½ mile from the source. In general, areas to the northwest, north, east, and southeast are primarily residential; areas to the west and south are industrial.

south is primarily industrial.

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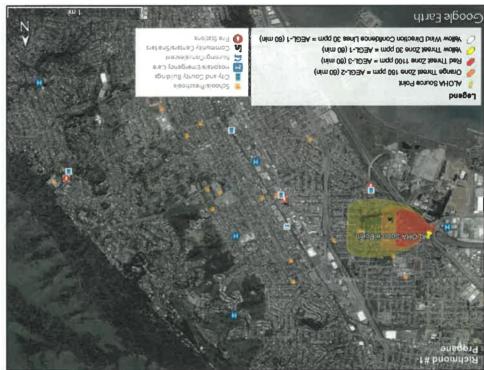
Google Earth

ALOHA Source Point

Wind Direction Confidence Lines 30 ppm = AEGL-1 (60 min)

(nim 06) 1-JESA = mqq 0c anoS teanTT woller Red Threet Zone 1100 pm = AEGL-3 (60 min) Orange Threat Zone 160 ppm = AEGL-2 (60 min)





E ce stations

Community Centerachesters

Morand, Coursiescend

City and County Buildings

Schools/Fraschools

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5.1.3 Scenario 3: Sulfuric Acid

The sulfuric acid (UN ID #1830) release isolation zone at Pinch Point Richmond #1 is shown in the following map. According to ERG guidelines, the isolation distance in the event that a fire is involved is ½ mile in all directions. Although slightly less extensive in area, the isolation zone is similar to the Propane BLEVE scenario. In general, areas to the northwest, north, east, and southeast are primarily residential; areas to the west and south are industrial.



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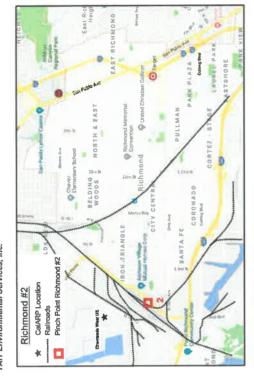
5.2 Pinch Point - Richmond #2

At the Richmond #2 pinch point, it will be assumed that the hazardous materials spill of a COC will result from an incident with a rail tank car holding 34,397 gallons of the ammonia/ anhydrous ammonia (worst-case scenario), a rall tank car holding 34,397 gallons of propane as LPG (worst-case scenario), and 13,350 gallons of sulfuric acid (worst-case scenario). The individual details are contained in the sections below.

Criteria used in the identification of the pinch point are summarized in the table below. Maps showing some of the criteria used in the determination of the pinch point are shown following the table.

	RICHMOND PINCH POINT #2 CRITERIA	A
CRITERIA	DESCRIPTION	COMMENTS
Location	Richmond Parkway south of MacDonald Ave.	
Elevation (feet above msl)	14	Above 12" rising tide
Lattude	37.934993	
Longitude	-122.374823	
	BNSF (pinch point)	Pinch point is at major rail siding
Railroads	RPRC (west)	
	UP (east)	
	1580	
	Richmond Parkway	
Highways & Arterial Roads	Sarrett Ave.	
	McDonald Ave.	
	W. Ohio Ave.	
Pipelines	Hazardous liquid pipelines parallel rainbad	Co-focated with rail lines at pinch point
TOTAL CONTRACTOR	Chevros Refinery	
Medicy Calence Fechines	Chemitrade West US	
	N-industrial	
Comments of the second state	E-commercial/residential (tow to moderate income)	Vulnerable population; critical facilities
Surrounding Card Use	S-indirection	
	W-industrial	
Monteho Dinosa todas	0-25 (east and southeast; 15.8 and 22.2 percentile)	Vulnerable population: critical facilities
receipt Force areas	75-100 (pinch point, north, south, and west)	
Wind Direction (from)	West (Feb-Nov), North (Nov-Feb)	
Rising Tides 12"	North and south of pineth point	
Liquefaction (high to very high)	Plinch point and to north, south, and west	

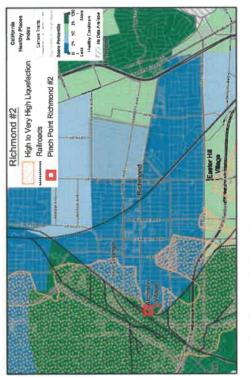
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5.2.1 Scenario 1: Ammonia

ALOHA model plume mapping at Pinch Point Richmond #2 for an ammonia/anhydrous ammonia (UN ID# 1005) release is shown in the following map. The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone is approximately 2 miles long and up to a mile wide and covers a significant portion of the residential and commercial areas of the central and downtown portion of the city of Richmond. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at itsis from an ammonia release. Areas to the southeast are also residential and commercial with some industry. Much of the area to the south is either industrial or part of San Francisco Bay.

Richmond R2
Anthydrod's Ammonia
Anthydrod's Ammonia
Change Three Sone for pym = AECL-3 (60 min)
Adomy Whad Direction Confidence Lines 30 ppm = AECL-3 (60 min)
Anthydrod's Change Change

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5.2.2 Scenario 2: Propane



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The propane plume is approximately 1 mile long and up to ½ mile wide. The Red Threat Zone is approximately ¼ mile long and up to ¼ mile wide. The entire plume covers a portion of the commercial and residential area of Richmond, including the downtown area. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place a limited area southeast and south at risk from a propane incident. Areas to the southeast are also residential. Much of the

The second map shows the Propane BLEVE scenario. In this scenario the area affected is known as the Thermal Radiation Threat Zone and is approximately % mile from the source, and the Red Threat Zone extends approximately % mile from the source. In general, areas to the northeast, east, and southeast are primarily commercial and residential; areas to the northwest, west, and south are industrial.

area to the south is primarily industrial.

ALOHA model plume mapping at Pinch Point Richmond #2 for propane (UN 1D# 1075) release is shown in the following maps. The first map shows the extent of a propane plume release. The second map shows the area affected in the event that the tank car explodes

in a BLEVE scenario.

Schools/Preschools City and County Buildings Prospies/Schools/Care

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ALOHA Source Point

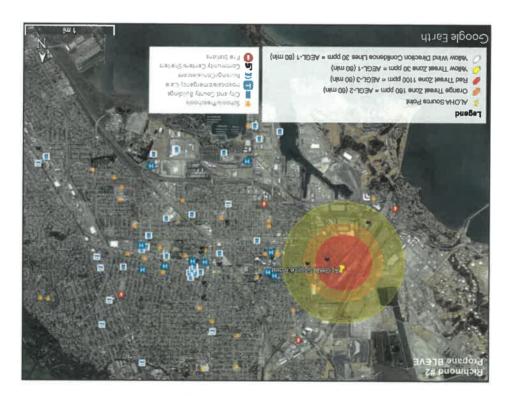
7# P

fellow Wind Direction Confidence Lines 30 ppm = AEGL-1 (60 min)

(nim 09) f-1534 = mdd 00 enoS teentT wollen Red Threet Zone 1100 pm = AEGL-3 (60 min)

Orange Three Zone 160 ppm = AEGL-2 (60 min)

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Hazardous Materials Commodity Flow Study with Special Focus on Saa Level Rise and Flood Risk Courta Costa County, California August 2019

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5.2.3 Scenario 3: Sulfuric Acid

The sulfuric acid (UN ID #1830) release isolation zone at Pinch Point Richmond #2 is shown in the following map. According to ERG guidelines, the isolation distance in the event that a fire is involved is \$\frac{1}{2}\$ mills in all directions. Although slightly less extensive in area, the isolation zone is similar to the Propane BLEVE scenario. In general, areas to the northeast and east are primarily residential; areas to the west and south are industrial.

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5.3 Pinch Point - Martinez #3

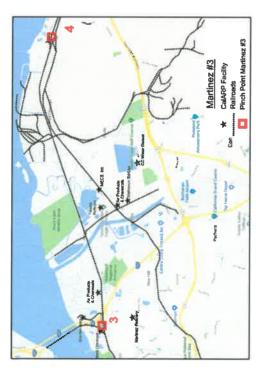
At the Martinez #3 pinch point, it will be assumed that the hazardous materials spill of a COC will result from an incident with a rail tank car holding 34,397gallons of the ammonia/anhydrous ammonia (worst-case scenario), a rail tank car holding 34,397 gallons of propane as LPG (worst-case scenario), and 13,350 gallons of sulfuric acid (worst-case scenario). The individual details are contained in the sections below.

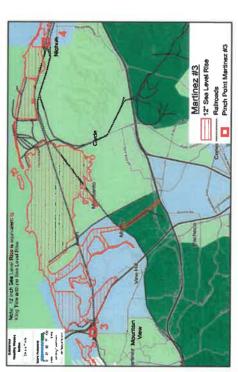
Criteria used in the identification of the pinch point are summarized in the table below. Maps showing some of the criteria used in the determination of the pinch point are shown following the table.

CRITERIA	DESCRIPTION	COMMENTS
Lecation	Shell Ave. and Marinz Vista Ave.	
Elevation (feet above mat)	13	Above 12" rising tide
Latifude	38,026135	
Longitude	-122,117939	
Refrostin	UP (pinch point)	Pinch point along major rail line
	BNSF (south)	
	089-1	
	Marina Vata Ave	
Highways & Arterial Roads	Shell Ave	
	Pacheco Sard	
	CA-4	Now there had state that the part rate seek that you can be the part that the part that the text tha
Pipetines	Numerous crude oil, hazardous liquid, and gas pipelines	Co-located with rail lines at pinch point
	Shell Chemical	Immediate vicinity of pinch point
	Martinez Refinery	Close to plach point
	Air Proclucts & Chemicals (2 focations)	1 location close to pinch point
Mearty CalARP Facilities	Eco Services	Close to pinch point
	Sesoro Refinery	
	Matheton Trl-Sas	
	CC Water District	
	MECS, Inc.	
	M-Industrial	
Surrounding Land the	E-motostras	
	9-commercial/esidential (low to moderale income)	Vulnerable population
	W-commercial (downlown)/hesidential (moderate income)	Vuherzbie population; critical facilities
Healthy Places Index	25-50 (pinch point, N, E, and SE)	
	50-75 (S and W)	
Wind Direction (from)	West (Fab-Nov), North (Nov-Fats)	
Rining Tides 12"	East and west of phoch point	Rafilfres in press 12" rising tide
Liquefaction thigh to very high!	At photh point, east and west of pinch point	Confirmation to the second sec

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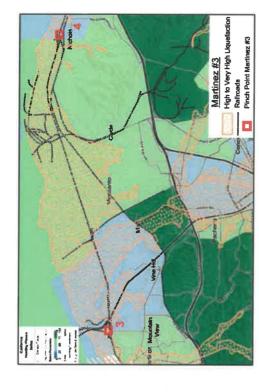
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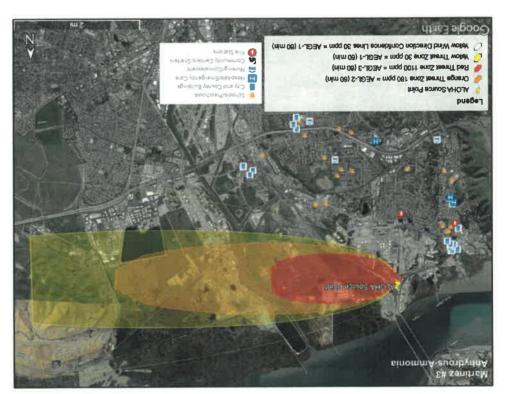
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5.3.1 Scenario 1: Ammonia

ALOHA model plume mapping at Pinch Point Martinez #3 for an ammonia/anhydrous ammonia (UN ID# 1005) release is shown in the following map. The ammonia plume is extentive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone is approximately 2 miles long and up to a mile wide and covers the industrial area northeast of the city of Martinez, including oil refineries. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are also industrial. Much of the area to the south is partly industrial and partly residential.

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5.3.2 Scenario 2: Propane

ALOHA model plume mapping at Pinch Point Martinez #3 for propane (UN ID# 1075) release is shown in the following maps. The first map shows the extent of a propane plume release. The second map shows the area affected in the event that the tank car explodes in a BLEVE scenario.

Zone is approximately ½ mile long and up to ¼ mile wide. The entire plume covers a portion of the industrial area in the northeastern part of Martinez. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place the industrial area south of the pinch point at risk from a The propane plume is approximately 1 mile long and up to lpha mile wide. The Red Threat

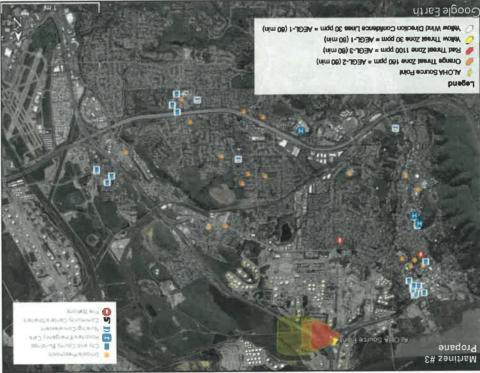
The second map shows the Propane BLEVE scenario. In this scenario the area affected is known as the Thermal Radiation Threat Zone and is approximately ¼ mile from the source, and the Red Threat Zone extends approximately ¼ mile from the source. The entire area affected by this scenario is industrial, including oil refinenes.

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TAIT Environmental Services, Inc. Vind Direction Confidence Lines 30 ppm = AEGL-1 (60 min) (nim 08) E-JB3A = mgq 0011 and I sentT beRI (nim 08) I-JB3A = mgq 0E and leanfT wollet Orange Threat Zone 180 ppm = AEGL-2 (60 min) Propane BLEVE ALOHA Source Point pueße

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5.3.3 Scenario 3: Sulfuric Acid

The sulfuric acid (UN ID #1830) release isolation zone at Pinch Point Martinez #3 is shown in the following map. According to ERG guidelines, the isolation distance in the event that a fire is involved is ½ mile in all directions. Although slightly less extensive in area, the isolation zone is similar to the Propane BLEVE scenario. The entire isolation zone is industrial, including oil refineries.

Martinez #3
Sulfuric Acid

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Google Earth

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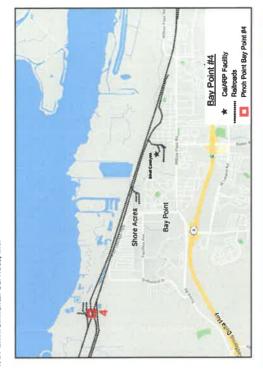
5.4 Pinch Point - Bay Point #4

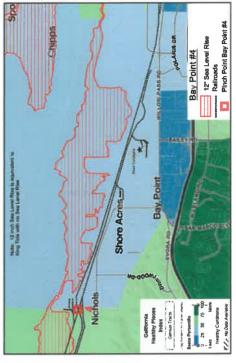
At the Bay Point #4 pinch point, it will be assumed that the hazardous materials spill of a COC will result from an incident with a rail tank car holding 34,397 gallons of the ammonia/annydrous ammonia/envorst-case scenario), a rail tank car holding 34,397 gallons of propane as LPG (worst-case scenario, and 13,350 gallons of sulfuric acid (worst-case scenario), are individual details are confained in the sections below.

Criteria used in the identification of the pinch point are summarized in the table below. Maps showing some of the criteria used in the determination of the pinch point are shown following the table.

	BAT POINT PINCH POINT #4 CKILERIA	RIERIA
CRITERIA	DESCRIPTION	COMMENTS
Location	Nichols Rd. North of Port Chicago Highway	
Elevation (feet above mail)	18	Above 12 rising tide
Lettude	36.045102	
Longituda	-121.987738	
Ralfroade	BNSF (pinch point)	Pinch point at railroad junction
	UP (pinch point)	Pinch point at raincad junction
	CA-4	
Highways & Arterial Roads	Kinney Blvd.	
	Port Chicago Highway	
Pipelines	Hazardous liquid, and gas pipelines	Partially co-located with rail lines at pinch point
	3 miles southwest of pinch point	
	Tesoro Refinery	
	Air Products and Chemcial	
Nearby CalARP Facilities	Matheson Tri-Gas	
	MECS	
	CC Water District	
	Shell Catalysts to east-southeast	
	N-industrial/open land	
Surrounding Land Use	E, S, W-open (and/some industrial	
	SE-residential (low to moderate income)	Wuhwrable population
Healthy Places Index	25-50 (pinch point and east)	
	50-75 (pinch point and west)	
Wind Direction (from)	West (Feb-Nov); North (Nov-Feb)	
Rising Tides 12"	Northwest and northeast	Rail line northwest in area of 12 rising tide
Liquefaction (high to very high)	immediately north, northwest, and northwest	Rail lines nortally in area of liquefaction

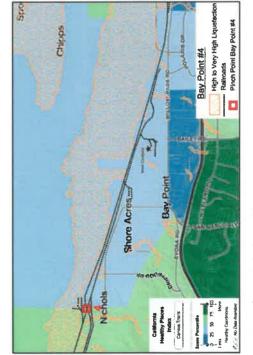
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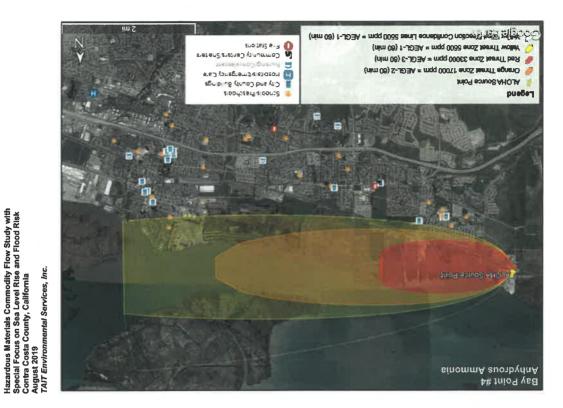
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5.4.1 Scenario 1: Ammonia

ALOHA model plume mapping at Pinch Point Bay Point #4 for an ammonia/anhydrous ammonia (UN ID# 1005) release is shown in the following map. The ammonia plume is extensive and is over 6 miles forg and up to 2 miles wide. The Red Threat Zone is approximately 2 miles long and up to a mile wide, and covers the industrial area and natural open land area along Suisun Bay north of the cities of Bay Point and Pittsburg. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are within the commercial, residential, and downtown areas of both Bay Point and Pittsburg.



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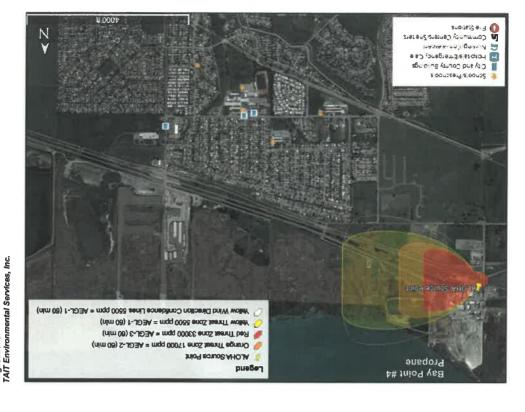
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5.4.2 Scenario 2: Propane

ALOHA model plume mapping at Pinch Point Bay Point #4 for propane (UN ID# 1075) release is shown in the following maps. The first map shows the extent of a propane plume release. The second map shows the area affected in the event that the tank car explodes in a BLEVE scenario. The propane plume is approximately 1 mile long and up to ½ mile wide. The Red Threat Zone is approximately ½ mile long and up to ¾ mile wide. The entire plume covers the industrial and natural open land area north of the city of Bay Point. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place primarily industrial area to the southeast and south at risk from a propane incident. Areas beyond this zone to the southeast are residential. The second map shows the Propane BLEVE scenario. In this scenario the area affected is known as the Thermal Radiation Threat Zone and is approximately % mile from the source, and the Red Threat Zone extends approximately % mile from the source. In general, the entire area is either industrial, natural open lands, or part of Suisun Bay. Areas beyond this zone to the southeast are residential.



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Scenario 3: Sulfuric Acid 5.4.3

The sulfuric acid (UN ID #1830) release isolation zone at Pinch Point Bay Point #4 is shown in the following map. According to ERG guidelines, the isolation distance in the event that a fire is involved is ½ mile in all directions. Although slightly less extensive in area, the isolation zone is similar to the Propane BLEVE scenario. The entire isolation zone in industrial and natural open land areas, including part of Suisun Bay.

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Pinch Point - Antioch #5 5.5

At the Antioch #5 pinch point, it will be assumed that the hazardous materials spill of a COC will result from an incident with a rail tank car holding 34,397 gallons of the armmoniadanhydrous armmonia (worst-case scenario), artif tank car holding 34,397 gallons of propane as LPG (worst-case scenario), and 13,350 gallons of sulfuric acid (worst-case scenario). The individual details are contained in the sections below.

Criteria used in the identification of the pinch point are summarized in the table below. Maps showing some of the criteria used in the determination of the pinch point are shown following the table.

CRITERIA	DESCRIPTION	COMMENTS
Location	End of Ancy Lane	
Elevedon (above mel)	17	Above 12" rising tide
Latttude	38.019168	
Longitude	-121.847427	
Railroads	BNSF (pinct point)	Pinch point along major rail the
	UP (eauth)	
Hehiones A. Arterial Roads	CA-4	
	W. 10th Street	
Divalinas	Gas pipeline at pinch point.	Partially co-located with ras the of pinch point
- posmers	Hazardous liquid to south along UP line	
	Haga	
	Defa Energy	
Nearby CalaRP Feckides	Costava Agriacience	
	K2 Pura Solutions	
	Gitray Energy Centler	
	N and NE-industriationen land	
	E-open landfindustrial	
Surrounding Lend Use	SE-commercial/residential beyond inclustrial	Witherable population; critical facilities
	S and SW-open land/industrial	
	W-industrial	
Realthy Places Index	25-50 (phrch point and inmediate area; 23.6 percentile)	
Wind Direction (from)	West (Feb-Nov); North (Nov-Feb)	
Alsang Tides 12"	North of pinch point along shoreline	
Liquiriaction (high to very tight)	North of pinch point and nearby drainage to west	Rail lines partially in area of inveloction

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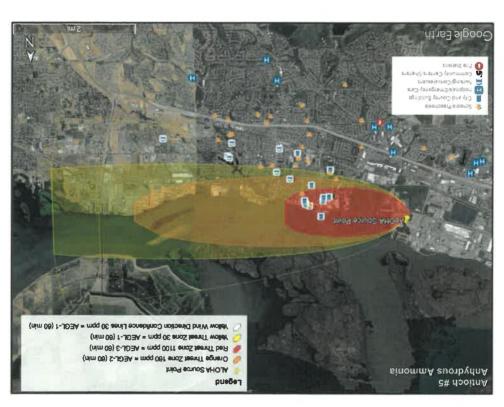
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5.5.1 Scenario 1: Ammonia

ALOHA model plume mapping at Pinch Point Antioch #5 for an ammonia/anhydrous ammonia (UN ID# 1005) release is shown in the following map. The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone is approximately 2 miles bong and up to a mile wide, and covers an industrial area, natural open lands area, and the northern part of the city of Antioch, including part of the downtown area, as well as part of Sulsun Bay. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are within the commercial, residential, and downtown areas of Antioch.

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5.5.2 Scenario 2: Propane

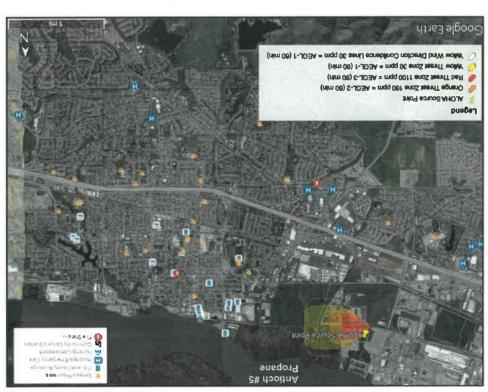
ALOHA model plume mapping at Pinch Point Antioch #5 for propane (UN ID# 1075) release is shown in the following maps. The first map shows the extent of a propare plume release. The second map shows the area affected in the event that the tank car explodes The propane plume is approximately 1 mile long and up to ½ mile wide. The Red Threat Zone is approximately ½ mile long and up to ¼ mile wide. The entire plume covers the industrial and natural open land area northwest of the city of Antioch. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction in a BLEVE scenario.

coming from the north. This will place primarily industrial area to the southeast and south

at risk from a propane incident. Areas beyond this zone to the southeast are residential.

The second map shows the Propane BLEVE scenario. In this scenario the area affected is known as the Thermal Radiation Threat Zone and is approximately % mile from the source, and the Red Threat Zone extends approximately % mile from the source. In general, the entire area is either industrial, natural open lands, or part of Suisun Bay. Areas beyond this zone to the southeast are residential.

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Antioch #S

ALONARGE Plant

ALONARGE (a) a Standard degree bure within 60 sectors and the part of the

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5.5.3 Scenario 3: Sulfuric Acid

The sulfuric acid (UN ID #1830) release isolation zone at Pinch Point Antioch #5 is shown in the following map. According to ERG guidelines, the isolation distance in the event that a fire is involved is 2 mile in all directions. Although slightly less extensive in area, the isolation zone is similar to the Propane BLEVE scenario. The entire isolation zone in industrial and natural open land areas, including part of Suisun Bay.

Schools Freechools

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The Statons enoZ noitslosi Antioch #5 Sulfuric Acid

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6.0 Integration of Data with GIS

Following this Flow Study, CCHSHMP will be working to display hazardous materials related data, along with sea level rise and flood data, in a GIS format. GIS mapping will be used to further communicate, display, and identify areas of concern as it relates to hazardous materials and flooding.

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7.0 Emergency Response and Mitigation

Data from the Commodity Flow Study portion of this project were used to determine the 5 pinch points which were used for chemical plume analysis. All of the pinch points were located along rallroad lines in the coastal areas of Contra Costa County, and portions of the areas surrounding the pinch points are potentially subjected to rising tides. Determination of the pinch points was based on numerous orities as outlined in Section 4.1 of this report, including the following:

- Rising Tides data and areas most susceptible to rising tides and sea level rise;
 California Healthy Places Index indicating vulnerable populations;
- Liquefaction Susceptibility data;
 - Location of CalARP Facilities;
 - Locations of Critical Facilities:
- Chemicals of Concern;
- Weather data;
- Railroad Locations; and
- Critical Arterial Road Locations.

In addition to the above criteria, vulnerable populations are located in the vicinity of many of the pinch points, and they typically contain lower and middle income housing, as well as numerous public buildings, medical facilities, shelters and community centers, and schools.

In addition, weather patterns indicate that the 2 major wind directions occur in the coastal cities of Contra Costa County. The major wind direction is from the west and occurs for 9 to ten (10) months of the year. The alternate wind direction is from the north and occurs for 2 to 3 months of the year. The chemical plume analysis utilized the predominant westerly wind direction; however, the plume footprints can change with the change in wind direction.

The ammonia/anhydrous ammonia plume is the most toxic plume that has been mapped at each of the pinch points. In the event that an evacuation is required due to an ammonia release incident, evacuations could be undertaken to remove vulnerable populations from the immediate incident area. Shelters could be set up, generally in areas outside the complete footprint of plume in facilities such as schools, churches, and public buildings. In addition, shelter-in-place procedures may need to be implemented to protect the population in the area. Shelter in place may be critical in the event that the release has occurred in flooded areas, and evacuation is not practicable or possible.

An incident involving ammonia could have catastrophic effects on these populations. The best approach to mitigate such an incident its a proactive approach, which allows properly equipped and trained first responders to immediately respond to an incident and work to mitigate/ferminate the source of the incident. This approach is paramount to preventing a massive reactive approach which would include movement and protection of a large vulnerable population.

The propane and sulfuric acid plumes cover a much smaller footprint than the ammonia plume and would be considered of lower toxicity than the ammonia plume. A propane explosion or BLEVE occurs almost instantaneously, and rapid emergency response, including evacuation, is necessary. Emergency response to a non-BLEVE propane release or a sulfuric acid release

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upon the circumstances. The most important aspect of immediate response to a propane or sulfuric acid release is to allow properly equipped and trained first responder to proactively mitigate/terminate the source of the incident. Flooding in the release area may complicate the should be similar to an ammonia release; however, evacuation may not be necessary depending response actions,

the railroad lines, particularly in the coastal areas. In order to mitigate any negative results due to a release incident along the pipelines, the first responders should coordinate with the pipeline operators to immediately isolate the affected lines. Isolation will ensure that a minimal amount of the population is affected by the incident. In addition, evacuation procedures should be in place The locations of the natural gas transmission pipelines and hazardous liquid pipelines within the coastal areas of Contra Costa County are known, and the major lines are often collocated along to quickly and efficiently remove the affected populations from the areas impacted by the incident.

risk in the event of a major hazardous materials incident. Because of this situation, a proactive The vulnerable populations within and adjacent to each of the 5 pinch point locations are at high approach to initial response by first responders, is the best approach, as it reduces the need for an overarching reactive response. There are 3 elements to this approach;

- Proper protective and response equipment, which will allow first responders to react proactively, quickly, and efficiently to a major hazardous materials release incident.
- Comprehensive training, including focused training of first responders to act both proactively and reactively to a major hazardous materials release incident.
- Mutual aid agreements with local, and state agencies that can immediately provide additional manpower, equipment, and trained assistance to a major hazardous materials

accident/incident. This approach will also minimize disruption of essential services, facilities, and infrastructure, and will ultimately save lives and property. A proactive approach in equipping and training first responders will serve to protect the vulnerable populations within the County in the event of a transportation-related hazardous material

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Summary 0.8

The goals and results of the Flow Study and Community Risk Assessment are summarized

rail. Three chemicals of concern (COCs) were determined from the railroad data, and these The Flow Study reviewed rail transport of hazardous chemicals through the County, and particularly within areas of the county where the rail lines may be susceptible to rising tides and flooding risks from changes in our climate. Chemical data from industries in the County helped to determine what types of hazardous chemicals were being transported through the County via (ammonia/anhydrous ammonia, propane, and sulfuric acid) were used in the plume analysis in the CRA portion of this report.

Based on the information obtained from the Flow Study, a series of vulnerable points ("pinch points") were determined from rising tides data and potential flooding, primarily along the rail lines, California Healthy Places data, liquefaction resulting from earthquakes, locations of CalARP facilities, specific COCs, background weather data, locations of railroads and critical arterial roadways, and locations of critical facilities including areas of vulnerable populations. Once specific pinch points were located, a comprehensive ČRA, including a chemical plume analysis, was performed to assess worst-case scenarios related to a COC release incident at these

and Flood Risk, fostered a greater understanding on how major hazardous materials transportation, such as Contra Costa County rail system, could be impacted by sea level rise/flooding and how the increased risk for hazardous materials incidents that could affect the The Flow Study and CRA were completed as a follow-on study to the San Francisco Bay Conservation and Development Commission Adaption to Rising Tides (ART) project. The current project titled Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise nealth and safety of our community.

facilities and vulnerable populations through toxic plume mapping using ALOHA technology. Identifying these issues will help the County to better address and plan for hazardous materials Goals of the project included identifying risks from hazardous materials release due to possible disruption of transportation due to sea level rise/flooding as predicted by the Adapting to Rising Tides program and the effect of a release of various portions of the County, including critical releases in order to protect and promote health, safety, and wellbeing of Contra Costa residents. Historical railroad and highway data were available from the "Hazardous Materials Transportation Study for Contra Costa County. Additional highway flow study data were also available from Marin County (2014) and Solano County (2016). The data used here from Marin and Solano Counties were compiled for the entry points from these counties into Contra Costa, specifically along Interstate Highways I-580 (Marin) and I-80 and I-680 (Solano). The Flow Study also incorporated railroad commodity information from 2016 through 2018, which was made available from UP and BNSF. The railroad data aided in the identification of the COCs: ammonia/anhydrous ammonia, propane, and sulfuric acid.

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Pipeline data, including identification and locations of hazardous liquid and gas transmission pipelines were also included as a reference in this report. In many areas, including the coastal areas, the pipelines are often co-located with the railroad lines. An incident along one of these transportation routes could potentially affect the other. Pipeline incidents dating from 2008 were listed and located on the pipeline maps.

goods through Contra Costa County, particularly alternate transportation along roadways. In the event of flooding due to rising tides, the stability of the rail lines in some areas (ballast and track RPRC, and BART. UP and BNSF transport the majority of commercial traffic, including hazardous materials throughout the coastal areas of Contra Costa County. Rail lines located along the shorelines serve as a first line of defense against inland flooding, also known as ad hoc flood protection. Disruption of rail line transportation can have significant impacts on the movement of bed materials) may be at risk of becoming structurally unsound. In addition, groundwater table rise due to climate change could also result in the instability of the rail lines due to the potential damage to track bed and ballast materials. Certain areas of the rail lines are in areas at risk of Railroads in Contra Costa County consist primarily of the following railroad lines: UP, BNSF high to very high liquefaction in the event of an earthquake.

Railroad incidents involving hazardous materials were reviewed from the time period of 2000 through 2019. A review of the above data indicates the following trends:

- Major cause of total rail incidents is derailment:
- Major causes of hazardous materials spill incidents are derailment, leaking train cars, and collision:
- Both UP and BNSF lines contained the major portion of the total rail incidents, as these
 - are the major rail lines in the area;
- Total rail incidents were located primarily in the cities of Richmond, Martinez, Pittsburg, UP had a higher percentage of hazardous materials spill incidents than BNSF;
 - Rodeo, and Crockett; and.
- Hazardous materials spill incidents were located primarily in Richmond, Martinez, Rodeo, and Crockett.

County data were available from the period of 2010 through 2019, and nationwide data were available from 2010 through 2016. The nationwide data indicated that the number of hazardous Information concerning highway and roadway incidents was limited, but some Contra Costa materials incidents occurs in about 12 to 14 times per 10,000 total truck trips. These numbers can be extrapolated to Contra Costa County, although there may be an increase in the frequency/rate of the incidents due to the following:

- High traffic volumes in a heavily populated urban area;
- Increased frequency of transportation of hazardous materials along arterial roadways; and
 - Increased number of incidents because of flooding due to rising tides.

Disruption of commercial rail traffic could result in increased commodity flow via trucks along various arterial roads and highways in the vicinity of the pinch points. This also results in a higher risk of a hazardous materials incident occurring along the roadways. In addition, inundation of

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the areas of the pinch points by water, due to rising tides or disruption of rail traffic due to seismic events could also affect the ability to move commercial goods via roadways.

the ports, then the additional stress in highway transport will be significant. In the event of a large rall incident scenario, a major disruption of commerce through the County could result in a cessation of manufacturing operations for an unspecified amount of time. It is also possible that In consideration of transporting hazardous materials via rail, primarily within rail tanker cars, it should be noted that one tanker car can generally contain 2 to 3 times the amount of commodity than one tanker truck. Based on the comparison of the amount of trucks that would be required to transport specific hazardous materials, such as sulfuric acid, which would normally be transported by rail would be dependent on the amount of rail cars that would be disrupted on a time-dependent basis. Unless, materials can be transported on still-operating rail lines or through highway transport may not be a viable option in areas of flooding, as the roadways themselves may also be closed.

The 5 pinch points were determined during this study for extended analysis in the event that a hazardous materials incident/accident occurred at these locations. The pinch points, which are all positioned along railroad lines, were located as follows:

- Richmond #1: I-580 at Meade Street
- Richmond #2: Richmond Parkway South of MacDonald Avenue
 - Martinez #3: Shell Avenue and Marina Vista Avenue
- Bay Point #4: Nichols Road North of Port Chicago Highway
 - End of Arcy Lane Antioch #5:

The determination of the pinch points was dependent in part on the following parameters, which were used to perform the CRA:

- Rising Tides data and areas most susceptible to rising tides and sea level rise;
 - California Healthy Places Index indicating vulnerable populations;
 - Liquefaction Susceptibility data;
- Location of CalARP Facilities;
- Locations of Critical Facilities; Chemicals of Concern;

 - Weather data;
- Railroad Locations; and
- Critical Arterial Road Locations.

A critical aspect of the determination of pinch points is an analysis of flooding due to rising tides and sea level rise, including king tides and storm surges. Data was compiled using the ART Shoreline Flood Explorer on-line maps for three different scenarios;

- 12-Inch Sea Level Rise, Equivalent to King Tide with no Sea Level Rise;
- 24-inch Sea Level Rise, Equivalent to 5-Year Storm Surge with no Sea Level Rise; and
 36-Inch Sea Level Rise, Equivalent to 50-Year Storm Surge with no Sea Level Rise.

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For purposes of the CRA, only the 12-inch Sea Level Rise, equivalent to a King Tide with no Sea Level Rise was used in the Chemical Plume Analysis section of this report.

As a note, levee failure was not included as a potential flood scenario in this project.

populations for the Community Risk Assessment, including areas of lower income residential development. Various HPI indicators and decision support layers were used to determine the HPI into the following categories ranging from "less" to "more" healthy conditions: The California Healthy Places Index (HPI) was used as an aid to determine more vulnerable

- 0-25 (least);
 - 25-50;
- 50-75; or
- 75-100 (most).

Large areas of high to very high susceptibility to liquefaction during a seismic event are located in the coastal areas of Contra Costa County. Liquefaction occurs where saturated sand and silt assume the characteristics of a liquid during an intense shaking during an earthquake. These areas are considered to be vulnerable to disruption of rail and road traffic, as a result of an incident during an earthquake. Locations of CaIARP facilities aided in the determination of the pinch points, as hazardous chemical from some of the CaIARP sites were transported through the area along the railroads and roadways. Some of the CaIARP facilities are considered to be critical operating facilities, as they include water treatment and energy generation /transfer facilities, as well as large economic

points. Many of these facilities are relevant to other hazards than the release of hazardous The locations of critical facilities were used as an aid in determining the locations of the pinch materials. As a result, and for the purposes of this CRA, critical facilities will refer to facilities that may contain vulnerable or essential emergency populations that will require mitigation/evacuation in the event of a hazardous materials release. Critical facilities located in the coastal areas of Contra Costa County can be summarized as

- City, County, Federal Buildings
- Hospitals and Emergency Medical Care
- Nursing and Convalescent Homes
 - Community Centers/Shelters

Based on the Flow Study data from the railroads, it was determined that the following 3 chemicals of concern would be used in the Chemical Plume Analysis in the CRA portion of this study to cover worst-case scenario situations at the pinch points in the event of a hazardous materials

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- Ammonia/anhydrous ammonia: highly toxic;
- Propane: highly explosive and commonly transported along the railroads in Contra Costa County; and
 - Sulfuric acid: commonly transported along the railroads in Contra Costa County.

the land surface. Based on the weather data, it was determined that in that the major wind direction from the west occurred throughout most of the year. As a result, the plume analysis utilized in this report covered an incident occurring in July. Weather for the coastal regions of Contra Costa County was available for several cities within the information was used as the basis of the weather pattems for this study. Wind direction is a critical component of toxic plume analysis, as it determines the direction which the plume will travel over For the most part, weather patterns for the coastal cities are very similar.

causes. In addition, disruption of commercial rail traffic could result in significant increases in commodity flow along major arterial roadways and highways throughout the coastal areas of Contra Costa County. It is also important to note that the rail lines that act as ad hoc flood These locations are considered to be higher risk. Many of the rail lines are co-located with underground pipelines, particularly along the coastal areas. Portions of the rail lines are located In areas of 12-inch (and greater) sea level rise, as well as in some areas of high to very high liquefaction which could be caused by earthquake events. Rail lines in these areas could become Each of the pinch points discussed in the CRA are located along or adjacent to railroad lines. compromised, resulting in potential hazardous materials incidents due to derailment or other protection could result in more significant flooding in surrounding areas due to overtopping effects.

the CAMEO suite of programs created by the U.S. Environmental Protection Agency (EPA). The CAMEO suite consists of CAMEO chemicals, ALOHA plume modeling through various release scenarios, and MARPLOT, which assists in plotting the information onto various map bases, such Plume diagrams for release of hazardous materials from the pinch points were determined using

The plume diagrams are utilized in determining the extent of threat zones based on the release of a particular chemical. Three threat zones were mapped for each chemical release:

- Red zone: Highest threat level
- Orange Zone: Moderate threat level
 - Yellow Zone: Low threat level

Chemical Plume Analysis for the CRA was based on the following general parameters:

- Weather conditions;
 - COCs; and
- Worst-case scenario conditions.

Ammonia/anhydrous ammonia is one of the highest production chemicals in the United States. It is used in manufacturing, refrigeration, and as an agricultural fertilizer, and is common in is used in manufacturing, refrigeration, and as an agricultural fertilizer, and is common in household chemicals. Ammonia can be absorbed into the body by inhalation, ingestion, and by

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skin and eye contact. A poisonous and visible vapor cloud is produced when ammonia comes in contact with water. Ammonia is extremely corrosive, and when it mixes with air it forms an explosive mixture. Although anhydrous ammonia is classified by the U.S Department of ransportation (USDOT) as nonflammable, ammonia vapor is flammable at concentrations of 15% to 28% by volume of air. Propane is a by-product of natural gas processing and crude oil refining and is produced from liquid components recovered during natural gas processing. Propane is a colorless, highly flammable liquefied gas and is one of the main components of liquid petroleum gas (LPG). Propane is biodegradable, and will readily evaporate into the environment. Inhalation of propane in minor amounts is not considered toxic; however, large amounts of propane in the air can displace oxygen and act as an asphyxiant. Skin absorption and ingestion of propane is not anticipated, although contact with propane in the liquid phase may result in frostbite

Propane is highly flammable and explosive, and spillages of large quantities of liquid propane will vaporize to propane gas. Propane vapors can travel considerable distances. An ignition source may cause propane to ignite, flash back, and explode. Propane explosions can result in Boiling Liquid Expanding Vapor Explosion (BLEVE). The U.S. Department of Transport Emergency Response Guidebook (ERG) has determined general evacuation distances to be undertaken in the event of propane-induced BLEVE. Sulfuric acid is a highly corrosive material. Spill cleanup of large spills of sulfuric acid should be undertaken by isolating the spill area with diking materials, including isolation from waterways. The acid can be treated with soda ash or lime, although neutralization will resolve a release of heat. Suffuric acid is not flammable, but can be highly reactive with combustible materials.

with water, it reacts vigorously forming an exothermic reaction. A vapor cloud of sulfuric acid can If sulfuric acid is mixed mix with water or water vapor to form a white cloud, which, based on the specific gravity is heavier Sulfuric acid spills are not considered as toxic, but can form a gray cloud.

Evacuation guidelines for sulfuric acid are contained with the ERG, and the isolation distance in the event that a fire is involved is $\frac{1}{2}$ mile in all directions. Although there is no stated isolation distance in the event of a sulfuric acid spill, or a spill into water, the ERG guidelines with respect to fire were used as a basis for evacuation and mitigation. Plume diagrams were produced using the ALOHA modeling program for the 5 determined pinch points located within coastal area of Contra Costa County At each of the pinch points, the ALOHA plume maps for ammonia and propane were produced based on the following data:

- Incident occurs in mid-July with an air temperature of 85°F;
 - Wind is from the west at 9 miles per hour;
 - Size of railroad tank care is 34,397 gallons;
 - Tank diameter of 10.66 feet; and
- The rupture in the tank car is a 10-inch diameter hole located near the bottom of the tank

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The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone is approximately 2 miles long and up to a mile wide. The propane plume is approximately 1 mile long and up to ½ mile wide. The Red Threat Zone is approximately ½ mile long and up to ¼ mile wide. In the BLEVE scenario, the area affected is known as the Thermal Radiation Threat Zone and is approximately ¾ mile from the source, and the Red Threat Zone extends approximately ${\cal V}$ mile from the source.

Sulfuric acid is not considered a toxic material that will create a toxic vapor plume during a release, and the ALOHA modeling program could not be used for this chemical. Although there is no stated isolation distance in the event of a sulfuric acid spill, or a spill into water, the ERG guidelines parameters used development of the isolation distance map for sulfunc acid at each of the 5 pinch with respect to fire were used as a basis for evacuation and mitigation. Some of

- Incident occurs in mid-July with an internal tank temperature of 85°F; Size of railroad tank care is 13,350 gallons;

 - Tank diameter of 8 feet; and
- The rupture in the tank car is a 10-inch diameter hole located near the bottom of the tank

Pinch Point Richmond #1

Pinch Point Richmond #1 is located along a major north-south rail corridor in the city of Richmond. Most of the cirtical facilities for Pinch Point Richmond #1 are located east of the pinch point, which is equivalent to the prevailing downwind direction. Much of this area is in commercial and residential land use. Most of the area west and southwest of the pinch point is industrial.

Threat Zone for the ammonia plume is approximately 2 miles long and up to a mile wide and covers a significant portion of the residential and commercial areas of east Richmond and El Cerrito. Although the prevailing wind direction is from the west, seasonal variations result in The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are also residential and commercial. Much of the area to the south is either industrial or part of San Francisco Bay. The entire propane plume covers a portion of the residential area of east Richmond and El Cerrito. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place a limited area southeast and south at risk from propane incident release. Areas to the southeast are also residential. Much of the area to the south is primarily industrial. Under the propane BLEVE scenario, the Thermal Radiation Threat Zone and is approximately % mile from the source, and the Red Threat Zone extends approximately % mile from the source. In general, areas to the northwest, north, east, and southeast are primarily residential; areas to the west and south are industrial.

Hazardous Materials Commodity Flow Study with Special Focus on Sea Level Rise and Flood Risk contra Costa County, California August 2019 TAIT Environmental Services, Inc. The sulfuric acid release isolation zone, although slightly less extensive in area, is similar to the propane BLEVE scenario. In general, areas to the northwest, north, east, and southeast are primarily residential; areas to the west and south are industrial.

Pinch Point Richmond #2

Pinch Point Richmond #2 is located along a major north-south rail corridor and rail siding in the city of Richmond. Most of the cirical facilities for Pinch Point Richmond #2 are located east of the pinch point, which is equivalent to the prevailing downwind direction. Much of this area is in commercial and residential land use. Downtown Richmond is located directly east of the pinch point. Most of the area wast of the pinch point is industrial.

The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone for the ammonia plume is approximately 2 miles long and up to a mile wide and covers a significant portion of the residential and commercial areas of the central and downtown portion of the city of Richmond. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are also residential and commercial with some industry. Much of the area to the south is either industrial or part of San Francisco Bay.

The entire propane plume covers a portion of the commercial and residential area of Richmond, including the downtown area. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place a limited area southeast and south at risk from a propane incident. Areas to the southeast are also residential. Much of the area to the south is primarily industrial.

Under the propane BLEVE scenario, the Thermal Radiation Threat Zone and is approximately % mile from the source, and the Red Threat Zone extends approximately ½ mile from the source. In general, areas to the northeast, east, and southeast are primarily commercial and residential; areas to the northwest, west, and south are inclustrial.

The sulfuric acid release isolation zone, although slightly less extensive in area, is similar to the propane BLEVE scenario. In general, areas to the northeast, east, and southeast are primarily commercial and residential; areas to the northwest, west, and south are industrial.

Pinch Point Martinez #3

Pinch Point Martinez #3 is located along the major UP rail line entering the Martinez area from the coast to the west. Most of the cirtical facilities for Pinch Point Martinez #3 are located southwest and south of the pinch point. Much of the area southwest of the pinch point is in commercial and residential land use and downtown Matinez is located in this direction. Most of the area to the south of the pinch point is residential. Industrial areas, including oil refineries, are located east of the pinch point, which is equivalent to the downwind direction. Industrial areas are also located north and west of the pinch point.

The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone for the ammonia plume is approximately 2 miles long and up to a mile wide and

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covers the industrial area northeast of the city of Martinez, including oil refineries. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are also industrial. Much of the area to the south is partly industrial and partly residential.

The entire propane plume covers a portion of the industrial area in the northeastern part of Martinez. Atthough the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place the industrial area south of the pinch point at risk from a propane incident.

Under the propane BLEVE scenario, the Thermal Radiation Threat Zone and is approximately % mile from the source, and the Red Threat Zone extends approximately ¼ mile from the source. The entire area affected by this scenario is industrial, including oil refineries.

The sulfuric acid release isolation zone, although slightly less extensive in area, is similar to the propane BLEVE scenario. The entire isolation zone is industrial, including oil refinences.

Pinch Point Bay Point #4

Pinch Point Bay Point #4 is located at the intersection of the major UP and BNSF rail lines heading east from Martinez. Most of the cirtical facilities for Pinch Point Bay Point #4 are located east-southeast of the pinch point. The major portion of the cities of Bay Point and Pittsburg, including the commercial, residentia, I and downtown areas of these cities. These cities are partially downwind of the prevailing wind direction. The area directly west of the pinch point are primarily industrial and natural coastal areas.

The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zone for the ammonia plume is approximately 2 miles long and up to a mile wide, and covers the industrial area and natural open land area along Suisun Bay north of the cities of Bay Point and Pittsburg. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are within the commercial, residential, and downtown areas of both Bay Point and Pittsburg.

The entire propane plume covers the industrial and natural open land area north of the city of Bay Point. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction corning from the north. This will place primarily industrial area to the southeast and south at risk from a propane incident. Areas beyond this zone to the southeast are residential.

Under the propane BLEVE scenario, the Thermal Radiation Threat Zone and is approximately 34 mile from the source, and the Red Threat Zone extends approximately 14 mile from the source. In general, the entire area is either Industrial, natural open lands, or part of Suisun Bay. Areas beyond this zone to the southeast are residential.

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The sulfuric acid release isolation zone, although slightly less extensive in area, is similar to the propane BLEVE scenario. The entire isolation zone in industrial and natural open land areas, including part of Suisun Bay.

Pinch Point Antioch #5

Pinch Point Antioch #5 is along the BNSF rail heading east from Martinez. Most of the cirtical facilities for Pinch Point Antioch #5 are located east and east-southeast (downwind) of the pinch point and includes a major portion of the city of Antioch, including the commercial, residential, and downtown areas of the city. The area surrounding the pinch point are primarily industrial and natural coastal areas.

The ammonia plume is extensive and is over 6 miles long and up to 2 miles wide. The Red Threat Zore is approximately 2 miles long and up to a mile wide, and covers an industrial area, natural open lands area, and the northem part of the city of Antioch, including part of the downtown area, as well as part of Suisun Bay. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place areas southeast and south at risk from an ammonia release. Areas to the southeast are within the commercial, residential, and downtown areas of Antioch.

The entire propane plume covers the industrial and natural open land area northwest of the city of Antioch. Although the prevailing wind direction is from the west, seasonal variations result in the wind direction coming from the north. This will place primarily industrial area to the southeast and south at risk from a propane incident. Areas beyond this zone to the southeast are residential.

Under the propane BLEVE scenario, the Thermal Radiation Threat Zone and is approximately % mile from the source, and the Red Threat Zone extends approximately % mile from the source. In general, the entire area is either industrial, natural open lands, or part of Suisun Bay. Areas beyond this zone to the southeast are residential.

The sulfuric acid release isolation zone, although slightly less extensive in area, is similar to the propane BLEVE scenario. The entire isolation zone in industrial and natural open land areas, including part of Suisun Bay.

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TAIT Environmental Services, Inc.

9.0 Concluding Statement

A Commodity Flow Study was prepared from historical and currently available railroad and highway data. Based on the results of the Flow Study, 3 COCs were identified to be used in the Community Risk Assessment portion of this report. Based on the COCs and other criteria, including rising tide data from the ART program, California Healthy Places Index, liquefaction susceptibility, CalARP facilities, locations of critical facilities, weather conditions, railroad locations, and critical arterial road locations, 5 pinch points were located in the coastal areas of Contra Costa County.

The pinch points were used to prepare the Community Risk Assessment and chemical plume analysis to determine worst-case scenario effects of a release of the ammonia/anhydrous ammonia, propane, and sulfuric acid, which were designated as the most critical COCs.

Based on the results of the chemical plume analysis, general emergency response procedures were outlined to allow for emergency response to a chemical release incident. Emergency response covers proper protective and response equipment, comprehensive training for emergency responders, and in-place mutual agreements with local agencies to allow for merging and pooling of emergency response resources.

The addition of the potential flooding of low-lying coastal areas of the county, including residential, commercial, and industrial areas, may serve to complicate emergency response to an incident, and additional measures may need to be implemented to adequately respond to a flooding situation at the site of a release incident.

A proactive approach in equipping and training first responders will serve to protect the vulnerable populations within the County in the event of a transportation-related hazardous material accident/incident. This approach will also minimize disruption of essential services, facilities, and infrastructure, and will ultimately save lives and property.

The East Contra Costa and Bay Area Wide Adapting to Rising Tides projects are still ongoing at 2019 and the fine project report. Both projects are anticipated to conclude in winter of 2019 and the final project reports and data will be available on the BCDC website www.adaptingtorisingtides.org.

APPENDIX A Hazardous Liquid Pipeline Details

APPENDICES

APPENDIX A-1 Richmond Area Pipeline Data

RL1. SFPP, LP Non-HVL Product Pipeline LS-70; (NIS) RICHMO

 Category: PIPELINE ATTRIBUTES 	ITES
OPERATOR ID	18092
OPERATOR MAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-70; (NIS) RICHMOND - POINT M
PIPELINE ID	LS-70; (NIS) RICHMO*
MILES	2.40
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HAL PRODUCT
INTERSTATE DESIGNATION	N
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	13
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	Xt
ZIP	77002

RL2. SFPP, LP Non-HVL Product Pipeline LS-71; LS-89 – RICH

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\$S		8	ENTITY	
SS		SS	PHONE	(713) 420-5608
SS		88	EMAIL	patrick_riban@kindermorgan.com
	HOUSTON TX 77602		ADDRESS	1001 LOUISIANA ST
	7X 77002		CITY	HOUSTON
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RL3. Phillips 66 Pipeline, LLC, Non-HVL Product Pipeline 2258_35

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82	7 Compliance
52	
SS	36
ESS	@p66.com
	at Blvd HQ-08-S820-05
CITY	
STATE	
ZIP 77043	

RL4. SFPP, LP Non-HVL Product Pipeline LS-75; IMTT/TIME

Catagory DIDE INFATTDIBITES	water
	JTES
OPERATOR ID	18092
OPERATOR MAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-75; IMTT / TIME - RICHMOND 8/3"
PIPELINE ID	LS-75; IMTT / TIME *
MILES	1.86
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HVL PRODUCT
INTERSTATE DESIGNATION	>
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	cl
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	TX
diZ	77002

RL5. SFPP, LP Non-HVL Product Pipeline LS-37; AMORCO-RIC

Attribute Category: PIPELINE ATTRIBUTES OPERATOR ID SYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME IS-37; AMORCO- PIPELINE ID AST; AMORCO- PIPELINE ID COMMODITY CATEGORY NON-HYL PRODUCT COMMODITY DESCRIPTION NON HYL PRODUCT INTERSTATE DESIGNATION NON HYL PRODUCT CATEGORY NON-HYL PRODUCT CATEGORY NON-HYL PRODUCT FIRST NAME FRYSION DATE FRYSION DATE O6/21/2018 FRYSION DATE FRST NAME REAMINT FIRST NAME RIBAN TITLE MANAGER-ENGIN FHONE FRYSION FRYSIO	TTES 18092 SFPP, LP SFPP, LP SFPP_NORTH LS-37; AMORCO - RICHMOND 12' LS-37; AMORCO - RIC* 20.83 Non-HVL Product NON HVL PRODUCT N Active (filled) 06/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST HOUSTON TX
IACI	18092 SFPP, LP SFP, LP SFPP, L
OPERATOR ID OPERATOR ID OPERATOR NAME SYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME ILS-37; AMORCO- PIPELINE ID COMMODITY CATEGORY NON-HVL Product COMMODITY DESCRIPTION INTERSTATE DESIGNATION NON HVL PRODU INTERSTATE DESIGNATION NON HVL PRODU INTERSTATUS CODE Active (filled) REVISION DATE FRP SEQUENCE NUMBER CATEGORY: GENERAL CONTACT FIRST NAME FREST NAME PHONE RIBANI TITLE MANAGER-ENGIN REMITY (713) 420-5608 FEMALL PRODUCT PATRICK RIBANI RIBANI RIBANI RIBANI RITTLE MANAGER-ENGIN REMAIL PHONE RIBANI RIBANI RIBANI RIBANI RIBANI RIBANI RIBANI RIBANI RIBANI RIPANI RIBANI RIBA	18992 SFPP, LP SFPP_NORTH LS-37; AMORCO - RICHMOND 12' LS-37; AMORCO - RIC* 20.83 Non-HVL Product NON HVL PRODUCT N Active (filled) 06/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindemorgan.com 1001 LOUISIANA ST MOUSTON TX T7002
OPERATOR NAME SYSTEM NAME SYSTEM NAME SUBSYSTEM NON-HVL Product COMMODITY CATEGORY NON-HVL PRODUCT INTERSTATE DESIGNATION NON HVL PRODUCT STATUS CODE Active (filled) REVISION DATE FRP SEQUENCE NUMBER CATEGORY: GENERAL CONTACT FIRST NAME RIBANI TITLE MANAGER-ENGIN ENTITY RIBANI RITTLE MANAGER-ENGIN REMAIL RIBANI RIBANI RIBANI RIBANI RIBANI RITTLE RIBANI RIBA	SFPP, LP SFPP_NORTH LS-37; AMORCO - RICHMOND 12' LS-37; AMORCO - RIC* 20.83 Non-HVL Product NON HVL PRODUCT N Active (filled) 06/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindemorgan.com 1001 LOUISIANA ST MOUSTON TX T7002
SYSTEM NAME SUBSYSTEM NON-HYL Product COMMODITY CATEGORY NON-HYL Product COMMODITY DESCRIPTION NON-HYL Product COMMODITY DESCRIPTION NON-HYL PRODUCT INTERSTATUS CODE Active (filled) REVISION DATE FRP SEQUENCE NUMBER CATEGORY: GENERAL CONTACT FIRST NAME RIBAN RIBAN RIBAN RIBAN RITHE MANAGER-ENGIN ENTITY (713) 420-5608 EMAIL PHONE RAMIN RIBAN	SFPP_NORTH LS-37: AMORCO - RICHMOND 12* 20.83 Non-HVL Product NON HVL PRODUCT N Active (filled) 06/21/2016 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindemorgan.com 1001 LOUISIANA ST HOUSTON TX T7002
SUBSYSTEM NAME LS-37; AMORCO- MILES COMMODITY CATEGORY COMMODITY DESCRIPTION INTERSTATE DESIGNATION CONSTRUCT FIRST NAME RIBAN TITLE MANAGER-ENGIN ENTITY (713) 420-5608 EMAIL PATRICK RIBAN R	LS-37: AMORCO - RICHMOND 12* LS-37: AMORCO - RIC* 20.83 Non-HVL Product NON HVL PRODUCT N Active (filled) G6/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST MOUSTON TX
MILES MILES COMMODITY CATEGORY COMMODITY DESCRIPTION INTERSTATE DESIGNATION INTERSTATE DESIGNATION INTERSTATE DESIGNATION INTERSTATE DESIGNATION REVISION DATE FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME RIBAN MANAGER-ENGIN FUND FU	LS-37; AMORCO - RIC* 20.83 Non-HVL Product NON HVL PRODUCT N Active (filled) G6/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST MOUSTON TX
MILES COMMODITY CATEGORY NON-HVL Product COMMODITY DESCRIPTION NON HVL PRODU INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE GOSTALOS CAtegory: GENERAL CONTACT FIRST NAME RIBAN TITLE MANAGER-ENGIN RIBAN RIBAN RIBAN RIBAN RIBAN RITTLE MANAGER-ENGIN ENTITY (713) 420-5608 EMAIL RIPAN RIBAN RIBAN RIBAN RIBAN RIBAN RIBAN RIBAN RITTLE MANAGER-ENGIN REMAIL RIPAN RAD-5608 EMAIL RAD-5608 E	20.83 Non-HVL Product NON HVL PRODUCT N Active (filled) 06/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST HOUSTON TX
COMMODITY CATEGORY COMMODITY DESCRIPTION INTERSTATE DESIGNATION NON HYL PRODUCTURESTATE DESIGNATION NON HYL PRODUCTURESTATE DESIGNATION NON HYL PRODUCTURESTATUS CODE Active (filled) REVISION DATE G671/2018 REVISION DATE G671/2018 REVISION NAME RIBAN TITLE MANAGER-ENGIN RITTLE MANAGER-ENGIN FINTITY RADIONE R	Non-HVL Product NON HVL PRODUCT N Active (filled) 06/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST HOUSTON TX
COMMODITY DESCRIPTION NON HAL PRODUCOMMODITY DESCRIPTION NO PIPELINE STATUS CODE Active (filled) FEMSION DATE FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME RIBAN TITLE MANAGER-ENGIN FHONE FOR SEQUENCE RIBAN RIBAN RIBAN RIBAN RIBAN RITTLE MANAGER-ENGIN FHONE FOR SEQUENCE RIBAN RIBAN RIBAN RITTLE MANAGER-ENGIN FHONE FOR SEQUENCE FOR SEQUENCE FOR SEGUENCE FOR SEQUENCE FOR	NA Active (filled) OG/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST HOUSTON TX 77002
INTERSTATE DESIGNATION N PIPELINE STATUS CODE FREVISION DATE FREP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME FIRST NAME RIBAN MANAGER-ENGIN FITTLE FINITY	N Active (filled) 06/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST HOUSTON TX
PIPELINE STATUS CODE REVISION DATE FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME PATRICK LAST NAME RIBAN MANAGER-ENGIN PHONE (713) 420-5608 EMAIL PATRICK RIBAN (713) 420-5608 EMAIL PATRICK RIBAN MANAGER-ENGIN PHONE RIBAN RIBAN MANAGER-ENGIN PHONE RIBAN RIBAN MANAGER-ENGIN PHONE RIBAN MANAGER-ENGIN PHONE RIBAN MANAGER-ENGIN RADIALO RADIALO	Active (filled) 06/21/2018 CT PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST HOUSTON TX
FRP SEQUENCE NUMBER - Category: GENERAL CONTACT FIRST NAME PATRICK RIBAN TITLE MANAGER-ENGIN PHONE (713) 420-5608 EMAIL PATRICK RIBAN MANAGER-ENGIN PHONE RIBAN MANAGER-ENGIN	CT PATRICK RIBANI MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindemorgan.com 1001 LOUISIANA ST HOUSTON TX
FRP SEQUENCE NUMBER - Category: GENERAL CONTACT FIRST NAME PATRICK LAST NAME RIBAN TITLE MANAGER-ENGIN PHONE (713) 420-5608 EMAL PATRICK PHONE (713) 420-5608 EMAL PATRICK PHONE (713) 420-5608 EMAL PATRICK PATR	PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindemorgan.com 1001 LOUISIANA ST MOUSTON TX
FIRST NAME PATRICK LAST NAME RIBANI TITLE MANAGER-ENGIN FINDNE (713) 420-5608 EMAIL PATRICK AND	PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindemorgan.com 1001 LOUISIANA ST HOUSTON TX 77002
AME	PATRICK RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindemorgan.com 1001 LOUISIANA ST MOUSTON TX 77002
ME	RIBAN MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST MOUSTON TX 77002
g	MANAGER-ENGINEERING (713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST MOUSTON TX 77002
ç	(713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST MOUSTON TX 77002
	(713) 420-5608 patrick_riban@kindermorgan.com 1001 LOUISIANA ST HOUSTON TX
Ç	patrick_riban@kindermorgan.com 1001 LOUISIANA ST MOUSTON TX
	1001 LOUISIANA ST HOUSTON TX 77002
ADDRESS (UD) COUSIANA	MOUSTON TX 77802
CITY	TX 77002
STATE	77002
ZIP 77002	

RL6. SFPP, LP Non-HVL Product Pipeline LS-8; RICHMOND-CO

- Category: PIPELINE ATTRIBUTES OPERATOR ID OPERATOR ID SYSTEM NAME SYSTEM SYS	Category: PIPELINE ATTRIBUTES DPERATOR ID 18092 SYSTEM NAME SFPP, LP SYSTEM NAME LS-8; RICHMON SUBSYSTEM NAME LS-8; RICHMON MARIES 22.42 COMMODITY CATEGORY Non-HVL Produc COMMODITY CATEGORY NON-HVL PROD COMMODITY DESCRIPTION Y PIPELINE STATUS CODE Active (filled) REVISION DATE G621/2018 RRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME PATRICK AST NAME RIBBAN FITLE MANAGER-ENG SHITTY (713) 420-5608 SHAILL patrick_riban@k NDDRESS 1001 LOUISIAN SITY HOUSTON	RTH MOND - CONCORD 8" MOND - CO* roduct PRODUCT
PPERATOR ID 18992 PPERATOR NAME SFPP, LP SYSTEM NAME SFPP, LP SYSTEM NAME LS-8: RICHMOND - CONCORD 8 SUBSYSTEM NAME LS-8: RICHMOND - CO* SPELINE ID LS-8: RICHMOND - CO* ACA 2 ACA 2 COMMODITY CATEGORY Non-HVL Product COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION Y NTERSTATE DESIGNATION Y REVISION DATE Active (filled) REVISION DATE Active (filled) REVISION DATE PATRICK AST NAME RIBAN AST NAME RIBAN PHONE (713) 42D-5608 PHONE (713) 42D-5608 PHONE PATRICK ADDRESS HOUSTON TX TX TX002	PPERATOR ID 18092 PPERATOR NAME SFPP, LP SYSTEM NAME SFPP, LP SUBSYSTEM NAME LS-8; RICHMON SPELINE ID LS-8; RICHMON MILES Non-HVL Produc COMMODITY CATEGORY Non-HVL Produc COMMODITY DESCRIPTION Y NTERSTATE DESIGNATION Y PRESIGN STATUS CODE Active (filled) REVISION DATE G6/21/2018 REPS SQUIENCE NUMBER Category: GENERAL CONTACT RAST NAME PATRICK ANDINE RIBAN PHONE (713) 420-5608 RAMIL PARRICK, riban@k ADDRESS 1001 LOUISIAN SITY HOUSTON	TTH MOND - CONCORD 8" MOND - CO* reduct RODUCT
OPERATOR NAME SFPP, LP SYSTEM NAME SFPP_NORTH SUBSYSTEM NAME LS-8: RICHMOND - CONCORD'S RICHMOND - CO* MALES 22.42 COMMODITY CATEGORY Non-HAL Product COMMODITY DESCRIPTION NON HAL PRODUCT INTERSTATE DESIGNATION Y PIPELINE STATUS CODE Active (filled) REVISION DATE G6/21/2018 FRP SEQUENCE NUMBER PATRICK LAST NAME PATRICK FIRST NAME PATRICK EMAIL MANAGER-ENGINEERING EMAIL PATRICK ADDRESS 1001 LOUISIANA ST CITY 1001 LOUISIANA ST CITY TX ZIP 77002	SYSTEM NAME SFPP, LP SYSTEM NAME SFPP, LP SUBSYSTEM NAME LS-8; RICHMON SPPELINE ID LS-8; RICHMON MILES 22.42 SOMMODITY CATEGORY Non-HVL Produc COMMODITY DESCRIPTION NON-HVL Produc NITERSTATE DESIGNATION Y PRELINE STATUS CODE Active (filled) REVISION DATE G6/21/2018 FRP SEQUENCE NUMBER PATRICK FAST NAME PATRICK FAST NAME RIBAN FAITH MANAGER-ENG FAITH ANDOME CATIONS (713) 420-5608 FWAIL patrick_riban@k ADDRESS 1001 LOUISIAN SITY HOUSTON	RTH MOND - CONCORD 8" MOND - CO* reduct RODUCT
SYSTEM NAME SFPP_NORTH BUBSYSTEM NAME LS-8: RICHMOND - CONCORDS MALES 22.42 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION NON HVL PRODUCT NITERSTATE DESIGNATION Y PIPELINE STATUS CODE Active (filled) REVISION DATE G6/21/2018 FRP SEQUENCE NUMBER RIBAN FRST NAME PATRICK FAST NAME PATRICK PHONE (7/13) 420-5608 EMAIL patrick_riban@kindermorgan.com VODISIANA ST 1001 LOUISIANA ST STATE TX TX 77002	SYSTEM NAME SFPP_NORTH BUBSYSTEM NAME LS-8; RICHMON #PELINE ID LS-8; RICHMON #ILES 22-42 ZOMMODITY CATEGORY Non-HVL Produc COMMODITY DESCRIPTION NON HVL PROD NITERSTATE DESIGNATION Active (filled) REVISION DATE G621/2018 FRP SEQUENCE NUMBER G621/2018 FRP SEQUENCE CONTACT RIBAN FRST NAME PATRICK AST NAME RIBAN FITLE MANAGER-ENG FAITHY (713) 420-5608 FAMAIL patrick_riban@k NDDRESS 1001 LOUISIAN SITY HOUSTON	MOND - CONCORD 8" MOND - CO* roduct RODUCT
ISYSTEM NAME ELINE ID ES AMODITY CATEGORY AMODITY DESCRIPTION ELINE STATUS CODE ASION DATE SEQUENCE NUMBER TREGORY, GENERAL CONTACT ST NAME T	SUBSYSTEM NAME LS-8: RICHMON WILES LS-8: RICHMON MILES 22.42 COMMODITY CATEGORY Non-HVL Produc COMMODITY DESCRIPTION NON HVL PROD NTERSTATE DESIGNATION Y NIPELINE STATUS CODE Active (filled) REVISION DATE GGZ1/2018 RRY SEQUENCE NUMBER GGZ1/2018 FRY SEQUENCE CONTACT PATRICK AST NAME PATRICK AST NAME RIBAN FITLE MANAGER-ENG ENTITY (713) 420-5608 PHONE (713) 420-5608 MADRESS 1001 LOUISIAN CITY HOUSTON	MOND - CONCORD 8" MOND - CO* reduct PRODUCT
1.5-8; RICHMOND - CO* 1.5-8; RICHMOND - CO* 1.5-9; RICHMOND	### RESPELINE ID 15-8; RICHMON ####################################	MOND - CO* roduct RODUCT
Manual	22.42	roduct PRODUCT 3)
COMMODITY CATEGORY COMMODITY DESCRIPTION NON HYL PRODUCT NTERSTATE DESIGNATION Y IPPELINE STATUS CODE REVISION DATE REVISION DATE REP SEQUENCE NUMBER Category: GENERAL CONTACT REST NAME PATRICK AST NAME RIBAN TITLE MANAGER-ENGINEERING SHITTY HOUSTON TOTO TO	COMMODITY CATEGORY NON-HYL Productory NTERSTATE DESIGNATION NON HYL PROD NTERSTATE DESIGNATION Y PELINE STATUS CODE REVISION DATE CATEGORY: GENERAL CONTACT CATEGORY: GENERAL CONTACT FIRST NAME STILE AST NAME RIBAN NTILE MANAGER-ENG STILE MANAGER-ENG MANAGE	roduct PRODUCT 3)
COMMODITY DESCRIPTION NON HAL PRODUCT NITERSTATE DESIGNATION Y PIPELINE STATUS CODE Active (filled) REASION DATE 06/21/2018 REP SEQUENCE NUMBER 06/21/2018 REST NAME PATRICK AST NAME PATRICK AST NAME RIBAN PHONE (713) 42D-5608 PHONE (713) 42D-5608 PHONE (713) 42D-5608 PAMILL patrick riban@kindermorgan.com ADDRESS 1001 LOUISIANA ST STATE TX TYDOZ TYDOZ TYDOZ	COMMODITY DESCRIPTION NON HAL PRODITY DESCRIPTION NTERSTATE DESIGNATION Y PEPELINE STATUS CODE Active (filled) RAYISION DATE G6/21/2018 REP SEQUENCE NUMBER PATRICK Category: GENERAL CONTACT PATRICK AST NAME PATRICK AST NAME RIBAN FITLE MANAGER-ENC ENTITY (713) 420-5608 MAIL patrick_riban@k ADDRESS 1001 LOUISIAN SITY HOUSTON	RODUCT
NTERSTATE DESIGNATION Y IPPELINE STATUS CODE Active (filled) REVISION DATE 06/21/2018 REP SEQUENCE NUMBER Category: GENERAL CONTACT Category: GENERAL CONTACT PATRICK AST NAME RIBAN PATRICK RIBAN PHONE RIBAN PHONE (713) 42D-5608 PHONE (713) 42D-5608 PAMAIL patrick riban@kindermorgan.com ADDRESS 1001 LOUISIANA ST SITY TX TYDOZ TIP TX	NTERSTATE DESIGNATION Y IPPELINE STATUS CODE REVISION DATE GEROUENCE NUMBER Category: GENERAL CONTACT CATEGORY: GENERAL CONTACT FIRST NAME RIBAN WANAGER-ENG FINITY OT 13) 420-5608 WANAGER-ENG FINITY OT 13) 420-5608 WANIL DERESS 1001 LOUISIAN	(F
REVISION DATE Active (filled) REVISION DATE 06/21/2018 REP SEQUENCE NUMBER 06/21/2018 Category: GENERAL CONTACT PATRICK AST NAME PATRICK AST NAME RIBAN PHONE (7/13) 42D-5608 EMILY (7/13) 42D-5608 EMAIL patrick riban@kindermorgan.com VODRESS 1001 LOUISIANA ST SITY TX TYDOZ TIP 77002	RAPELINE STATUS CODE Active (filled) REVISION DATE 06/21/2018 RP SEQUENCE NUMBER 06/21/2018 Category: GENERAL CONTACT PATRICK AST NAME RIBAN RYILE MANAGER-ENC RITITY (713) 420-5608 HONE 1001 LOUISIAN SITY HOUSTON	1)
REVISION DATE 06/21/2018 RP SEQUENCE NUMBER Category: GENERAL CONTACT Category: GENERAL CONTACT PATRICK AST NAME RIBAN RIBAN MANAGER-ENGINEERING SITITY (7/13) 42D-5608 PATRICK PATRICK ANDINE (7/13) 42D-5608 BANIL patrick, riban@kindermorgan.com VDDRESS 1001 LOUISIANA ST SITY TX TTOOZ TIP 77002	REVISION DATE GREZIZO18 GREZIZO18 GREGON; GENERAL CONTACT FIRST NAME RIBAN WILE MANAGER-ENC FINITY WHONE WHONE MANAGER-ENC TOTIOUSSIAN HOUSTON TOTIOUSTON	
FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME PATRICK AST NAME RIBAN WILE MANAGER-ENGINEERING HONE (7/13) 420-5608 EMAIL patrick, riban@kindermorgan.com VODRESS 1001 LOUISIANA ST SITY TX TY002 TP 77002	FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME FAST NAME FRIBAN NUTLE MANAGER-ENG HONE FOTO 13) 420-5608 MAIL PARTICK T(713) 420-5608 MAIL PARTICK TOOT LOUISIAN	
Category: GENERAL CONTACT THIST NAME PATRICK RIBAN WILLE MANAGER-ENGINEERING WITTY HONE WANAGER-ENGINEERING WANAGER-ENGINEERIN	Category: GENERAL CONTACT THIST NAME AST NAME RIBAN WILLE MANAGER-ENG WITH (713) 420-5608 MAIL Datrick_riban@k NDDRESS 1001 LOUISIAN HOUSTON	
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99	99	ENGINEERING
88	SS	
SS	SS	909
SS	YESS.	in@kindemorgan.com
		SIANAST
	ZIP 77002	

RL7. Phillips 66 Pipeline, LLC Non-HVL Product Pipeline 2258_35

Attribute	Value
- Category: PIPELINE ATTRIBUTES	JTES
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	RICHMOND PRODUCTS LINE
SUBSYSTEM NAME	RICHMOND TERM/RODEO REFINERY
PIPELINE ID	2258_35
MILES	6.32
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	02/22/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	cı
FIRST NAME	Todd
LAST NAME	Тиво
TITLE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1636
EMAIL	Todd.L. Tullio@p66.com
ADDRESS	2331 Citywest Blvd HQ-08-S820-05
CITY	Houston
STATE	XT
Zip	77043

RL8. SFPP, LP Non-HVL Product Pipeline LS-46/41; RICHMOND

E ATTRIBUT	ue
E ATTRIBUT	
OPERATOR NAME SFP SYSTEM NAME SFP SUBSYSTEM NAME LS-4 LS-4 LS-4 LS-4 LS-4 LS-4 LS-4 LS-4	269
	SFPP, LP
	SFPP_NORTH
	LS-46/41; RICHMOND - BRISBANE 8
	LS-45/41; RICHMOND *
MILES 2.31	-
COMMODITY CATEGORY Non-	Non-HVL Product
COMMODITY DESCRIPTION NON	NON HVL PRODUCT
INTERSTATE DESIGNATION N	
PIPELINE STATUS CODE Activ	Active (filled)
REVISION DATE 06/2	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME PATE	PATRICK
LAST NAME RIBAN	AN
TITLE MAN	MANAGER-ENGINEERING
ENTITY	
PHONE (713)	(713) 420-5608
EMAIL, patri	patrick_riban@kindermorgan.com
ADDRESS 1001	1001 LOUISIANA ST
CITY	HOUSTON
STATE	
ZIP 77002	02

RL9. Shell Pipeline Co., LP Non-HVL Product Pipeline 854529

31174	
Attribute	Value
- Category: PIPELINE ATTRUBUTES	UTES
OPERATOR ID	31174
OPERATOR NAME	SHELL PIPELINE CO., L.P.
SYSTEM NAME	SAN PABLO PIPELINE
SUBSYSTEM NAME	854529 - 12IN SAN PABLO
PIPELINE ID	854529
MILES	10.53
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	EMPTY
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/15/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	CT
FIRST NAME	Pratik
LAST NAME	Bhakta
TITLE	Regulatory Engineer
ENTITY	
PHOME	(832) 762-2782
EMAIL	pratik.bhakta@shell.com
ADDRESS	P.O. BOX 2648
CITY	Houston
STATE	XT
ZIP	77252
Addition addendanting	0.000000

RL10. Chevron Pipeline Co.; Non-HVL Product Pipeline CAL0001

Attribute	Value
- Category: PIPELINE ATTRIBUTES	JTES
OPERATOR ID	2731
OPERATOR NAME	CHEVRON PIPE LINE CO
SYSTEM NAME	BAY AREA PIPE LINE
SUBSYSTEM NAME	BAY AREA PRODUCTS LINE (BAPL)
PIPELINE ID	CAL0001
MILES	21.69
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	GASOLINE, DIESEL AND/OR JET
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/12/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	CT
FIRST NAME	Garrett
LAST NAME	Parker
ппе	Regulatory Assurance Specialist
ENTITY	
PHONE	(832) 854-4596
EMAIL	PARKERG@chevron.com
ADDRESS	1500 Lousiana
CITY	Houston
STATE	艾
ZIP	77002

APPENDIX A-2 Crockett Area Pipeline Data

CL1. Shell Pipeline Co., LP Non-HVL Product Pipeline 854529

Attribute	Value
Category: PIPELINE ATTRIBUTES	JTES
OPERATOR ID	31174
OPERATOR NAME	SHELL PIPELINE CO., L.P.
SYSTEM NAME	SAN PABLO PIPELINE
SUBSYSTEM NAME	854529 - 12IN SAN PABLO
PIPELINE ID	854529
MILES	10.53
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	EMPTY
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/15/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	5
FIRST NAME	Pratik
LAST NAME	Bhakta
TITLE	Regulatory Engineer
ENTITY	
PHOME	(832) 762-2782
EMAIL	pratik.bhakta@shell.com
ADDRESS	P.O. BOX 2648
CITY	Houston
STATE	X
ZIP	77252

CL2. SFPP, LP Non-HVL Product Pipeline LS-37; AMORCO-RIC

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- Category: PIPELINE ATTRIBUTES	TTES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-37; AMORCO - RICHMOND 12"
PIPELINE ID	LS-37; AMORCO - RIC*
MILES	20.83
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HVL PRODUCT
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	13
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	X
diZ	77002

CL3. SFPP, LP Non-HVL Product Pipeline LS-8; RICHMOND-CO

ann mark	WCJANICS .
	200
Category: PIPELINE ATTRIBUTES	ITES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-8; RICHMOND - CONCORD 8"
PIPELINE ID	LS-8; RICHMOND - CO*
MILES	22.42
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HAL PRODUCT
INTERSTATE DESIGNATION	>
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Calegory: GENERAL CONTACT	
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	X
diZ	77002

CL4. Shell Pipeline Co.; Non-HVL Product Pipeline 854214

ES 3174 SHELL PIPELINE CO., L.P. SAN PABLO PIPELINE 854214 24.17 Non-HVL Product EMPTY N Active (unfilled) U6/15/2018
ELINE CO., L.P. O PIPELINE SIN SAN PABLO Toduct
ELINE CO., L.P. O PIPELINE BIN SAN PABLO Troduct
O PIPELINE SIN SAN PABLO Toduct
SIN SAN PABLO Toduct
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roduct
led)
(peq)
(paq)
Regulatory Engineer
(832) 762-2782
pratit.bhakta@shell.com
P.O. BOX 2648
178 154

CL5. Phillips 66 Pipeline LLC Non-HVI. Product Pipeline 2258_05

POTY: PIPELINE ATTRIBUT TOR NAME M NAME STEM NAME STATE DESIGNATION STATE DESIGNATION NE STATUS CODE ON DATE COUENCE NUMBER SOUNS: GENERAL CONTACT NAME NAME SSS	21004	
ERATOR ID 31684 ERATOR ID 31684 ERATOR NAME PHILLIPS 66 PIPELINE LLC STEM NAME RICHMOND TERWIRODEO REI BRYSTEM NAME RICHMOND TERWIRODEO REI FELINE ID 2258_D5 LES 1.30 MMODITY CATEGORY Non-HVL Product MMODITY DESCRIPTION Netive (filed) VISION DATE Active (filed) VISION DATE 02/22/2018 P SEQUENCE NUMBER Todd ST NAME Todd TITY (332) 765-1636 ONE (332) 765-1636 All Todd TOD Tompliance TITY Houston AT Houston TA Houston	ribute	Value
ERATOR 10 31684 ERATOR NAME PHILLIPS 66 PIPELINE LLC STEM NAME RICHMOND PRODUCTS LINE BSYSTEM NAME RICHMOND TERWIRODEO REFI FELINE ID 2258_D5 LS 1.30 MAMODITY CATEGORY Non-HVL Product MAMODITY DESCRIPTION N VISION DATE Active (filled) VISION DATE 02/22/2018 P SEQUENCE NUMBER Todd ST NAME Todd TITY Manager, DOT Compliance TITY (332) 765-1636 All Todd TITY Houston All Todd.L.Tullio@p66.com DRESS 2331 Citywest Blvd HQ-08-88204 AT Houston AT Houston	ategory: PIPELINE ATTRIB	JTES
ERATOR NAME PHILLIPS 66 PIPELINE LLC STEM MAME RICHMOND PRODUCTS LINE BSYSTEM NAME RICHMOND TERWIRODEO REFINE FELINE ID 2258_D5 LS 1.30 MAMODITY CATEGORY Non-HVL Product MAMODITY DESCRIPTION N FESTATE DESIGNATION N VISION DATE 02/22/2018 P SEQUENCE NUMBER Active (filled) AST NAME Todd ST NAME Todd TITY Manager, DOT Compliance TITY Todd AIL Todd AIL ToddL. Tullio@p66.com DNESS 2331 Citywest Bird HQ-08-88204 AT Houston AT Houston AT Houston	ERATOR ID	31684
STEM NAME RICHMOND PRODUCTS LINE BSYSTEM NAME RICHMOND TERMIRODEO REFI ELINE ID 2258_D5 ES 1.30 MAMODITY CATEGORY Non-HAL Product MMODITY DESCRIPTION Non-HAL Product MAMODITY DESCRIPTION Non-HAL Product MAMODITY DESCRIPTION Active (filled) VISION DATE 02/22/2018 P SEQUENCE NUMBER Todd ST NAME Todd TITY Manager, DOT Compliance TITY Manager, DOT Compliance TITY 10dd L. Tullio@p66.com ONE 2331 Citywest Blvd HQ-08-88204 MESS 2331 Citywest Blvd HQ-08-88204 MESS TX	ERATOR NAME	PHILLIPS 66 PIPELINE LLC
SEA	STEM NAME	RICHMOND PRODUCTS LINE
ES 1.30 MMODITY CATEGORY MMODITY DESCRIPTION ERSTATE DESIGNATION RESTATE DESIGNATION RESTATE DESIGNATION ASION DATE 0.2727/2018 P SEQUENCE NUMBER ategory: GENERAL CONTACT Todd UE Manager, DOT Compliance UE Manager, DOT Compliance TIMIN ONE (832) 765-1636 AIL Todd. L'Inlin@p68.com DRESS 2.331 Citywest Bivd HQ-08-88204 Houston TX	BSYSTEM NAME	RICHMOND TERMIRODEO REFINERY
### 1.30 ###################################	ELINE ID	2258_05
MAMODITY CATEGORY Non-HVL Product MAMODITY DESCRIPTION Non-HVL Product ERSTATE DESIGNATION N VISION DATE 02/22/2018 P SEQUENCE NUMBER 100/22/2018 ST NAME Todd ST NAME Todilio UE Manager, DOT Compliance UE Hodd.L. Tulio@p66.com AIL Todd.L. Tulio@p66.com AIL Todd.L. Tulio@p66.com AT Houston TX Houston	.Es	1.30
MAMODITY DESCRIPTION ERSTATE DESIGNATION N PELINE STATUS CODE Active (filled) VISION DATE 02/22/2018 P SEQUENCE NUMBER Todd ST NAME Todd ST NAME Todd TITY Manager, DOT Compliance UE Manager, DOT Compliance UE Manager, DOT Compliance UE Manager, DOT Compliance TITY (832) 765-1636 ONE (832) 765-1636 AIL Todd.L. Tulilo@p66.com DRESS 2331 Citywest Blvd HQ-08-S820-4 Y Houston TX TX	MIMODITY CATEGORY	Non-HVL Product
ERSTATE DESIGNATION N PELINE STATUS CODE Active (filed) VISION DATE 02/22/2018 P SEQUENCE NUMBER Todd ST NAME Todilio ST NAME Todilio TITY Manager, DOT Compliance TITY (832) 765-1636 ONE (832) 765-1636 AIL Todd.L.Tullio@p66.com DRESS 2331 Citywest Blvd HQ-08-S8204 Y Houston TX TX	MMODITY DESCRIPTION	
PELINE STATUS CODE Active (filled) VISION DATE 02/22/2018 P SEQUENCE NUMBER 100 CONTACT ST NAME Todd ST NAME Tollio TITY Manager, DOT Compliance TITY (832) 765-1636 ONE (832) 765-1636 AIL Todd.L.Tullio@p66.com DRESS 2331 Citywest Blvd HQ-08-S8204 Y Houston TX TX	TERSTATE DESIGNATION	Z
ANSION DATE P SEQUENCE NUMBER category: GENERAL CONTACT ST NAME TUllio ST NAME TULE Manager, DOT Compliance TITY (332) 765-1636 IONE VAIL TODRESS TODR	PELINE STATUS CODE	Active (filled)
P SEQUENCE NUMBER Stregory: GENERAL CONTACT SST NAME Tolds Tullio THE Manager, DOT Compliance TITY ONE (332) 765-1636 TAIL Told CLTulio@p66.com DRESS 2331 Citywest Bird HQ-08-S8204 TY Houston TX	VISION DATE	02/22/2018
Action of the Property of State of Stat	P SEQUENCE NUMBER	
JAME JAME	ategory: GENERAL CONTA	5
AME	ST NAME	Todd
SS	ST NAME	Tullio
SS	UE .	Manager, DOT Compliance
SS	YIII	
SS	ONE	(832) 765-1636
SS	MIL	Todd.L. Tullio@p66.com
	DRESS	2331 Citywest Bivd HQ-08-S820-05
	CITY	Houston
	STATE	XT
77043		77043

CL6. Phillips 66 Pipeline LLC Non-HVI Product Pipeline 2258_15

Attribute	Value
- Category: PIPELINE ATTRIBUTES	UTES
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	RICHMOND PRODUCTS LINE
SUBSYSTEM NAME	RICHMOND TERM/RODEO REFINERY
PIPELINE ID	2258_15
MILES	3.82
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	02/22/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	CT
FIRST NAME	Todd
LAST NAME	Tullio
TITE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1636
EMAIL	Todd.L. Tulfio@p66.com
ADDRESS	2331 Citywest Blvd HQ-08-S820-05
CITY	Houston
STATE	TX
ZIP	77043
i	

CL7. Phillips 66 Pipeline LLC Non-HVL Product Pipeline 2260_60

	Anna
- Category: PIPELINE ATTRIBUTES	ITES
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	JUNCTION TO RODEO REFINERY
SUBSYSTEM NAME	COALINGA PMP STARODEO REFIN
PIPELINE ID	2260_60
MILES	7.22
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	02/22/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	d
FIRST NAME	Todď
LAST NAME	Tullio
TITLE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1636
EMAIL	Todd L Tullio@p65.com
ADDRESS	2331 Citywest Blvd HC-08-5820-05
CITY	Houston
STATE	XX
diZ	77043

CL8. Nustar Terminals Operations Non-HVL Product Pipeline 775

- Category: PIPELINE ATTRIBUTES	o u
	2
	26094
OPERATOR NAME	NUSTAR TERMINALS OPERATIONS
SYSTEM NAME	SELBY PIPELINES
SUBSYSTEM NAME	SELBY P5 PIPELINE
PIPELINE ID	775
MILES	1.06
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	PRODUCTS
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/14/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME	Kyle
LAST NAME	Oppliger
TITLE	VP Terminal Operations
ENTITY	
PHONE	(800) 759-0033
EMAIL	kyle.oppliger@nustarenergy.com .
ADDRESS	19003 IH-10 West
CITY	San Antonio
STATE	¥
ZIP	78257

CL9. Phillips 66 Pipeline LLC Crude Oil Pipeline 2260_65

DHUBBILL	Value
NU TOUT CO	Aging
Category: PIPELINE ATTRIBUTES	JTES
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	JUNCTION TO RODEO REFINERY
SUBSYSTEM NAME	COALINGA PMP STA/RODEO REFIN
PIPELINE ID	2260_65
MILES	0.48
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	02/22/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	C
FIRST NAME	Todd
LAST NAME	Tullio
TITLE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1636
EMAIL	Todd.L. Tullio@p66.com
ADDRESS	2331 Citywest Blvd HC-08-S820-05
CITY	Houston
STATE	TX
diZ	77043

CL10. DOD Defense Energy Support Non-HVL Product Pipeline 0064

William Into	Value
- Category: PIPELINE ATTRIBUTES	UTES
OPERATOR ID	31460
OPERATOR NAME	DOD DEFENSE ENERGY SUPPORT
SYSTEM NAME	OZO
SUBSYSTEM NAME	OZOL-8 INCH
PIPELINE ID	0064
MILES	7.45
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/13/2019
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	CT
FIRST NAME	Todd
LAST NAME	Williams
TITLE	Facility Manager/COR, DFSP San Pedro
ENTITY	
PHONE	(310) 241-2834
EMAIL	Todd.williams@dla.mil
ADDRESS	3171 N Gaffy Street
CITY	San Pedro
STATE	CA
ΔIZ	90731

APPENDIX A-3 Martinez Area Pipeline Data

ML1. Shell Pipeline Co., LP Non-HVI. Product Pipeline 854214

311/4	
Attribute	Value
· Category: PIPELINE ATTRIBUTES	ПЕЅ
OPERATOR ID	31174
OPERATOR NAME	SHELL PIPELINE CO., L.P.
SYSTEM NAME	SAN PABLO PIPELINE
SUBSYSTEM NAME	854214 - 16IN SAN PABLO
PIPELINE ID	854214
MILES	24.17
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	EMPTY
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/15/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	cī
FIRST NAME	Pratik
LAST NAME	Bhakta
TILE	Regulatory Engineer
ENTITY	
PHONE	(832) 752-2782
EMAIL	pratik.bhakla@shell.com
ADDRESS	P.O. BOX 2648
CITY	Houston
STATE	大
diZ	77252

ML2. SFPP, LP Non-HVI. Product Pipeline LS-37; AMORCO-RIC

Attribute	Value
Category: PIPELINE ATTRIBUTES	TES
OPERATOR (D	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-37; AMORCO - RICHMOND 12*
PIPELINE ID	LS-37; AMORCO - RIC*
MILES	20.83
COMMODITY CATEGORY	Non-HVI, Product
COMMODITY DESCRIPTION	NON HVL PRODUCT
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	Ė
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	X
dIZ	77002

ML3. Shell Pipeline Co., LP; Non-HVL Product Pipeline 305

Attribute	Value
- Category: PIPELINE ATTRIBUTES	TES
OPERATOR ID	31174
OPERATOR NAME	SHELL PIPELINE CO., L.P.
SYSTEM NAME	BAY AREA PRODUCTS LINE
SUBSYSTEM NAME	305 - 10IN BAY AREA PRODUCTS LI
PIPELINE ID	305
MILES	2.41
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	EMPTY
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/15/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	F
FIRST NAME	Pratik
LAST NAME	Bhakta
TITLE	Regulatory Engineer
ENTITY	
PHONE	(832) 762-2782
EMAIL	pratik.bhakta@shell.com
ADDRESS	P.O. BOX 2648
CITY	Houston
STATE	XT
ZIP	77252
	tancan.

ML4. Shell Pipeline Co., LP; Non-HVL Product Pipeline 306

Attribute Value - Category: PIPELINE ATTRIBUTES 31174 OPERATOR ID 31174 OPERATOR NAME SHELL PIPELINE CO., I SYSTEM NAME BAY AREA PRODUCTS SUBSYSTEM NAME 306-10IN BAY AREA PRODUCTS SUBSYSTEM NAME 306 MILES 0.21 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION NULTIPLE PRODUCTS INTERSTATE DESIGNATION N PIPELINE STATUS CODE Activo (filled) REVISION DATE 06/15/2019 REVISION DATE 06/15/2019	Value ES 31174 SHELL PIPELINE CO., L.P. BAY AREA PRODUCTS LINE
Category: PIPELINE ATTRIBUTES OPERATOR (ID OPERATOR NAME SHELL PIPER SYSTEM NAME BAY AREA PI SUBSYSTEM NAME 306 - 10IN BA PIPELINE ID 3.21 MILES 0.21 COMMODITY CATEGORY Non-HAL Pro COMMODITY DESCRIPTION MULTIPLE PI INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 56/15/2018 FRP SEQUENCE NUMBER 36/15/2018	ELINE CO., L.P. PRODUCTS LINE
OPERATOR ID 31174 OPERATOR NAME SHELL PIPEL SYSTEM NAME SAC - 101N BA SUBSYSTEM NAME 306 - 101N BA SUBSYSTEM NAME 306 - 101N BA MILES 3.21 COMMODITY CATEGORY Non-HAL Pro COMMODITY DESCRIPTION MULTIPLE PI INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 56/15/2018 FRP SEQUENCE NUMBER 56/15/2018	ELINE CO., L.P. PRODUCTS LINE
OPERATOR NAME SYSTEM NAME SUBSYSTEM	ELINE CO., L.P. PRODUCTS LINE
SYSTEM NAME BAY AREA PI SUBSYSTEM NAME 306 - 10IN BA PIPELINE ID 306 . MILES 0.21 COMMODITY CATEGORY Non-HVL. Pro- COMMODITY DESCRIPTION MULTIPLE PI INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 36(45)2019 FRP SEQUENCE NUMBER 36(45)2019	PRODUCTS LINE
SUBSYSTEM NAME 306 - 10IN BA PIPELINE ID 308 . MILES 0.21 COMMODITY CATEGORY Non-HVL Pro COMMODITY DESCRIPTION MULTIPLE PP INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/15/2019 FRP SEQUENCE NUMBER 06/15/2019	
MILES	306 - 10IN BAY AREA PRODUCT LIN.
MILES COMMODITY CATEGORY Non-HAL Pro COMMODITY DESCRIPTION MULTIPLE PI INTERSTATE DESIGNATION N PIPELINE STATUS CODE REVISION DATE SECULENCE NUMBER 3.21 Non-HAL Pro ROMHIPLE PI SECULENCE NUMBER 3.21 Non-HAL Pro ROMHIPLE PI SECULENCE NUMBER 3.21 Non-HAL Pro ROMHIPLE PI SECULENCE NUMBER 3.21	
COMMODITY CATEGORY COMMODITY DESCRIPTION INTERSTATE DESIGNATION PIPELINE STATUS CODE REVISION DATE S6/15/2018 FRP SEQUENCE NUMBER	
COMMODITY DESCRIPTION MULTIPLE PI INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 56/15/2018 FRP SEQUENCE NUMBER	oduct
INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 56/15/2018 FRP SEQUENCE NUMBER	PRODUCTS
PIPELINE STATUS CODE Active (filled) REVISION DATE 06/15/2018 FRP SEQUENCE NUMBER	
REVISION DATE 06(15/20)18 FRP SEQUENCE NUMBER	
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME Pratik	Automotive
LAST NAME Bhakta	
TITLE Regulatory Engineer	Ingineer
ENTITY	
PHONE (832) 762-2782	782
EMAIL pratik.bhakta@shell.com	a@shell.com
ADDRESS P.O. BOX 2648	548
CITY Houston	
STATE	
ZIP 77252	

MLS. DOD Defense Energy Support; Non-HVL Product Pipeline 0064

31460	
Attribute	Value
- Category: PIPELINE ATTRIBUTES	JTES
OPERATOR ID	31460
OPERATOR NAME	DOD DEFENSE ENERGY SUPPORT
SYSTEM NAME	OZOL
SUBSYSTEM NAME	OZOL-8 INCH
PIPELINE ID	0064
MILES	7.45
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/13/2019
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	C
FIRST NAME	Todd
LAST NAME	Williams
TITLE	Facility Manager/COR, DFSP San Pedro
ENTITY	
PHONE	(310) 241-2834
EMAIL	Todd:williams@dla.mil
ADDRESS	3171 N Gaffy Street
CITY	San Pedro
STATE	CA
ZIP	90731

ML6. Phillips 66 Pipeline, LLC; Crude Oil Pipeline 2260_60

والمراجعة	A III
CHARTA TAN ITAIN	
Category: PIPCLINE ALLISIDULES	JES
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	JUNCTION TO RODEO REFINERY
SUBSYSTEM NAME	COALINGA PMP STARODEO REFIN.
PIPELINE ID	2260_60
MILES	7.22
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	02/22/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME	Todd
LAST NAME	Tullio
TITLE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1636
EMAIL	Todd.L. Tulio@p66.com
ADDRESS	2331 Citywest Blvd HIQ-08-S820-05
CITY	Houston
STATE	XT
ZiP	77043

ML7. Chevron Pipeline Co; Non-HVL Pipeline CAL0001

Ibute RATOR 1D RATOR 1D RATOR 1D RATOR NAME STEM NAME SISYSTEM NAME ELINE ID ES SS STEM NAME SS STATE DESIGNATION AMODITY DESCRIPTION AMODITY DESCRIPTION AMODITY DESCRIPTION ERS TATE DESIGNATION AMODITY DESCRIPTION TO STATUS CODE ASSOURCE NUMBER TO NAME	Attribute	Attribute Category: PIPELINE ATTRIBUTES OPERATOR ID SYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME BAY AREA PIPE LINE CALOOOT MILES COMMODITY CATEGORY MILES COMMODITY CATEGORY MILES COMMODITY CATEGORY MON-HYL Product COMMODITY CATEGORY NON-HYL Product COMMODITY CATEGORY NON-HYL Product COMMODITY CATEGORY NON-HYL Product COMMODITY CATEGORY NON-HYL Product CATEGORY:	273	
- Category: PIPELINE ATTRIBUTES OPERATOR ID OPERATOR NAME SUBSYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPL) PIPELINE ID MILES COMMODITY CATEGORY Non-HVL Product CALGODY	- Category: PIPELIME ATTRIBUTES OPERATOR ID OPERATOR NAME SUBSYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPL DIPELINE ID MILES COMMODITY CATEGORY Non-HAL Product CAMMODITY NON-HAL PROGRAM NON	- Category: PIPELINE ATTRIBUTES OPERATOR ID OPERATOR NAME SUBSYSTEM NAME MILES COMMODITY CATEGORY Non-HVL Product COMMODITY CATEGORY Non-HVL COMMODITY CATEGORY NON-HVL CATEGORY	Attribute	Value
OPERATOR ID 2731 OPERATOR NAME CHEVRON PIPE LINE SYSTEM NAME BAY AREA PRODUCTS LINE (BAPL PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HVL Product REVISION DATE Active (filled) REVISION DATE Active (filled) FRP SEQUENCE NUMBER Active (filled) FRP SEQUENCE NUMBER Genreit FRST NAME Parker FITLE Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ADDRESS TX	OPERATOR ID 2731 OPERATOR NAME CHEVRON PIPE LINE CO SYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPL PIPELINE CO MILES 21.69 COMMODITY CATEGORY Non-HYL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REA/SION DATE 06/12/2018 FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME Parker TITLE Regulatory Assurance Specialist ENTITY PANKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ZIP TX ZIP TX	OPERATOR ID 2731 OPERATOR ID 2731 OPERATOR NAME CHEVRON PIPE LINE SYSTEM NAME BAY AREA PRODUCTS LINE (BAPIPE LINE PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HAL Product COMMODITY DESCRIPTION Active (filled) INTERSTATE DESIGNATION Active (filled) REVISION DATE Active (filled) FIRST NAME Gaarest FIRST NAME Parker TITLE Regulatory Assurance Specialist ENTITY Parker TITLE Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ZIP TX ZIP TX	- Category: PIPELINE ATTRIBL	TES
SYSTEM NAME CHEVRON PIPE LINE CO SYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPIPELINE ID PIPELINE ID CALGOD1 MILES 21.69 COMMODITY CATEGORY Non-HAL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER Carrett - Category: GENERAL CONTACT Parker TITLE Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ADDRESS 1500 Lousiana CITY TX	SYSTEM NAME CHEVRON PIPE LINE CO SYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PIPE LINE PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION Non-HVL Product COMMODITY DESCRIPTION Active (filled) REVISION DATE Active (filled) FRP SEQUENCE NUMBER C6/12/2018 FRRST NAME Parker TITLE Regulatory Assurance Specialist PHONE (832) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP 77002	SYSTEM NAME CHEVRON PIPE LINE SYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPIPE LINE) PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JE INTERSTATE DESIGNATION A CRIVE (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER GA12/2018 - Category: GENERAL CONTACT Garrett FIRST NAME Parker TITLE Regulatory Assurance Specialist ENTITY PHONE PHONE (332) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX	OPERATOR ID	2731
SYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPI PIPELINE ID CAL3001 MILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME Parker TITLE Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ADDRESS 1500 Lousiana CITY TX	SYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPI CALDOD1 MILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION GASOLINE, DISSEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REA/SION DATE PREVISION BAR FRP SEQUENCE NUMBER C6/12/2018 - Category: GENERAL CONTACT Regulatory Assurance Specialist FIRST NAME Parker ENTITY Regulatory Assurance Specialist ENTITY PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX	SYSTEM NAME BAY AREA PIPE LINE SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAY MILES PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HVI. Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR, JE INTERSTATE DESIGNATION Active (filled) REVISION DATE Active (filled) FRP SEQUENCE NUMBER Active (filled) - Category: GENERAL CONTACT Garrett FIRST NAME Parker PHONE Regulatory Assurance Specialist ENTITY PHONE PHONE PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX	OPERATOR NAME	CHEVRON PIPE LINE CO
SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPI MILES PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HAL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER CATIVE CONTACT FIRST NAME Garrett LAST NAME Parker TITLE Regulatory Assurance Specialist ENTITY PHONE PHONE (832) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ADDRESS 1500 Lousiana CITY TX ADDRESS 1500 Lousiana CITY TX	SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAPINELINE ID PIPELINE ID CALG001 MILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE PRACEROUSE FRP SEQUENCE NUMBER Cannett LAST NAME Parker TITLE Regulatory Assurance Specialist PHONIE PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX	SUBSYSTEM NAME BAY AREA PRODUCTS LINE (BAY MILES PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HYL Product COMMODITY CATEGORY Non-HYL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JE INTERSTATE DESIGNATION Non-HYL Product REVISION DATE Active (filled) REVISION DATE D6/12/2018 FIRST NAME Garrett FIRST NAME Parker FIRST NAME Regulatory Assurance Specialist ENTITY PHONE PHONE (332) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX	SYSTEM NAME	BAY AREA PIPE LINE
PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY OESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER - - Category: GENERAL CONTACT Garrett FIRST NAME Parker TITLE Regulatory Assurance Specialist ENTITY PHONE PHONE (832) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX	PIPELINE ID CAL0001 MAILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE Active (filled) FRP SEQUENCE MUMBER Cartespory: GENERAL CONTACT FIRST NAME Parker LAST NAME Parker ENTITL Regulatory Assurance Specialist ENTITY PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX ZIP T7002	PIPELINE ID CAL0001 MILES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JE INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRE SEQUENCE NUMBER 06/12/2018 - Category: GENERAL CONTACT FIRST NAME LAST NAME Garrett PHONE Regulatory Assurance Specialist ENTITY PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP T7002	SUBSYSTEM NAME	BAY AREA PRODUCTS LINE (BAPL
MILES	MILES	MALES 21.69 COMMODITY CATEGORY Non-HVL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JE INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER C6/12/2018 - Category: GENERAL CONTACT FIRST NAME LAST NAME Garrett PHONE Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ZIP T7002	PIPELINE ID	CAL0001
COMMODITY CATEGORY Non-HAL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REASOLINCE MUMBER Active (filled) - Category: GENERAL CONTACT FIRST NAME FIRST NAME Garrett LAST NAME Parker PHONE Regulatory Assurance Specialist ENTITY PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX 2107 TX002	COMMODITY CATEGORY Non-HAL Product COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER Cartegory: GENERAL CONTACT FIRST NAME Garrett LAST NAME Parker PHONE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist ENTITY PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX ZIP T7002	COMMODITY CATEGORY COMMODITY DESCRIPTION CASOLINE, DIESEL AND/OR JE INTERSTATE DESIGNATION N PIPELINE STATUS CODE REVISION DATE CAREGORY: GENERAL - CAREGORY: GENERAL CASTOLINE SPACE LAST NAME LAST NAME CASTOLINE, DIESEL AND/OR JE Active (filled) REVISION DATE CAREGORY: GENERAL CASTOLINE FIRST NAME CASTOLINE, DIESEL AND/OR JE CASTOLINE, DIESEL AND/OR JE CASTOLINE, DIESEL AND/OR JE CASTOLINE CAS	MILES	21.69
COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER 06/12/2018 - Category: GENERAL CONTACT Garrett FIRST NAME Parker TITLE Regulatory Assurance Specialist PHONE (832) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX 2107 TX002	COMMODITY DESCRIPTION GASOLINE, DIESEL AND/OR JET INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER 06/12/2018 - Category: GENERAL CONTACT Garett FIRST NAME Garett LAST NAME Parker PHONE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist ENTITY PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX	COMMODITY DESCRIPTION CASOLINE, DIESEL AND/OR JE INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE D6/12/2018 FRP SEQUENCE NUMBER CARRON - Category: GENERAL CONTACT Garrett FIRST NAME Parker TITLE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist PHONE (332) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX ZIP T7002	COMMODITY CATEGORY	Non-HVI. Product
INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER - Category: GENERAL CONTACT FIRST NAME Carrett LAST NAME Parker TITLE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist ENTITY HOUSE (832) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TANDERS STATE TANDERS STATE TO STA	INTERSTATE DESIGNATION N	INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE D6/12/2018 FRP SEQUENCE NUMBER Active (filled) - Category: GENERAL CONTACT Garrett FIRST NAME Parker TITLE Parker PHONE (332) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP 77002	COMMODITY DESCRIPTION	GASOLINE, DIESEL AND/OR JET
PIPELINE STATUS CODE Active (filled) REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER 06/12/2018 - Category: GENERAL CONTACT Carrett FIRST NAME Parker TITLE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist PHONE (832) 864-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY TX 2107 TX 2107 TX	PIPELINE STATUS CODE Active (filled) REASION DATE 06/12/2018 FRP SEQUENCE NUMBER 06/12/2018 - Category: GENERAL CONTACT Garrett FIRST NAME Parker TITLE Parker TITLE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP TX ZIP TX	PIPELINE STÄTUS CODE Active (filled) REVISION DATE D6/12/2018 FRP SEQUENCE NUMBER Carrett - Category: GENERAL CONTACT Garrett FIRST NAME Parker TITLE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP 77002	INTERSTATE DESIGNATION	Z
PEPASION DATE 06/12/2018	REVISION DATE 06/12/2018 FRP SEQUENCE NUMBER - Category: GENERAL CONTACT FIRST NAME Carrett LAST NAME Parker PARTILE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist PHONE (832) 854.4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZiP 77002	REVISION DATE D6/12/2018 FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME Garrett LAST NAME Parker TITLE Regulatory Assurance Specialist ENTITY Regulatory Assurance Specialist EMTITY Regulatory Assurance Specialist EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP 77002	PIPELINE STATUS CODE	Active (filled)
FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME CAST NAME FINATE FREQUENCY Assurance Specialist ENTITLE FROGULATORY Assurance Specialist FROGULATORY FRO	FRP SEQUENCE NUMBER - Category: GENERAL CONTACT FIRST NAME LAST NAME TITLE FORMINTY PHONE Regulatory Assurance Specialist ENTITY PHONE RAMIL ADDRESS CITY TX ZIP T7002	FIRST NAME LAST NAME LAST NAME Caregory: GENERAL CONTACT Garrett LAST NAME Regulatory Assurance Specialist ENTITLE Regulatory Assurance Specialist FATOR LOUSIAN PHOUSE STATE TX ZIP T7002	REVISION DATE	06/12/2018
- Category: GENERAL CONTACT FIRST NAME LAST NAME Parker TITLE Regulatory Assurance Specialist ENTITY PHONE (832) 854-4596 EMAIL ADDRESS 1500 Lousiana CITY STATE TX	- Category: GENERAL CONTACT FIRST NAME Garrett TITLE Parker TITLE Regulatory Assurance Specialist ENTITY (832) 854-4596 PHONE PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZIP 77002	- Category: GENERAL CONTACT FIRST NAME Garrett LAST NAME Parker TITLE Regulatory Assurance Specialist ENTITY (332) 854-4596 EMAIL PARKERG@chevron.com ADDRESS 1500 Lousiana CITY Houston STATE TX ZiP 77002	FRP SEQUENCE NUMBER	
NAME VAME	NAME VAME E E E E S S S	VAME FSS	- Category: GENERAL CONTAC	<u>}</u>
Y Y E E E SS	V Y ESS	AAME F ESS	FIRST NAME	Garrett
SS SS	SS SS	SS 83	LAST NAME	Parker
SS	88		TITLE	Regulatory Assurance Specialist
SS	88	SS	ENTITY	
SS	SS	S.	PHONE	(832) 854-4596
SS	SS	SS	EMAIL	PARKERG@chevron.com
			ADDRESS	1500 Lousiana
			CITY	Houston
			STATE	X
			ZIP	77002

ML8. SFPP, LP; Non-HVL Pipeline LS-8; RICHMOND-CO

Attribute	Value
- Category: PIPELINE ATTRIBUTES	ITES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-8; RICHMOND - CONCORD 8"
PIPELINE ID	LS-8; RICHMOND - CO*
MILES	22.42
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HM, PRODUCT
INTERSTATE DESIGNATION	>
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA SIT
CITY	HOUSTON
STATE	X
ZID	77002

ML9. Phillips 66 Pipeline, LLC; Non-HVL Pipeline 2234_615

Category: PIPELINE ATTRIBUTES	
	ES
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	SFAR PRODUCTS LINE
SUBSYSTEM NAME	VINE/COLLIER
PIPELINE ID	2234_615
MILES	8.39
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	02/22/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME	Todd
LAST NAME	Tullio
TITE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1636
EMAIL	Todd.L.Tuffio@p66.com
ADDRESS	2331 Citywest Blvd HQ-08-S820-05
CITY	Houston
STATE	X
dIZ	77043

ML10. Shell Pipeline Co., LP; Crude Oil Pipeline 490

Attribute	Value
	value
- Category: PIPELINE ATTRIBUTES	ES
OPERATOR ID	31174
OPERATOR NAME	SHELL PIPELINE CO., L.P.
SYSTEM NAME	VINE HILL
SUBSYSTEM NAME	490 - 10IN VINE HILL CRUDE
PIPELINE ID	490
MILES	1.25
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	CRUDE
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/15/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	lee
FIRST NAME	Pratik
LAST NAME	Bhakta
	Regulatory Engineer
ENTITY	
PHONE	(832) 762-2782
EMAIL	pratik.bhakta@shell.com
ADDRESS	P.O. BOX 2648
CITY	Houston
STATE	TX
dIZ	77252

ML11. SFPP, LP; Non-HVL Pipeline LS-72; RODEO-CONC

tribute Catagory: PIPELINE ATTRIBUT PERATOR ID PERATOR NAME USSYSTEM NAME IPELINE ID ILES OMMODITY CATEGORY OMMODITY DESCRIPTION JTERSTATE DESIGNATION THERSTATE DESIGNATION DISTINE STATIS CODE	Value ES 18092 SFPP_LP SFPP_NORTH LS-72; RODEO - CONCORD 6"
govy: PIPELINE ATTRIBUT VOR ID VTOR NAME M NAME S'STEM NAME NE ID ODITY CATEGORY ODITY DESCRIPTION STATE DESIGNATION NE STATIS CODE	LP NORTH ; RODEO - CONCORD 6" RODEO - CONC
TOR ID TOR NAME M NAME STEM NAME NE ID ODITY CATEGORY ODITY DESCRIPTION STATE DESIGNATION STATE DESIGNATION NE STATIS CODE	LP MORTH ; RODEO - CONCORD 8" : RODEO - CONC
M NAME M NAME STEM NAME STEM NAME NE ID ODITY CATEGORY ODITY DESCRIPTION STATE DESIGNATION NE STATIS CODE	NORTH RODEO - CONCORD 8"
SYSTEM NAME SUBSYSTEM NAME SUBSYSTEM NAME ILS-72; MILES COMMODITY CATEGORY COMMODITY DESCRIPTION INTERSTATE DESIGNATION PIDEN INFERSTATE CODE Aretical Aretical Aretical Aretical Aretical Aretical Aretical Aretical Aretical	NORTH RODEO - CONCORD 8"
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NE ID ODITY CATEGORY ODITY DESCRIPTION STATE DESIGNATION IN STATIS CODE	RODEO - CONC*
ODITY CATEGORY ODITY DESCRIPTION STATE DESIGNATION NE STATIC CODE	
N N	
,	Non-HWL Product
	NON HAL PRODUCT
	Active (filled)
REVISION DATE 06/21/2018	2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME PATRICK	CK
LAST NAME RIBAN	7
TITLE MANA	MANAGER-ENGINEERING
ENTITY	
PHONE (713) 4	(713) 420-5608
EMAIL patrick	patrick_riban@kindermorgan.com
ADDRESS 10011	1001 LOUISIANA ST
CITY HOUSTON	TON
STATE TX	
ZIP 77002	

ML12. Valero Refining Co. CA; Crude Oil Pipeline TRANSBAY_20IN

	AGIRA
- Category: PIPELINE ATTRIBUTES	UTES
OPERATOR ID	32223
OPERATOR NAME	VALERO REFINING COMPANY - CA
SYSTEM NAME	SJV TRANSBAY CRUDE (CSFM 060
SUBSYSTEM NAME	
PIPELINE ID	TRANSBAY ZOIN
MILES	2.10
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/05/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	CT
FIRST NAME	John
LAST NAME	Lazorik
TITLE	Staff Environmental Engineer
ENTITY	
PHONE	(707) 745-7660
EMAIL	john.lazorik@valero.com
ADDRESS	3400 E. 2nd St.
CITY	Benicia
STATE	CA
ZIP	94510

ML13. SFPP, LP; Non-HVL Pipeline LS-47; (NIS) CONCOR

- Category: PIPELINE ATTRIBUTES OPERATOR ID 180	
	ES
	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-47; (NIS) CONCORD - SUISUN J
PIPELINE ID	LS-47; (NIS) CONCOR*
MILES	4.65
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HAL PRODUCT
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	·
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1801 LOUISIANA ST
CITY	HOUSTON
STATE	X
ZIP	77002

ML14. SFPP, LP; Non-HVL Pipeline LS-130A; CONCORD-WA

Attribute	Value
- Category: PIPELINE ATTRIBUTES	JTES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-130; CONCORD - SACRAMENTO
PIPELINE ID	LS-130A; CONCORD-WA*
MILES	3.47
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HVL PRODUCT
INTERSTATE DESIGNATION	>-
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	d
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindemorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	TX XT
ZIP	77002

ML15. Tesoro Logistics Operations; Non-HVL Pipeline 609

ES 31874 TESORO LOGISTICS OPERATION GOLDEN EAGLE 8IN TESORO 203 609 1.14 Non-HVL Product N Active (filled) 96/14/2018
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8
Marusich
Operations Area Manager
(925) 335-3452
Matthew.V.Marusich@andeavor.com
150 Solano Way
P .1 > ē

ML16. Tesoro Logistics Operations; Crude Oil Pipeline 611

Amilyase	Value
Attainage	Taking
 Category: PIPELINE ATTRIBUTES 	UTES
OPERATOR ID	31874
OPERATOR NAME	TESORO LOGISTICS OPERATIONS
SYSTEM NAME	GOLDEN EAGLE
SUBSYSTEM NAME	TESORO 63 CRUDE
PIPELINE ID	611
MILES	1.24
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/14/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	(CT
FIRST NAME	Matthew
LAST NAME	Marusich
TITLE	Operations Area Manager
ENTILY	
PHONE	(925) 335-3452
EMAIL	Matthew.V.Manusich@andeavor.com
ADDRESS	150 Solano Way
CITY	Martinez
STATE	₹ _O
ZIP	94553

ML17. Tesoro Logistics Operations; Crude Oil Pipeline 612

- Category: PIPELINE ATTRIBUTES	
	ES
OPERATOR ID	31874
OPERATOR NAME	TESORO LOGISTICS OPERATIONS
SYSTEM NAME	GOLDEN EAGLE
SUBSYSTEM NAME	12IN TESORO 200 CRUDE
PIPELINE ID	612
MILES	1.26
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/14/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	June 2
FIRST NAME	Matthew
LAST NAME	Marusich
TITLE	Operations Area Manager
ENTITY	
PHONE	(925) 335-3452
EMAIL	Matthew.V.Marusich@andeavor.com
ADDRESS	150 Solano Way
CITY	Martinez
STATE	CA
Zib	94553

ML18. Plains Marketing, LP; Non-HVL Product Pipeline 14937

	Value
Category: PIPELINE ATTRIBUTES	ITES
OPERATOR ID	26085
OPERATOR NAME	PLAINS MARKETING, L.P.
SYSTEM NAME	PLAINS PRODUCTS TERMINALS
SUESYSTEM NAME	LINE 191
PIPELINE ID	14937
MILES	0.88
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	PRODUCTS
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (unfilled)
REVISION DATE	03/15/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	CT
FIRST NAME	BRYAN
LAST NAME	FERGUSON
TITLE	MGR GIS/DATA INTEGRATION
ENTITY	
PHONE	(713) 646-4308
EMAIL	beferguson@paalp.com
ADDRESS	333 CLAY STREET SUITE 1600
CITY	HOUSTON
STATE	X
ΔIZ	77002

ML19. Phillips 66 Pipeline, LLC; Crude Oil Pipeline 2260_50

OPERATOR ID 31684
PHILLIPS 66 PIPELINE LLC
JUNCTION TO RODEO REFINERY
COALINGA PMP STA/RODEO REFIN
2260_50
3.36
Crude Oil
Z
Active (filled)
02/22/2018
Todd
Tullio
Manager, DOT Compliance
(832) 765-1636
Todd.L. Tulfa@p66.com
2331 Citywest Blvd HQ-08-5820-05
Houston
X
77043

MI20. SFPP, LP; Non-HVL Product Pipeline LS-90/50/60; CONCOR

Attribute Value - Category: PIPELINE ATTRIBUTES 18692 OPERATOR ID 18692 OPERATOR NAME SFPP_LP SYSTEM NAME LS-90/50/60; CONCOR* SUBSYSTEM NAME LS-90/50/60; CONCOR* MALES 34.83 COMMODITY DESCRIPTION Non-HVL Product COMMODITY DESCRIPTION NON HYL PRODUCT INTERSTATE DESIGNATION NON HYL PRODUCT FRP SEQUENCE NUMBER Active (filled) REVISION DATE PATRICK Category: GENERAL CONTACT RIBBAN FIRST NAME PATRICK RUMITY ANANAGER-ENGINEERING ENTITY (713) 420-5608 EMAIL ADDERSS ADDRESS 1001 LOUIS/ANA ST CITY HOUSTON TX 77002	
Category: PIPELINE ATTRIBUTES	
OPERATOR ID 18692 OPERATOR ID 18692 OPESATOR NAME SFPP_NORTH SUBSYSTEM NAME LS-90/50/60; CO MALES 34.83 COMMODITY CATEGORY Non-HVL Produc COMMODITY DESCRIPTION NON HVL PROD FRP SEQUENCE NUMBER Active (filled) CATST NAME PATRICK FRRST NAME RIBBAN TTTLE MANAGER-ENG FENTITY (713) 420-5608 PHONE TX CITY HOUSTON STATE TX ZIP T7002	
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SYSTEM NAME SFPP_NORTH SUBSYSTEM NAME LS-90/50/60; CO PIPELINE ID LS-90/50/60; CO MALES COMMODITY CATEGORY Non-HYL Produc COMMODITY DESCRIPTION NON HYL PROD INTERSTATE DESIGNATION NON HYL PROD INTERSTATUS CODE REVISION DATE FREST NAME REVISION DATE REST NAME RIBAN TITLE MANAGER-ENG ENTITY ADDRESS 1001 LOUISIAN CITY TOTAL ADDRESS TYOUS TOTAL TOTAL ADDRESS TYOUS TOTAL TOT	
SUBSYSTEM NAME LS-90/50/60; CO NAMES 34.83 COMMODITY CATEGORY NON-HVL Produc COMMODITY DESCRIPTION NON HYL PROD INTERSTATE DESIGNATION NON HYL PROD INTERSTATE DESIGNATION NON HYL PROD INTERSTATUS CODE REVISION DATE FRP SEQUENCE NUMBER CATEGORY: GENERAL CONTACT FIRST NAME RIBAN TITLE MANAGER-ENG ENTITY ADDRESS 1001 LOUISIAN CITY HOUSTON STATE TX ZIP T7002	
12-90/50/60; CO	LS-90/50/60; CONCORD - FRESNO 12"
MALES	ONCOR*
COMMODITY CATEGORY NON-HYL Product COMMODITY DESCRIPTION NON HYL PROD INTERSTATE DESIGNATION NON HYL PROD Active (filled) REVISION DATE REVISION DATE REP SEQUENCE NUMBER Category: GENERAL CONTACT CATEGORY: GENERAL CONTACT FIRST NAME RIBAN MANAGER-ENG MANAGER-ENG FINTITY (713) 420-5608 EMAIL PHONE RIBAN MANAGER-ENG MANAGER-ENG HOUSTON STATE TX ZIP TT002	
COMMODITY DESCRIPTION NON HYL PROD INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE BESTURE CONTACT Category: GENERAL CONTACT FIRST NAME RIBAN TYLE MANAGER-ENG ENTITY (713) 420-5608 EMAIL PATRICK (713) 420-5608 EMAIL PATRICK HOUSIAN CITY HOUSIAN STATE TX	ct
INTERSTATE DESIGNATION N PIPELINE STATUS CODE Active (filled) REVISION DATE DESIZO18 REVISION DATE DESIZO18 REVISION DATE REP SEQUENCE NUMBER CATEGORY: GENERAL CONTACT RIRET NAME RIBAN TITLE MANAGER-ENG ENTITY (713) 420-5608 EMAIL PRIVING (713) 420	DUCT
PIPELINE STATUS CODE	
REVISION DATE 06/21/2018 FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME PATRICK LAST NAME RIBAN FINITY MANAGER-ENG FINITY (713) 420-5608 PHONE patrick_riban@ki EMAIL patrick_riban@ki ADDRESS 1001 LOUIS/AN CITY HOUSTON STATE TX ZIP TX ZIP TX ZIP TX	
FRP SEQUENCE NUMBER Category: GENERAL CONTACT FIRST NAME RIBAN TITLE MANAGER-ENG FINITY PHONE PHONE Patrick_riban@kd ADDRESS CITY HOUSTON STATE TX ZIP T7002	
Category: GENERAL CONTACT FIRST NAME PATRICK LAST NAME RIBAN RIBAN MANAGER-ENG ENTITY (713) 420-5608 PHONE patrick_riban@ki ADDRESS 1001 LOUIS/AN CITY HOUSTON STATE TX ZIP TX ZIP TX ZIP TX	
NAME AME	
AME:	
89	
88	GINEERING
88	
88	
SS	patrick_riban@kindermorgan.ccmx
	IA ST

ML21. SFPP, LP; Non-HVL Product Pipeline LS-27; MARTINEZ-C

- Category: PIPELINE ATTRIBUTES	
	TES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-27; MARTINEZ - CONCORD 12*
PIPELINE ID	LS-27; MARTINEZ - C*
MILES	5.24
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HVL PRODUCT
INTERSTATE DESIGNATION	>
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	Ε.
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	X
ИZ	77002

ML22. SFPP, LP; Non-HVL Product Pipeline LS-33; MOCOCO JCT

JOSY: PIPELINE ATTRIBUT TOR ID TOR NAME M NAME STEM NAME	
TOR ID TOR NAME M NAME STEM NAME VE ID	
TOR NAME M NAME STEM NAME VEID	192
SYSTEM NAME SFP SUBSYSTEM NAME L9-3 PIPELINE ID LS-3 MILES A 4.55	SFPP, LP
STEM NAME NE ID	SFPP_NORTH
VE ID	LS-33; MOCOCO JCT - CONCORD 12"
VOCATACATION	LS-33; MOCOCO JCT -*
	LG)
	Non-HVL Product
COMMODITY DESCRIPTION NO	NON HVL PRODUCT
INTERSTATE DESIGNATION Y	
PIPELINE STATUS CODE Activ	Active (filled)
REVISION DATE 06/2	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME PAT	PATRICK
LAST NAME RIB	RIBAN
TITLE MAN	MANAGER-ENGINEERING
ENTITY	
PHONE (713	(713) 420-5608
EMA!L patri	patrick_riban@kindermorgan.com
ADDRESS 100	1001 LOUISIANA ST
CITY HOL	HOUSTON
STATE	
ZIP 77602	302

ML23. Shell Pipeline Co., LP; Crude Oil Pipeline 92

Attribute	
	Value
- Category: PIPELINE ATTRIBUTES	TES
OPERATOR ID	31174
OPERATOR NAME	SHELL PIPELINE CO., L.P.
SYSTEM NAME	COALINGA-AVON
SUBSYSTEM NAME	92 - 16IN 20 N 24IN COALINGA TO A
PIPELINE ID	92
MILES	2,92
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	CRUDE
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/15/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	F
FIRST NAME	Pratik
LAST NAME	Bhakta
TITLE	Regulatory Engineer
ENTITY	
PHONE	(832) 762-2782
EMAIL	pratik.bhakta@shell.com
ADDRESS	P.O. BOX 2648
CITY	Houston
STATE	XT
ZIP	77262

ML24. Plains Marketing, LP; Non-HVL Pipeline 15588

PELINE ATTRIBUT	Value
PELINE ATTRIBUT	
	ES
OPERALOR ID	26085
OPERATOR NAME	PLAINS MARKETING, L.P.
SYSTEM NAME	PLAINS PRODUCTS TERMINALS
SUBSYSTEM NAME	LINE 191
PIPELINE ID	15588
MILES	2.68
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION F	PRODUCTS
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	03/15/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME	BRYAN
LAST NAME	FERGUSON
TITLE	MGR GIS/DATA INTEGRATION
ENTITY	
PHONE ((713) 646-4308
EMAIL	bcferguson@paalp.com
ADDRESS	333 CLAY STREET SUITE 1600
CITY	HOUSTON
STATE	X
ZIP 4IZ	77002

MI25. SFPP, LP; Non-HVL Pipeline LS-16; CONCORD-SA

Attribute	Vafue
- Category: PIPELINE ATTRIBUTES	HES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-16; CONCORD - SAN JOSE 10*
PIPELINE 10	LS-16; CONCORD - SA*
MILES	22.81
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HWL PRODUCT
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	L3
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindemorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	XT
dIZ	77002

ML26. Phillips 66 Pipeline, LLC; Crude Oil Pipeline 2260_42

Attribute	1/afina
	Value
Category: PIPELINE ATTRIBUTES	UTES
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	JUNCTION TO RODEO REFINERY
SUBSYSTEM NAME	COALINGA PMP STA/RODEO REFIN
PIPELINE ID	2260_42
MILES	7.95
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	02/22/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	CT
FIRST NAME	Todd
LAST NAME	Tullio
TITLE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1636
EMAIL	Todd:L. Tullio@p66.com
ADDRESS	2331 Citywest Bhd HC-08-S820-05
CITY	Houston
STATE	XT
diZ	77043

ML27. SFPP, LP; Non-HVL Product Pipeline LS-9; CONCORD-BRADSHAW-10"

Court I was proper	
- Category: PIPELINE ALLKIBULES	ITES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-9; CONCORD - BRADSHAW 10*
PIPELINE ID	LS-9; CONCORD - BRA*
MILES	32.60
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HAL PRODUCT
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	E
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	X
diZ.	77002

MI28. Shell Pipeline Co., LP; Crude Oil Pipeline 92

	90104
 Category: PIPELINE ATTRIBUTES 	TES
OPERATOR ID	31174
OPERATOR NAME	SHELL PIPELINE CO., L.P.
SYSTEM NAME	COALINGA-AVON
SUBSYSTEM NAME	92 - 16INĮ26INĮ24IN COALINGA TO A
PIPELINE ID	92
MILES	22.49
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	CRUDE
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/15/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	ь.
FIRST NAME	Pratik
LAST NAME	Bhakta
	Regulatory Engineer
ENTITY	
PHONE	(832) 762-2782
EMAIL	pratik.bhakta@shell.com
ADDRESS	P.O. BOX 2648
	Houston
STATE	TX
	77252

MI29. Phillips 66 Pipeline, LLC; Crude Oil Pipeline 2260_40

Attribute	Value
- Category: PIPELINE ATTRIBUTES	ES.
OPERATOR ID	31684
OPERATOR NAME	PHILLIPS 66 PIPELINE LLC
SYSTEM NAME	JUNCTION TO RODEO REFINERY
SUBSYSTEM NAME	COALINGA PMP STAROBEO REFIN.
PIPELINE ID	2260_40
MILES	22.49
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	62/22/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	
FIRST NAME	Todd
LAST NAME	Tullio
TITLE	Manager, DOT Compliance
ENTITY	
PHONE	(832) 765-1635
EMAIL	Todd.L.Tullio@p66.com
ADDRESS	2331 Citywest Blvd HQ-08-S820-05
CITY	Houston
STATE	X
ZIP	77043
terd trader	

ML30. Chevron Pipeline, Co; Non-HVL Product Pipeline CAL0002-3

ALC: DOLC	Velue
	Value
Category: PIPELINE ATTRIBUTES	UTES
OPERATOR ID	2731
OPERATOR NAME	CHEVRON PIPE LINE CO
SYSTEM NAME	BAY AREA PIPE LINE
SUBSYSTEM NAME	BAY AREA PRODUCTS LINE (BAPL)
PIPELINE ID	CAL 0002-3
MILES	3.53
COMMODITY CATEGORY	Non-HVI Product
COMMODITY DESCRIPTION	GASOLINE, DIESEL AND/OR JET
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/12/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	CI
FIRST NAME	Garrett
LAST NAME	Parker
TILE	Regulatory Assurance Specialist
ENTITY	
PHONE	(832) 854-4596
EMAIL	PARKER G@chevron.com
ADDRESS	1500 Lousians
CITY	Houston
STATE	XF
diZ	77002

ML31. Crimson Pipeline, LP; Crude Oil Pipeline 76

Category: PIPELINE ATTRIBUTES	UTES
OPERATOR ID	32103
OPERATOR NAME	CRIMSON PIPELINE L.P.
SYSTEM NAME	LOS MEDANOS - VINE HILL
SUBSYSTEM NAME	
PIPELINE ID	76
MILES	15.65
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	08/10/2017
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	cr
FIRST NAME	Mike
LAST NAME	Romley
TITLE	Operations Director
ENTITY	
PHONE	(661) 343-3218
EMAIL	กู่เฉกะใช <i>ง</i> @crimsonpl.com
ADDRESS	2459 Redondo Ave.
CITY	Long Seach
STATE	40
ZIP	90755

ML32. New Operator Pending; Natural Gas Liquids Pipeline 0770

Attribute	Vatue
Category: PIPELINE ATTRIBUTES	UTES
OPERATOR ID	88888
OPERATOR NAME	SOLD - PENDING NEW OPERATOR
SYSTEM NAME	RYER COMPRESSOR TO NICHOLS
SUBSYSTEM NAME	CONDENSATE
PIPELINE ID	0770
MILES	1.89
COMMODITY CATEGORY	Natural Cas Liquids
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/13/2013
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	CT
FIRST NAME	are .
LAST NAME	
ENTITY	NPMS STAFF
PHONE	(703) 317-6294
EMAIL	npms@dol.gov
ADDRESS	NA NA
CITY	NA
STATE	VA.
ZIP	9

ML33. Chevron Pipeline Co.; Non-HVL Product Pipeline CAL0006B

Attribute	Value
- Category: PIPELINE ATTRIBUTES	TES
OPERATOR ID	2731
OPERATOR NAME	CHEVRON PIPE LINE CO
SYSTEM NAME	BAY AREA PIPE LINE
SUBSYSTEM NAME	BAY AREA PRODUCTS LINE (BAPL)
PIPELINE ID	CAL00068
MILES	1.24
COMMODITY CATEGORY	Non-HVI, Product
COMMODITY DESCRIPTION	GASOLINE, DIESEL AND/OR JET
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/12/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	F.
FIRST NAME	Garrett
LAST NAME	Parker
TITLE	Regulatory Assurance Specialist
ENTITY	
PHONE	(832) 854-4596
EMAIL	PARKERG@chevron.com
ADDRESS	1500 Lousiana
CITY	Houston
STATE	XT
ZIP	77002

ML34. Tesoro Logistics Operations; Crude Oil Pipeline 1107

Category: PIPELINE ATTRIBUTES	
	UTES
OPERATOR (D	31874
OPERATOR NAME	TESORO LOGISTICS OPERATIONS
SYSTEM NAME	GOLDEN EAGLE
SUBSYSTEM NAME	TESORO 63A CRUDE LINE
PIPELINE ID	1107
MILES	0.25
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/14/2018
FRP SEQUENCE NUMBER	
Category: GENERAL CONTACT	cT
FIRST NAME	Matthew
LAST NAME	Marusich
TITLE	Operations Area Manager
ENTITY	
PHONE	(925) 335-3452
EMAIL	Matthew.V.Manusich@andeavor.com
ADDRESS	150 Solano Way
CITY	Martinez
STATE	CA
ZIP	94553

ML35. Tesoro Logistics Operations; Crude Oil Pipeline 1107

31874	
Attribute	Value
- Category: PIPELINE ATTRIBUTES	JIES
OPERATOR ID	31874
OPERATOR NAME	TESORO LOGISTICS OPERATIONS
SYSTEM NAME	GOLDEN EAGLE
SUBSYSTEM NAME	12IN TESORO 200A CRUDE
PIPELINE ID	1108
MILES	0.25
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/14/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	CT
FIRST NAME	Matthew
LAST NAME	Marusich
TITLE	Operations Area Manager
ENTITY	
PHONE	(925) 335-3452
EMAIL	Matthew.V.Marusich@andeavor.com
ADDRESS	150 Solano Way
CITY	Martinez
STATE	CA
Zip	94553

APPENDIX A-4 Pittsburg Area Pipeline Data

PL1. Crimson Pipeline, LP Crude Oil Pipeline 76

Attribute	Value
- Category: PIPELINE ATTRIBUTES	TES
OPERATOR ID	32103
OPERATOR NAME	CRIMSON PIPELINE L.P.
SYSTEM NAME	LOS MEDANOS - VINE HILL
SUBSYSTEM NAME	
PIPELINE ID	76
MILES	15.65
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	08/10/2017
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	b
FIRST NAME	Mike
LAST NAME	Romley
TITLE	Operations Director
ENTITY	
PHONE	(661) 343-3218
EMAIL	rjromley@crimsonpl.com
ADDRESS	2459 Redondo Ave.
CITY	Long Beach
STATE	CA
JP.	90755
díZ	90756
and Marian	

PL2. SFPP, LP Non-HVL Product Pipeline LS-90/50/60; CONCOR

Category: PIPELINE ATTRIBUTES	TES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-90/50/60; CONCORD - FRESNO 12"
PIPELINE ID	LS-50/50/60; CONCOR*
MILES	34 83
COMMODITY CATEGORY	Non-FWL Product
COMMODITY DESCRIPTION	NON HWL PRODUCT
INTERSTATE DESIGNATION	2
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	k
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITLE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA ST
CITY	HOUSTON
STATE	TX
diZ	77002

PL3. Chevron Pipeline Co., Non-HVL Product Pipeline CAL0002-8

Attribute	
	Value
- Category: PIPELINE ATTRIBUTES	ES
OPERATOR ID	2731
OPERATOR NAME	CHEVRON PIPE LINE CO
SYSTEM NAME	BAY AREA PIPE LINE
SUBSYSTEM NAME	BAY AREA PRODUCTS LINE (BAPL)
PIPELINE ID	CAL0002-8
MILES	19.60
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	GASOLINE, DIESEL AND/OR JET
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/12/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	_
FIRST NAME	Garnett
LAST NAME	Parker
TITLE	Regulatory Assurance Specialist
ENTITY	
PHONE	(832) 854-4596
EMAIL	PARKERG@chevron.com
ADDRESS	1500 Lousiana
CITY	Houston
STATE	Xt
ZIP	77002

PL4. SFPP, LP; Non-HVL Product Pipeline LS-9; Concord-BRA

- Category: PIPELINE ATTRIBUTES	
	TES
OPERATOR ID	18092
OPERATOR NAME	SFPP, LP
SYSTEM NAME	SFPP_NORTH
SUBSYSTEM NAME	LS-9; CONCORD - BRADSHAW 10"
PIPELINE ID	LS-9; CONCORD - BRA*
MIES	32.60
COMMODITY CATEGORY	Non-HVL Product
COMMODITY DESCRIPTION	NON HAL PRODUCT
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	06/21/2018
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	H
FIRST NAME	PATRICK
LAST NAME	RIBAN
TITE	MANAGER-ENGINEERING
ENTITY	
PHONE	(713) 420-5608
EMAIL	patrick_riban@kindermorgan.com
ADDRESS	1001 LOUISIANA SIT
CITY	HOUSTON
STATE	大
diZ	77002

PL5. Crimson Pipeline, LP Crude Oil Pipeline 499

32103	
Attribute	Value
- Category: PIPELINE ATTRIBUTES	IES
OPERATOR ID	32103
OPERATOR NAME	CRIMSON PIPELINE L.P.
SYSTEM NAME	LOS MEDANOS
SUBSYSTEM NAME	
PIPELINE ID	499
MILES	20.50
COMMODITY CATEGORY	Crude Oil
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	Z
PIPELINE STATUS CODE	Active (filled)
REVISION DATE	08/10/2017
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	5
FIRST NAME	Mike
LAST NAME	Romley
TILE	Operations Director
ENTITY	
PHONE	(661) 343-3218
EMAIL.	rjromley@crimsonpl.com
ADDRESS	2459 Redondo Ave.
CITY	Long Beach
STATE	CA
ZIP	90755

PL6. Abandoned Pittsburg-Antioch Pipeline 31590

- Cotogory: PIPELINE ATTRIBUTES OPERATOR 1D 999 OPERATOR NAME AB	
Category: PIPELINE ATTRIBUT OPERATOR ID OPERATOR NAME	
	ES
OPERATOR NAME	66666
	ABANDONED
SYSTEM NAME	PITTSBURG-ANTIOCH PIPELINE
SUESYSTEM NAME	PITTSBURG-ANTIOCH PIPELINE
PIPELINE ID	31590
MILES	8.40
COMMODITY CATEGORY	Empty Liquid
COMMODITY DESCRIPTION	
INTERSTATE DESIGNATION	z
PIPELINE STATUS CODE	Permanently Abandoned
REVISION DATE	03/26/2004
FRP SEQUENCE NUMBER	
- Category: GENERAL CONTACT	_
FIRST NAME	
LAST NAME	
TITLE	
ENTITY	NPMS STAFF
PHONE	(703) 317-6294
EMAIL	npms@dat.gov
ADDRESS	NA NA
CITY	NA
STATE	W
dZ	0

APPENDIX B Critical Facilities Data

APPENDIX B-1 CRITICAL FACILITIES: RICHMOND PINCH POINT #1

Critical Facility Category	Critical Facility	Street Addess	Clty	State	State Latitude	Longitude
City and County Buildings	El Cerrito Building Inspection	10890 San Pablo Ave.	El Cerrito	S	37,915730	-122,3110 m
	El Cerrito Police Department	10900 San Pablo Ave.	El Cerrito	ð	37.916210	-122,311497
	Kensington Police Department	217 Arilington Ave.	Kensington	ð	37.913850	-122.280670
	Bayview Branch Public Library	5100 Hartnett Ave.	Richmond	ð	37.915187	37.915187 -122.32384m
	El Cerrito Library-Contra Costa County Library	6510 Stockton Ave.	El Cerrito	đ	37.908499	-122,303988
	Kensington Library-Contra Costa County Library	61 Arilington Ave.	Kensington	5	37,913179	-122.281062
Fire Stations	Richmond Fire Department Station 64	4801 Bawiew Ave.	Richmond	5	37.914680	37.914680 -122.323770
	El Cerrito Fire Department	10900 San Pablo Ave.	El Cerritto	5	37.916210	37.916210 -122.311#90
	Kensington Fire District	217 Arlington Ave.	Kensington	5	37,913850	37.913850 -122.280670
Josephals /Emergency Care	Castro Theram Unit	1435 Lawrence St.	El Cerrito	5	37,920390	37.920390 -122.304560
	New MD & Urrent Care	10612 San Pablo Ave.	El Cerrito	5	37,911990	37,911990 -122,307410
	Kenstrum Clink	60 Arlington Ave.	El Cerrito	5	37.929730	37.929730 -122.304330
	Kensington Physical Therapy	303 Arlington Ave.	Kensington	S	37.903309	37.903309 -122.277489
	UHS Sure cal Services	3427 Hegatta Blvd.	Richmond	đ	37,919381	37.919381 -122.334910
Vursing/Convelescent	El Cerrito Royale	6510 Gladys Ave.	El Cerrito	ð	37,919320	37,919320 -122,311930
Coromunity Centers/Weithers	Booker T. Anderson Community Center	960 S. 47th St.	Richmond	5	37,918610	37,918610 -122,326740
	Monterey Pines Community Room	680 S. 37th St.	Richmond	5	37 923210	37.923210 -122.333950
	St. Johns Community Center	6500 Gladys Ave.	El Cerrito	5	37,919470	37.919470 -122.312050
	El Cerrito Midtown Activa, Center	10940 San Pablo Ave.	El Cerrito	ð	37.916750	37.916750 -122.311770
	El Cerrito Community Center	7007 Moeser Lane	El Cerrito	5	37,914620	37,914620 -122,302880
	Kensing on Community Center	59 Arithmon Ave.	Kensington	ð	37,903660	37.903660 -122.278310
chools/Preschools	Fairmont Benentary	724 Keaminy St.	El Cerrifto	5	37.915670	37,915670 -122,310430
	Kensington Elementary	90 H shland Blvd.	Kensington	5	37,914170	37,914170 -122,278950
	Wilson Elementary	7150 Portola Dr.	El Cerrito	5	37.915370	37.915370 -122.302390
	Stege Elementary	4949 Cypress Ave.	Richmond	5	37.919800	37.919800 -122.322390
	El Cerrito High School	540 Ashbury Ave.	El Cerrito	S	37.906170	37.906170 -122.294390
	Summit Public Schools	1800 Elm St.	El Cerrito	ð	37.925720	37.925720 -122.312990
	Caliber Beta Academy	4301 Berk Ave.	Richmond	ð	37.922720	37.922720 -122.327400
	Kenn or Hah School	4300 Cutting Blvd.	Richmond	5	37.925170	37.925170 -122.329290
	Kin_elementary	4022 Florida Ave.	Richmond	5	37.929430	37.929430 -122.347640
	Little House Preschool	4443 Potrero Ave.	Richmond	CA	37.920910	-122,318720
	Keystone Montessori Pre-School	6639 Blake St.	El Cerrito	S	37.923240	-122.312620
	Sycamore Christian School	1111 Navellier St.	El Cerrito	5	37.917280	-122.301330
	Pride and Joy Pre-School	1226 Liberty St.	El Cerrito	S	37.916010	37.916010 -122.308380
	El Cerrito Preschool Co-op	7200 Moeser Ln.	El Cerrito	S	37,915080	-122.300620
	Nomura Preschool	1711 Carlson Blvd.	Richmond	S	37.909490	-122.315100
	Little inti Daycare Preschool	Everett and Eureka	El Cerrito	5	37.907740	37.907740 -122.299730
	Ocean View Montessori Day Care	717 Clayton Ave.	El Cerrito	z	37,909060	37,909060 -122,297820

APPENDIX B-2 CRITICAL FACILITIES: RICHMOND PINCH POINT #2

Cottical Earlitte Catassure	Celtical Facility	Street Addess	20	State	State Latitude Lousthade	Louistinge
		A PARTY OF THE PAR			0000	
City and County Buildings	Richmond Police Department	1701 Regatta Blvd.	Richmond	ð	37.917180	-122.349950
	Richmond Police Commission	450 Clvic Center Plaza	Richmond	5	37.937590	122,343210
	Richmond City Hall	450 Civic Center Plaza	Richmond	5	37.937590	-122.343210
	Richmond Humn Resources Department	2544 Barrett Ave.	Richmond	ð	37.935900	-122.329300
	Richmond Emergence Services Office	440 Civic Center Plaza	Richmond	5	37.936800	-122.342890
	Richmond Memorial Convention Center	403 Civic Center Plaza	Richmond	5	37.937020	-122.344130
	Machailla	430 Clvic Center Plaza	Richmond	5	37,936320	-122,343490
	Richmond Private Industry Council	330 25th St.	Richmond	5	37.936690	-122.345260
	Richmond City Recreation Comilex	3230 MacDonald Ave.	Richmond	ð	37.934120	-122,338210
	Richmond Building Services	6 13th St.	Richmond	5	37,931520	-122,356890
	Memorial Youth Center	213 S. 33rd St.	Richmond	5	37,927950	-122,338100
	Richmond Sewer Maintenance	3200 Regette Blvd.	Richmond	5	37.916680	-122,340190
	Richmond Housing Community	1401 Marina Way S.	Richmond	5	37.912750	-122.356290
	Port of Rehmond Administration	1411 Harbour Wire S.	Richmond	5	37.913680	-122.361470
	Contra Costa County Office of the Public Defender	3811 Bissell Ave.	Richmond	5	37,933070	-122,333110
	Contra Costa County Victim Witness	100 S. 37th St.	Richmond	4	37.930740	122, 334520
	Contra Posta Susendon Office	11780 San Dablo Ave	El Cerrito		37 917010	OX CE 12 CC 1.
	Contra Costa County Emilionment and Human Sardens	4006 MacDonald Ave.	Richmond	3	37,917910	-122,313270
	Contra Costs, Dadings Candras	100 30th Ce	Dichmond	1	37.037394	177 333073
	Contra Corta Courte Court	TOOL STAFF CO	Dichmond	5 2	97 000 780	100 004440
	Contra Costa County Court	Acces avelon.	McIllifolia	5 3	91.00000	1000000000
	Contra Costa County Community Center	SOUS ZYTH SE.	Richmond	5 3	37.921286	-122.343389
	west county housing conjugation	AND LIST SE	Richmond	5 8	37.833000	- 122.348130
	Contra Costa County Children and Family Services	1275 Hall Ave.	Richmond	5	37.914901	-122.357240
	Contra Costa County Probation	1275 Hall Ave.	Richmond	5	37.914901	-122.357240
	Richmond Public Library	325 Clvic Center Plaza	Richmond	5		122.344111
	Contra Costa County Law Library	100 37th St.	Richmond	ð	37.932619	-122.333694
	Northern Regional Library	1301 S. 46th St.	Richmond	3	37.917708	-122.334999
	Northern Assonal Ubrary Facility	400 S. 47th St.	Richmond	ర	37.917454	-122.335430
Fire Stations	Richmond Fire Devartment Station 61	140 W. Richmond Ave.	Richmond	40	37,926169	-122 385421
	Richmond Fire Desertment Station 67	1131 Cutting Blod	Richmond	2		.122.358283
	Richmond Fire Desertment Station 62	1065 7th St	Richmond	5		122 365558
	Richmond Fire Desertment Station 66	4100 Clinton Ave	Richmond	5 2		.122 3288AT
	Richmond Fire Desertment	A40 Chir Center Plaza	Richmond	5 2		122 342890
	dening in a Community	THE CHIEF CHIEF I WAS	DIO INC.	5	Proposed to	0.024.777
Hospitals/Emergency Care	Kalser Permanente Richmond Medical Center	901 Nevin Ave.	Richmond	S	37.837222	-122,360545
	UfeLorm Brookside Richmond Health Center	1030 Nevin Ave.	Richmond	2	37.836649	-122,359183
	UfeLong William Jenkins health Center	150 Harbour Way	Richmond	S		-122.359809
	RotaCare Bay Area Richmond Clinic	256 24th St.	Richmond	5	37.835025	-122.346134
	LifeLon, Brazell H. Carter health Center	2600 MacDonald Ave.	Richmond	క	37.834913	-122.343620
	Nevin House	3215 Nevin Ave.	Richmond	5	37.835720	-122.337902
	Community Clinic Consortium	3720 Barrett Ave.	Richmond	5	37.036308	-122.333293
	Contra Costa County Mental	100 38th St.	Richmond	S	37.032344	-122,332883
	UHS Surgit al Services	3427 Regetta Blvd.	Richmond	S	37.919381	-122.334909
	Kalser Permanente School of Aliked Health	938 Marina War	Richmond	5	37.918685	-122.354788
Marshal/Concalencent	El Cerrito litografe	6510 Gladys Ave.	El Cerrito	3	37.019027	-122.311572
	Shields-Richmond Nursing Center	1919 Cutting Blvd.	Richmond	5	37.925548	-122,350905
	Grace Homes Residential Care	423 McLaurhlin St.	Richmond	3	37,034253	-122.323838
	Grace Homes Assisted Living	S27 McLaumhlin	Richmond	ð	37.038061	37.838061 -122.324813
	Palm Tree Care Home	712 McLaughlin	Richmond	S	37.941350	-122.326482
	Rosewood Residence Assisted Living	5311 Garvin Ave.	Richmond	ð	37,845339	-122.324834
	Richmond Post-Acute Care	955 23rd St.	Richmond	ð	37.046382	-122,347785
	TLC Home Care Menry	13201 San Pablo Ave.	San Pablo	ర	37.951585	-122.333290
Community Contern/Online	Booker J Anderson Communicate Combar	OCT C A784 CA	Dirhmond	24	27 018502	122 226704
н	St. Johns Community Center	6500 Glaritor Ave.	El Cerrito	5 5	37.919484	
	El Cerrito Midtown Activity Center	10940 San Pablo Ave.	El Cerritto	S	37,916793	
	El Cerrito Community Center	2007 Moeser Lane	El Cerrito	8	37.014847	-122,303138
	E.M. Downer Family YMCA	263 S. 20th St.	Richmond	ð	37.028575	-122.350715
	Bobhy Bowen Progressive Center	2540 MacDonald Ave.	Richmond	3		-122.344440
	Nevin Community Center	598 Nevîn Ave.	Richmond	ð		-122,363998
	Atchison Villare Mutual Homes Coril.	270 Curre St.	Richmond	8	37.534701	-122.371511
	Point Richmond Community Center	139 Washington	Richmond	3	37,926558	37,926550 -122,385314
	Catholic Charities of the East Bay West County Service Center	217 Harbour Way	Richmond	5	37.934488	-122.360148
	Bay Area Rescue Mission	200 MacDonald Ave.	Richmond	5	37.035415	-122.367472
	Bur Area Rescue Mission	2114 MacDonald Ave.	Richmond	ð	37.935566	-122,349177
	West Contra Costa Family Justice Center	256 24th St.	Richmond	S	37.835033	-122.346123
	Rubicon Programs	2500 Bissell Ave.	Richmond	5	37.633663	-122.345300
	Rubicon Programs	101 Broadway	Richmond	ð	37,833031	-122,346268
	Richmond Emergency Food Panting	2369 Barrett Ave.	Richmond	ð	37.638622	-122.345982
	House Rabbit Society	148 Broadway	Richmond	3 :		-122,345447
	GOOD NEWL PITTLE PUBLIS RESCUE	2309 Brooks Ave.	Michanond	5 8	37.941010	-122.345646
100	The Milo Foundation	220 S, Garrard Bive.	Кептопа	5	88/5:77L- \$50078'10	-122.379905
Schools	Arithmton Christian School	6382 Arlington Blvd.	Richmond	S	37.940958 -122.31230	-122.312302

APPENDIX B-2 CRITICAL FACILITIES: RICHMOND PINCH POINT #2

Critical Facility Catagory	Critical Facility	Street Addess	City	State	Latitude	Longfude
	Mira Vista Elementary	6397 Hazel Avenue	Richmond Hell CA	S	37.941057	-122.313808
	De Jean Middle School	3400 MacDonald Ave.	Richmond	ð	37.032582	37.032582 -122.336903
	Stare Bementary	4949 Cypress Ave.	Richmond	đ	37,920018	-122.322952
	Suramit Public Schools	1800 Ehm St.	El Cerrito	S	37.825312	37.925312 -122,313583
	Caliber Beta Academy	4301 Berk Ave.	Richmond	ð	37.922820	37.922820 -122.328938
	Kenned, Hie School	4300 Cutting Blvd.	Richmond	ð	37.924780	-122.328610
	King elementary	4022 Florida Ave.	Richmond	S	37.029098	37.029096 -122.331587
	Manzanita Charter Middle School	461 33rd St.	Richmond	S	37.936665	37.936665 -122.337477
	Grant Elementary	2400 Downer Ave.	Richmond	ð	37.942513	-122,345048
	St. Cornelius Catholic School	201 28th St.	Richmond	ð	37,933887	-122.342160
	Coronado Elementary	2100 Maine Ave.	Richmond	S	37.927785	-122.349510
	Mytrom Elementary	230 Harbour Way 5.	Richmond	g	37,928159	-122,359289
	Richmond Calle, e Pres Schools	1014 Florida Ave.	Richmond	5	37.929065	37.029085 -122.359318
	West Contra Costa Costa Unified School District/Delta High	1108 Bissell Ave.	Richmond	ð	37,933594	-122.358640
	Leadershin Public Schools	880 Bissell Ave.	Richmond	ð	37.933805	37.933805 -122.381142
	Samuel Gomeers Continuation School	831 Chanslor Ave.	Richmond	S	37.933384	37.933384 -122.361183
	John Henry High	1402 Marina Way S.	Richmond	3	37.912774	-122,354919
	Peres Elementary	719 Sth St.	Richmond	5	37.942773	-122.384531
	Chavez Elementary	960 17th St.	Richmond	5	37.946992	37.946992 -122.352907
	Richmond High	1250 23rd St.	Richmond	క	37.952453	-122,345902
	Washington Elementary	565 Wine St.	Richmond	5	37.924457	-122.380094
	Downer Elementary	1231 18th St.	San Pablo	5	37.952095	37,952095 -122,352947
	United Christian Collage	3219 MacDonald Ave.	Richmond	đ	37.934653	-122.338147
	Uttle house Preschool	4443 Potrero Ave.	Richmond	z	37.921264	37.921264 -122.327371
	Richmond Children's Academ	2900 Cutting Rd.	Richmond	5	37.924958	37.924958 -122.341429
	Curious Explorers Academy	4121 MacDonald Ave.	Richmond	s	37.933663	37.933663 -122.330236
	A Little World Montessori	374 37th St.	Richmond	z	37.934432	37.934432 -122.333815
	Happy Brown Bears Pre-school	2225 Gaynor Ave.	Richmond	đ	37.944708	37.944708 -122.347780
	In Patite Academuse Richmond	1221 Nevin Ave.	Richmond	CA.	37 937652	S7 837662 -122 357002

APPENDIX 8-3 CRITICAL FACILITIES: MARTINEZ PINCH POINT #3

Critical raciffy Category	Curcal radius	Street Addess	Olty	State	Latitude	Tonguide
City and County Buildings	Martinez City Hall	525 Henrietta St.	Martinez	ð	38.014112	-122,135351
	Martinez Planning and Zoning	525 Henrietta St.	Martinez	S	38.014112	-122,135351
	Martinez Police Department	525 Henrietta St	Martinez	2	38 014112	.129 19K9E
	Marelana Makes Do settonos	COE Hondoften Co	a forther		0000000	400 405054
	Mai timez vyater Departillelit	252 Delliletta 3t.	Martinez	5	20.014112	122.13535
	Martinez Detention Facility	1000 Ward St.	Martinez	5	38,017912	-122.133154
	Martinez traffic Signal Maintenance	2467 Waterbird Way	Martinez	ð	38.001369	-122.073085
	Contra Costa County Jail	901 Court St.	Martinez	ð	38.017168	-122,132167
	Contra Costa County Court Records	1111 Ward St.	Martinez	ð	38.018607	-122.133033
	Contra Costa county Sheriff's Office	651 Pine St.	Martinez	ð	38.019302	-122,133676
	Contra Costa County Sheriff-Criminalistics	1122 Escobar St.	Martinez	ð	38.019518	-122.133310
	Contra Costa County Sheriff	500 Court St.	Martinez	5	38.019112	-122,135273
	Contra Costa County Sheriff Denactment	1980 Melr Rd	Martinez	9	37 080707	
	Contra Court Country Shorter Toolsainsi Consissed	and manual to the	Manhines	5 8	27000747	
	Contra Costa County Strent Preciminal Services	So diaciei Di.	Maillet	5 8	SPIORE TO	
	Contra Costa Public Works Surplus	4785 Blum Rd.	Martinez	đ	38,000368	-122.07397
	Contra Costa County Public Works Department	255 Glacier Dr.	Martinez	ð	37.988076	-122.08685
	Contra Costa County Flood Control	2475 Waterbird Way	Martinez	S	37.999995	
	Contra Costa Animal Services Department	4800 Imhoff Pi.	Martinez	5	37.999225	-122.071217
	Contra Costa County Library-Martinez Branch	740 Court Street	Martinez	S	38.017990	
	Contra Costa County Law Library	1020 Ward St.	Martinez	S	38,018074	
	Degan Medical Ubrary	2500 Alhambra Ave.	Martinez	ð	38.006961	-122.132743
THE STRUOUS	Contra Costa Fire Station 12	1240 Shell Ave.	Martinez	đ	38.010631	38.010631 -122.118226
	Contra Costa Fire Station 14	521 Jones St.	Martinez	5	38.012950	-122.13429
Hospitals/Emergency Care	Contra Costa Regional Medical Center	2500 Alhambra Ave.	Martinez	CA	38.006789	-172 13280
	Contra Costa County-Martinez Health Center	2500 Alhamhra Ave.	Martinez	2	38 OD8780	
	Telecare House	300 llene St	Martinaz	5	SE OTBOOK	
	Kaleara Darmananta	200 Mulrad	Rdarbings	5 5	37 003657	400 44008
		AND INITIAL TOP	Tall Miles	5	and and a	-124.11000
Nursing/Convalescent	Alhambra Convalescent Hospital	331 llene St.	Martinez	5	38.008379	38.008379 -122.133390
	Tender Touch Residential Care	58 Midhill Dr.	Martinez	5	37.997924	-122.098378
	Martinez Convalescent Home	4110 Alhambra Wav	Martinez	5	37.993374	
	Legacy Nursing and Rehab	1790 Mulr Rd.	Martinez	S	37.988972	
community Centers/Shelters	Northern California Family Center	2244 Pacheco Blvd.	Martinez	5	38.012737	
	City of Martinez Senior Center	818 Green St.	Martinez	ð	38.016676	-122.13428
	Martinez Community and Economic Center	525 Henrietta St.	Martinez	ð	38.014112	-122,13535
	Shell Clubhouse	1635 Pacheco Blvd.	Martinez	ð	38.014692	-122.125936
	Mountain View Emergency Family Shelter	1391 Shell Ave.	Martinez	5	38.012520	-122.11806
	Contra Costa County Care Group	1350 Arnold Dr.	Martinez	ð	37.992109	-122,098600
	Contra Costa County Adontion	2530 Amold Dr.	Martinez	5	37.992721	-122.078862
chools	Martinez Unified School District	021 Greens Ch	Martinos	42	38.014816	-475 425ABS
	Martinez Early Intervention	971 Sucana St	Martines	5 5	38 014815	
	Creekside Montescori	1333 Echidillo St	Martinas	5 5	38 0427AB	455 498444
	Ct Catherine of Clans Critical	EOA Modiment	P.Continue	5 8	200770	400 40400
	Marelnes Instantille Colonia	acon Mellins St.	Mar unez	5 2	30.014084	-122.13408
	Marcinez Junior Figure School	1900 COURT SE	Martinez	5	38.013582	-122.130663
	Aliambra High School	150 E St.	Martinez	ð	38.002629	-122.13337
	American Indian Cultural and Education Program	600 F St.	Martinez	ð	38.000612	-122.130826
	John Muir Elementary	205 Vista Way	Martinez	5	38,000191	-122,120000
	International Mission-Higher Education	1117 Brittan, Hills Ct.	Martinez	3	38.002084	-122.100287
	Morello Park Elementary	1200 Morello Park Dr.	Martinez	S	38.001644	-122.099178
	Community Day Schools Program	3930 Pacheco Blvd.	Martinez	3	38.008221	-122.095910
	Las Juntas Elementary	4105 Pacheco Blvd.	Martinez	5	38.008372	-122.092840
	White Stone Christian Academy	1151 Polson	Martinez	ð	37,991556	-122.10317
	Electrical Trade School	1255 Muir Rd.	Martinez	ð	37,990672	-122.099489
	Mt. McKinley School	202 Glacier Dr.	Martinez	ð	37,988808	-122.087844
	Contra Costa Community College District	500 N. Court St.	Martinez	S	38.019142	-122,135067
	Creekside Montessori	1333 Estudillo St.	Martinez	ð	38.013748	-122.133144
	Morello Hills Christian Preschool and Daycary	1000 Morello Hills Dr.	Martinez	3	38.000527	-122.103590
	Forest Hills Preschool	127 Midhill Rd.	Martinez	ð	37,997407	-122,095239
	Helping Hands Christian Preschool	1865 Arnold Dr.	Martinez	5	37,992202	-122,089436
				ļ	ı	

APPENDIX B-4 CRITICAL FACILITIES: BAY POINT PINCH POINT #4

Critical Facility Category	Critical Facility	Street Addess	Oth	State	State Latitude Longitude	Longitude
Chy and County Buildings	Pittsbur Housin Rehabilitation	710 Black Diamond St.	Pittsburg	S	38.030467	38,030467 -121,885856
	Pittsbu Community Access	915 Cumberland St.	Pittshiir	A.	38 028210	-121 883603
	District Louis Additional	Ode Cumbosland Co	Distant	5 8	2000000	
	Theorem Industry Annie	OTO COMPOSITION OF	LINSON B	5	00,021,801	-121.00##00
	PICEDIC PUBLIC WORKS DEDICTMENT	357 E. 12th St.	PittSburg	5	38.025882	-121.882888
	Pittsburg City Engineeering	65 Clvic Ave.	Pittsbur	S	38.019983	38.019983 -121.891780
	Pittsburg City Center	Center Dr.	Pittsbur	5	38.019248	-121.891683
	Pittsburg Police Department	65 Civic Ave.	Pittshur	4	38 010983	
	Contra Costa County Shoriff Department	650 Port Chicago Hum	Ra. Doint		98 034800	121 060502
	Contra Court Valletin Della timent	COS POLICINICA DI MAY.	Dayroull	5 3	00.004080	121.000000
	Contra Costa County Community Services	2430 Willow Pass Rd.	Bay Point	5	38.027303	
	Contra Costa County Community Services	3103 Willow Pass Rd.	Bay Point	5	38.026323	-121,949683
	Contra Costa County Public Health	215 Pacifica Ave.	BayPoint	8	38.033785	-121.968129
	Contra Costa County Small Claims Court	1000 Center Dr.	Pittsbur	3	38.019357	-121.889802
	Contra Costa County Municipal Court-Traffic Citations	45 Civic Ave.	Pittsbure	4		
	Ran Doint I Brand Contra Cotta Country I Brany	20% Dacifies Asia	Day Dolor		00000000	404 007070
	District Library Contra Costs County Library	SOS PACING AVE.	Day FORT	5 3	36.033900	
	Fileson Die Problem Costa Commy Library	an Lower Avellue	Fittsour	5	38.018808	-127.890870
	Contra Losta County Public Law Library	1000 Center Drive	Pittsburg	5	38.019272	-121.880042
In Stations	Contra Costa Fire Station 87	ROO W. Leland Ave.	Dittshuru	82	38 014433	.121 010832
	Contra Costa Fire Station 86	3000 Willow Pass Rd.	Pittsburg	5	38 027003	38 027093 -121 94RDRR
foundatels/Emergency Care	Phtsburg Health Center	2311 Loveri me Rd.	Pittsburg	2	38,006538	38.006538 -121.869891
dursing/Convalescent	Pittsburg Care Center	535 School Street	Disteriora	45	98 020267	SE CONSET 194 BZDS49
	Docate Carolina	222 Ocean Dates	Distraction of the second	5 8	30.020201	200.000 101 102020.00
	Witness of Confession Con-	372 Ocean Drive	LINS DOLL	5 3	30.021284	30.UZ1284 -121.B10032
	West and header that cale	ZZZO WESTWOOD CL.	LICONIL	3	38.013778	-121.H3/022
	SMI Lay Elderly Home Lare	2242 Mr. Whitney Dr.	Pittsburg	3	38.011661	38.011661 -121.931778
Community Centers/Shelters	Ambrose Recreation and Park District	3105 Willow Pass Rd.	Bay Point	CA	38 026273	38 026273 -121 BAB188
	Г	60 Civic Ave.	Pittsburg	5	38.022857	-121.889848
	People Who Care Children Association Youth Center	2231 Railroad Ave	Distribura	2	38 013586	38 013588 -121 880000
	Love-A-Child Missions Homeless Recovery Shelter	2279 Willow Pass Rd.	Bay Point	5	38.028690	38.026690 -121.934428
	Pittsburg Family Center	84 W. 6th St.	Pittsbur	5	38,032089	-121,886121
	Pacific Community Services	329 Railroad Ave.	Pittsburg	đ	38.033064	
Chooks	Bir Vieta Hamanta	C14 Dackley Ass	Delice.	4.5	022,000 00	***************************************
none	Observation Middle School	OUT PACIFICA AVE.	Buy Polin	5 8	38.033776	
	Diversion Middle School	200 Pacifica Ave.	day rollin	5 3	38.033000	
	determination	233 Facilica	Bay Point	5 ;	38,083677	
	New Jerusalem School	290 Anchor Ur.	Bay Point	5 3	38.030529	
	Above and Beyond Academy	Se Amador Ct.	Bay Point	3	38,023197	
	Bel Air Elementary	663 Canal Rd.	Bay Point	3	38.020228	
	Willow Cove Elementary	1880 Hanlon Way	Pittsburg	5	38.024622	
	Rancho Medanos Junior High School	2301 Range Rd.	Pittsburg	ð	38.016920	-121.912776
	Shore Acres Elementary	351 Marina Rd.	Pittsbur	ð	38.035718	-121.989783
	Rancho Medanos Junior High School	2301 Range Rd.	Pittsburg	B	38.016630	-121.911927
	Los Medanos Elementary School	610 Crowley Ave.	Pittsburg	ð	38.016794	-121,901093
	Parkside Elementary	985 W. 17th St.	Pittsburg	5	38.022699	
	St. Peter Martyr School	425 W. 4th St.	Pittsburg	8	38,033798	-121.890736
	Marina Vista	50 E. 8th St.	Pittsburg	2	38.029231	
	Pittsbur School District Office	2000 Rallroad Ave.	Pittsburn	8	38.019804	
	Child Nutrition Services Department	2000 Railroad Ave.	Pittsburg	8	38.019804	
	Pittsbur High School	1750 Harbor St.	Pittsburn	3		
	YMCA Contra Costa/Sacramento - Bary point	225 Pacifica Ave.	Bay Point	8		
	Klds First Academy	2340 Willow Pass Rd.	Bay Point	S	38.026921	
	Mi Mi's Learning Center	2131 Riesling Ct.	Pittsburg	3	38.016378	
	First Baprist Head Start	204 Odessa Ave.	Pittsburg	5		
	Railroad Junction School	2224 Railroad Ave.	Pittsburg	5	38.013584	-121.891587
	Pittslyur Pre-School and Community	1760 Chester Dr.	Pittsburg	8	38,016808	
			- Delivery	;		

APPENDIX B-5 CRITICAL FACILITIES: ANTIOCH PINCH POINT #5

	WIIICAI FACILITY	Street Addess	45	State	Latttude	Longitude
City and County Buildham	Anthorh Chu Hall	200 H St	Anrioch	CA	98.048749	121 815104
	Antloch Building Inspection Division	200 H St.	Antioch	5 5	38,016712	
	Antloch City Marina	5 Marina Plaza	Antioch	8	38.020070	
	Antloch Engineeing and Land	200 H St.	Antloch	8	38.016712	
	Antloch Animal Services	3001.51.	Antioch	3	38.016192	-121 82078
	Antioch Public Works Department	1201 W. 4th St.	Antioch	8	38.015480	38.015480 -121.820833
	Antloch City Purchasing	1307 W. 4th St.	Antioch	8	38.015308	
	Antioch Lynn House Gallery	809 W. 1st St.	Antioch	5	38.017450	
	Antioch City Human Resources	3rd St. and H St.	Antioch	5	38,016231	-121.815042
	Antioch Police Department	3001.5t.	Antioch	5	38,016192	-121.820785
	East County Veterans Resource Center	708 W. 2nd St.	Antioch	ð	38.017103	-121.81537
	Contra Costa Housing Choice	801 W. 8th St.	Antioch	S	38.012440	-121,817132
	Contra Costa County Event Center	1201 W. 10th St.	Antioch	3	38.008732	-121.822840
	Antioch Library-Contra Costa County Library	501 W. 18th Street	Antloch	5	38.004716	-121.81269
Fire Stations	Contra Costa Fire Station 81	315 W. 10th St.	Anthoch	8	38.010976	-121 81095
	Contra Costa Fire Station 83	2717 Gentrylawn Dr.	Antloch	CA	37.997322	
Manual Property of the Parket	Kalear Antionk	Dates Parket California	A calcol			
nospirati/cure/gency Late	Contract Dales Manager Contract	SAUU Derta Fair BIVO.	Antioch	5 8	38.004428	-121.84212
	John Marie Delegan Cons	S901 Lone Iree Way	Antloch	8 8	37.982569	-121.80290
	John Muir Primary Care	3440 Hillorest Ave.	Antioch	4	37.986844	-121,78053
	Kaiser Permanente Antioch Medical Center	4501 Sand Creek Rd.	Antioch	5	37.950952	-121.77522
	RotaCare Bay Area	2210 Gladstone Dr.	Pittsburg	8	38.009467	-121.88603
	Pritsburg Hearth Center	2311 Loveringe Rd.	Pittsburg	5	38.006547	-121.869626
	La Clinica Medical	2240 Gladstone Dr.	Pittsburg	5	38.008922	-121.887712
	Cooke Costs Industrial Modes Chair	2213 Buchanan Rd.	Antioch	8	37.998344	-121.836101
	Older Adults Clare	SEAL LANG Tree Miles	Antioch	5 5	37.998256	721.84062
	Older Addres Cillin	ANA HALL TOUR LOCK	Antiocn	R)	37.897440	21208721
Nursing/Convalencent	Antioch Convalescent Hospital	1201 A Street	Antioch	5	38.009288	-121.808247
	Independent Living Resource	301 W. 10th St.	Antioch	ð	38.010922	-121,810418
	Amarylis Care Home	100 W. 20th St.	Antioch	ð	38.003659	-121.807026
	Hitcrest Memory Care	825 E. 18th St.	Antioch	ð	38.005412	-121.791095
	Court Dies Assessed Date	1925 Garden Ct.	Antioch	5	38.002307	-121.79240
	Viera Recidential Care Home	2179 Viers Ave	Antioch	5 5	38.005809	121./916/4
	Vieta Nesidellula care monte	CALS VIEIG AVE.	Adicipen	5		DGL///121-
Community Centers/Shelbers	East County Shelter	1401 W. 4th St.	Antioch	5	38.015349	38.015349 -121.823755
	East County Senior Coalition	301 W. 10th St.	Antioch	ð	38.010922	-121.81041
	Community Outreach Center	525 E. 18th St.	Antioch	ď	38.005317	-121.795088
	Shelter, Inc.	4553 Delta Fair Blvd.	Antioch	đ	39.006207	-121.85441
Schools	East County Elementary Special Education	4207 Delta Fair Blvd.	Antioch	5	38.003377	-121 851461
	Mission Elementary	1711 Mission Dr.	Antloch	5	37.996817	-121.832163
	Park Middle School	1 Spartan Way	Antioch	5	37.093181	-121,81401
	Belshaw Elementary	2801 Roosevelt Ln.	Antioch	5	37.095322	-121,80030
	The Child Day Schools	112 E. Tregalias Rd.	Antloch	5		-121.803021
	Marsh Elementary	2304 G St.	Antloch	5	38.000119	-121.81636
	Bidwell Continuation High School	800 Gary Ave.	Antioch	5	38,000087	-121.792597
	Antioch High School	700 W. 18th St.	Antloch	5	38,008321	-121.81593
	Live Oak Hi h School	1708 F St.	Antloch	5	38,005615	-121.81306
	Antioch Middle School	1500 D St.	Antioch	5	38,005883	-121.81297
	How Down Catholic Cathori	1413 F. St.	Antioch	5	38.007605	-121.812210
	Kimball Flomentary	1210 Aumet Mon	Antioch	5 5	38,007549	38,007549 -121,804934
	Antioch Charter Academic	222E Hodenda Was	Anthorn	5 8	38.007834	USTUBLIZE-
	Antioch Charter Academy II	1201 W 10th St	Antioch	5 5	99 000040	9900000 121- 020000 00
	Prospects High School	820 W. 2nd St.	Antioch	5 5	38.047147	-121 84670
	Antioch Unified School District	510 6.5t.	Antioch	5 2	38.014410	38 G144419 -121 814978
	First Bapitist Head Start	1203 W. 10th	Antioch	5 5	38.010821	-121 82480
	So B. Preschool	1201 W. 10th St.	Antioch	5	38,008856	-121.82260
	Vicky's Day Care & Preschool	84 Russell Dr.	Antitoch	CA	38,003103	-121.814156
	Ima_ination Academy Preschool	2032 Hillcrest Ave.	Antioch	Ą	38,001454	-121.788335
	Kids Clubs Preschool	800 Gary Ave.	Antioch	5	38.000246	-121.79185
	Maho any Way Kinder Care	2300 Mahogany Way	Antioch	5 3	38.003030	-121.83229
	Corner Christian Preschool	2800 Sunser in	Anthoch	5 5	97 00578R	-121.61546F-
	Harbour Light Preschool	1020 E. Trettallas Rd.	Antioch	5 5	37.898589	-121 7B143
	La Petite Academy of Antiocis	1350 E. Tregallas Rd.	Antioch	3	37,995521	-121.787375
	Los Medanos College	2700 E. Leland Rd.	Antioch	8	38.005430 -121.860328	-121 860328
	LUS INICURIOS CONCESO	Z/Uo E, Leidild NG.	Ahrmen	LA .	38.002	뒭

APPENDIX C ALOHA Background Data

APPENDIX C-1 Pinch Point Richmond #1

ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

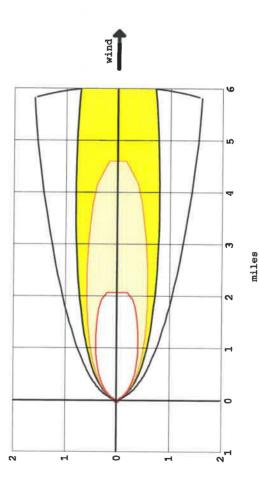
Chemical Name: AMMONIA

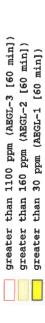
Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:

Model Run: Heavy Gas
Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])
Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])
Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

miles





Note: Threat zone picture is truncated at the 6 mile limit.

wind direction confidence lines

Source Strength (Release Rate)

ALOHA® 5.4.7

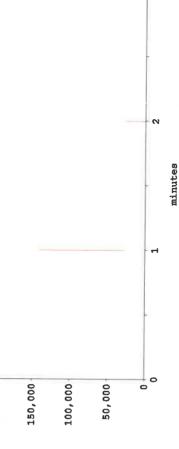
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: AMMONIA

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank Contains 11quid
Chemical Mass in Tank: 83.5 tons
Tank is 98% full
Chemical Mass in Tank: 83.5 tons
Chemical Paration: 2 minutes
Opening is 5 inches from tank bottom
Release Duration: 2 minute or more)
Max Average Sustained Release Rate: 140,000 pounds/min
(average over a minute or more)
Total Amount Released: 167,000 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

pounds/minute

200,000



Text Summary

SITE DATA:

ALOHA® 5.4.7

Location: RICHMOND, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:

Molecular Weight: 17.03 g/mol AEGL-2 (60 min): 160 ppm AEGL-3 (60 min): 1100 ppm 150000 ppm UEL: 280000 ppm CLemical Name: AMMONIA CAS Number: 7664-41-7 AEGL-1 (60 min): 30 ppm AEGL-2 (60 min): 160 ppm AEGL-IDLH: 300 ppm LEL: 150000 ppm UEL: 280000 ppm Ambient Boiling Point: -28.2 F Vapor Pressure at Ambient Temperature: greater than 1 atm Ambient Saturation Concentration: 1,000,000 ppm or 100.0\$

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA) Wind: 9 miles/hour from w at 3 meters Ground Roughness: urban or forest Alt Temperature: 95° F No Inversion Height

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50%

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical secaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank contains liquid
Tank contains liquid
Tank: 83.5 fons
Tank contains liquid
Circular Opening Diameter: 10 inches
Opening is 5 inches from tank bottom
Release Duration: 2 minutes
Max Average Sustained Release Rate: 140,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 167,000 pounds
Note: The chemical escaped as a mixture of gas and merosol (two phase flow).

THREAT ZONE:

Model Run: Heavy Gas

Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])

Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])

Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

foxic Threat Zone

ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:
Model Run: Heavy Gas
Model Run: Heavy Gas
1 469 yards --- (33000 ppm = AEGL-3 [60 min])
Orange: 611 yards --- (17000 ppm = AEGL-2 [60 min])
Yellow: 1142 yards --- (5500 ppm = AEGL-1 [60 min])

greater than 17000 ppm (AEGL-2 [60 min]) greater than 33000 ppm (AEGL-3 [60 min])

greater than 5500 ppm (ABGL-1 [60 min])

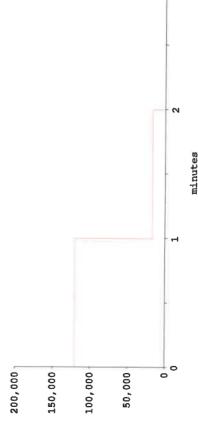
wind direction confidence lines

Source Strength (Release Rate)

ALOHA® 5.4.7

Tank Diameter in 66 feet Tank (not burning)
Tank Diameter: 10.66 feet Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank volume: 34397 gallons
Tank contains liquid
Chemical Mass in Tank: 68.1 tons
Tank contains liquid
Chemical Mass in Tank: 68.1 tons
Tank is 98% full
Circular Opening Diameter: 10 inches
Opening is 5 inches from tank bottom
Release Duration: 2 minutes
Max Average Sustained Release Rate: 120,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 136,200 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow). Time: July 18, 2019 1200 hours PDT (user specified) Chemical Name: PROPANE SOURCE STRENGIH:

pounds/minute







Location: RICHMOND, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:

Chemical Name: PROPANE

CAS Number: 74-98-6 Molecular Weight: 44.10 g/mol AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min): 33000 ppm

JULE: 2100 ppm LEL: 21000 ppm VEL: 95000 ppm Ambient Boiling Point: -43.7% F Vapor Pressure at Ambient Temperature: greater than 1 atm Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA) Wind: 9 miles/hour from w at 3 meters Ground Roughness: urban or forest Air Temperature: 85° F No Inversion Height

SOURCE STRENGTH:

Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Nameter: 10.66 feet
Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank volume: 34397 gallons
Tank contains liquid
Teak contains liquid
The contains liquid
To feet and the second second

rHREAT ZONE:
Wodel Run: Heavy Gas
Wodel Run: 469 yards --- (33000 ppm = AEGL-3 [60 min])
orange: 671 yards --- (17000 ppm = AEGL-2 [60 min])
Yellow: 1142 yards --- (5500 ppm = AEGL-1 [60 min])

Thermal Radiation Threat Zone

ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

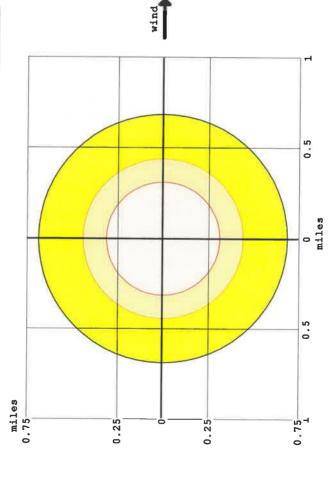
THREAT ZONE:

These Modeled: Thermal radiation from fireball

Red : 549 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)

Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)

Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)



greater than 10.0 kW/(sq m) (potentially lethal within 60 sec) greater than 5.0 kW/(sq m) (2nd degree burns within 60 sec) greater than 2.0 kW/(sq m) (pain within 60 sec)

Text Summary



SITE DATA:

Location: RICHMOND, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:

Chemical Name: PROPANE

CAS Number: 74-98-6
AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min): 33000 ppm

Inches 2100 ppm LEL: 21000 ppm UEL: 95000 ppm Amblent Boiling Point: -43.7° F
Vapor Pressure at Ambient Temperature: greater than 1 atm Amblent Saturation Concentration: 1,000,000 ppm or 100.0\$

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 9 miles/hour from w at 3 meters
Ground Roughiness: urban or forest
Air Temperature: 85° F
No Inversion Height

BLEVE of flammable liquid in horizontal cylindrical tank Tank Diameter: 10.66 feet Tank Length: 51.5 feet Tank Volume: 31397 gallons Tank contains liquid SOURCE STRENGIH:

Tank is 98% full Internal Storage Temperature: 85° F Chemical Mass in Tank: 68.1 tons Percentage of Tank Mass in Fireball: 100% Fireball Diameter: 251 yards

Burn Duration: 14 seconds

Threat Modeled: Thermal radiation from fireball

Red : 549 yards --- (10.0 kW/(sq m) - potentially lethal within 60 sec)

Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)

Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)



Time: July 18, 2019 1200 hours PDT (user specified)

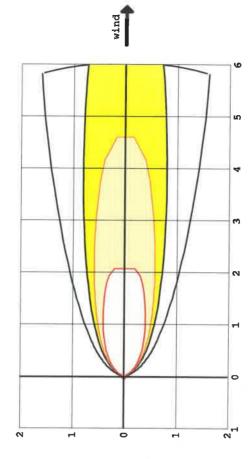
Chemical Name: AMMONIA

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:
Model Run: Heavy Gas
Model Run: Heavy Gas
Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])
Crange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])
Vellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

miles

Pinch Point Richmond #2 **APPENDIX C-2**



miles

greater than 1100 ppm (AEGL-3 [60 min]) greater than 160 ppm (AEGL-2 [60 min])

greater than 30 ppm (AEGL-1 [60 min])

wind direction confidence lines

Note: Threat zone picture is truncated at the 6 mile limit.

Source Strength (Release Rate)

ALOHA® 5.4.7

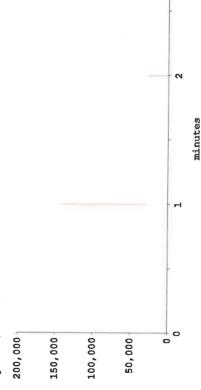
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: AMMONIA

SOURCE STRENGTH:

Control at the control of the contro

pounds/minute



Text Summary



Location: RICHMOND, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:

Chemical Name: AMMONIA

CAS Number: 7664-41-7

Molecular Weight: 17.03 g/mol

AEGI-2 (60 min): 160 ppm

AEGI-3 (60 min): 1100 ppm

LEI: 150000 ppm

Ambient Soliling Point: -28.2° F

Vapor Pressure at Ambient Temperature: greater than 1 atm

Ambient Saturation Concentration: 1,000,000 ppm or 100.0\$

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA) Wind: 9 miles/hour from w at 3 meters Ground Roughness: urban or forest Air Temperature: 85° F No Inversion Height

SOURCE STRENGTH:

Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Nameter: 10.66 feet
Tank Volume: 34397 gallons
Tank volume: 34397 gallons
Tank volume: 14397 gallons
Tank contains liquid
Chemical Mass in Tank: 83.5 tons
Tank appearature: 85 from tank bottom
Max Average Sustained Release Rate: 140,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 167,000 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

THREAT ZONE:

Model Run: Heavy Gas Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min]) Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min]) Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

ALOHA® 5.4.7

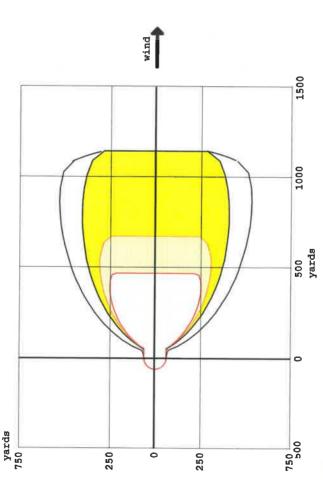
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:
Model Run: Heavy Gas
Red : 469 yards --- (17000 ppm = AEGL-3 [60 min])
Orange: 671 yards --- (17000 ppm = AEGL-2 [60 min])
Yellow: 1142 yards --- (5500 ppm = AEGL-1 [60 min])





greater than 33000 ppm (AEGL-3 [60 min]) greater than 17000 ppm (AEGL-2 [60 min]) greater than 5500 ppm (AEGL-1 [60 min])

wind direction confidence lines

Source Strength (Release Rate)

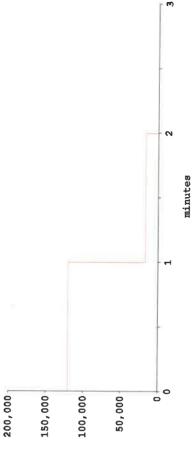


Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 3437 gallons
Tank contains liquid
Chemical Mass in Tank: 68.1 tons
Tank is 98 full
Circular Opening Diameter: 10 inches
Opening is 5 inches from tank bottom
Release Duration: 2 minutes
Max Average Sustained Release Rate: 120,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 136,200 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

pounds/minute



Text Summary

ALOHA® 5.4.7

Location: RICHMOND, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE CHEMICAL DATA:

CAS Number: 74-99-6 Molecular Weight; 44.10 g/mol AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min):

33000 ppm
IDLH: 2100 ppm
IDLH: 2100 ppm
LEL: 21000 ppm
Tablent Boiling Point: -43.78 F
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.08

NIMOSPHERIC DATA: (MANUAL INPUT OF DATA)

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% Wind: 9 miles/hour from w at 3 meters Ground Roughness: urban or forest Alt Temperature: 859 F No Inversion Height

OURCE STRENGTH:

Volkes Interval to the Amount Released: 120,000 pounds |

Note: The Amount Released: 136,200 pounds |

Total Amount Released: 136.20 pounds |

Total Amount Released: 136,200 pounds |

Total Amount Released: 136,200 pounds |

Tank from horizontal mass in Tank: 66.1 tons |

Tank total Amount Released: 136,200 pounds |

Tank is 98% full |

Tank is

THREAT ZONE:

Model Run: Heavy Gas
Red : 469 yards --- (33000 ppm = AEGL-3 [60 min])
Orange: 671 yards --- (17000 ppm = AEGL-2 [60 min])
Yellow: 1142 yards --- (5500 ppm = AEGL-1 [60 min])

Thermal Radiation Threat Zone



Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:

Threat Modeled: Thermal radiation from fireball

Red : 549 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)

Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)

Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)

wind miles 0.25 0.25 greater than 10.0 kW/(sg m) (potentially lethal within 60 sec) greater than 5.0 kW/(sq m) (2nd degree burns within 60 sec)

miles

0.75

greater than 2.0 kW/(sq m) (pain within 60 sec)

Text Summary



SITE DATA:

Location: RICHMOND, CALIFORNIA

Building Air Exchanges Per Hour: 0.85 (unsheltered single storied)

Time: July 18, 2019 1200 hours PDT (user specified)

Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:
Chemical Name: PROPANE

CAS Number: 74-98-6

ARGI-1 (60 min): 5500 ppm ARGI-2 (60 min): 17000 ppm ARGI-3 (60 min):

IDIM: 2100 ppm

Amblent Boiling Point: 43.7° F

Vapor Pressure at Amblent Temperature: greater than 1 atm

Amblent Saturation Concentration: 1,000,000 ppm or 100.0\$

ATMOSPHERIC DATA: (WANUAL INPUT OF DATA)

Whind: 9 miles/hour from w at 3 meters

Ground Roughness: urban or forest

Air Temperature: 85° F

Relative Humidity: 50\$

APPENDIX C-3
Pinch Point Martinez #3

Threat Modeled: Thermal radiation from fireball

Red : 549 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)
Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)
Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)

THREAT ZONE:

Internal Storage Temperature: 85° F
Chemical Mass in Tank: 68.1 tons
Percentage of Tank Mass in Fireball: 100\$
Fireball Diameter: 251 yards
Burn Duration: 14 seconds

BLEVE of flammable liquid in horizontal cylindrical tank
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank contains liquid

ALOHA® 5.4.7

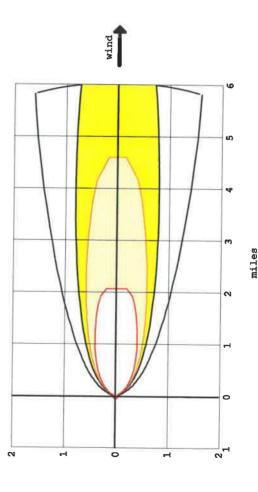
Time: July 18, 2019 1200 hours PDT (user specified)

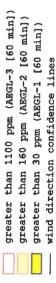
Chemical Name: AMMONIA

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:
Model Run: Heavy Gas
Model Run: Heavy Gas
Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])
Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])
Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

miles





Note: Threat zone picture is truncated at the 6 mile limit.

Source Strength (Release Rate)

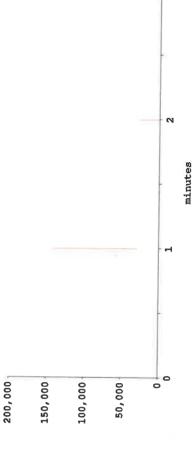


Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: AMMONIA

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank Contains liquid
Chemical Mass in Tank: 83.5 tons
Tank contains liquid
Chemical Mass in Tank: 83.5 tons
Tank is 98% full
Circular Opening blameter: 10 inches
Opening is 5 inches from tank bottom
Release Duration: 2 minutes
Max Average Sustained Release Rate: 140,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 167,000 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

pounds/minute



ALOHA® 5.4.7

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Text Summary
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CAS Number: 7664-41-7

Molecular Weight: 17.03 g/mol
AEGL-1 (60 min): 30 ppm AEGL-2 (60 min): 160 ppm AEGL-3 (60 min): 1100 ppm
IDLH: 300 ppm AEGL-3 (60 min): 1100 ppm
Ambient Boiling Point: -28.28
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0\$ Under Sirguscian:

Just from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Flammable chemical escaping from tank (not burning)
Flammable chemical solution and salidated in the state of the state in Location: WARTINE2, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified) Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% Model Run: Heavy Gas
Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])
Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])
Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min]) ALMOSPHERIC DATA: (WANUAL INPUT OF DATA) Wind: 9 miles/hour from w at 3 meters Ground Roughness: urban or forest Air Temperature: 85 F No Inversion Height Chemical Name: AMMONIA OURCE STRENGTH: CHEMICAL DATA: HREAT ZONE: SITE DATA:

Toxic Threat Zone



Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:
Model Run: Heavy Gas
Red : 469 yards --- (17000 ppm = AEGL-3 [60 min])
Orange: 671 yards --- (17000 ppm = AEGL-2 [60 min])
Yellow: 1142 yards --- (5500 ppm = AEGL-1 [60 min])

greater than 17000 ppm (AEGL-2 [60 min]) greater than 33000 ppm (AEGL-3 [60 min]) greater than 5500 ppm (AEGL-1 [60 min])

wind direction confidence lines

Source Strength (Release Rate)

ALOHA® 5.4.7

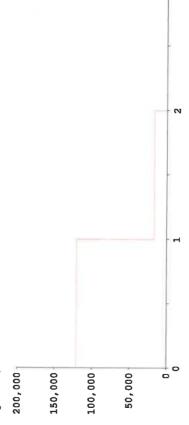
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

SOURCE STRENGTH:

Tank Diameter: 10.66 feet
Tank Jameter: 10.66 feet
Tank Volume: 34397 gallons
Tank Contains liquid
Chemical Mass in Tank; 68.1 tons
Tenk contains liquid
Chemical Mass in Tank; 68.1 tons
Tenk contains liquid
Circular Opening Diameter: 10 inches
Opening 18 5 inches from tank bottom
Release Duration: 2 minutes
Max Average Sustained Release Rate: 120,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 136,200 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

pounds/minute



minutes

ext Summary

ALOHA® 5.4.7

SITE DATA: Location: MARTINEZ, CALIFORNIA

Building Air Exchanges Fer Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE CHEMICAL DATA:

CAS Number: 74-99-6 Molecular Weight: 44.10 g/mol AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min):

33000 ppm IDLH: 2100 ppm LEL: 21000 ppm UEL: 95000 ppm Ambient Boiling Point: -43.78 F Vapor Pressure at Ambient Temperature: greater than 1 atm Ambient Saturation Concentration: 1,000,000 ppm or 100.08

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 9 miles/hour from w at 3 meters
Ground Roughness: urban or forest
Air Temperature: 85° F
No Inversion Height

SOURCE STRENGTH:

Tank Diameter in 66 feet
Tank Diameter in 66 feet
Tank Diameter in 66 feet
Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank Contains liquid
The contains liquid
Tank Length: 51.5 feet
Tank Length: 51.5 feet
Tank Length: 51.5 feet
Tank Contains liquid
Tank Length: 51.5 feet

THREAT ZONE:
Model Run: Heavy Gas
Model Run: Heavy Gas
Red : 469 yards --- (17000 ppm = AEGL-3 [60 min])
Orange: 671 yards --- (17000 ppm = AEGL-2 [60 min])
Yellow: 1142 yards --- (5500 ppm = AEGL-1 [60 min])

Thermal Radiation Threat Zone

ALOHA® 5.4.7

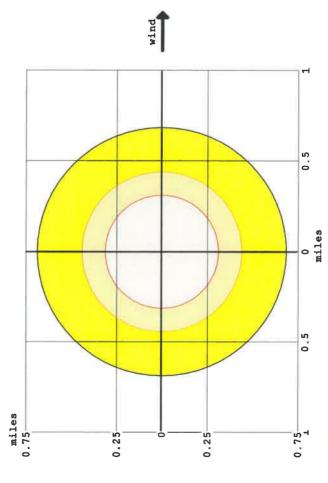
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:

Threat Modeled: Thermal radiation from fireball
Threat Modeled: Thermal radiation from fireball
Threat 15.9 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)
Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)
Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)



greater than 10.0 kW/(sg m) (potentially lethal within 60 sec) greater than 5.0 kW/(sq m) (2nd degree burns within 60 sec) greater than 2.0 kW/(sq m) (pain within 60 sec)

Text Summary



SITE DATA:

Location: MARTINEZ, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:

Chemical Name: PROPANE

CAS Number: 74-98-6 AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min):

33000 ppm

JULY: 2100 ppm LEL: 21000 ppm UEL: 95000 ppm Amblent Boiling Point: -43.7° F
Vapor Pressure at Ambient Temperature: greater than 1 atm Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

Stability Class: D Relative Humidity: 50% Cloud Cover: 5 tenths AUMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 9 miles/hour from w at 3 meters
Ground Roughness: urban or forest
Air Temperature: 85° F
No Inversion Height

SOURCE STRENGTH:

BIEVE of flammable liquid in horizontal cylindrical tank Tank Diameter: 10.66 feet Tank Length: 51.5 feet Tank Volume: 34397 gallons Tank contains liquid

Tank is 98% full Internal Storage Temperature: 85° F Chemical Mass in Tank: 68.1 tons Percentage of Tank Mass in Fireball: 100* Fireball Diameter: 251 yards Bur

Burn Duration: 14 seconds

THREAT ZONE:

Threat Modeled: Thermal radiation from fireball Red : 549 yards --- (10.0 kW/(sq m) - potentially lethal within 60 sec) Ocange: 775 yards --- (5.0 kW/(sq m) - 2nd degree burns within 60 sec) Yellow: 1206 yards --- (2.0 kW/(sq m) - pain within 60 sec)



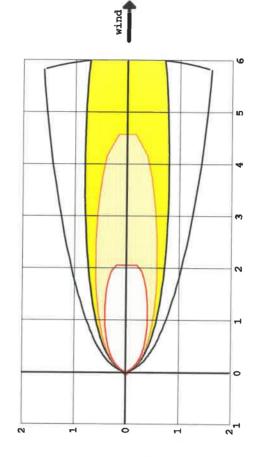
Time: July 18, 2019 1200 hours PDT (user specified)

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:
Model Run: Heavy Gas
Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])
Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])
Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

miles

Pinch Point Bay Point #4 APPENDIX C-4



miles

greater than 1100 ppm (AEGL-3 [60 min]) greater than 160 ppm (AEGL-2 [60 min])

greater than 30 ppm (AEGL-1 [60 min]) wind direction confidence lines

Note: Threat zone picture is truncated at the 6 mile limit.

Chemical Name: AMMONIA

Source Strength (Release Rate)

ALOHA® 5.4.7

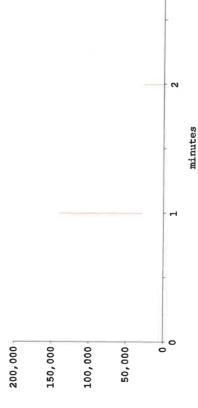
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: AMMONIA

SOURCE STRENGTH:

Care from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank volume: 34397 gallons
Tank contains liquid
Teank 18 98 full
Tank 18 full
Tank 18 98 full
Tank 18 98

pounds/minute



Text Summary



Location: BAY POINT, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:

Chemical Name: AMMONIA

CAS Number: 7664-41-7

CAS Number: 7664-41-7

CAS Number: 7664-41-7

ARGL-1 (60 min): 30 ppm

ARGL-2 (60 min): 160 ppm

ARGL-3 (60 min): 1100 ppm

IDIA: 300 ppm

Ambient Boiling Point: -28.3* F

Vapor Pressure at Ambient Temperature: greater than 1 atm

Ambient Saturation Concentration: 1,000,000 ppm or 100.0*

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA) Wind: 9 miles/hour from w at 3 meters Ground Roughness: urban or forest Air Temperature: 85° F No Inversion Height

Internal Temperature: 858 Tank is 98% full SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank contains liquid
Chemical Mass in Tank: 83.5 tons
Circular Opening Diameter: 10 inches
Opening is 5 inches from tank bottom
Release Duration: 2 minutes

Max Average Sustained Release Rate: 140,000 pounds/min (average Sustained Released: 167,000 pounds Total Amount Released: 167,000 pounds Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

Model Run: Heavy Gas Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min]) Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min]) Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

ALOHA® 5.4.7

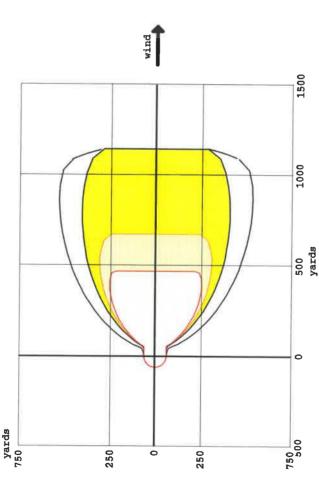
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Toxic Threat Zone

Wind: 9 miles/hour from w at 3 meters





greater than 33000 ppm (AEGL-3 [60 min]) greater than 17000 ppm (AEGL-2 [60 min]) greater than 5500 ppm (AEGL-1 [60 min])

wind direction confidence lines

Source Strength (Release Rate)

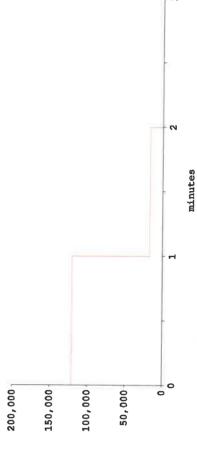
ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable ofhemical escaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank Contains 14941d
Chemical Mass in Tank: 68.1 tons
Chemical Mass in Tank: 68.1 tons
Chemical Mass in Tank: 61.1 tons
Chemical Mass in Tank: 62.1 tons
Release Duration: 7 minutes
Max Average Sustained Release Rate: 120,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 136,200 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

pounds/minute



Text Summary

ALOHA® 5.4.7

Location: BAY POINT, CALIFORNIA
Building Air Exchanges Per Hour: 0.85 (unsheltered single storied)
Time: July 18, 2019 1200 hours PDT (user specified) Chemical Name: PROPANE CAS Number: 74-98-6 CHEMICAL DATA:

CAS Number: 74-98-6 Molecular Weight: 44.10 g/mol ARGI-1 (60 min): 5500 ppm ARGI-2 (60 min): 17000 ppm ARGI-3 (60 min): JULE 2100 ppm LEL: 21000 ppm UEL: 95000 ppm Ambient Boiling Point: -43.96 F
Vapor Pressure at Ambient Temperature: greater than 1 atm Ambient Saturation Concentration: 1,000,000 ppm or 100.08

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 9 miles/hour from w at 3 meters
Ground Roughness: urban or forest
Air Temperature: 85° F
No Inversion Height

SOURCE STRENGTH:

Tank Valuate: 10.66 feet
Tank Valuate: 10.66 feet
Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank Contains liquid
Chemical Mass in Tank: 68.1 tons
Tank topening Diameter: 10 inches
Opening is 5 inches from tank bottom
Release Duration: 2 minutes
Max Average Sustained Release Rate: 120,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 136,200 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

Model Run: Heavy Gas Red : 468 yards --- (33000 ppm = AEGL-3 [60 min]) Orange: 671 yards --- (17000 ppm = AEGL-2 [60 min]) Yellow: 1142 yards --- (5500 ppm = AEGL-1 [60 min]) "HREAT ZONE:

Thermal Radiation Threat Zone

ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

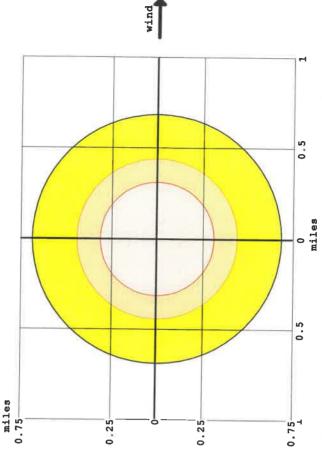
Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:

Threat Modeled: Thermal radiation from fireball

Red : 549 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)
Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)
Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)



greater than 10.0 kW/(sq m) (potentially lethal within 60 sec) greater than 5.0 kW/(sg m) (2nd degree burns within 60 sec) greater than 2.0 kW/(sq m) (pain within 60 sec)

Text Summary

SITE DATA:

ALOHA® 5.4.7

Incation: BAY POINT, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA:
Chemical Name: PROPANE
CAS Number: 74-98-6
AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min):

33000 ppm
ILEL: 21000 ppm
Ambient Boiling Point: -43.9° F
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0\$

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 9 miles/hour from w at 3 meters
Ground Roughness: urban or forest
Alr Temperature: 85° F
No Inversion Reight

Burn Duration: 14 seconds SOURCE STRENGTH:

BLEVE of flammable liquid in horizontal cylindrical tank
Tank Diameter: 10.66 feet
Tank Diameter: 10.66 feet
Tank Contains liquid
Internal Storage Temperature: 85° F
Chemical Mass in Tank: 68.1 tons
Percentage of Tank Mass in Fireball: 100‡
Fireball Diameter: 251 yards
Burn Duration: 14 secon

THREAT ZONE:
Threat Modeled: Thermal radiation from fireball
Red : 549 yards --- (10.0 kW//sg m) = potentially lethal within 60 sec)
Grange: 775 yards --- (5.0 kW//sg m) = 2nd degree burns within 60 sec)
Yellow: 1206 yards --- (2.0 kW/(sg m) = pain within 60 sec)

Pinch Point Antioch #5 APPENDIX C-5

ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

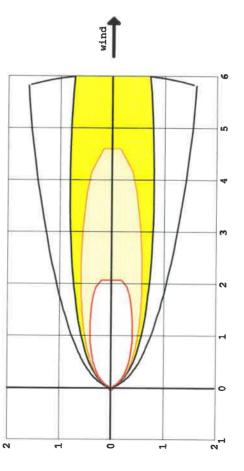
Chemical Name: AMMONIA

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:

Model Run: Heavy Gas
Wodel Run: Heavy Gas
Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])
Orange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])
Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min])

miles



miles

greater than 1100 ppm (AEGL-3 [60 min]) greater than 160 ppm (AEGL-2 [60 min])

greater than 30 ppm (AEGL-1 [60 min])

Note: Threat zone picture is truncated at the 6 mile limit. wind direction confidence lines



Source Strength (Release Rate)

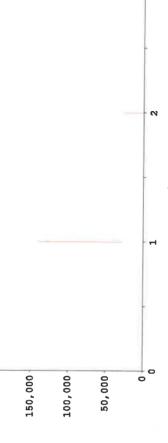
Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: AMMONIA

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank Contains liquid
Chemical Mass in Tank: 83.5 tons
Tank is 98% full
Chemical Mass in Tank: 83.5 tons
Release Duration: 2 minutes
Max Average Sustained Release Rate: 140,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 167,000 pounds
Note: The Chemical escaped as a mixture of gas and aerosol (two phase flow).

pounds/minute

200,000



minutes

SITE DATA:

ALOHA® 5.4.7

```
Text Summary
```

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical secaping from tank (not burning)
Tank Diameter: 10.66 feet
Tank Volume: 3437 gallons
Tank contains liquid
Tank contains liquid
Chemical Mass in Tank: 83.5 tons
Chemical Mass in Tank: 83.5 tons
Chemical Pass in Tank: 83.5 tons
Chemical Pass in Tank: 83.5 tons
Chemical Spaning CAS Number: 7664-41-7
AEGL-1 (60 min): 30 ppm AEGL-2 (60 min): 160 ppm AEGL-3 (60 min): 1100 ppm AEGL-1 (60 min): 150000 ppm UEL: 280000 ppm UEL: 280000 ppm Ambient Boiling Point: -28.28 F Location: ANTIOCH, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unsheltered single storied) Time: July 18, 2019 1200 hours PDT (user specified) Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% Model Run: Heavy Gas
Red : 2.1 miles --- (1100 ppm = AEGL-3 [60 min])
Crange: 4.6 miles --- (160 ppm = AEGL-2 [60 min])
Yellow: greater than 6 miles --- (30 ppm = AEGL-1 [60 min]) ITMOSPHERIC DATA: (MANUAL INPUT OF DATA) Wind: 9 miles/hour from w at 3 meters Ground Roughness: urban or forest ArI Temporature: 85° F No Inversion Height Chemical Name: AMMONIA CHEMICAL DATA:

Threat Zone



Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:
Model Run: Heavy Gas
Model Run: Heavy Gas --- (33000 ppm = AEGL-3 [60 min])
Red : 469 yards --- (17000 ppm = AEGL-2 [60 min])
Orange: 671 yards --- (5500 ppm = AEGL-1 [60 min])

greater than 17000 ppm (AEGL-2 [60 min]) greater than 33000 ppm (AEGL-3 [60 min])

greater than 5500 ppm (AEGL-1 [60 min])

wind direction confidence lines

Source Strength (Release Rate)

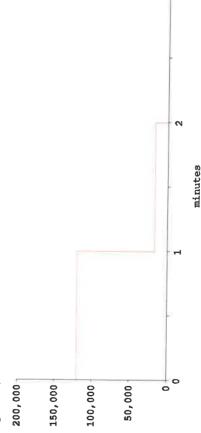
ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

Chemical Name: PROPANE

SOURCE STRENGTH:
Leak from hole in horizontal cylindrical tank
Flammable chemical escaping from tank (not burning)
Tank Volume: 34397 gallons
Tank Volume: 34397 gallons
Tank Contains liquid
Chemical Mass in Tank: 68.1 tons
Tank contains liquid
Chemical Mass in Tank: 68.1 tons
Tank tis 98% full
Chemical Sinches from tank bottom
Release Duration: 2 minutes
Max Average Sustained Release Rate: 120,000 pounds/min
(averaged over a minute or more)
Total Amount Released: 136,200 pounds
Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

pounds/minute



Text Summary

ALOHA® 5.4.7

Location: ANTIOCH, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unshaltered single storied) Time: July 18, 2019 1200 hours PDT (user specified)

CHEMICAL DATA: Chemical Name: PROPANE

CAS Number: 74-99-6 AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min):

33000 ppm IDLH: 2100 ppm LEL: 21000 ppm UEL: 95000 ppm Ambient Boiling Point: -43.7° F Vapor Pressure at Ambient Temperature: greater than 1 atm Ambient Saturation Concentration: 1,000,000 ppm or 100.0\$

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50% ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
Wind: 9 miles/hour from w at 3 meters
Ground Roughness: urban or forest
Alr Temperature: 85° F
No Inversion Height

SOURCE STRENGTH:

Volume: 34397 gallons
Tank Contains 14397 gallons
Tank contains 14307 gallons
Tank contains 14307 gallons
Tank is 98% full
Tank is 98

Model Run: Heavy Gas Red : 469 Yards --- (33000 ppm = ARGL-3 [60 min]) Orange: 671 yards --- (17000 ppm = ARGL-2 [60 min]) Yellow: 1142 yards --- (5500 ppm = ARGL-1 [60 min])

Thermal Radiation Threat Zone

ALOHA® 5.4.7

Time: July 18, 2019 1200 hours PDT (user specified)

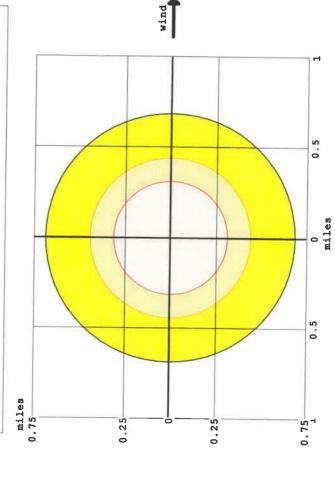
Chemical Name: PROPANE

Wind: 9 miles/hour from w at 3 meters

THREAT ZONE:

Threat Modeled: Thermal radiation from fireball

Red : 549 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)
Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)
Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)



greater than 10.0 kW/(sq m) (potentially lethal within 60 sec) greater than 5.0 kW/(sq m) (2nd degree burns within 60 sec) greater than 2.0 kW/(sq m) (pain within 60 sec)

Fext Summary



Location: ANTIOCH, CALIFORNIA Building Air Exchanges Per Hour: 0.85 (unshaltered single storied) Time: July 18, 2019 1200 hours PDI (user specified)

CHEMICAL DATA:
Chemical Name: PROPANE
CAS Number: 74-98-6
AEGL-1 (60 min): 5500 ppm AEGL-2 (60 min): 17000 ppm AEGL-3 (60 min):

33000 ppm
IDLM: 2100 ppm
LEL: 21000 ppm
Ambient Boiling Point: -43.7* F
Vapor Pressure at Ambient Temperature: greater than 1 atm
Ambient Saturation Concentration: 1,000,000 ppm or 100.0\$

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA) Wind: 9 miles/hour from w at 3 meters Ground Roughess: urban or forest Air Temperature: 85° F No Inversion Height

Cloud Cover: 5 tenths Stability Class: D Relative Humidity: 50%

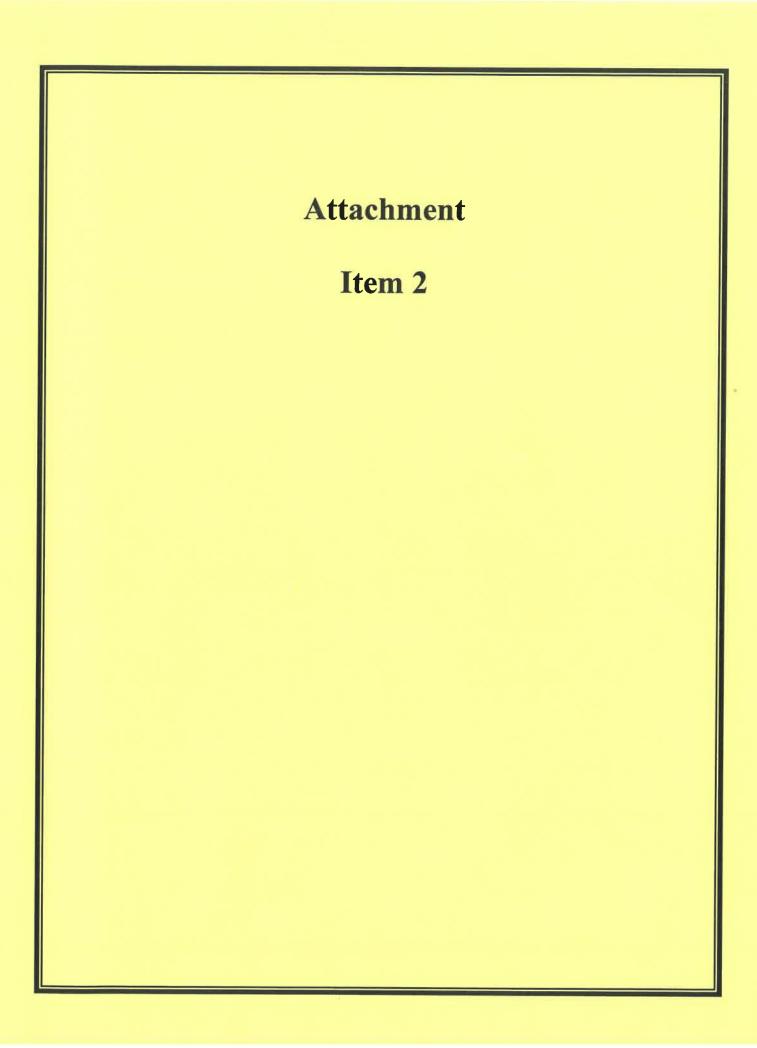
SOURCE STRENGTH:

BIEVE of flammable liquid in horizontal cylindrical tank
Tank Diameter: 10.66 feet
Tank Volume: 34397 gallons
Tank contains liquid
Internal Storage Temperature: 85° F
Chemical Mass in Tank: 68.1 tons
Percentage of Tank Mass in Fireball: 100*
Fireball Diameter: 251 yards
Burn Duration: 14 secon

Burn Duration: 14 seconds

Threat Modeled: Thermal radiation from fireball

Red : 549 yards --- (10.0 kW/(sq m) = potentially lethal within 60 sec)
Orange: 775 yards --- (5.0 kW/(sq m) = 2nd degree burns within 60 sec)
Yellow: 1206 yards --- (2.0 kW/(sq m) = pain within 60 sec)



Proposed County Legislative Platform General Principle Statements from Planning and Policy Development Committee – January 15, 2020

Exposure

- 1) Support legislative efforts to reduce or eliminate lead and toxic substances in consumer products, particularly those used by infants and children.
- 2) Support legislative efforts to reduce exposure to toxic air pollutants and reduction of greenhouse gases.

Land Use

- 3) Support legislative efforts to evaluate, clean up and redevelop contaminated sites.
- 4) Support legislative efforts that address the illegal dumping of household hazardous wastes through incentives and enforcement.

Pipeline Safety

5) Support legislative efforts that increase the safety of the shipment of hazardous materials by pipeline through better monitoring, detection, operational practices and equipment.

School Siting

6) Support legislative efforts that reduce the risk to students from the accidental release of hazardous materials by requiring risk assessments that account for all sources of hazardous materials as part of school siting and re-building decisions.

Goods Movement

7) Support legislative efforts to increase and improve waterborne transportation of goods when it increases safety.

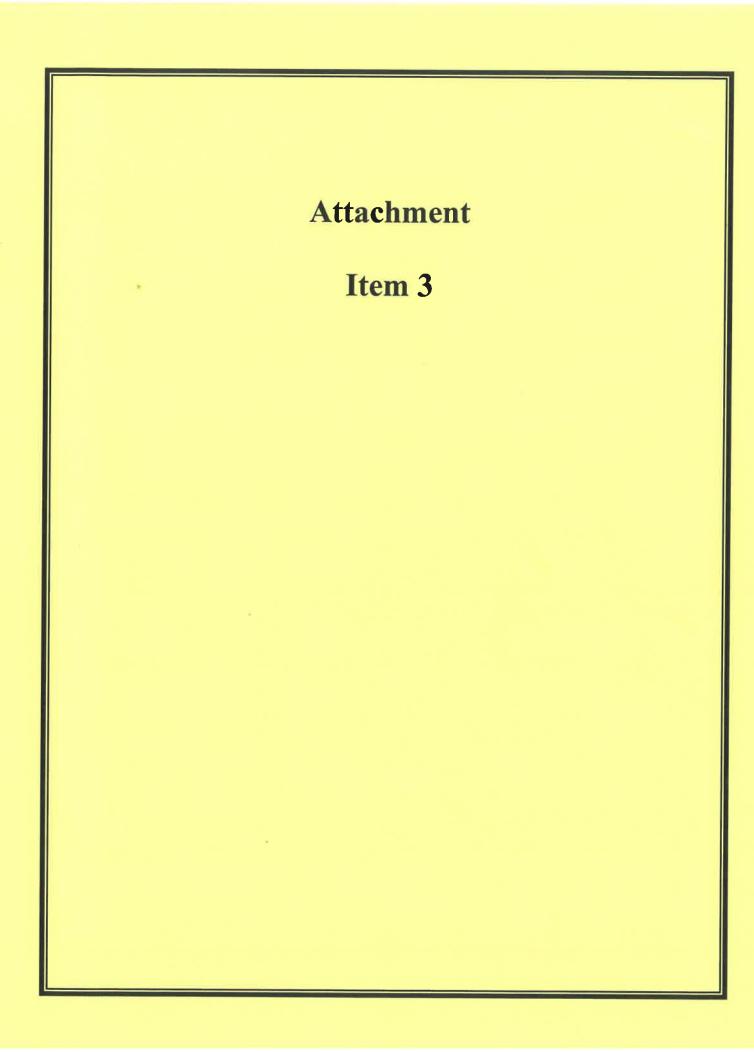
Rail Safety

8) Support legislative efforts that improve the safety of the shipment of hazardous materials by rail through training for local first responders, increased sharing of data, reduction of material hazards, and appropriate speed limits.

Waste Management

9) Support legislative efforts that establish producer responsibility for management at the end of their useful life of products, including pharmaceuticals, batteries, sharps and veterinary medicine.

- 10) Support legislative efforts to allow third parties, under specific circumstances and conditions, to collect and transport household hazardous waste to collection facilities.
- 11) Support legislative efforts that reduce the amount of harmful pharmaceuticals (including veterinary medicine) that ultimately enter waste water treatment facilities, bodies of water, and landfills.



2019 State Legislative Platform

Health Care

- 112.SUPPORT legislative efforts to reduce or eliminate lead and toxic substances in consumer products, particularly those used by infants and children.
- 113. SUPPORT legislative efforts to reduce exposure to toxic air pollutants and the reduction of greenhouse gases.

Land Use/Community Development

224. SUPPORT efforts to promote economic incentives for "smart growth," in Priority Development and Priority Production Areas including in-fill and transit-oriented development. Balancing the need for housing and economic growth with the urban limit line requirements of Measure J (2004) will rely on maximum utilization of "smart growth" and Sustainable Community Strategy principles. Priority Production Areas are locally designated zones where manufacturing, warehousing, distribution and repair services would be a priority consideration in determining future land use.

246. SUPPORT legislation that funds programs to remediate brownfield sites in the County and modifies
existing programs to make implementation easier or apply more broadly. Specifically:
☐ Consider modification to the Cleanup Loans and Environmental Assistance to Neighborhoods
(CLEAN) program that would simply the approval process for applications;
☐ Broaden the criteria for sites that are eligible for California Land Reuse and Revitalization Act
(CLRRA) to include all sites that are listed by the State or Federal Government as contaminated; and
☐ Fully fund the California Recycle Underutilized Sites (CALReUse) program.

Law and Justice System

248. SUPPORT legislation that provides a practical and efficient solution to addressing the problem of abandoned and trespassing vessels and ground tackle in an administrative process that allows the California State Lands Commission to both remove and dispose of such vessels and unpermitted ground tackle. Boat owners in increasing numbers are abandoning both recreational and commercial vessels in areas within the Commission's jurisdiction. Our state waterways are becoming clogged with hulks that break up, leak, sink and add pollutants to our waterways and marine habitat.

Pipeline Safety

267. SUPPORT legislation that contains specific mitigations or solutions for installation of Automatic Shutoff Valves for both High Consequence Areas (HCA) and for those that transverse Active Seismic Earthquake Faults for all intrastate petroleum pipelines. State Fire Marshal Annual Inspections of all Intrastate Petroleum Pipelines do not contain the specific mitigations or solutions for installation of Automatic Shutoff Valves for both High Consequence Areas (HCA) and for those that traverse Active Seismic Earthquake Faults that are mandated for Gas Pipelines under AB 2856. The County has several petroleum pipelines that should be classified under these categories and present the same explosive nature as gas pipelines do.

268. SUPPORT legislation that contains specific language for protection of all seasonal and all year creeks and all State Waterways where petroleum pipelines are present. New and replacement pipelines near environmentally and ecologically sensitive areas should use the best available technology including, but not limited to, the installation of leak detection technology, automatic shutoff systems or remote controlled sectionalized block valves, or any combination of these technologies to reduce the amount of oil released in an oil spill to protect state waters and wildlife.

Transportation

278. SUPPORT efforts to coordinate planning between school districts, the state, and local jurisdictions for the purposes of: (1) locating and planning new schools, (2) funding programs that foster collaboration and joint use of facilities, and (3) financing off-site transportation improvements for improved access to existing schools. The County will urge the California Department of Education's current Title 5 update effort to include removing the current conflict between current school siting policies and sustainable communities. Related to this effort, the County supports reform of school siting practices by way of legislative changes related to any new statewide school construction bond authorization. The County takes the position that reform components should include bringing school siting practices and school zone references in the vehicle code into alignment with local growth management policies, safe routes to school best practices, State SB 375 principles, and the State Strategic Growth Council's "Health in All Policies Initiative." The County will also urge DOE's current Title 5 update effort to apply the requirements of Title 5, as they pertain to evaluating the risks from hazardous materials, to schools being rebuilt on the site of existing schools and to charter schools, and to include the evaluation of risks from hazardous materials potentially released from nearby industrial facilities due to fire, explosions or accidental releases to school siting criteria. Related to this, the County supports the development of guidelines for assessing and mitigating the risks of siting new schools near industrial facilities and rail lines due to potential explosions and fires from the use, storage, manufacture and transportation of hazardous materials, similar to the guidelines they have established for assessing and mitigating the risks from the transportation of hazardous materials through pipelines. State financial and/or technical support to offset the cost of adhering to new guidelines or requirements should be provided.

280. SUPPORT efforts to increase waterborne transport of goods and obtaining funds to support this effort. The San Francisco to Stockton Ship Channel is a major transportation route for the region, providing water access to a large number of industries and the Ports of Sacramento and Stockton. A project is underway to deepen the channel, providing additional capacity to accommodate increasing commerce needs of the Ports and providing better operational flexibility for the other industries. Increased goods movement via waterways has clear benefits to congestion management on highways and railroads (with resultant air quality benefits).

281. SUPPORT legislative and administrative measures to enhance rail safety, increase state oversight of railroad bridges, provide funding for the training of first responders, and implement regulations that increase tank car safety standards for cars transporting crude oil and other hazardous materials, and regulations that require railroads to share data with state emergency managers and local responders.

Waste Management

288. SUPPORT legislation that establishes producer responsibility for management at the end of their useful life of products, including pharmaceuticals, batteries, sharps and veterinary medicine.

290. SUPPORT legislative and regulatory efforts to allow third parties, under specific circumstances and conditions, to collect and transport household hazardous waste to collection facilities.

295. SUPPORT legislation that can reduce the amount of harmful pharmaceuticals (including veterinary medicine) that ultimately enter waste water treatment facilities, bodies of water, and landfills.

June 25 recs to Board

- 1) Support federal legislation that improves leak detection systems in pipelines.
- 2) Support federal legislation that requires pipeline operators to contract for an independent technical seismic vulnerability study on HCA pipelines affected by potentially active faults to feed into the pipeline risk analysis, and make the study available to the public.

Attachment Item 4



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Executive Summary

Contra Costa County's Industrial Safety Oxolinance (ISO), adopted in 1998 by the Board of Supervisors, requires regulated facilities in the county to implement comprehensive safety programs to prevent chemical accidents. The ISO's requirements are some of the most stringent in the United States, if not the world. The goal is for facilities to implement comprehensive safety programs, instill a safety culture at the work place and create management systems that prevent incidents that could have detrimental impacts to surrounding communities. The ISO also mandates outreach and participation from industries, agencies, elected officials and the public.

Three major oil refineries and three chemical facilities are required to comply with ISO requirements. Two facilities (one refinery and one chemical plant) within the City of Richmond are required to comply with the Richmond Industrial Safety Ordinance (RISO), which mandates the same requirements from a separate municipal authority. Both ordinances are administered by Contra Costa County's Hazardous Materials Programs (CCHMP), a division of Contra Costa Health Services. CCHMP annually evaluates and reports on ISO performance to the Board of

There were no Major Chemical Accidents or Releases (MCAR) as defined in the ISO at any regulated facility in this reporting period and, while there have been Community Warning System (CWS) Level II and CWS Level III incidents that caused community concern over the past two decades, there is an overall observable trend of fewer and less severe incidents in the county. CCHMP believes that ISO is a major contributor to the safety records of these

It can be a challenge to stay vigilant and ensure continuous safe facility operations in mature prevention programs, but recent amendments to program requirements have helped the ISO and RISO programs continue to improve the thoroughness and completeness of audits and inspections. In 2014, for example, the Board of Supervisors adopted amendments to the ISO as recommended by the U.S. Chemical Safety and Hazard Investigation Board (CSB). In 2015, CCHMP staff piloted procedure walk-downs and field verifications of Piping and Instrumentation Diagrams (PRIDs) at ISO facilities. These field activities have since been incorporated into the audit activities at other hazardous materials regulated facilities.

CCHMP also worked closely with Department of Industrial Relations (DIR), California Office of Emergency Services (Cal OES) and California Environmental Protection Agency (CalEPA) to develop two new, statewide petroleum refinery safety regulations: The California Accidental Release Prevention Program (Program 4) and the Process Safety Management requirement for Petroleum Refineries. Both were developed from requirements in Contra Costa's ISO and were adopted into regulation by the state in October 2017. CCHMP believes these new regulations will further improve safety programs at all California petroleum refineries as demonstrated here in Contra Costa County. CCHMP is also working closely with other Certified Unified Program Agencies (CUPA) in the development and implementation of these regulations for refineries.

CCHMP's Accidental Release Prevention (ARP) Program engineers oversee the ISO and RISO programs and work with other agencies such as the U.S. Environmental Protection Agency (EPA), the California Occupational Safety and Health Administration (Cal-OSHA), CSB and other local program agencies. This Interagency collaboration includes sharing of incident and inspection results, discussion of regulatory interpretations and joint training.

Public Participation

CCHMP has an established public outreach process and is continually looking for ways to improve it. The following community engagement efforts took place in this reporting period:

- Public outreach information booths at existing venues
- Safety audits for Shell Martinez Refinery, Air Products Shell and Air Products Marathon Martinez Refinery
 were shared at Alhambra Christmas Tree Farm, Martinez, During National Night Out, August 6, 2019
 - Chevron Richmond Refinery and Chemtrade Richmond's safety plans and safety audits were shared at the Cinco De Mayo celebration in Richmond on May 5, 2019
- CCHMP staff answered questions and shared information regarding the CalARP/ISO/RISO programs at the John Muir Birthday and Earth Day celebration at the John Muir National Historic Site in Martinez on April 20, 2019
- Presentations to Interested Groups
- Presentation of the safety audit to the Marathon Martinez Refinery Community Advisory Panel (CAP) on August 28, 2019
- Presentation of the safety audit to the Shell Refinery's Community Advisory Panel (CAP) on May 13, 2019
 Presentation of the safety audit to the Phillips 66's Community Advisory Panel (CAP) on August 27, 2018
- Attend public meetings after major incidents
- There were no Severity III incidents in this reporting period
- The most recent audit findings are summarized in an easily read format in English and Spanish and posted at cchealth.org/hazmat
 - Information on regulated businesses is presented in an easily read format in English and Spanish
- Industrial Safety Ordinance Information Sheets are prepared in English and Spanish

The Board of Supervisors also requested that staff provide copies of the annual report to communities through the Community Advisory Panels (CAP). This 2019 Annual Report is available on our website and will be sent to CAP representatives for distribution.

Audits

Audits of regulated businesses are required at least once every three years to ensure that the facilities are implementing required programs. We completed two ISO and RISO audits in 2019:

- Chevron Richmond Refinery June 2019
- Marathon Martinez Refinery September 2019

Major Chemical Accidents or Releases

There were no MCAR events at ISO-regulated facilities in this reporting period.

Conclusion

The severity of MCAR events in Contra Costa County has declined since the implementation of the ISO, with a few minor irregularities in the trend. The ISO has improved regulated facilities's afety programs and operations.

CCHMP has sought assistance from stakeholders, including regulated facilities, workers and community members, to include the CSB-recommended improvements to the ordinance that the Board of Supervisors adopted in 2014. These further reduce likelihood of chemical accidents at these industrial facilities.

Background

The Board of Supervisors adopted the ISO due to significant accidents that occurred at oil refineries and chemical plants in the county in the 1990s. The effective date of the ISO was January 15, 1999. The ordinance applies to oil refineries and chemical plants with specified North American Industry Classification System (NAICS) codes that were required to submit a Risk Management Plan to the U.S. EPA and are Program Level 3 Stationary Sources as defined by the U.S. EPA Risk Management Program. The ordinance specified the following:

- Stationary sources had one year to submit a safety plan to CCHMP stating how they are complying with the ordinance, except the Human Factors portion (completed January 15, 2000)
 - CCHMP would develop a Human Factors Guidance Document (completed January 15, 2000)
- After an MCAR event, stationary sources are required to perform a root cause analysis as part of their incident investigations (ongoing)
- CCHMP may perform its own incident investigation, including a root cause analysis (ongoing)
- All processes at stationary sources are covered as Program Level 3 (now Petroleum Refineries Program Level 4
 processes as defined by the CalARP program)
- Stationary sources are required to consider inherently safer systems for new processes or facilities and for mitigations identified in a process hazard analysis
 - CCHMP reviewed all the submitted safety plans and inspected all the stationary sources' safety programs
 within one year of receipt (completed January 15, 2001) and every three years after the initial audit or
 inspection



CCHIMP issued the first Contra Costa County Safety Program Guidance Document on January 15, 2000. The stationary sources were required to comply with the Human Factors section of this guidance document by January 15, 2001. CCHIMP performed a specialized audit for all the stationary sources for their Human Factors programs and for Inherently Safer Systems in 2002.

The 2006 amendments to the ISO required:

- 1. Expanding the Human Factors Program to include Maintenance
- Expanding the Management of Organizational Change to include Maintenance and all of Health and Safety positions
- Requiring stationary sources to perform safety culture assessments one year after CCHMP developed guidance (completed November 2009)
- . Requiring stationary sources to perform Security Vulnerability Analysis

Hazardous Materials Programs staff worked with the regulated facilities to develop a Safety Culture Assessment Guidance Document, which was finalized and issued on November 10, 2009. Staff began reviewing these assessments in December 2010. A revised Safety Program Guidance Document that reflects the ISO amendments and additional clarifications based on the audit findings was issued in July 2011.

IIn June 2014, the Board of Supervisors approved an amendment to the ISO to address recommendations by CSB, set forth in the Chevron refinery fire interim investigation report (August 2012), that broadened the goals of the regulation by requiring:

- Use of performance indicators in the evaluation of process safety systems and to provide required contents in
 the annual performance review and evaluation report provided to the Board of Supervisors
 - Expand the implementation of inherently safer systems as much and as soon as possible. Stationary sources
 are now required to evaluate and document inherently safer system analysis:
 - Every five years for existing covered processes,
- b. In the development and analysis of recommended action items identified in a process hazard
- As part of a management of change review, whenever a major change is proposed at a facility that
 could reasonably result in a major chemical accident or release,
- d. When an incident investigation report recommends a major change that could reasonably result in
 a major chemical accident or release,
 - When a root cause analysis report recommends a major change that could reasonably result in a major chemical accident or release, and
 - f. During the design of new processes, process units and facilities.
- Conduct, document and complete a safeguard protection analysis for all processes by June 30, 2019, and every five years thereafter.

Regulated Stationary Sources Listing

The six stationary sources covered by the ISO are:

- Air Liquide Rodeo Hydrogen Plant at Phillips 66
 Air Products at the Shell Martinez Refining Company
- 3. Air Products at the Marathon (formerly Tesoro Golden Eagle Refinery)
- 4. Shell Martinez Refining Company
- 5. Phillips 66 Rodeo Refinery (formerly Conoco-Phillips Rodeo)
- 6. Marathon Martinez Refinery (formerly Tesoro Golden Eagle Refinery)

The facilities covered by RISO are:

- Chevron Richmond Refinery
- Chemtrade West Richmond Works (formerly General Chemical Richmond)

Status of Safety Plans and Programs

The status of each of the regulated stationary sources is given in Table I and includes:

- When the latest updated safety plans were submitted
- When notices of deficiencies were issued
- When plans were determined to be complete by CCHMP
 - When public meetings were held about safety plans
- When audits were complete
- When public meetings were held on preliminary audit findings
- When safety plans were revised to include human factors programs When notices of deficiencies were issued for human factors-revised safety plans
- When human factors components of safety plans were determined to be complete
- When audit/inspections were completed
- When human factors audit preliminary findings public meetings were held



Table | Table | Sales Sales | Sales Sales

Status
Source
tationary
rdinance S
Safety O
Industrial

NAME					V	
	Received	Deficiencies (NOD) Issued-SP	Sarery Flan Complete	Ar rublic Meeting Date	Audit/ Inspection	Avdir Public Meeting
Air Liquide	40/01/2	12/13/12	3/01/13	7/21/13	01/10/9	10/08/11
	7/14/10	1/03/13	11/12/13	10/05/13	5/28/13	10/05/13
Hydrogen Plant	11/03/13			10/14/17	2/29/16	10/14/17
	1/23/17				1/22/19	
Air Products— Shell & Tesoro	1/14/00 1/16/01 (HF update)	6/15/00 5/10/01 (HF	8/30/00 6/19/01 (HF	9/13/00	11/22/00 5/03/02 (HF)	5/08/03
)	6/26/03	undate)	undate)	9/23/07	2/23/04 (mr)	9/23/07
	7/14/05	8/24/07	9/14/07	6/19/10	1/22/07	01/61/9
	12/01/06	3/14/11	80/10/2	4/21/12	7/20/09	4/20/13
	6/20/08	7/11/14	7/14/14	4/15/15	4/16/12	4/23/15
	01/08/9			8/06/19	3/30/15	4/23/16
	6/30/14				1/11/18	8/06/19
	1/15/00	3/14/00	5/30/00	9/15/00	9/30/00	4/09/02
	1/12/01 (HF update)	10/01/6	3/18/02	5/09/02	11/05/01	6/22/04
ConocoPhillips) -	8/10/05	(HF update)	(HF update)	10/07 &	(HF)	7/08/04
	60/2/8	3/28/06	8/9/02	10/13/07	8/01/03	10/07 &
	8/07/12	11/22/10	11/5/07	10/08/11	8/15/06	70/13/07
	8/0//15	6/05/17	1/27/11	10/05/13	10/06/08	01/81//
	01/00/0		7/03/13	107/17/2	1/00//1	10/0/01
			/: /to/o	1	1/04/17	10/00/11
						10/05/13
						10/24/15
						10/14/17
Shell Martinez	1/14/00	00/61//	4/09/01	5/8/03	10/31/00	5/08/03
	1/16/01 (HF update)	11/9/01	1/03/02	9/24/06	4/29/02 (HF)	9/24/06
	7/22/02	(HF update)	(HF update)	9/23/07	11/26/04	9/23/07
	1/11/06	3/21/03	9/15/03	4/21/12	10/23/06	01/61/9
	9/03/10	8/15/06	11/2/06	4/18/15	4/30/05	4/20/13
	9/03/13	10/25/11	3/27/12	4/22/17	2/13/12	4/23/16
	8/23/19		3/30/1/		5/11/15	
Marathon	1/14/00	8/16/00	1/31/01	5/06/03	9/15/00	5/06/03
	1/12/01 (HF update)	10/81/6	12/14/01	9/23/07	12/3/01 (HF)	9/24/06
	6/21/02	(HF update)	(HF update)	01/01/9	8/8/03	9/23/07
	6/22/07	2/30/02	6/21/03	9/06/12	11/07/05	01/01/9
	12/11/09	8/06/12	11/05/07	4/22/17	8/18/08	9/06/12
	6/01/12		6/04/10	8/02/18	4/18/11	4/18/15
	6/30/15		8/27/12		1/06/14	8/07/18
	6/13/1/		81/02/9		10/05/16	

Locations of the Regulated Stationary Sources Safety Plans

places the updated plan in the Contra Costa Library branch or branches closest to the regulated stationary source so it Regulated stationary sources are required to update their safety plans at least once every three years. These plans are available for public review at the Hazardous Materials Programs office, 4585 Pacheco Blvd., Suite 100, Martinez. When CCHIMP determines that a safety plan update is complete, prior to the required 45-day public comment period, staff is easily accessible for public review. Table II lists each safety plan location.

Location of Safety Plans—Libraries

Regulated Stationary Source	Location 1	Location 2	Location 3
Air Liquide Large Industries	Hazardous Materials	Rodeo Public Library	Crockett Public Library
	Programs Office		
Air Products at Shell	Hazardous Materials	Martinez Public	
	Programs Office	Library	
Air Products at at Marathon (formerly	Hazardous Materials	Martinez Public	
Tesoro)	Programs Office	Library	
Shell Refining-Martinez	Hazardous Materials	Martinez Public	
	Programs Office	Library	
Phillips 66 (formerly ConocoPhillips)	Hazardous Materials	Rodeo Public Library	Crockett Public Library
Rodeo Refinery	Programs Office		8
Marathon (formerly Tesoro Golden	Hazardous Materials	Martinez Public	
Eagle Refinery)	Programs Office	Library	

Effectiveness of Implementation of the Industrial Safety Ordinance

Contra Costa Hazardous Materials Programs has developed policies, procedures, protocols and questionnaires to implement the California Accidental Release Prevention (CalARP) Program and the Industrial Safety Ordinance. The policies, procedures, protocols and questionnaires for these programs are listed below:

- Audits/Inspections Policy
- Conducting the Risk Management Plan/Safety Plan Completeness Review Protocol
 - Risk Management Plan Completeness Review Questionnaires
 - Safety Plan Completeness Review Questionnaires
 - Conducting Audits/Inspections Protocol
- CalARP Program Audit Questionnaires Safe Work Practices Questionnaires
- Safety Program Audit Questionnaires
- Conducting Employee Interviews Protocol
- **Employee Interview Questionnaires**
- Procedure Field Verification Protocol
- Piping and Instrumentation Diagram Field Verification Protocol
 - Public Participation Policy

- Dispute Resolution Policy
- Reclassification Policy
- Covered Process Modification Policy
- CalARP Internal Performance Audit Policy
- Conducting the Internal Performance Audit
- CalARP Internal Audit Performance Audit Submission
- Fee Policy
- Notification Policy
- Unannounced Inspection Policy
- Risk Management Plan Public Review Policy

the Contra Costa County Safety Program Guidance Document, which was updated and reissued to regulated facilities Hazardous Materials Programs also developed the Contra Costa County CalARP Program Guidance Document and on July 22, 2011. All policies, procedures, protocols and questionnaires are available through Hazardous Materials Programs office, and the guidance documents are available electronically at: http://cchealth.org/hazmat/calary/ guidance-document.php and http://cchealth.org/groups/hazmat/industrial_safety_ordinance_guidance_p/p

CCHMP staff is working with regulated facilities and labor representatives to revise the Safety Program Guidance Document based on audit results and set expectations for compliance with the ordinance.

Effectiveness of the Procedures for Records Management

CCHMP has digital files for each stationary source. The files include:

- 1. Annual status reports 2. Audits & inspections
- Communications
- Completeness review
- Incident investigation Emergency response ó, 'n
- Trade secret information

Accidental Release Prevention Program files contain regulations, policies, information from the U.S. EPA, the Governor's Digital copies of the files are stored on the Hazardous Materials Programs network and are accessible to the Accidental Office of Emergency Services, CSB, and other information pertinent to the engineers. The risk management and safety Portable document format (PDF) versions of these files are also available for public viewing at the CCHMP office. The Release Prevention Program engineers, supervisor and the Environmental Health and Hazardous Materials Chief plans are received in hard copy, scanned and kept at the CCHMP office.

Number and Type of Audits and Inspections Conducted

In fall of 2019, CCHIMP began required audits at each of the ISO and RISO facilities. It is the eighth round of audits since 2000.

to respond. The ARP engineer will work with the stationary source until the plan contains the required changes. When stationary source must make before the plan is determined to be complete. The stationary source has 60 to 90 days the plan is complete, the ARP engineer will open a public comment period and make the plan available in a public When CCHMP ARP engineers review a safety plan, a notice of deficiencies is issued documenting any changes the

meeting or venue as well as at the public library branch closest to the stationary source. The ARP engineer will respond to all written comments in writing and, when appropriate, use the comments in upcoming audit/inspections of the regulated stationary source.

them available in a public meeting or venue and at the public library branch closest to the stationary source. The ARP submit an action plan to correct any uncovered ISO compliance issues, which the ARP Engineer will review. If the ARP Engineer agrees with the action plan, CCHMP will issue the preliminary audit findings for public comment and make engineer will consider comments received during the public comment period and may revise the Preliminary Audit Findings report. When the public review process is complete, the ARP engineer will issue the Final Audit Findings An ARP engineer will issue a Preliminary Audit Findings report after each facility audit/inspection. The stationary report and respond in writing to any written public comments received. Table I lists the status of each stationary source will have 90 days to respond and the ARP engineer will review the response. The stationary source must source's safety plan, audit and inspections of their safety programs, and public meetings.

Root Cause Analyses and/or Incident Investigations Conducted by CCHMP

events starting in 1992 is available at http://cchealth.org/groups/ hazmat/accident history.php. This list also includes CCHMP performed no root cause analyses or incident investigations in the past year. A historical listing of MCAR major accidents that occurred prior to the adoption of the ISO.

Annual Performance Review and Evaluation Report

The ISO specifies that this report must contain::

- A brief description of how CCHMP is meeting the requirements of the ordinance including:
- The program's effectiveness in getting regulated businesses to comply
 - Effectiveness of the procedures for records management
- Number and type of ISO-required audits and inspections conducted by CCHMP
- Number of root cause analyses and/or incident investigations conducted by CCHMP
 - CCHMP's process for public participation
- Effectiveness of the Public Information Bank
- Effectiveness of the Hazardous Materials Ombudsperson
- Other required program elements necessary to implement and manage the ordinance
- A listing of stationary sources covered by the ordinance, including for each:
 - The status of the stationary source's safety plan and program
- A summary of tsafety plan updates and where theys are publicly available
- ISO-required annual accident history reports submitted by regulated stationary sources
- being conducted by the stationary sources, including the status of implementation of recommendations A summary and status of any ISO-required root cause analyses and incident investigations conducted or
 - A summary and status of any audits, inspections, root cause analyses and/or incident investigations conducted by CCHMP, including the status for implementing the recommendations

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- Description of Inherently Safer Systems implemented by regulated stationary sources
- Total fees, service charges and other assessments collected specifically for the support of the ordinance Legal enforcement actions initiated by CCHMP, including administrative, civil and criminal actions
 - Total personnel and personnel years used by the jurisdiction to directly implement or administer the
- Comments that raise public safety issues from interested parties regarding the effectiveness of the local
- The impact of the ordinance in improving industrial safety

CCHMP's Process for Public Participation

recommendation from the Board of Supervisors, CCHMP also shares ISO annual reports and makes presentations to CCHMP continues the practice of sharing results of safety plans and preliminary audit findings and receiving public comment about them at community events, as recommended by community members in 2005. Based on a 2012 Community Advisory Panels.

Effectiveness of the Public Information Bank

The Hazardous Materials Programs section of the Contra Costa Health Services website (<u>cchealth.org/hazmat</u>) includes:

- Industrial Safety Ordinance
- Risk Management Chapter discussion Description of covered facilities
- » Copy of the ordinance
- Land Use Permit Chapter discussion
 - » Copy of the ordinance
- Safety Program Guidance Document
- Frequently Asked Questions
- Public Outreach strategies

- California Accidental Release Prevention (CalARP) Program
- Program Level description
- Contra Costa County's California Accidental Release Prevention Program Guidance Document
- Management Plan to Hazardous Materials Program. The map links to a description of each of the facilities A map locating the facilities that are subject to the CalARP Program and are required to submit a Risk and the regulated substances handled

Discussion on Public Participation for both CalARP Program and the Industrial Safety Ordinance

- A link to the Office of Emergency Services (OES) website for the CalARP regulation
- Hazardous Materials Inventories and Emergency Response Program
 - Descriptions
- **Underground Storage Tanks**
- Description of the program
- Copies of the Underground Storage Tanks Health & Safety Code sections
- Underground Storage Tanks forms
- Green Business Program

- Description of the Green Business Program with a link to the Association of Bay Area Government's website on the Green Business Program
 - Hazardous Materials Incident Response Team
- Including information of the Major Chemical Accidents or Refeases that have occurred
- The County's Hazardous Materials Incident Notification Policy
- A link to the Phillips 66 and Chevron Fenceline Monitors
 - Unannounced Inspection Program
- Lists the facilities that are subject to unannounced inspections under the Unannounced
 - Hazardous Materials Interagency Task Force Inspection Program
- Includes a matrix of who has what hazardous materials and regulatory responsibilities
 - Minutes from past meetings
- Presentations from past meetings
 - Incident Response
- Accident history that lists summaries of major accidents from industrial facilities in
- Contra Costa County from 1992 to the most recent
 - Additional resource links for more information
- Information on the July 6, 2018 Shell flaring incident, including the Root Cause report
 - Relevant 72-hours and 30-day incident report for MCAR events

Effectiveness of the Hazardous Materials Ombudsperson

personnel are performing their duties. Attachment A is a report from the Hazardous Materials Ombudsperson on the The Hazardous Materials Ombudsperson is a conduit for the public to express their concerns about how CCHMP effectiveness of the position for this reporting period.

Other Required Program Elements Necessary to Implement and Manage the ISO

The CalARP Program is administered in Contra Costa County by CCHMP. Stationary sources are required to submit risk management plan similar and in addition to ISO safety plans. An ARP engineer reviews risk management plans and performs CalARP Program audits simultaneously with ISO audits.

CCHMP staff also perform unannounced inspections of CalARP program stationary sources that are also required to submit a risk management plan to the U.S. EPA. These inspections aim to exercise how a facility will respond to an incident, including notifying emergency response agencies and CCHMP.

Annual Accident History Report and Inherently Safer Systems Implemented as Submitted by the Regulated Stationary Sources

implemented during this reporting period. Attachment B includes individual reports from stationary sources that also The ISO requires stationary sources to update their accident history in their safety plans and include how they have used inherently safer processes within the last year. Table III summarizes Inherently Safer Systems that have been include the required reporting of four common process safety performance indicators.

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Inherently Safer Systems Contra Costa County Facilities Table III

Regulated			
Stationary Source	Inherently Safer System Implemented	Design Strategy	Approach
Air Liquide Large Industries	No new inherently safer systems have been implemented		
Air Products at Shell	No new inherently safer systems have been implemented		
Air Products at Marathon (formerly Tesoro)	Reduced patential of exposure by changing layout or design, equipment (1 time)	Passive	Moderate
Phillips 66 (formerly ConocoPhillips)	Reduced inventory by changing equipment in proces (12 times)	Inherent	Moderate
—Rodeo Refinery	Reduced potential of exposure by changing layout or design, equipment (10 times)	Passive	Moderate
	Reduced potential unit upset by changing equipment or adding alarms (4 times)	Active	Moderate
	Reduced potential of exposure by changing equipment layout or design (1 time)	Active	Simplify
	Reduced potential of error by adding administrative controls (2 times)	Procedural	Simplify
Shell Martinez	Eliminated equipment from process(2 times)	Inherent	Simplify
	Reduced potential of exposure by changing design, equipment metallurgy (21 times)	Inherent	Moderate
	Simplified unit design and chemical by changing equipment (1 time)	Active	Simplify
	Reduced potential unit upset by changing equipment or adding alarms (6 times)	Active	Moderate
	Reduced potential of error in procedure (1 time)	Procedural	Moderate
	Reduced potential of error by changing service in procedure (3 times)	Procedural	Simplify
Marathon (formerly Tesoro Golden	Reduced potential for escalation of an incident, (5 times)	Inherent	Moderate
Eagle Refinery)	Reduced potential of the hazardous condition by	Passive	Moderate

Status of the Incident Investigations, including the Root Cause Analyses Conducted by the Regulated

The ISO requires regulated stationary sources to conduct an incident investigation including a root cause analysis (RCA) after each MCAR incident. MCAR incidents meet the definition of a Level 3 or Level 2 incident in the Community Warning System incident level classification system defined in the Hazardous Materials Incident Notification Policy, as determined by Contra Costa Health Services; or result in the release of a regulated substance and meet one or more of the following criteria:

- Results in one or more fatalities
- Results in greater than 24 hours of hospital treatment of three or more persons
- Causes on-and/or off-site property damage (including cleanup and restoration activities) initially estimated at \$500,000 or more. On-site estimates shall be performed by the regulated stationary source. Off-site estimates shall be performed by appropriate agencies and compiled by Health Services



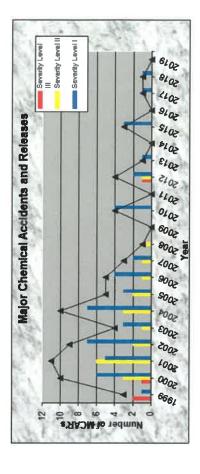
Results in a vapor cloud of flammables and/or combustibles that is more than 5,000 pounds
 The regulated stationary source is required to submit a report to CCHMP 30 days after the root cause analysis is complete. There was no MCAR incidents that occurred within this reporting period in Contra Costa County at an ISO facility. All RCA reports for MCAR incident reports are available at the CCHMP office and website.

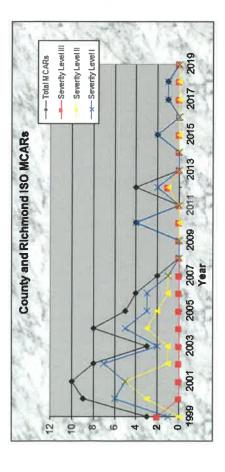
Major Chemical Accidents or Releases

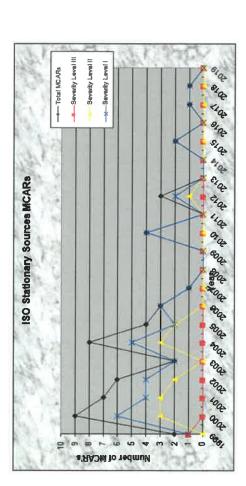
CCHMP analyzed the number and severity of MCARs that occurred since the implementation of the ISO:

- Severity Level III Resulted in a fatality, serious injunes or major on-site and/or off-site damage
- Severity Level II Resulted in an impact to the community, or could easily have become a Level III incident if the situation was slightly different, or it is a recurring type of incident at that facility
 - Severity Level I Resulted in no or minor injuries, no or slight impact to the community, and no or minor on-site damage

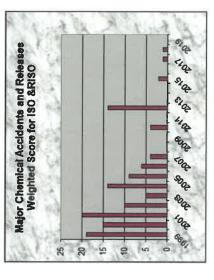
These charts show MCARs from January 1999 through October 2017 for all stationary sources in Contra Costa County, MCARs at stationary sources regulated by the ISO, and MCARs at stationary sources regulated by the ISO or by the RISO. The charts include MCARs at stationary sources only, none that occurred during transportation.







The graph below uses a weighted score developed by CCHMP as an overall process safety metric for facilities regulated by ISO and RISO. This metric assigns a severity level II incident 3 points and a severity level I incident 1 point.



Legal Enforcement Actions Initiated by Contra Costa Hazardous Materials Programs

As part of the enforcement of the ISO and CalARP Program, CCHMP staff may issue notices of deficiency on the safety and risk management plans of ISO-regulated facilities and may issue audit findings detailing what a stationary source is required to change to come into compliance with the regulations. CCHMP has taken no legal enforcement actions on the ISO facilities during this reporting period.

Penalties Assessed as a Result of Enforcement

No penalties have been assessed in this period for noncompliance with the ISO.

Total Fees, Service Charges and Other Assessments Collected Specifically for the ISOFees charged for the ISO cover the time ARP engineers use to enforce the ordinance, the position of the Hazardous Materials Ombudsperson, outreach material and to cover a portion of the overhead for CCHMP. Fees charged for administering this ordinance for fiscal year 2018–2019 total \$ 585,721.

Total Personnel and Personnel Years Used by Hazardous Materials Program to Implement the Industrial Safety Ordinance

ARP engineers review resubmitted Safety Plans, prepare and present information for public meetings, perform audits of stationary sources for compliance with both the CalARP Program and ISO and do follow-up work after MCARs. During the current reporting period:

Three ISO/CalARP Program facility audits were performed in 2018, requiring four to five engineers four weeks
to perform the on-site portion of each audit. The audit process encompasses off-site time that includes report
preparation, a quality assurance review process, working with the facility to address any questions, assessing the
facility's proposed remedies for completeness, preparing communication materials and posting public notices,
attending a public forum to share audit findings, addressing any questions from the public and issuing the final

dedicated to the ISO, or 1, 200 hours. This year, CCHMP used larger teams that included recently hired ARP engineers, report. The total time taken to perform these audits was 3,600 hours. Approximately one-third of the time was who participated in audits as part of their training for an additional 850 hours.

- Reviewing information for the website—180 hours
- Reviewing safety plans and following up with the facilities on any deficiencies—650 hours
- Reviewing and participating in investigation, root cause analysis and proposed recommendations—500 hours
- Preparing material for presentations and public meetings 450 personnel hours.

Approximately 3,828 hours total of CCHMP personnel time was spent on the ISO during the current reporting period. The total does not include ombudsperson time spent preparing for public meetings, working with engineers on questions arising from the ISO, and answering questions from the public on the ISO.

Comments from Interested Parties Regarding the Effectiveness of the Industrial Safety Ordinance

No comments were received by CCHMP regarding ISO or RISO during current reporting period

The Impact of the ISO on Improving Industrial Safety

The ISO is one of four programs that work together to reduce the risk of accidental release from a regulated stationary source that could impact communities in Contra Costa County. Those programs are:

- the Process Safety Management Program administered by Cal/OSHA
- the federal Accidental Release Prevention Program administered by the U.S. EPA
 - the California Accidental Release Prevention Program administered by CCHMP
 - the Industrial Safety Ordinance, also administered by CCHMP

Each of the programs is very similar in requirements. On October 1, 2017, California petroleum refineries are required to comply with requirements of CalARP Program 4 and OSHA PSM for refineries. Both are based on the ISO, CalARP Program 3 differs from the Federal Accidental Release Prevention Program in the following ways:

- The number of chemicals regulated
- The threshold quantity of these chemicals
- An external events analysis, including seismic and security and vulnerability analysis, is required
- Additional information in the Risk Management Plan
- CCHMP is required to audit and inspect stationary sources at least once every three years
 - The interaction required between the stationary source and CCHMP

The ISO differs from CaIARP Program 3, which the chemical facilities are required to follow, in the following ways:

- Stationary sources are required to include a root cause analysis with the incident investigations for Major Chemical Accidents or Releases
- development and analysis of recommended action items identified in a process hazard analysis, as part of a management of change review, as part of incident investigation or root cause analysis development of The stationary sources are required to consider inherently safer systems for existing processes, in the recommendation, and during the design of new processes, process units and facilities.
 - All of the processes at the regulated stationary sources are covered
- The implementation of a Human Factors Program evaluation of latent conditions in existing units, operating and maintenance procedures and in root cause analysis
 - Managing changes in the organization for operations, maintenance and emergency response

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A requirement that the stationary sources perform a Security and Vulnerability Analysis and test the effectiveness of the changes made as a result of the Security and Vulnerability Analysis

- The stationary sources perform Safety Culture Assessments
- Conduct, document and complete safeguard protection analysis for process hazard analysis to reduce
- Use and report of process safety performance indicators in the annual performance review and evaluation report

Major Program difference of ISO from CalARP Program 4 and PSM for Refineries is that the Program 4 requirements include:

- Mechanical Integrity must include assessment of Damage Mechanism Review base on operating history and industry experience
- Contractor and any subcontractors use a skilled and trained workforce pursuant to Health and Safety Code process safety information Section 25536.7

Process Hazard Analysis must include review of Damage Mechanism Review report compiled as part of

- Require a Management system with specific requirement for managing and communicating recommendations from the prevention program elements
 - Require a Stop Work procedure and an anonymous hazard reporting system

Guidance Document was updated to reflect all the updates in September 2010. The Accidental Release Prevention The Safety Culture Assessment guidance chapter was finalized in November 2009. The Industrial Safety Ordinance inherently Safer Chemical Processes, a book that is referenced in the ordinance and with the Center for Chemical participating in the third edition of CCPS: Inherently Safer Chemical Processes to further clarify and promote the Engineers have participated with the Center for Chemical Process Safety on developing the second edition of Process Safety on developing process safety metrics for leading and lagging indicators. CCHMP is currently practice and consideration of Inherently Safer System.

The success of Contra Costa's programs at reducing MCARs and improving facility safety practices have been frequently cited as exemplary or model policies within the regulatory community:

- Contra Costa County was recognized as an alternative model for doing process-safety inspections by the CSB in its report on a 2005 refinery accident in Texas City, TX. The board also mentioned Contra Costa in its DVD, Anatomy of a Disaster: Explosion at BP Texas City Refinery," as a model resource.
 - CSB Chair Carolyn W. Merritt also recognized Contra Costa County in testimony to the House of Representatives Committee on Education and Labor.
- Board, asked Mr. Bresland about the Contra Costa County program for process safety audits of refineries and Senator Barbara Boxer, during a 2007 hearing to consider John Bresland's nomination to chair of the CSB chemical companies.
- recommended that regulatory agencies in the area audit their chemical facilities using Contra Costa County's In its final investigation report of a 2008 incident at the Bayer CropScience Institute in West Virginia, the CSB process. CCHMP staff and a representative from the local United Steelworkers Union were part of a panel when the CSB presented this report to the Kanawha Valley community.
- Subcommittee on Employment and Workplace Safety regarding the success of Accidental Release Prevention CCHMP was asked to give testimony at a June 2010 hearing on "Work Place Safety and Worker Protections in the Gas and Oil Industry" before the U.S. Senate Committee on Health, Education, Labor, and Pensions

Programs in place in Contra Costa County.

- In September 2012, CCHMP was asked to present at the "Expert Forum on the Use of Performance-based Regulatory Models in the U.S. Oil and Gas Industry: Offshore and Onshore" in Texas City, Texas to share the regulatory experience at Contra Costa County and give testimony on how local, state and Federal agencies can work together and have an unprecedented alignment on regulations that is required for the same facilities. This meeting was spearheaded by Federal Occupational Safety and Health Administration and attended by Bureau of Safety and Environmental Enforcement, U.S. Coast Guard, U.S. EPA, Pipeline and Hazardous Materials Safety Administration, United Steelworkers, American Petroleum Institute, academia and industry representatives.
- CCHMP staff also testified at a June 2013 hearing on "Oversight of Federal Risk Management and Emergency Planning Programs to Prevent and Address Chemical Threats, Including the Events Leading up to the Explosions in West, TX and Geismar, LA" before the U.S. Senate's Committee on Environment and Public Works.

City of Richmond Industrial Safety Ordinance

The Richmond City Council passed its version of the ISO on December 18, 2001. Richmond's Industrial Safety Ordinance (RISO) mirrors the ISO, covering two stationary sources: Chevron Richmond Refinery (Chevron) and Chemtrade West Richmond, (Chemtrade, formerly General Chemical), CCHMP administers RISO for the city.

The sixth RISO/CalARP audit at Chevron was completed in August 2016 and in July 2017 for Chemtrade. CCHMP received an annual performance update from Chevron and Chemtrade in June 2017. CCHMP will begin the seventh RISO/CalARP audit at Chevron in June 2020. CCHMP worked with U.S. EPA, Cal OSHA, BAAQMD and CSB in CSB's independent investigation of the August 6, 2012.

Table V Richmond Industrial Safety Ordinance Stationary Source Status

Name/ Location of copies	Safety Plan (SP) Received	Notice of Deficiencies (NOD) Issued-SP	Safety Plan Complete	SP Public Meeting Date	Audit/ Inspection	Audit Public Meeting
Chevron Ritchmond/ Point Ritchmond Ritchmond And Ritchmond Main Public Library Chemitade Richmond	1/21/03 6/21/04 9/29/06 9/25/09 9/24/12 9/30/15 6/28/18	4/23/03 11/08/12 4/11/03 2/18/10	10/10/03 6/22/04 5/21/07 11/04/09 11/125/18 7/25/18 10/10/03	10/14/03 6/24/04 6/02/07 9/25/10 10/26/13 10/24/15 5/05/19 10/14/03	1/11/01 (Non-RISO) 9/29/03 2/13/06 4/14/08 2/08/11 10/03/13 7/18/16 6/03/19 5/29/01 (Non-RISO)	6/24/04 6/02/07 4/25/09 9/24/11 10/24/15 5/05/19 6/24/04 6/224/04
Works/Point Richmond and Richmond Richmond Library	417/09 8/05/14 11/26/18	7/10/15	5/26/10	9/25/10 5/01/16 5/05/19	4/24/06 8/18/03 1/05/09 1/05/12 9/08/14 7/17/17	9/25/10 10/05/13 10/24/15 5/05/19

Inherently Safer Systems Richmond Facilities

Inherent Inherent Passive Procedural Procedural Procedural	Regulated	Inherently Safer System	Design	Approach
Inherent Inherent Inherent Passive Passive Procedural Procedural		Implemented	A Spanis	
Inherent Inherent Passive Active Procedural Procedural Procedural Procedural Passive P		Reduce the inventory of hazardous	Inherent	Minimization
Inherent Inherent Passive Passive Procedurat Procedurat		substance by minimizing piping		
Inherent Inherent Passive Procedurat Procedurat		and equipment (2		
Inherent Inherent Passive Procedural Procedural Procedural Procedural Procedural Passive Inherent Inhe		imes)		
Inherent Inherent Passive Active Procedural Procedural	-	Eliminated chemicals	Inherent	Eliminate
Inherent Inherent Passive Active Procedural Procedural Procedural Passive Passive Inherent In		in new process (1 time)		
Passive Active Procedural Prossive	-	Reduced the	Inherent	Moderate
Inherent Passive Active Procedural Procedural		potential of exposure		
Passive Active Procedural Procedural		by equipment design		
Passive Procedurat Prossive	_	lirie)		
Passive Active Procedural Passive		Eliminated	Inherent	Simplify
Passive Procedurat Prossive		equipment from		
Passive Active Procedural Prossive		process (1 time)		
Active Procedural Prossive		Reduced potential of	Passive	Moderate
Active Procedural Prossive		exposure and hazard		
Active Procedural Prossive		by equipment design		
Active Procedural Passive		(1 time)		
Procedural Passive		Reduced potential of	Active	Moderate
Procedural Passive		exposure and hazard		
Procedural Passive		by equipment design		
Procedural Passive		3 firmes)		
Passive		Reduced potential	Procedural	Simplify
Passive		of exposure with		
Passive		steps to include		
Passive		maximum target		
Passive		(1 fime)		
sposure and hazard		Reduced potential of	Passive	Moderate
/ equipment/piping		exposure and hazard		
		y equipment/piping		
ograde (1 11me)		upgrade (1 time)		



I. INTRODUCTION

On July 15, 1997 the Contra Costa County Board of Supervisors authorized creation of an Ombudsman position for the County's Hazardous Materials Programs. The first Hazardous Materials Ombudsman began work on May 1, 1998. The Contra Costa County Board of Supervisors adopted an Industrial Safety Ordinance on December 15, 1998. Section 450-8022 of the Industrial Safety Ordinance requires the Health Services Department to continue to employ an Ombudsman for the Hazardous Materials Programs. Section 450-8,030(8)(vii) of the Industrial Safety Ordinance requires an annual evaluation of the effectiveness of the Hazardous Materials Ombudsman, with the first evaluation to be completed on or before October 31, 2000.

The goals of section 450-8.022 of the Industrial Safety Ordinance for the Hazardous Materials Ombudsman are:

- To serve as a single point of contact for people who live or work in Contra Costa County regarding environmental health concerns, and questions and complaints about the Hazardous Materials Programs.
- To investigate concerns and complaints, facilitate their resolution, and assist people in gathering information about programs, procedures, or issues.
- 3. To provide technical assistance to the public.

The Hazardous Materials Ombudsman currently accomplishes these goals through the following program elements:

- Continuing an outreach strategy so that the people who live and work in Contra Costa County can know about and utilize the program.
- Investigating and responding to questions and complaints, and assisting people in gathering information about programs, procedures, or issues.
- 3. Participating in a network of environmental programs for the purpose of providing technical assistance.

This evaluation covers the period from November 2018 through November 2019 for the Hazardous Materials Ombudsman program. The effectiveness of the program shall be demonstrated by showing that the activities of the Hazardous Materials Ombudsman meet the goals established in the Industrial Safety Ordinance.

II. PROGRAM ELEMENTS

1. Continuing an Outreach Strategy

This period efforts were focused on maintaining the outreach tools currently available. The web page was maintained for the program as part of Contra Costa Health Services website. This page contains information about the program, links to other related websites, and information about upcoming meetings and events. A toll-free phone number is published in all three Contra Costa County phone books in the Government

2. Investigating and Responding to Questions and Complaints, and Assisting in Information Gathering

During this period, the Hazardous Materials Ombudsman received 137 information requests. Over 95 percent of these requests occurred via the telephone, and have been requests for information about environmental issues. Requests via e-mail are slowly increasing, mainly through referrals from Health Services main web page. Most of these requests concern problems around the home such as asbestos removal, household hazardous waste disposal, pesticide misuse, mold and lead contamination.

Information requests about environmental issues received via the telephone were generally responded to within one business day of being received. Many of the information requests were answered during the initial call. Some requests required the collection of information or written materials that often took several days to compile. Telephone requests were responded to by telephone unless written materials needed to be sent as part of the response.

This year the Ombudsman began facilitating monthly debriefings of the Hazardous Materials Program Incident Response team incidents.

 Participating in a Network of Environmental Programs for the Purpose of Providing Technical Assistance. Technical assistance means helping the public understand the regulatory, scientific, political, and legal aspects of issues. It also means helping them understand how to effectively communicate their concerns within these different arenas. This year, the Ombudsman continued to staff a number of County programs and participate in other programs to be able to provide technical assistance to the participants and the public.

- CAER (Community Awareness and Emergency Response)—This non-profit organization addresses industrial accident prevention, response and communication. The Ombudsman participated in the Emergency Notification subcommittee of CAER.
- Hazardous Materials Commission—In 2001, the Ombudsman took over as staff for the Commission. As staff to the Commission, the Ombudsman conducts research, prepared reports, drafts letters and provides support for 3 monthly Commission meetings. During this period the Commission sent letter a letter to the Board of Supervisors concerning pipeline safety, developed the criteria for adding an ad-hoc student seat to the Commission and held a workshop on cybersecurity for businesses and government agencies.
- Integrated Pest Management Advisory Committee—During this period the Ombudsman represented the Health Department on the County Integrated Pest Management Advisory Committee. This Committee brings Department representatives and members of the public together to help implement the County's Integrated Pest Management policy.
- Asthma Program—The Ombudsman participated in the Public Health Department's Asthma Program as a
 resource on environmental health issues. The Ombudsman represented the Asthma Program on a regional
 collaborative related to asthma issues, the Ditching Dirty Diesel Collaborative. The Ombudsman served on the

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lechnical Advisory Board for RAMP, the Regional Asthma Management Prevention program, and supported the Public Health Department's participation in the AB 617 Community Air Quality program in Richmond. The Ombudsman provided a presentation to an after-school High School program about air pollution and asthmar. The Ombudsman completed a Technical Assistance grant with MCE, the new energy provider for 14 of the 19 jurisdictions in Contra Costa County and the Department of Conservation and Development, to develop a business plan for performing in-home asthma trigger assessments. The Ombudsman collaborated assessment porture or a second Technical Assistance grant to secure stable funding for the assessment program.

Climate Change

California Public Utilities Commission and the Alameda County Public Health Department on the connection regionally, the Bay Area Regional Health Inequities Initiative's Built Environment committee which addresses with the Public Health Nursing program to help their clients apply to the County's Weatherization program. climate change, the Contra Costa Sustainability Exchange, the California Local Health Departments Climate capstone projects of the Public Health Solutions students and hosted a Public Health Solutions intern who Development, hired a Civic Spark intern to expand this effort to 15 other programs in CCHS and EHSD. The Excessive Heat Response Plan for Contra Costa Health Services which was completed during the year. The Ombudsman represented the Public Health Department in local, regional and state efforts to address the impacts of Climate Change, including the revision of the County's Climate Action Plan, a Bay Conservation variety of climate change issues. He completed a report with RAMP about the pilot project he conducted Ombudsman made 9 presentations about the Weatherization program to CCHS and EHSD programs the clients of which could benefit from the program. The Ombudsman coordinated the effort to develop an and Development Commission-led effort to address sea level rise issues in East Contra Costa County and between energy efficiency, Climate Change and Public Health. The Ombudsman helped to evaluate the The Ombudsman, together with the Energy Efficiency Program in the Department of Conservation and During this period the Ombudsman provided technical assistance to the Public Health department on a Committee. The Ombudsman also made presentations to the Bay Area Regional Energy Network, the Change Community of Learning, and the Delta Conservancy's Climate Action Plan Technical Advisory The Ombudsman assisted 8 Public Health Nursing Clients complete their weatherization application. worked on climate change issues. The Hazardous Materials Ombudsman also attended workshops, presentations, meetings and trainings on a variety of environmental issues to be better able to provide technical assistance to the public. Topics included Environmental Justice, Air Quality, emergency management, energy policy and land-use planning for greenhouse gas reduction.

II. PROGRAM MANAGEMENT

The Hazardous Material Ombudsman continued to report to the Public Health Director on a day-to-day basis during this period, while still handling complaints and recommendations about the Hazardous Materials Programs through the Health Services Director. The Ombudsman was also a member of Health Services Emergency Management Team (EMT), participated in EMT trainings and drills, and participated on its HEEP management team.

IV. GOALS FOR THE 2019-2020 PERIOD

In this period, the Ombudsman will provide essentially the same services to Contra Costa residents as was provided in the last period. The Ombudsman will continue respond to questions and complaints about the actions of the Hazardous Materials Programs; answer general questions that come from the public and assist them in understanding regulatory programs; staff the Hazardous Materials Commission; represent the Public Health Department in the Ditching Dirty Diesel Collaborative and the Integrated Pest Management Advisory Committee; and participate in the CAER Emergency Notification committee. The Ombudsman will continue to be part of the Health Department's HEEP team and the Emergency Management Team.

During this period the Ombudsman will continue to provide technical assistance to the Public Health Department on Climate Change issues by being on the County-wide work group updating the Climate Action Plan, providing input on the BCDC regional ART project, and representing the Public Health Department on the BARHII Built Environment Committee. The Ombudsman will continue to work with collaboratives at the local, regional and state level. If the Health Department is successful in receiving the Technical Assistance grant to develop reimbursement strategies for assessing in-home asthma triggers, the Ombudsman will take a lead role in implementing the grant and applying for funding to implement the program.





Annual Performance Review and Evaluation Submittal June 30, 2019

'Attach additional pages as necessary

- Name and address of Stationary Source: Air Liquide Rodeo Hydrogen Plant, 1391 San Pablo Ave., Rodeo, California 94572
- Contact name and telephone number (should CCHMP have questions): Dave Steffens (510) 245-7285 x 2204
- Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030[B](2)(i)):
 The Rodeo SMR utilizes the programs and processes identified in the ISO Safety Program/Plan. Better execution of
 the Plan occurs as the organization continuously works to implement the different requirements.
- Summarize Safety Plan updates (i.e., brief explanation of update and corresponding date) (450-8.030(B)(2)(ii)): No updates of the Plan occurred in 2018. The next revision of the ISO Safety Program is due 12/1/2019.
- List of locations where Safety Plans are/will be available for review, including contact
 telephone numbers if the source will provide individuals with copies of the document (4508.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez; Martinez Public Library, Rodeo
 Public Library, Crockett Public Library.
- 6. Provide any additions to the annual accident history reports (i.e. updates) submitted pursuant to Section 450-8.016(E)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e., provide information identified in Section 450-8.016(E)(1) for all major chemical accidents or releases occurring between the last annual performance review report and the current annual performance review and evaluation submittal (12-month history)): There were no major chemical accidents or releases during the past 12 months.
- Summary of each Root Cause Analysis (Section 450-8.016(Cl) including the status of the analysis and the status of implementation of recommendations formulated during the analysis (450-8.030(B)(2)(V)): There were no Root Cause Analyses performed specific to major chemical accidents or releases during the last 12 months.
- Summary of the status of implementation of recommendations formulated during audits, inspections, Root Cause Analyses, or Incident investigations conducted by the Department (450-8.030(B)(2)(v)): 1) Incorporated MCAR levels into the SMR Emergency Response and Notification Procedure, 2) Initiated contractor reviews for crafts working on covered processes, 3) Incorporated ISS evaluation & change methodology into selected MOC's for the 2019 TAR.
 - Summary of inherently safer systems implemented by the source including but not limited to inventory reduction (i.e., intensification) and substitution (450-8.030(B)(2)(vI)): Inherently Safer System evaluation for the SMR was performed on 6/18-6/20/2019. This requirement is captured in ISO Audit Ensure Action Item #A34-11.
- Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and
 any actions turned over to the Contra Costa County District Attorney's Office) taken with the
 Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)[2]
 (Vil)): There were no enforcement actions during this period.

- Summarize total penalties assessed as a result of enforcement of this Chapter (450-8.030(3)): No penalties have been assessed against this facility.
- 12. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)): The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$822,604. The total Industrial Safety Ordinance program fees for these eight facilities was \$578,390. (NOTE: These fees include those for the County and City of Richmond ISO facilities.
- 13. Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): 3,828 hours were used to audit/inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): None
- 15. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): This chapter reinforces the need to maintain, follow, and continuously improve our structured safety program to help ensure the safety of our employees and the community in which we operate.
- 16. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and Incident Investigations in units not subject to CalARP regulations; recommendations from RCA's) that significantly decrease the severity or likelihood of accidental releases. (1) Completed our first round of contractor safety audits in 2018, with the next round of contractor safety audits to be completed in 2019, 2) Working to conduct a Site Safety Assessment to be completed after the 2019 TAR. This assessment will include input from the majority of contractors working during the TAR. 3) Risk Management is incorporating ISS methodology at other Air Liquide PSM locations.
- 17. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN activation) in response to major chemical accidents or releases: Conducted two EAP drills with the local fire department within the last 12 mo. The 3/28/2019 drill also included personnel from the P66 refinery.

18. Common Process Safety Performance Indicators:

Overdue inspection for piping and pressure vessels based on total number of circuits

2018	Overdue	Repeat
January	16	16
February	16	16
March	16	16
April	16	16
May	16	16
June	16	16
July	16	16
August	16	16
September	117	117
October	117	117
November	117	117
December	117	117
TOTAL	117	117

RBI study completed September, 2016. The Increase in "Overdue" Inspections is based on RBI methodology although not implemented in 2018.

^{2.} Total number of circuits: 187 piping circuits & 36 vessels (# circuits increased from 2018 ISO Update

Report due to changes in new RBI methodology).

^{3. 65} RBI inspections completed in Q1, 2019

^{4.} Total number of annual planned circuit inspection: dependent on data from RB

Past due PHA recommended actions, includes seismic and LCC recommended actions

Overdue 37 37 37 37 38 24 21 19 17 19 17 19 17 18 5			
14.7	:018	Overdue	Repeat
11.7	anuary	37	37
	ebruary	37	37
	larch .	34	34
47	pril	33	33
447	flay	24	24
ıΩ	nne	21	21
io	uly	19	19
	ugust	17	17
	September	14	14
	October	-	11
	Jovember	00	00
	Jecember	5*4	**0
	FOTAL	ις.	łO

^{*} Two Al's reopened after the Feb, 2019 ISO audit.

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
Мау	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES STARTING 2011

Year	2011	2012 2013	2013	2014	2015	2016	2017	2018
No. Tier 1 LOPC	0	0	0	0	0	0	0	0
Incident rate for Tier 1	0	0	0	0	0	0	0	0
Refinery or Industry Rate	0.1553	0.0995	0.0947	0.0925	0.1038	0.0627		
Refinery or								
Industry Mean ²	*	1.49	1.30	1.38	1.55	1.01		
Tier 2 LOPC	0	0	0	0	0	0	0	0
Incident rate for Tier 2	0	0	0	0	0	0	0	0
Refinery Rate¹	*	0.2405	0.2531		0.2380 0.2063	0.1726		
Refinery Mean ²	*	*	*	*	3.08	2.78		

Petroleum refineries to report publically available refinery rate for API Tier 1 and Tier 2 classification. Chemical plants to report publically available mean only for ACC Tier 1
Petroleum refineries to report publically available refinery mean for API Tier 1 and Tier 2 classification. Chemical plants to report publically available mean only for ACC Tier 1
Petroleum chinacy rates or means are not publicly available

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⁺ Five Al's deferred until the October, 2019 TAR

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'Attach additional pages as necessary

- Name and address of Stationary Source:
- Air Products—Shell Martinez Refinery, 110 Waterfront Road, Martinez, CA 94553
- Contact name and telephone number (should CCHMP have questions): Andrew Celin 925-723-2861
- Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030(B)(2)
 (f)): The stationary source's safety plan is complete per the CCHS requirement. The program was audited in January 2018 by CCHS as part of the three year CCHS site audit, and in October 2015 as part of an unannounced
- Summarize Safety Plan updates (i.e., brief explanation of update and corresponding date) (450-8.030(B)(2)(ii)):
- List of locations where Safety Plans are/will be available for review, including contact
 telephone numbers if the source will provide individuals with copies of the document (4508.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez; Martinez Library (libraries
 closest to the stationary source).
- 6. Provide any additions to the annual accident history reports (i.e. updates) submitted pursuant to Section 450-8.016(E)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e., provide information identified in Section 450-8.016(E)(1) for all major chemical accidents or releases occurring between the last annual performance review report and the current annual performance review and evaluation submittal (12-month history)): There were no major accidents or injuries to report.
- Summary of each Root Cause Analysis (Section 450-8.016(C)) including the status of the
 analysis and the status of implementation of recommendations formulated during the analysis
 (450-8.030(B)(2)[v)): There are no outstanding recommendations.
- Summary of the status of implementation of recommendations formulated during audits, inspections, Root Cause Analyses, or Incident Investigations conducted by the Department (450-8.030(B)(2)(v)): Final recommendations from the 3 year CCCHS audit are in progress.
- Summary of inherently safer systems implemented by the source including but not limited to inventory reduction (i.e., intensification) and substitution (450-8.030(B)(2)(vi)):
- Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and
 any actions turned over to the Contra Costa County District Attorney's Office) taken with the
 Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)(2)
 (vil)): There were no enforcement actions during this period.
- Summarize total penalties assessed as a result of enforcement of this Chapter (450-8.030(3)):
 No penalities have been assessed against this facility.

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12. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)): The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$1,006,798. The total Industrial Safety Ordinance program fees for these eight facilities was-\$535,535.(NOTE: These fees include those for the County and City of Richmond ISO facilities).

- 13. Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): 3,828 hours were used to audit/inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- 14. Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): None.
- 15. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): Air Products is committed to the safer operation of our facilities and has implemented applicable requirements outlined in the ISO and CalARP regulations. Both the ISO and Human Factors programs are an integral part of our five year Operating Hazard Review revalidations and ongoing management of change process. The most recent OPHR was conducted in for April 2018. There have been no incidents resulting in an offsike impact. The Chapter has helped reinforce the need to maintain and follow a structured safety program to help ensure the safety of our empoloyees and the communities in which we operate.
- 16. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and incident Investigations in units not subject to CalARP regulations; recommendations from RCA's) that significantly decrease the severity or likelihood of accidental releases.

 The Air Products facility is tracking various metrics (leading and lagging). These include those called out in ISO API/ACC Tier 1 and 2 events, past due PHA recommendations and past due incident investigation recommendations. A baseline was developed and metrics are tracked for the facility on a company share site.
- 17. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN activation) in response to major chemical accidents or releases: There were no emergency response activities to this site.
- Date the last Safety Culture Assessment was completed: January 2015 Survey method: Annust 2019
- Date the results of the Safety Culture Assessment were reported to the workforce and management; Sept. 16-18, 2019.

- 20. Answer the following regarding the Safety Culture Evaluation previous to the one listed in 18:
 - Survey method: Electronic
- Areas of improvements being addressed: Quality of APT, improving field safety contact among regional
 engineering support, better implementing safety drills in the JSA process, and improvement in the shift logs
 - Action Plan made Progress on the identified areas of improvement?: (Yes or No) No

 If Yes, did the improvements meet the goals and if not was the action plan amended to address what is
- being done to meet the goals?

 If No, has a new action plan been developed to address the identified areas of improvement? Yes, and action plan has been developed with routine check ins to determine the effectiveness of the actions.
- action plan has been developed with routine check ins to determine the effectiveness of the actions.
 21. Have milestones and metrics been developed to determine how the Safety Culture
 Assessment actions are being implemented? No. Currently under development. Actions are tracked as part of recurring meeting focused on implementation of the actions.
- 22. Describe the process that included employees and their representatives used to determine if the action items effectively changed the expected culture items: Employees were involved in the development of the survey, collection of the data, analysis of the data, and distribution of the findings. Additionally, the same team of cross functional employees were responsible for developing the action plan, and double clicking on the potential areas for improvement. Steps were taken to develop SMART goals.
- 23. Date of the mid-cycle progress evaluation: Target completion in the August 2021 timeframe
- 24. Describe the action plan (for no 18) make progress on the identified areas of improvement? Not yet.
 24. Describe the process that included participation of employees or their representatives used to determine whether the action items from the SCA and the mid-cycle progress effectively changed the expected culture items: Not applicable.

25. Common Process Safety Performance Indicators:

Overdue inspection for piping and pressure vessels based on total number of circuits

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

Total number of circuits: 91 completed during calendar year 2018 Total number of annual planned circuit inspections: 91

Past due PHA recommended actions, includes seismic and LCC recommended actions

Overdue Repeat	0	0	0	0	0	0	0 0	0 0	0 0	0 0	0 0	
2018	January	February	March	April	May	June	July	August	September	October	November	December

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES STARTING 2011

Year	2011	2012	2013	2014	2015	2016	2017	2018	ere er
No. Tier 1 LOPC	0	0	0	0	0	0	0	0	
Incident rate for Tier 1	0	0	0	0	0	0	0	0	6
Refinery or Industry Rate	0.155	0.099	0.094	0.092	0.103	0.062		0.053	•
Refinery or Industry Mean ²		1.49	1.30	1.38	1.55	1.01			o
Tier 2 LOPC	0	0	0	0	0	0	0	0	****
Incident rate for Tier 2	0	0	0	0	0	0	0	0	
Refinery Rate		0.24	0.253	0.238	0.206	0.172			
Refinery Mean ²					3.08	2.78			

Petroleum reflecties to report publically available reflnery rate for API Tier 1 and Tier 2 classification. Chemical plants to report publically available reason only for ACC Tier 1.
*Petroleum reflneries to report publically available refinery mean for API Tier 1 and Tier 2 classification. Givennical plants to report piablically available mean only for ACC Tier 1.
*Petroleum reflneries to response publically available refinery mean for API Tier 1 and Tier 2 classification. Givennical plants to report piablically available available available available available available available available.

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'Attach additional pages as necessary

- 1. Name and address of Stationary Source:
- Air Products Marathon Martinez Refinery, 150 Solano Way, 3rd & F Streets, Inside Tesoro Refinery, CA 94553
- Contact name and telephone number (should CCHMP have questions):
- January 2018 by CCHS as part of the three year CCHS site audit, and in October 2015 as part of an unannounced Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030(B)(2) (i)): The stationary source's safety plan is complete per the CCHS requirement. The program was audited in Joseph Delengowski 925-316-9415 က်
- Summarize Safety Plan updates (i.e., brief explanation of update and corresponding date) (450-8.030(B)(2)(ii)): 4

inspection.

- telephone numbers if the source will provide individuals with copies of the document (450-8.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez, Martinez Library (libraries List of locations where Safety Plans are/will be available for review, including contact closest to the stationary source). ιĠ
- performance review and evaluation submittal (12-month history)): There were no major accidents or releases occurring between the last annual performance review report and the current annual provide information identified in Section 450-8.016(E)(1) for all major chemical accidents or pursuant to Section 450-8.016(E)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e., Provide any additions to the annual accident history reports (i.e. updates) submitted injuries to report. ė.
- analysis and the status of implementation of recommendations formulated during the analysis Summary of each Root Cause Analysis (Section 450-8.016(C)) including the status of the (450-8.030(B)(2)(Iv)): There are no outstanding recommendations.
- Inspections, Root Cause Analyses, or Incident Investigations conducted by the Department Summary of the status of implementation of recommendations formulated during audits, (450-8.030(B)(2)(v)): Final recommendations from the 3 year CCCHS audit are in progress.
- Summary of inherently safer systems implemented by the source including but not limited to inventory reduction (i.e., intensification) and substitution (450-8.030(B)(2)(vi)): 6
- any actions turned over to the Contra Costa County District Attorney's Office) taken with the Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)(2) Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and (vii)): There were no enforcement actions during this period. 30

- Summarize total penalties assessed as a result of enforcement of this Chapter (450-8.030(3)): No penalties have been assessed against this facility.
- 12. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)): The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$1,006,798. The total Industrial Safety Ordinance program fees for these eight facilities was - \$535,535. (NOTE: These fees include those for the County and City of Richmond ISO facilities).
- 13. Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): 3,828 hours were used to audit/Inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- 14. Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): None.
- 45. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): Air Products is committed to the safer operation of our facilities and has implemented applicable requirements outlined in the ISO and CalARP regulations. Both the ISO and Human Factors programs are an integral part of our five year Operating Hazard Review revaliablations and on going management of change process. The most recent OPHR was completed in April 2018, and attended by CCHS personnel. There have been no incidents resulting in an offsite impact. The Chapter has helped reinforce the need to maintain and follow a structured safety program to help ensure the safety of our empoloyees and the communities in which we operate.
- 16. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and Incident Investigations in units not subject to CalARP regulations; recommendations from RCA's) that significantly decrease the severity or likelihood of accidental releases.

 The Air Products facility is tracking various metrics (leading and lagging). These include those called out in ISO API/ACC Ter 1 and 2 events, past due PHA recommendations and past due incident investigation recommendations. A baseline was

developed, and metrics are tracked for the facility on a company share site.

- 17. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN activation) in response to major chemical accidents or releases: There were no emergency response activities to this site since the previous Annual Performance review associated with a chemical accident. However, the emergency response team was deployed in response to a series of personal medicals that resulted in the individual being treated for non-work related conditions. Each each condition, the response time was stellar.
- 18. Date the last Safety Culture Assessment was completed; August 2019.
- Date the results of the Safety Culture Assessment were reported to the workforce and management: Sept. 16-18, 2019
- Answer the following regarding the Safety Culture Evaluation previous to the one listed in 18: Survey method: Electronic

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- Areas of improvements being addressed: Quality of APT, improving field safety contact among regional
 engineering support, better implementing safety drills in the JSA process, and improvement in the shift logs.
 Action Plan made Progress on the identified areas of improvement?: (Yes or No) No
- If Yes, did the improvements meet the goals and if not was the action plan amended to address what is being done to meet the goals?
- if No, has a new action plan been developed to address the identified areas of improvement? Yes, and
 action plan has been developed with routine check ins to determine the effectiveness of the actions.
- 21. Have milestones and metrics been developed to determine how the Safety Culture Assessment actions are being implemented? No. Currently under development. Actions are tracked as part of recurring meeting focused on implementation of the actions.
- 22. Describe the process that included employees and their representatives used to determine if the action items effectively changed the expected culture items. Employees were involved in the development of the survey, collection of the data, analysis of the data, and distribution of the findings. Additionally, the same team of cross functional employees were responsible for developing the action plan, and double clicking on the potential areas for improvement. Steps were taken to develop SMART goals.
- 23. Date of the mid-cycle progress evaluation: Target completion in the August 2021 timeframe
- » Did the action plan (for no 18) make progress on the identified areas of improvement? Not yet
- 24. Describe the process that included participation of employees or their representatives used to determine whether the action items from the SCA and the mid-cycle progress effectively changed the expected culture items: Not applicable.
- 25. Common Process Safety Performance Indicators:

Overdue inspection for piping and pressure vessels based on total number of circuits

Overdue Repeat	0	0 0	0	0 0	0 0	0	0	0	0	0	0	0
2018	January	February	March	April	May	June	July	August	September	October	November	December

Total number of circuits: 91

Total number of annual planned circuit inspections: 17

Past due PHA recommended actions, includes seismic and LCC recommended actions

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	Ģ	0
October	O	0
November	0	0
December	0	0

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES... STARTING 2011

Year	2011	2011 2012	2013	2014	2015	2016	2017	2018	,
No. Tier 1 LOPC	0	0	0	0	0	0	0	0	
Incident rate for Tier 1	0	0	0	0	0	0	0	0	
Refinery or Industry Rate	0.155	0.099	0.094	0.092	0.103	0.062		0.053	
Refinery or Industry Mean ²		149	1 30	138	25.	101			g
Tier 2 LOPC	0	0	0	0	0	0	0	0	20
Incident rate for Tier 2	0	0	0	0	0	0	0	0	
Refinery Rate		0.24	0.253	0.238	0.206	0.172			
Refinery Mean ²					3.08	2.78			

"Pétroleum refinentes to report publically available refineny rate for API Tier 1 and Tier 2 classification, Chemical plants to report publically available maan only for ACC IFF.
Petroleum refinentes to report publically available refinery mean for API Tier 1 and Tier 2 classification, Chemical plants to report publically available refinery many for ACC IFF.
Petroleum refinertes to report publically available verifiery was a constructed as a construction of the construction of the

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'Attach additional pages as necessary

- Name and address of Stationary Source: Phillips 66 Rodeo Refinery, 1380 San Pablo Avenue, Rodeo, CA 94572
- Contact name and telephone number (should CCHMP have questions): Morgan Walker 510-245-4665
- Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030(B)(2)(i)): The Safety Plan was last updated in August of 2018.
- 4. Summarize Safety Plan updates (i.e., brief explanation of update and corresponding date) (460-8.030(B)(2)(ii)): The original Safety Plan for this facility was filed with Contra Costa Health Services on January 14, 2000. A revised plan was filed on April 7, 2000 with the updated recommendations requested by CCHS. A Human Factors Amendment was submitted on January 15, 2001. In conjunction with CCHSs required 2rd public meeting on our plan and audit findings, we submitted a complete revision of the plan to reflect the change in ownership of our facility and to update where needed. We took this opportunity to include Human Factors within the plan instead of having it as an amendment. On August 9, 2002 the plan was resubmitted. Public meetings for our plans were held on June 22, 2004 in Rodeo and July 8, 2004 in Crockett. As required the Plan was fully updated in August 2005 on the 3 year cycle. The Plan was reviewed by CCHS and was revised on July 28, 2006 with recommended changes. The Safety Plan was updated in July 2009 per the 3 year cycle. Recommendations requested by CCHMP were incorporated into the Safety Plan on November 4, 2010. Safety Plan was updated in August 2012 and August 2015 per the 3 year cycle. Recommendations requested by CCHMP won May 22, 2017 were incorporated into the plan on August 2018.
- List of locations where Safety Plans are/will be available for review, including contact
 telephone numbers if the source will provide individuals with copies of the document (4508.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez; Crockett and Rodeo Libraries
 (closest to the stationary source).
- Provide any additions to the annual accident history reports (i.e. updates) submitted
 pursuant to Section 450-8.016(E)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e.,
 provide information identified in Section 450-8.016(E)(1) for all major chemical accidents or
 releases occurring between the last annual performance review report and the current annual
 performance review and evaluation submittal (12-month history)): There were no major chemical
 accidents or releases at the Rodeo Refinery in the 2018-2019 time period.
- Summary of each Root Cause Analysis (Section 450-8.016(C)) including the status of the analysis
 and the status of implementation of recommendations formulated during the analysis (450-8.030(B)
 (2)(iv)): There were no root cause analysis of major chemical accidents or releases at the Rodeo Refinery in the
 2018-2019 time period.
- 8. Summary of the status of implementation of recommendations formulated during audits,

inspections, Root Gause Analyses, or Incident Investigations conducted by the Department (450-8.030(B)(2)(V)): TThere is one "ensure" item and one "consider" item remaining from the 2017 CalARP ISO audit. Both items will be closed with the 2019 revision to the Risk Management Plan.

- Summary of inherently safer systems implemented by the source including but not limited to inventory reduction (i.e., intensification) and substitution (450-8.030(B)(2)(vi)): See ATTACHMENT 1 for the listing of Inherently Safer Systems Improvements.
- 10. Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and any actions turned over to the Contra Costa County District Attorney's Office) taken with the Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)(2) (Vil)): There were no enforcement actions during this period.
- Summarize total penalties assessed as a result of enforcement of this Chapter (450-8.030(3));
 No penalities have been assessed against this facility.
- 12. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)): The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$1.006.798. The total Industrial Safety Ordinance program fees for these eight facilities was \$535,535. (NOTE: These fees include those for the County and City of Richmond ISO facilities).
- 13. Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): 3,828 hours were used to audit/inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- 14. Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): No comments were received.
- 15. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): In addition to the Phillips 66 Corporate Health Safety Environment Management Systems the ISO provides another tool for the improvement of process safety performance.
- 16. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and Inclent Investigations in units not subject to CalARP regulations; recommendations from RCA's) that significantly decrease the severity or likelihood of accidental releases. Units that were not covered by RNP, CalARP, and PSM are covered under the ISO and PHAs are scheduled and performed on all these units. Recommendations from the PHAs are implemented at an accelerated rate. A list of inherently safer system improvements, required by the ISO or PHA recommendations and projects, are listed in Atlachment 1.
- 17. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN

activation) in response to major chemical accidents or releases: There were no major chemical accidents or releases at the Rodeo Refinery in the 2018–2019 time period.

- 18. Date the last Safety Culture Assessment was completed: 4/15/2016 Survey method: written survey
- 19. Date the results of the Safety Culture Assessment were reported to the workforce: 6/24/16 management: 4/15/16
- 20. Answer the following regarding the Safety Culture Evaluation for no. 18:
 - SURVEY METHOD: written survey
- Areas of improvements being addressed:
- » No areas were identified as scoring significantly below normal values.
- Improvements require too many reviews/approvals.
- Maving enough qualified people to do the work in their area. » Employees are reluctant to reveal problems or errors.
- Action Plan made Progress on the identified areas of improvement? YES
- If Yes, did the improvements meet the goals and if not, was the action plan amended to address subsequent SCA. Improvement opportunities were identified in the most recent SCA and recommendations what is being done to meet the goats? Yes, Progress was made and improvements observed in the identified.
- If No, has a new action plan been developed to address the identified areas of improvement? (Yes or No)
- actions are being implemented? Yes or if not, Why not? YES. Specific improvements were identified by a 21. Have milestones and metrics been developed to determine how the Safety Culture Assessment management & union team and implemented.
- 22. Describe the process that included employees and their representatives used to determine if the action items effectively changed the expected culture items: A midcycle written survey will be utilized to evaluate the effects on the culture. The evaluation team will include management and union representatives per policy.
- 23. Date of the mid-cycle progress evaluation: Scheduled in 2019
- » Did the action plan (for no 18) make progress on the identified areas of improvement? Yes or if not, has a new action pan been developed? (Yes or No) (to be determined)
- the expected culture items: By policy, our process will include management and union representatives to review the determine whether the action items from the SCA and the mid-cycle progress effectively changed 24. Describe the process that included participation of employees or their representatives used to results and develop modified recommendations as appropriate.
- 25. Common Process Safety Performance Indicators:

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Overdue inspection for piping and pressure vessels based on total number of circuits

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

Total number of circuits: 22,424

Total number of annual planned circuit inspections: 5,037

Past due PHA recommended actions, includes seismic and LCC recommended actions

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0
87		

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

118	Overdue	Repeat
January	0	0
February	0	0
March	0	0
oril	0	0
May	0	0
Ine	0	0
λĺΙ	0	0
rgust	0	0
September	0	0
October	0	0
√ovember	0	0
December	0	0

API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES-STARTING 2011

Vaar	2011	2012	2013	2014	2015	2016	2017	2018
No. Tier 1 LOPC	2	ო	0	0	2	0	0	0
Incident rate for Tier 1	0.17	0.29	0	0	0.21	0	0	0
Refinery or Industry Rate ¹	0.15	0.09	0.09	0.09	0.10	0.06	0.07	0.00
Refinery or Industry Mean ²	*	1.49	1.30	1.38	1.55	1.01	1.13	0.92
Tier 2 LOPC	S	က	0	-	2	2	2	0
Incident rate for Tier 2	0.43	0.29	0	0.10	0.21	0.17	0.22	0
Refinery Rate	*	0.24	0.25	0.23	0.20	0.17	0.18	0.17
Refinery Mean ²	*	*	*	łk	3.08	2.78	2.73	2.79

26. Process Safety Performance Indicators for refineries only:

- 1. Number of Major Incidents in 2018: 0
- II. The number of temporary piping and equipment repairs that are installed on hydrocarbon and high energyutility systems that are past their date of replacement with a permanent repair:

2018	Total*	Overdue	Repeat
January	25	0	0
February	28	0	0
March	28	0	0
April	59	0	0
May	59	0	0
June	59	0	0
July	09	0	0
August	09	0	0
September	09	0	0
October	42	0	0
November	43	0	0
December	44	0	0
TOTAL	44	4	-

Petroleum refineries to report publicly available refinery rate for API Tlar 1 and Tler 2 classification.
Chenkell plants to report publicly available mean only for ACC Tler 1 API Tlar 1 and Tler 2 classification. Chemical plants to report publicable variable refinery mean for API Tler 1 and Tler 2 classification. Chemical plants to report publicable available mean only for ACC The time for the anomator and anomator and the second of the publication of the public anomator and the second of the public and the public anomator and the public and th

	At	tachment	Attachment 1: June 2017—June 2018 ISS improvements
Baternass	Approved	US Category	WOO Dimension
IMP226913	Moderate	Passive	Heat exchanger had been re-rated tone w/ process design conditions-this addresses the PHA recommendation. All pertinent PSI information is to reflect the new conditions.
IMP226903	Moderate	Passive	Piping has been re-rated, which addresses the LOPA recommendation.
IMP226891	Moderate	Passive	Secondary containment built for F-256 Silicone Tank.
IMP232568	Simplify	Passive	SIL calculations performed to provide additional IPLS to protect against a fuel rich trebox in B-1 Heater.
IMP226567	Simplify	Passive	The plping on the pump-outline was extended so that the valve on the pump-outline and the adjacent valve do not create a pinch point.
IMP232562	Moderate	Procedural	New procedure added to limit loaned rate 5 minutes before shutdown to minimize lifting relief valves.
IMP232563	Moderate	Inherent	Added check valves to critical Check Valve List and removing three out of service valves.
IMP226849	Moderate	Passive	A closed loop sampling station was installed with septum-capped bottles to minimize operator exposure to high H2S vapors.
IMP227554	Simplify	Procedural	New alarms added to address 8 HAZOP recommendations and 45 LOPA recommendations.
IMP220030	Moderate	Active	Two new SIL-1 rated shutdowns added to prevent accumulation of unburned fuel in B-1 frebox after a loss of fuel gas or pilot gas.
IMP226880	Moderate	Active	Installed redundant independent level indicator and alarm on F-57 Phase Separator to notify operators of potential sour gas release.
IMP226845	Moderate	Active	Installed new shutdown trip voling logic (foe4) to prevent potential tube failure frem low flow conditions in B-202 Convection heater.
IMP226874	Simplify	Procedural	Revised locked open valve list to decrease likelihood for human error.
IMP226848	Minimize	Passive	Installed cover on E-101A/Bk/C to protectoperators from potential exposure to hot water and H2S in the event of tube leak or increased temperature.
IMP227651	Moderate	Active	Installed two new PSV to provide enhanced overpressure protection to G-811A/B pump discharge piping.
IMP226848	Minimize	Passive	Installed dual mechanical seats with API Plan 538 seating system on Stabilizer Feed Pumps 5g-503A/B to reduce the likelihood of loss of containment.

M2019308-001	Moderate	Inherent	Replaced butane cooler cooling water return with upgraded metallurgy pipe.
M20181236-001	Moderate	Inherent	Upgraded metallurgy case installed on G-116C pump.
M20176355-001	Moderate	Inherent	Upgrade E-208 Salt Water Outlet Spool Piece to Monel.
M20176004-001	Moderate	Inherent	Upgrade DSO Piping on Merichem to 316L SS
M20175710-001	Moderate	Inherent	F-302 Froth Chute Metallurgy Upgrade
M20175686-001	Moderate	Inherent	E-303 Bundle Metallurgy Upgrade from carbon stoel to stainless steel.
M20173980-001	Moderate	Inherent	Upgrade G-221 Jet Pump Bypass Spool Piece to Incorei 625
M20173012-001	Moderate	Inherent	Upgrade D-601 Overhead Vapor Bypass Line from carbon steel to C276 overlay carbon steel.
M20172446-001	Moderate	Inherent	Upgrade F-540 Bridles to 316 SS
M20172359-001	Moderate	Inherent	Replacement of F-805 with 304SS
M20171966-001	Moderate	Inherent	Upgrade the exchanger metallurgy to 317 LSS to provide resistance to naphthenic acid as well as high temperature suffiderion.
M20171704-002	Moderate	Passive	Upgrade U215/U267 Naphtha Sample Stations to Closed Loop
M20165957-001	Moderate	Passive	Upgrade U250 D-713 and D-714 Sample Stations to Closed Loop
M20101727-005	Moderate	Passive	Upgrade sample stations D201B, D-202, and D-203 effluent and rec. gas
M20176265-001	Moderate	Passive	Change Amine Service Fin Fan Tube Plug Gasket Type
M20184089-002	Simplify	Active	Investig R-101 and R-102 Header C2 Analyzers

Annual Performance Review and Evaluation Submittal June 30, 2019

"Attach additional pages as necessary

- Name and address of Stationary Source: Shell Oil Products U.S. Martinez Refinery, 3485 Pacheco Blvd., Martinez, CA 94553.
- Contact name and telephone number (should CCHMP have questions): Nicola Maher: 925-229-6175
- Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030(B)(2)(I)): SMR's Safety Plan was last updated in August 2016. SMR's Safety Plan is due for update in August 2019.
- Summarize Safety Plan updates (i.e., brief explanation of update and corresponding date) (450-8.030(B)(2)(ii)): SMR's Safety Plan was last updated in August 2016. The changes addressed actions from the CCHS 2015 audit. SMR's August 2019 submittal will address actions from the CCHS 2018 audit.
- List of locations where Safety Plans are/will be available for review, including contact telephone numbers if the source will provide individuals with copies of the document (450-8.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez: Martinez Library (library closest to the stationary source).
- 6. Provide any additions to the annual accident history reports (i.e. updates) submitted pursuant to Section 450-8.016(E)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e., provide information identified in Section 450-8.016(E)(1) for all major chemical accidents or releases occurring between the last annual performance review report and the current annual performance review and evaluation submittal (12-month history)): There was one MCAR for the reporting period on July, 6.2018, Release at LOP (Light Oil Processing) Flare.
- Summary of each Root Cause Analysis (Section 450-8.016(C)) including the status of the analysis
 and the status of implementation of recommendations formulated during the analysis (450-8.030(B)
 (2)(iv)): 7/6/18 Release at LOP Flare MCAR root cause analysis was completed and a final report submitted to
 CCHMD. Four actions are open and on schedule for 1/2020 completion. All other actions (37) were completed
- Summary of the status of implementation of recommendations formulated during audits, inspections, Root Cause Analyses, or Incident Investigations conducted by the Department (450-8.030(B)(2)(v)): T2018 County ISO/CalARP audit action items have been finalized and final responses sent June 2019. Due dates for action items accepted by County. Approximately 40% of action items complete. Remaining action items to be completed per agreed upon schedule.
- Summary of inherentity safer systems implemented by the source including but not limited to inventory reduction (i.e., intensification) and substitution (450-8.030(B)(2)(v)); See Attachment 1
- Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and any actions turned over to the Contra Costa County District Attorney's Office) taken with the Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)(2) (Vil)): There were no enforcement actions during this period.

- Summarize total penalties assessed as a result of enforcement of this Chapter (450-8.030(3)):
 No penaltities have been assessed against this facility.
- 12. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)): The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$1,006,798. The total Industrial Safety Ordinance program fees for these eight facilities was—\$535,535. (NOTE: These fees indude those for the County and City of Richmond ISO facilities).
- 13. Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): 3,828 hours were used to audit/inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- 14. Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): None received
- 45. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): SMR has integrated requirements of the Industrial Safety Ordinance into our Health, Safety, and Environment Management System; in the context of our HSE MS, the ISO requirements drive continual improvement in our HSE performance.
- 16. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and incident Investigations in units not subject to CalARP regulations; recommendations from RCA's) that significantly decrease the severity or likelihood of accidental releases. All process units are now covered under CalARP Program 4. Examples of changes made to the stationary source are summarized in Table 1 (see question 9).
- 47. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN activation) in response to major chemical accidents or releases: 7/6/18 Release at LOP Flare... Shell activated the Emergency Operations Center, which brings together Environmental, Health & Safety, Security, Operations, and Management to assist in coordinating the response. In addition, Shell's Community Sampling Team was deployed to the community to monitor for potential offsite impacts (noise, odors, etc). The refinery's Ground Level Monitors located on the facility fence, line showed no detection of H2S or SO2 above background levels and the community sampling did not detect any offsite readings.
- 18. Date the last Safety Culture Assessment was completed: 3/31/19 (survey conducted Q4, 2018)
- Date the results of the Safety Culture Assessment were reported to the workforce and management: 4/10/19 and beyond (4/24/19 sitewide distribution, various meetings to discuss results).
- 20. Answer the following regarding the Safety Culture Evaluation for no. 18:
- Survey method: Anonymous computer based and paper based survey
- Areas of improvements being addressed: Incident reporting and Learnings from incidents and Rewards and
 - Recognition

- Action Plan made Progress on the identified areas of improvement?: (Yes or No) YES
- » If Yes, did the improvements meet the goals and if not was the action plan amended to address what is
- being done to meet the goals? Too early to assess. Adjustments will be made to the action plan as needed.
- » If No, has a new action plan been developed to address the identified areas of improvement? (Yes or No)
- 21. Have milestones and metrics been developed to determine how the Safety Culture Assessment actions are being implemented? Yes or if not, Why not? Yes.
- 22. Describe the process that included employees and their representatives used to determine if the action items effectively changed the expected culture items: Quarterly meetings with a Safety Culture team that includes represented employees to discuss progress of Culture action items and determine if a change to the action item is required. Small group surveys or reviews will occur as needed.
- 23. Date of the mid-cycle progress evaluation:TBD
- » Did the action plan (for no 18) make progress on the identified areas of improvement? Yes or if not, has a new action pan been developed? (Yes or No) N/A
- 24. If a mid-cycle progress evaluation was performed during this reporting year, describe the process that included participation of employees or their representatives that determined whether the action items effectively changed the expected culture items: N/A

25. Common Process Safety Performance Indicators:

Overdue inspection for piping and pressure vessels based on total number of circuits

vessers based on total littliner of circuits	io Jaguinui is	CHCUILS
2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0
Total number of circuite: 12 479		

Total number of circuits: 12,478

Total number of annual planned circuit inspections: 1,577

Past due PHA recommended actions, includes seismic and LCC recommended actions

סכוסווווס מוומ בפפ וכנסווווופוומפת מכנוסווס	cilded actions	
2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	4	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0
TOTAL	4	

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
pril	-	0
lay	0	0
nne	0	0
July	0	0
ugust	0	0
eptember	_	0
October	₹ं	~
November	0	0
December	0	0
TOTAL	2	~

API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES STARTING 2011

Year	2011	2012	2013	2014	2015	2016	2017	2018
No. Tier 1 LOPC	₩	~	_	0	_	0	2	
Incident rate for Tier 1	0.07	0.07	0.08	0.00	0.07	00'0	0.11	90.0
Refinery or Industry rate ¹	0.15	0.09		0.09	0.10	90.0	0.07	90.0
Refinery or Industry mean ²	46	1.49	1.30	1.38	1.55	1.01	1.13	0.92
No. Tier 2 LOPC	2	0	5	2	S	_	2	2
Incident rate for Tier 2	0.14	0	0.41	0.11	0.42	90'0	0.11	0.11
Refinery rate ¹	*	0.24	0.25	0.23	0.20	0.17	0.18	0.17
Refinery mean ²	*	*	*	łĸ	3.08	2.78	2.73	2.79

Petroleum refineries to report publically available refinery rate for API Tier 1 and Tier 2 classification.

Chemical plants to report publically available mean only for ACC Tier 1

26. Process Safety Performance Indicators for refineries only:

I. Number of Major Incidents in 2018: 0

II. The number of temporary piping and equipment repairs that are installed on hydrocarbon and high energy utility systems that are past their date of replacement with a permanent

Repeat	0	0	0	0	0	Ö	0	0	0	0	0	0	0
Overdue	0	0	0	0	0	0	0	0	0	0	0	0	0
2018	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL

Petroleum refineries to report publically available refinery mean for API Tier 1 and Tier 2 classification. Chemical plants to report publically available mean only for ACC Tier 1

^{*} Refinery Industry rates or means are not publicly available.

Attachment 1

	Table 1: Summary of Implemented ISS
Approprie	NDC Deserbition
Active/Moderate	Added High Level Atarms to HP and LP Blowdown Drums in Utiliti
2nd order inherent/Moderate	Upgraded the metallurgy in heater in Allymation Plant
2nd order inherent/Moderate	Replaced cyclone trickle valves for the reactor with upgraded metallurgy in the Cat Cracker Plant
2nd order inherent/Moderate	Upgraded metallungy on identified piping in the Cat Gas Hydrotreater Plant
2nd order inherent/Moderate	Upgraded metallurgy in pump Case in Hydrocracker Plant
2nd order inherent/Moderate	Upgraded P2951 Seal Bellows Assembly Retaining Band Material in Hydrocracker Plant
2nd order inherent/Moderate	Upgraded disaster bushing in seal for caustic recycle pump in Sat Gas Plant.
Inherent/Simplify	Hydrogen and Corrosion Probes Removed in the Delayed Coker Unit
Active/Simplify	Installed actuated interlocked values to coke drums in Delayed Coker Unit to reduce opportunity for human error
Active/Moderate	Upgraded DCU Wet Gas Compressor Control System in the Delayed Coker Unit
2nd order inherent/Moderate	Heater Metallurgy Upgraded and De-rate in the Distiliate Hydrotreater
Active/Moderate	Installed vibration shutdown system on Distillation Hydrotreater compressors.
Active/Moderate	Installed trip systems for high CO/CH4 TDL on 14 heaters across site
Active/Moderate	Installed Foam System on tank in tank farm
2nd order inherent/Moderate	Upgraded Main Frae Stury Plping Metallurgy in Cat Cracker Unit
Active/Moderate	Added Seal Oil Flow Indication in Sat Gas Plant
2nd order inherent/Moderate	Upgraded pump material for pumps in Alkylation Unit
2nd order inherent/Moderate	Upgraded Mechanical Scal O-ring for pumps in Alkylation service
2nd order inherent/Moderate	P2195 Materials Upgrade and Flush Modification
2nd order inherent/Moderate	Upgraded metallurgy for stripper reflux pumps in Sulfur Recovery Unit
2nd order inherent/Moderate	Upgraded pump seal in Logistics

Average	lable 1: Continued
2nd order inherent/Moderat	Upgraded acid boot Piping from vessel in Allyjation unit
Inherent/Simplify	Replaced sight glass with a magnetic level indicator on a vessel in the Flexicoker unit
2nd order inherent/Moderate	Upgraded piping spool metallungy in Hydrogen Plant.
2nd order inherent/Moderate	Upgraded reclaimer pump o-fing in amine service.
2nd order inherent/Moderate	Metal Gasket Modification and upgrade in Cat Crecker Unit.
2nd order inherent/Moderate	Upgraded Lube Oil Filter Housing and added pressure indication in Logistics.
2nd order inherent/Moderate	Upgraded pump o-ring material in Straight Run Hydrotreater plant.
2nd order inherent/Moderate	Upgraded metallurgy of Spent Acid Line in Alkylation Unit
2nd order inherent/Moderate	Upgraded Metallungy and design of piping for the flare lighting system in LOP
Procedural/Simplify	Change in Start-up procedure for CO Bollers in Utilities
Procedural/Simplify	Change in loading procedure in Tank Storage Area
Procedural/Simplify	Change in draining process to reduce draining in Tank storage area.
rocedural/Moderate	Procedural/Moderato Change in fuel gas treater procedure to reduce set points and update step

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Annual Performance Review and Evaluation Submittal June 30, 2019

*Attach additional pages as necessary

- Name and address of Stationary Source: Tesoro Golden Eagle Refinery, 150 Solano Avenue, Martinez, CA 94553
- Contact name and telephone number (should CCHS have questions): James Jeter 925-370-3279 or Sabiha Gokcen at 925-370-3620.
- 3. Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030(B) (2)(I)): The most recent Safety Plan was sumitted to Contra Costa Hazardous Materials Program (CCHMP) in June 2017. CCHMP has compelted seven audits on the safety programs. The first audit was in September 2000 on the Safety programs. The second audit was in December 2001 and focused on Inherently Safer Systems and Human Factors. CalARP/ISO audits were conducted in August 2003, November-December 2005, August-October 2008, April-May 2011, January, 2014 and most recently October 2016. All safety program elements required by the ISO have been developed and are implemented.
- 4. Summarize Safety Plan updates (1.e., brief explanation of update and corresponding date) (450-8.030(B)(2) (iii): The original Safety Plan for this facility was filed with CCHMP on January 14, 2000. An amended plan, updated to reflect CCHS recommendations and ownership change, was filed on November 30, 2000. A Human Factors Amendment was submitted on January 15, 2001. A Power Disruption Plan was submitted, per Board of Supervisor request, on June 1, 2001. An amended Safety Plan, updated to reflect ownership change was submitted on June 12, 2002.

The Safety Plan for this facility is updated whenever changes at the facility warrant an update or every three years. In addition, the accident history along with other information is updated every year on June 30 in the Annual ISO Update to CCHMP. The most recent Safety Plan was submitted in June, 2017.

- List of locations where Safety Plans are/will be available for review, including contact telephone numbers if the source will provide individuals with copies of the document (450-8.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez; Martinez Library (library closest to the stationary source).
- Provide any additions to the annual accident history reports (i.e. updates) submitted pursuant
 to Section 450-8.016(£)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e., provide
 information identified in Section 450-8.016(£)(1) for all major chemical accidents or releases
 occurring between the last accident history report submittal (January 15) and the annual
 performance review and evaluation submittal (June 30)): There have been no MCARS during the last year.
- Summary of each Root Cause Analysis (Section 450-8.016(Cl)) including the status of the
 analysis and the status of implementation of recommendations formulated during the analysis
 (460-8.030(B)(2)(iv)) Status of Root Cause Analysis Recommendations: The recommended action
 tiems for all MCARs are closed.

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8. Summary of the status of implementation of recommendations formulated during audits, inspections, Root Cause Analyses, or Incident Investigations conducted by the Department (450-8.030(B)(2)(v)): "CCHS information": CCHS completed an audit on September 15, 2000. December 2001, August 2003, November/December 2005. August-October 2008. April-May 2011, January 2014 and October 2016. There are no RCA or Incident Investigations that have been conducted by the Department.

Facility status of audit recommendations. All recommendations from CCHMP audits prior to 2016 are closed, here are 3 open audit recommendations from the 2016 audit which are on target regarding due dates.

- Summary of inherently safer systems implemented by the source including but not limited to inventory reduction (I.e., intensification) and substitution (450-8.030(B)(2)(vI)): The refinery is submitting a list of the Inherently Safer Systems (ISS) that meet the criteria for Inherent or Passive levels only and that were completed within the last year (see attached).
- Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and any actions turned over to the Contra Costa County District Attorney's Office) taken with the Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)(2)(vii)): There were no enforcement actions during this period.
- Summarize total penaltites assessed as a result of enforcement of this Chapter (450-8.030(3)): No penaltities have been assessed against this facility.
- 12. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)): "CHCMP Information": The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$1,006.798. The total Industrial Safety Ordinance program fees for these eight facilities was—\$535,535. (NOTE: These fees include those for the County and City of Richmond ISO facilities).
- Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): "CCHMP Information": 3828 hours were used to audit/inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- 14. Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): This facilty has not received any comments to date regarding the effectiveness of the local program.
- 15. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): Chapter 450-8 improves industrial safety by expanding the safety programs to all units in the refinery. In addition, the timeframe is shorter to implement recommendations generated from the Process Hazard Analysis (PHA) safety program than state or federal law. This has resulted in a faster implementation of these recommendations.

Chapter 450-8 also includes requirements for inherently safer systems as part of implementing PHA recommendations and new construction. This facility has developed an aggressive approach to implementing inherently safer systems in these areas.

Chapter 450-8 has requirements to perform root cause analyses on any major chemical accidents or releases (MCAR). This facility has applied that rigorous methodology to investigate any MCARs that have occurred since January, 1999.

Chapter 450-8 requires a human factors program. This facility has developed a comprehensive human factors program and is in the process of implementing the program.

Chapter 450-8 requires a safety culture assessment. This facility has developed a safety culture assessment program that meets the requirements in the ordinance...

16. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and Incident Investigations in units not subject to CalARP regulations; recommendations from RCAs) that significantly decrease the severity or likelihood of accidental releases.

This question was broadly answered under question 15 above. Some examples of changes that have been made due to implementation of the ordinance are as follows. There are some units that were not covered by RMP, CalARP or PSM. Those units are now subject to the same safety programs as the units covered by RMP, CalARP and PSM. Those units are now subject to the same safety programs as the units covered by RMP, CalARP and PSM. They have had PHAs performed on them according to the timeliue specified in the ISO and the PHA recommendations have been resolved on the timeline specified in the ISO. A list of inherently safer systems as required by the ISO for PHA recommendations and new construction is attached to this filing as mentioned in the response to question. With respect Compliance Audits, there was a compliance audit performed in April 2015 in addition to the CCHMP audits mentioned above. All audit findings are being actively resolved. Root Cause Analysis findings and recommendations for MCARs are listed in the response under question 6.

- 17. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN activation) in response to major chemical accidents or releases: Pleae refer to #6 which has the CWS classifications for the major chemical accidents and releases as well as any information regarding emergency responses by agency personnel.
- 18. Common Process Safety Performance Indicators: 8/8/16-9/1/16
- Date the results of the Safety Culture Assessment were reported to the workforce and management: 4/4/17-5/15/17 and 11/17/16
- 20. Answer the following regarding the Safety Culture Evaluation Previous to the one listed in 18;
 - » Survey method: Survey
- Areas of improvements being addressed: The safety culture areas of improvement identified are: the maintenance work process, procedures, leadership of process safety, resources for process safety, and new hire training
 Action Plan made Progress on the identified areas of improvement?: (Yes or No) Yes
- If Yes, did the improvements meet the goals and if not was the action plan amended to address what is being
 done to meet the goals? There was improvement from 2013 to 2016 in some of the identified areas. The
 action plan for 2016 included the work that was performed previously and addressed continuing the effort to
 completion.

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- If No, has a new action plan been developed to address the identified areas of improvement? (Yes or No)
- 21. Have milestones and metrics been developed to determine how the Safety Culture Assessment actions are being Implemented? Yes or if not, Why not? Yes
- 22. Describe the process in place that includes employees and their representatives that will determine if the action items effectively changed the expected culture items; Once the initial report was received on the survey from the 3rd party consultant, the PSM Superintendent and USW Process Safety Representative reviewed the data and recommendations from the consultant in great detail as well as the 2013 survey. A preliminary action plan was developed from the in-depth analysis. The consultant's report and the preliminary action plan were reviewed with management, the it. H&S Committee and the union negotiation committee for input. In addition, the USW Process Safety Representative held as everal sessions with USW leadership to review the data in more detail. After this process was completed, it was determined the preliminary action plan was the final action plan.
- 23. Date of the mid-cycle progress evaluation: 2019 for SCA dated 2016
- Did the action plan (for no 18) make progress on the identified areas of improvement? NJA midcycle scheduled for this year
- Yes or if not, has a new action pan been developed? (Yes or No) N/A.
- 24. If a mid-cycle progress evaluation was performed during this reporting year, describe the process that included participation of employees or their representatives that determined whether the action items effectively changed the expected culture items: Please refer to above question detailing development of action plan. Mid-cycle will occur in 2019.

Overdue inspection for piping and pressure vessels based on total number of circuits

2018	Overdue	Repeat
January	1	0
February	က	0
March	0	0
April	0	0
May	0	0
June	0	0
July	~	0
August	4	←
September	0	~
October	0	0
November	0	0
December	0	0
TOTAL	9	2
Total preparate of piper ites 7.433		

Fotal number of circuits: 7,423

Total number of annual planned circuit inspections: 1,249 in the year 2018

25. Common Process Safety Performance Indicators:

Past due PHA recommended actions, includes seismic and LCC recommended actions

)
2018	Overdue	Repeat
January	0	0
February	9	0
March	9	တ
April	~	_
May	0	0
June	13	0
July	29	φ
August	51	27
September	9/	46
October	29	63
November	99	64
December	75	64
TOTAL	390	17

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

2018	Overdue	Repeat
January	2	,-
February	0	8
March	0	2
April	0	_
May	0	_
June	←	_
July	0	_
August	0	1
September	0	0
October	~	0
November	0	_
December	~	_
TOTAL	S.	4

eum refineries to report publically available refineny rate for API Tier 1 and Tier 2 dessification. Chemical plants to report publically available meun only for ACC Tier 1 eum refineries to report publically available receineny mean for API Tier 1 and Tier 2 dessification. Chemical plants to report publically available mean only for ACC Tier 1 e

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API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES STARTING-2011

	וממו	7011	71.07	2013	4107	CLOZ	2010	7107	2018
	No. Tier 1 LOPC	0	0	0	-	-	0	~	_
	Incident rate for Tier 1	0	0	0	0.05	90.0	O	0.04	0.04
	Refinery or Industry rate ¹	0.15	0.09	0.09	0.09	0.10	90.0	0.07	0.06
	Refinery or Industry mean2	*	1.49	1.30	1.38	1.55	1.01	1.13	0.92
	Tier 2 LOPC	_	_	2	eo	က	0	ო	4
•	Incident rate for Tier 2	0.06	0.05	0.12	0.16	0.17	0	0.12	0.17
•	Refinery rate ¹	*	0.24	0.25	0.23	0.20	0.17	0.18	0.17
-	Refinery mean ²	*	*	ø	*	3.08	2.78	2.73	2.79

Petroleum refineries to report publically available refinery rate for API Tier 1 and Tier 2 classification.

Chemical plants to report publically available mean only for ACC Tier 1 Petroleum refineries to report publically available refinery mean for API Tier 1 and Tier 2 classification.

Chemical plants to report publically available mean only for ACC Tier 1

* Petroleum refineries to report publically available refinery mean for API Tier I and Tier 2. Chemical plants to report publically available mean only for ACC Tier 1

**Data is not publicly available; report from AFPM only went back to 2012.

***Data not available at the time of reporting

26. Process Safety Performance Indicators for refineries only:

1. Number of Major Incidents in 2018; One (1)

 The number of temporary piping and equipment repairs that are installed on hydrocarbon and high energy utility systems that are past their date of replacement with a permanent repair.

2018	Total	Overdue	Repeat
January	111	56	0
February	112	0	56
March	105	4	55
April	106	_	59
May	105	2	58
June	107	0	9
July	108	_	9
August	109	9	61
September	110	ന	29
October	86	0	58
November	96	2	56
December	26	ന	58
TOTAL	26	78	29

Inherently Safer Systems Implemented

Item Identifier	Implementation Risk Reduction Category Category	Risk Reduction Category	ISS Approach
400I-2016-028	РНА	Passive	Moderate—Modification of physical conditions to less hazardous conditions.
19-2016-001	PHA	Passive	Moderate—Modification of physical conditions to less hazardous conditions.
AO 19-2016-016	PHA	Passive	Moderate—IModification of physical conditions to less hazardous conditions.
039-2018-008	РНА	Inherent	Second Order Inherent Salety - The hazard associated with emergency response equipment was resolved through the application of inherently safer principles to reduce the potential escalation of an incident.
056-2017-013	PHA	Passive	Moderate—Modification of physical conditions to less hazardous conditions.
XI02-2017-013	РНА	Inherent	Second Order Inherent Safely - The hazard associated with emergency response equipment location was resolved through the application of inherently safer principles to reduce the potential escalation of an incident.
102-2017-018	РНА	Inherent	Second Order Inherent Sately Application of inherently safer principles to reduce the likelihood of an incident.
, 102-2017-019	PHA	Inherent	Second Order Inherent Safety Application of inherently safer principles to reduce the likelihood of an incident.
102-2017-020	РНА	Inherent	Second Order Inherent Safety Application of inherently safer principles to reduce the likelihood of an incident.
102-2017-021	РНА	Passive	Moderate—Modification of physical conditions to less hazardous conditions.



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'Attach additional pages as necessary

- Name and address of Stationary Source: Chevron U.S.A. Inc. (CUSA), Richmond Refinery, 841 Chevron Way, Richmond, California 94802
- 2. Contact name and telephone number (should CCHMP have questions): Greg Shockey, 510-242-362
- Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030(B)(2)(ij):
 The CUSA Richmond Refinery (Refinery) initial Site Safety Plan (5SP) was completed in 2003, and the most recent revision is dated July 24, 2018.. The SSP was prepared in accordance with the City of Richmond Industrial Safety Ordinance (RISO), which was adopted by the Richmond City Council on January 17, 2002.
- Summarize Safety Plan updates (i.e., brief explanation of update and corresponding date) (450-8.030(B)(2)(ii)): The SSP was updated in 2018. The next revision will be shared in 3Q2021.
- List of locations where Safety Plans are/will be available for review, including contact
 telephone numbers if the source will provide individuals with copies of the document (4508.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez; Richmond Public Library at 325 Civic
 Center Plaza Richmond, CA 94804, and Point Richmond Public Library at 135 Washington Ave., Richmond, CA 94801.
- 6. Provide any additions to the annual accident history reports (i.e. updates) submitted pursuant to Section 450-8.016(E)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e., provide information identified in Section 450-8.016(E)(1) for all major chemical accidents or releases occurring between the last annual performance review report and the current annual performance review and evaluation submittal (12-month history)): There were no major chemical accidents or releases ("MCAR") as defined in Section 450-8.014(ii) between June 1, 2018 and June 1, 2019.
- Summary of each Root Cause Analysis (Section 450-8.016(C)) including the status of the
 analysis and the status of implementation of recommendations formulated during the analysis
 (450-8.030(B)(2)(Iv)): There were no MCAR events between June 1, 2018 and June 1, 2019, and accordingly
 there were no Root Cause Analyses conducted under section 450-8.016(c) during this period.
- 8. Summary of the status of implementation of recommendations formulated during audits, inspections, Root Cause Analyses, or Incident Investigations conducted by the Department (450-8.030(B)(2)(v)): The 2011 Cal APR/ISO Audit had 73 ensure and consider recommendations, from which 85 total action itmes were created, and 85 of those action items are complete. The final report and action plans from the 2013 Cal ARP/ISI benoal ISO audit were accepted by the County and Richmond Refinery in 2015. The 2013 Cal ARP/ISO audit had 163 ensure and consider recommendations, from which 177 total action items were created, and 170 of those action items are complete. The remaining action items are in progress, some with multivar timelines for completion. The report and action plans from the 2015 Cal ARP/Richmond ISO audit had 74 ensure and consider recommendations, from which 80 total action items are complete. The ensure and consider recommendations, from which 80 total action items are complete. The ensure and consider recommendations, from which 80 total action items are complete. The ensure and consider items for the 2016 audit were finalized on November 6, 2017.

- Summary of inherently safer systems implemented by the source including but not limited to inventory reduction (i.e., intensification) and substitution (450-8.030(B)(2)(v)); See Attachment 1 on page 5.
- 10. Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and any actions turned over to the Contra Costa County District Attorney's Office) taken with the Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)(2)(vih)): Therewere no enforcement actions during this period.
- Summarize total penalties assessed as a result of enforcement of this Chapter (450-8.030(3)): No penalities have been assessed against this facility.
- 12. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)). The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$1.006,798. The total Industrial Safety Ordinance program fees for these eight facilities was \$535,535. (NOTE: These fees include those for the County and City of Richmond ISO facilities).
- 13. Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): 3.828 hours were used to audit/inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- 14. Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): No comments were received during this period regarding the effectiveness of the local program that raise public safety issues.
- 16. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): Operating safety is one of CUSA's core values and underpins our commitment to enhancing our process safety programs. The RISO assists CUSA in improving our process safety performance. We have worked closely with CCHMP in its implementation of the RISO and its oversight of our operations, including during its periodic reviews of our operations. Consistent with this commitment, and as part of the company's efforts to continually improve its process safety performance, CUSA will continue to confer with the CCHMP as it refines and implements these actions.
- 16. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compliance Audits, and Incident Investigations in units not subject to CalARP regulations; recommendations from RCAs) that significantly decrease the severity or likelihood of accidental releases.
 In addition to the Inherently Safer Systems implemented in Question 9, CUSA has also made other changes to the facility pursuant to the RISO and beyond to decrease the severity or likelihood of accidental releases. A few examples include the following.
- Changes implemented based on findings from Tier 1 and Tier 2 Incident Investigation with solutions due between June 2018 to June 2019

- Added a new requirement during the mechanical-run testing to measure and record with accelerometers the vibration of piping supported solely by the compressor casing (e.g. balance lines, etc.).
- » Completed initial review of 13 major compressor balance lines with resonance testing to confirm natural frequencies that could be excited by the compressor running speed as well as reviewed existing bracing
 - » Identified all CS seal overhead vessels and piping in sour gas services to be upgraded to SS.
- sRCM (Streamlined Reliability-Centered Maintenance) continued implementing studies to set up ITPM/s (inspection, testing, and preventative maintenance tasks) refinery wide.
- The Fixed Equipment Asset Strategies Project (piping) improves the refinery's existing asset strategy, designed to
 prevent and mitigate loss of containment in piping systems and to describe the process for creating and maintaining
 these strategies.
- Completed Damage Mechanism Reviews on PSM-covered equipment and piping.
- Continued performing Safeguard Protection Analysis (Layers of Protection Analysis) consistent with the RISO.
 - Equipment and procedural changes implemented to reduce risks identified during PHAs, including:
- Implementing program to upgrade centrifugal pump seals to reduce or eliminate potential consequences
 that may result from seal failures.
 Completed project to install vibration monitoring and shutdown systems on API Class I pumps to minimize
 - poteritial loss of containment

 Continued effort to conduct procedural PHAs across refinery units to identify and mitigate potential human factors that may lead to loss of containment; with a focus on emergency, startup, and shutdown
- 17. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN activation) in response to major chemical accidents or releases; There were no level two or three CWS or TENS activations between June 1, 2018 and June 1, 2019.
- Common Process Safety Performance Indicators: Data collected Sept 2015 reported to work force June 2016
- 19. Date the results of the Safety Culture Assessment were reported to the workforce: June 2016
- 20. Answer the following regarding the Safety Culture Evaluation to the one listed in 18:
 - Survey method: Focus Groups
- Areas of improvements being addressed: Communication and resource planning
- Action Plan made Progress on the identified areas of improvement?: (Yes or No) Yes
- » If Yes, did the improvements meet the goals and if not was the action plan amended to address what is being done to meet the goals? Yes, the improvements met the goals.

If No, has a new action plan been developed to address the identified areas of improvement? (Yes

or No) N/A

 Have milestones and metrics been developed to determine how the Safety Culture Assessment actions are being implemented? Yes or if not, Why not?

Yes. Milestones are tracked in the Chevron Database system of record.

- 22. Describe the process that included employees and their representatives used to determine if the action items effectively changed the expected culture items: Employees and their representatives were involved in the review of data, development of the improvement suggestions as well as the development of the final action items. Through the process of meeting with the representatives we came to agreement on what data needed an action and what action would solve the milestones.
- 23. Date of the mid-cycle progress evaluation: None were conducted as they were not required at the time for SCA dated: June 2016
 - » o Did the action plan (for no 18) make progress on the identified areas of improvement? Yes or if not, has a new action pan been developed? (Yes or No) N/A.
- 24. If a mid-cycle progress evaluation was performed during this reporting year, describe the process that included participation of employees or their representatives that determined whether the action items effectively changed the expected culture items: N/A. Mid-cycle progress evaluation was not performed in this reporting year.
- 25. Common Process Safety Performance Indicators:

Overdue inspection for piping and pressure vessels based on total number of circuits

Overdue Repeat	0	0	0 0	0 0	0	0 0	0	0 0	0 0	0 0	0 0	
2018	January	February	March	April	May	June	July	August	September	October	November	Dogomeka

Total number of circuits: 8,414*

Total number of annual planned circuit inspection: 1,979*

*An ongoing project is re-evaluating piping circuit designations to align each circuit with the anticipated damage mechanisms. As the project progresses, the total number of piping circuits and subsequently, the number inspected, will change to accommodate the long-term strategy for inspections and reliability.

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Past due PHA recommended actions, includes seismic and LCC recommended actions

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

2048	0.10	
4010	overnue	Lebear
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES STARTING 2011

Year	2011	2012	2013	2014	2015	2013 2014 2015 2016 2017	2017	2018
No. Tier 1 LOPC	4	ო	0	-	2	_	~	-
Incident rate for Tier 1	0.14	0.11	00.00	0.02	0.05	0.02	0.05	0.01
Refinery or Industry rate ¹	0.1553	0.995	0.0947	0.0925	0.1038	0.0627	0.076	0.0570
Refinery or Industry mean2	1	1.49	1.30	1.38	1.55	1.01	1.13	0.92
No. Tier 2 LOPC	5	œ	9	3	_	e	ιO	4
Incident rate for Tier 2	0.18	0.29	0.19	0.07	0.02	0.07	0.10	0.06
Refinery or Industry rate¹	#	0.2405	0.2531	0.2380	0.2063	0.1726	0.1843	0.1728
Refinery or Industry mean ²	‡	*	#	8	3.08	2.78	2.73	2.79

Petroleum refineries to report publicly available refinery rate for API Tier 1 and Tier 2 classification. Chemical plants to report publicly available mean only for ACC Tier 1 (data from AFPM website;

Chemical plants to report publicly available mean only for ACC Tier 1 (data from AFPM website: https:// ···· https://www.afpm.org/754-reporting/).
²Petroleum refineries to report publicly available refinery mean for API Tier 1 and Tier 2 classification. www.afpm.org/754-reporting/).

** Refinery Industry rates or means are not publicly available at this time and will be provided when

available or released.

26. Process Safety Performance Indicators for refineries only:

Number of Major Incidents in 2018: One (1)
 The number of temporary piping and equipment repairs that are installed on hydrocarbon and high energy utility systems that are past their date of replacement with a permanent repair.

2018	Total	Overdue	Repeat
January	64	0	0
February	53	0	0
March	53	0	0
April	55 55	0	0
May	57	0	0
June	22	0	0
July	72	0	0
August	74	0	0
September	75	0	0
October	7.4	0	0
November	63	0	0
December	61	0	0
TOTAL	61	0	0
	75		

Attachment 1—Question 9

Risk Reduction Category	ISS Approach	Description
Inherent	Minimize	New amine plant was located next to the SRUs to minimize piping runs of acid gas containing H2S.
Inherent	Minimize	Caustic Scrubber is located close to plant to minimize the length of the H2S piping and to take advantage of elevated caustic tank location eliminating the need for caustic pumps.
Inherent	Moderate	The design pressure of a drum has been increased to reduce the potential for overpressure in the event of a blocked outlet relief case.
Inherent	Simplify	Removed abandoned 500 psi steam line and all obsolete equipment from plot plan of new plant.
Inherent	Eliminate	MEA and arsenic (in the form or sodium arsenite) has been eliminated from decommissioning plants and are not used in the new plants. This includes process piping and equipment, routine storage external to the process unit(s), and hazardous waste generation from maintenance activities.
Inherent	Substitute	Richmond Retinery can convert a portion of the existing anhydrous ammonia inventory into Hydrogen and Nitrogen and this will lead to a reduction in anhydrous ammonia inventory within the refinery.
Active	Moderate	Furnace Trip added to reduce the operating pressures and temperatures in an overpressure scenario.
Active	Moderate	Added high vibration shutdown to pumps to reduce the risk of a patential loss of containment.
Passive	Moderate	Spiash guards were added to a pump to reduce the consequence of a loss of containment.
Active	Moderate	Low flow SIS system installed on pump.
Procedural	Simplify	Procedure updated to clarify maximum target levels in sphere to reduce the likelihood of a loss of containment.

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*Attach additional pages as necessary

- Name and address of Stationary Source: Chemtrade Logaitics West US, LLC. 525 Castro St. Richmond, CA 94801
- 2. Contact name and telephone number (should CCHMIP have questions): Andrew Hornbeck 973-650-0257.
- Summarize the status of the Stationary Source's Safety Plan and Program (450-8.030(B)(2)(I)):
 The sites Safety Plan was submitted to the Hazardous Materials Program on 1.1/21/19 and is currently up to date.
- Summarize Safety Plan updates (i.e., brief explanation of update and corresponding date)
 (450-8.030(B)(2)(ii)): The recent Safety Plan submission included a substantial amount of updates. Major updates
 included updating the plan to current safety practices and included changes to the sites investigation and corrective
 action plans, human factors program, process hazard analysis procedures and document contol procedures.
- List of locations where Safety Plans are/will be available for review, including contact telephone numbers if the source will provide individuals with copies of the document (450-8.030(B)(2)(ii)): CCHMP Office at 4585 Pacheco Boulevard, Suite 100, Martinez: Richmond Public Library, (135 Washington Ave., Richmond, CA 94801).
- Provide any additions to the annual accident history reports (i.e. updates) submitted
 pursuant to Section 450-8.016(E)(2) of County Ordinance 98-48 (450-8.030(B)(2)(iii)) (i.e.,
 provide information identified in Section 450-8.016(E)(1) for all major chemical accidents or
 releases occurring between the last annual performance review report and the current annual
 performance review and evaluation submittal (12-month history)): No major chemical releases
 requiring a Root Cause Analysis since the last annual performance report.
- Summary of each Root Cause Analysis (Section 450-8.016(C)) including the status of the analysis and the status of implementation of recommendations formulated during the analysis (450-8.030(B)(2)(iv)): 135 of 136 action items written as a result of the 2017 CCHMP audit have been completed.
- Summary of the status of implementation of recommendations formulated during audits, inspections, Root Cause Analyses, or Incident Investigations conducted by the Department (450-8.030(B)(2)(v)): Site recently replaced old piping on the oleum system to meet current Chemtrade oleum piping specifications.
- Summarize the enforcement actions (including Notice of Deficiencies, Audit Reports, and
 any actions turned over to the Contra Costa County District Attorney's Office) taken with the
 Stationary Source pursuant to Section 450-8.028 of County Ordinance 98-48 (450-8.030(B)(2)
 (VII)): There were no enforcement actions during this period.

22

 Summarize total penalties assessed as a result of enforcement of this Chapter (450-8.030(3)): No penaltities have been assessed against this facility.

- 11. Summarize the total fees, service charges, and other assessments collected specifically for the support of the ISO (450-8.030(B)(4)): The total CalARP Program fees for the eight facilities subject to the Industrial Safety Ordinance was \$1,006,798. The total Industrial Safety Ordinance program fees for these eight facilities was -\$535,535. (NOTE: These fees include those for the County and City of Richmond ISO facilities)
- 12. Summarize total personnel and personnel years utilized by the jurisdiction to directly implement or administer this Chapter (450-8.030(B)(5)): 3,828 hours were used to audit/inspect and issue reports on the Risk Management Chapter of the Industrial Safety Ordinance.
- 13. Copies of any comments received by the source (that may not have been received by the Department) regarding the effectiveness of the local program that raise public safety issues(450-8.030(B)(6)): No formal comments have been received. The site continues to host bi-monthly CAP meetings with community members.
- (4. Summarize how this Chapter improves industrial safety at your stationary source (450-8.030(B)(7)): Significant improvments have been made in the sites human factors program and inherently safer system reviews as a result of this chapter.
- 15. List examples of changes made at your stationary source due to implementation of the Industrial Safety Ordinance (e.g., recommendations from PHA's, Compiliance Audits, and Incident Investigations in units not subject to CalARP regulations; recommendations from RCAs) that significantly decrease the severity or likelihood of accidental releases.

 Site has improved it's human factors program and PHA system improvements have been implemented as a result of the Industrial Safety Ordinance. Chemitrade has adopted ISS reviews across the company as a result of ISO.A standardized Safety Culture Assessment has been developed.
- 16. Summarize the emergency response activities conducted at the source (e.g., CWS or TEN activation) in response to major chemical accidents or releases: No major chemical accidents or
- 17. Date the last Safety Culture Assessment was completed; 8/14/18
- 18. Date the results of the Safety Culture Assessment were reported to the workforce and management: 9/19/18
- 19. Answer the following regarding the Safety Culture Evaluation previous to the one listed in 18:
- Survey method: Anonymous multiple choice survey developed with comments available for each question
- Areas of improvements being addressed: Improve safety incentives and improve including hourly employees when conducting investigations
 - Action Plan made Progress on the identified areas of improvement? (Yes or No)

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- » If Yes, did the improvements meet the goals and If not was the action plan amended to address what is being done to meet the goals? Yes, in progress, SCA to be conducted again in 2019 to review progress
- If No, has a new action plan been developed to address the identified areas of improvement? (Yes or No)
- 20. Have milestones and metrics been developed to determine how the Safety Culture Assessment actions are being implemented? Yes or if not, Why not? Yes
- 21. Describe the process that included employees and their representatives used to determine if the action items effectively changed the expected culture items: SCA will be conducted again in 2019 and the results will be compared to 2018.
- 22. Date of the mid-cycle progress evaluation: August 2019
- Old the action plan (for no 18) make progress on the identified areas of improvement? Yes or if not, has a new action pan been developed? (Yes or No?
- 23. If a mid-cycle progress evaluation was performed during this reporting year, describe the process that included participation of employees or their representatives that determined whether the action items effectively changed the expected culture items. N/A
- 24. Common Process Safety Performance Indicators:

Overdue inspection for piping and pressure vessels based on total number of circuits

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

Total number of circuits: 351

Total number of annual planned circuit inspections: 273

Past due PHA recommended actions, includes seismic and LCC recommended actions

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

Past due investigation recommended actions for API/ACC Tier 1 and Tier 2 incidents

2018	Overdue	Repeat
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	0	0

API/ACC TIER 1 & TIER 2 INCIDENTS AND RATES STARTING 2011

Year	2011	2012	2013	2013 2014	2015		2016 2017 2018	2018
No. Tier 1 LOPC	0	0	0	0	0	0	0	0
Incident rate for Tier 1	0	0	0	0	0	0	0	0
Refinery or Industry rate1	0.1553	0.0995	0.0947	0.0995 0.0947 0.0925	0.1038	0.0627	0.0761	
Refinery or Industry mean ²	*	1.49	1.30	1.38	1.55	1.01	1.13	
No. Tier 2 LOPC	0	0	0	0	0	0	0	τ
Incident rate for Tier 2	0	0	0	0	0	0	0	1.8
Refinery rate								
Refinery mean ²								

Petroleum refineries to report publically available refinery rate for API Tier 1 and Tier 2 classification.

Chemical plants to report publically available mean only for ACC Tier 1.

Petroleum refineries to report publically available refinery mean for API Tier 1 and Tier 2 classification. Chemical plants to report publically available mean only for ACC Tier 1).

"Refinery Industry rates or means are not publicly available.

