Kelly Aviles (State Bar No. 257168)
kaviles@opengovlaw.com
LAW OFFICES OF KELLY AVILES
1502 Foothill Blvd., #103-140
La Verne, California 91750
Telephone: (909) 374-0665

Peter Bibring (State Bar No. 223981)
peter@bibringlaw.com
LAW OFFICE OF PETER BIBRING
2210 W. Sunset Blvd. #203
Los Angeles, CA 90026
Telephone: (213) 471-2022

Attorneys for Petitioner/Plaintiff
TORRANCE REFINERY ACTION ALLIANCE, INC.

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

TORRANCE REFINERY ACTION ALLIANCE, INC., Petitioner/Plaintiff, v. CITY OF TORRANCE, Respondent/Defendant.	Case No.: **VERIFIED PETITION FOR WRIT OF MANDATE AND COMPLAINT FOR DECLARATORY RELIEF FOR VIOLATIONS OF THE CALIFORNIA PUBLIC RECORDS ACT WITH EXHIBITS A THROUGH G.**

Under California Code of Civil Procedure sections 1085 and 1060 and Government Code sections 7923.000 and 7923.100, Petitioner/Plaintiff **TORRANCE REFINERY ACTION ALLIANCE, INC.** ("TRAA" or "Petitioner") petitions this Court for a writ of mandate and declaratory relief directed to Respondent/Defendant **CITY OF TORRANCE** ("City"), ordering the City to produce all records responsive to Petitioner's California Public Records Act ("CPRA") requests, and to disclose any withheld or improperly redacted portions of the Hierarchy of Hazard Control Analysis

("HCA") Report for the Torrance Refinery, as required by the California Public Records Act and governing state regulations. In this verified Petition, Petitioner alleges as follows:

In this verified Petition, TRAA alleges as follows:

INTRODUCTION

1. This case involves the City of Torrance's unlawful withholding of a critically important public safety document—the Hierarchy of Hazard Control Analysis ("HCA") Report for the Torrance Refinery, located at 3700 W. 190th Street, Torrance, California—from the public, despite state regulations specifically requiring that the report be made available to the public. The City withheld the report entirely for over twenty-one months following TRAA's first CPRA request, and when it finally produced a partial response on April 28, 2025, it heavily redacted the HCA Report on the asserted bases of trade secret and other exemptions, and withheld additional records under a blanket claim of attorney-client privilege without any specific showing. As explained below, those claims of exemption are legally unsupportable, the redacted information is not a legitimate trade secret, and the overwhelming public interest in disclosure of this information vastly outweighs any conceivable interest in continued secrecy.

2. The stakes could not be higher. Modified hydrofluoric acid ("MHF") is one of the most dangerous industrial chemicals in existence. It is used for the alkylation process at only two refineries in all of California: the Torrance Refinery, owned and operated by PBF Energy/Torrance Refining Company ("ToRC"), and the Valero Refinery in Wilmington. The other California refineries that perform alkylation use a far safer alternative—sulfuric acid. (See www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2019/2019-feb1-025.pdf, last accessed on March 24, 2026.) Both MHF-using refineries are situated in densely populated communities in Los Angeles County, where hundreds of thousands of residents live within range of a potential catastrophic release.

3. The danger posed by MHF is not hypothetical. On February 18, 2015, an explosion at the Torrance Refinery registered as a small earthquake, injured four workers, and launched a 40-ton piece of debris that landed just five feet from tanks containing approximately 50,000 pounds of MHF. The U.S. Chemical Safety and Hazard Investigation Board ("CSB") investigated the explosion and concluded that the surrounding communities had narrowly "dodged a bullet." (See www.csb.gov/csb-releases-final-report-into-2015-explosion-at-exxonmobil-refinery-in-torrance-california/, last accessed on March 24, 2026.) Had those tanks ruptured, the resulting release could have caused mass casualties throughout the South Bay area. Independent scientific analysis shows that MHF, when released, forms a ground-hugging toxic cloud capable of traveling at lethal concentrations up to two miles. (See www.nrdc.org/court-battles/hydrogen-fluoride-refineries, last accessed on March 24, 2026.) The additive used to "modify" the acid—sulfolane—is present at only in small concentrations, which is far too little to prevent MHF from behaving as dangerously as unmodified hydrofluoric acid. (See www.traa.blog/2020/03/22/1986-hydrofluoric-acid-release-test/, last accessed on March 24, 2026.)

4. In recognition of these extraordinary dangers, the State of California has enacted some of the most stringent refinery safety regulations in the nation. Program 4 of the California Accidental Release Prevention Program ("CalARP"), codified at California Code of Regulations, Title 19, Chapter 4.5, requires petroleum refineries to conduct a Hierarchy of Hazard Control Analysis ("HCA") for their covered processes. Cal. Code Regs., tit. 19, § 2762.13 (renumbered to § 5110.16 as of March 2024). State regulations expressly mandate that HCA reports be made available to the public, with only legitimate trade secret information redacted. (Cal. Code Regs., tit. 19, § 2762.13(b)(4); see www.law.cornell.edu/regulations/california/19-CCR-2762.13, last accessed on March 24, 2026.)

5. Congress and the California Legislature have taken notice of the MHF threat. In February 2026, Representative Maxine Waters reintroduced the Preventing

Mass Casualties from Release of Hydrofluoric Acid at Refineries Act of 2026 (H.R. 7384), which would amend the Toxic Substances Control Act to prohibit the use of hydrogen fluoride at petroleum refineries nationwide. (See www.congress.gov/bill/119th-congress/house-bill/7384, last accessed on March 24, 2026.) California's South Coast Air Quality Management District ("SCAQMD") has also conducted extensive proceedings regarding the safety of MHF, including Proposed Rule 1410, which would have required phase-out of MHF at the Torrance and Valero refineries. (See www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1410, last accessed on March 24, 2026.) The existence of all this legislative and regulatory activity reinforces that the public's need for access to the HCA Report is not merely theoretical—it is urgent and essential. The SCAQMD also reported in 2022 that at least 2 new alkylation processes were proven alternatives.

6. TRAA submitted its first CPRA request for the HCA Report on June 21, 2023. The City denied that request entirely on August 14, 2023—fifty-four days after the request, well beyond the statutory deadline—citing exemptions for trade secrets, official information, and privacy interests without any specific factual showing. The City's internal emails confirm that City Fire Chief David Dumais had already made an a priori determination that the HCA Report was "not a public record we can provide" before even receiving TRAA's formal CPRA request, and coordinated that position with the LAFD CUPA and state regulators. On December 22, 2023, TRAA submitted a second, expanded CPRA request. The City then issued seven delay notices over sixteen months, repeatedly claiming it needed additional time without any substantive update. On April 28, 2025, the City finally produced a heavily redacted version of the 2022 HCA Report—in which almost all substantive information was removed—and withheld additional records under a blanket claim of attorney-client privilege, without identifying the withheld records or making any specific showing to support that claim.

7. The City's delay and withholding violate the CPRA in multiple respects. The CPRA requires agencies to respond to records requests within ten days and to

disclose public records promptly. (Gov. Code §§ 7922.535, 7922.530.) The City's sixteen-month delay in responding to a straightforward request for a report that state regulations affirmatively require to be made public is, standing alone, a serious and inexcusable violation. Moreover, the City's redactions are improper: the HCA Report does not contain trade secrets as defined under California law; the City has not met its burden of demonstrating that any claimed exemption applies; and even if some limited redactions were permissible, the City is required to disclose all non-exempt portions of the report with redactions only for legitimately exempt material, not to make sweeping redactions that effectively conceal the entire substance of the report. Further, the City's blanket claim that certain records are attorney-client privileged, without any identification of the specific records or any specific showing of privilege, is insufficient to justify withholding.

8. Petitioner brings this action to compel the City to fulfill its legal obligations under the CPRA: to produce the complete, unredacted HCA Report (or at minimum to provide far more limited and specifically justified redactions); to produce all remaining responsive records; and to provide proper legal and factual justification for any continued withholding. The public's right to understand how MHF is being evaluated, monitored, and controlled at the Torrance Refinery, as well as what available alternatives exist, is fundamental to both their safety and to the meaningful exercise of democratic oversight over one of the most dangerous chemical hazards in California.

THE PARTIES

9. Petitioner/Plaintiff TORRANCE REFINERY ACTION ALLIANCE, INC. ("TRAA") is a California 501(c)(4) nonprofit corporation organized under the laws of the State of California, with its principal office located in Torrance, California. TRAA advocates for the replacement of MHF at the Torrance Refinery and the Valero Refinery in Wilmington—the only California refineries that continue to use this extremely dangerous chemical in their alkylation process. TRAA's mission is the

protection of the health and safety of the communities surrounding these refineries. TRAA is a "person" entitled to institute proceedings to enforce public records rights under the CPRA. (Gov. Code § 7920.520; *Sierra Club v. Superior Court* (2013) 57 Cal.4th 157, 163.)

10. Respondent/Defendant CITY OF TORRANCE ("City") is a local public agency as defined by Government Code sections 7920.510 and 7920.525(a), and is therefore subject to the CPRA. The City and its Fire Department act as a Participating Agency with the Los Angeles County Certified Unified Program Agency ("CUPA") and manage the following four hazardous materials programs within the City of Torrance: the Hazardous Materials Disclosure Program (Article 1, Chapter 6.95 of the Health & Safety Code), the California Accidental Release Program ("CalARP") (Article 2, Chapter 6.95 of the Health & Safety Code), the Underground Storage Tank Program (Chapter 6.7 of the Health & Safety Code), and the California Fire Code hazardous materials management plans program. In its CalARP capacity, the City's Fire Department is the Unified Program Agency ("UPA") responsible for oversight of Program 4 compliance at the Torrance Refinery, including the requirement that HCA reports be made publicly available. The records at issue are believed to be situated in and accessible from the City's offices located in Torrance, Los Angeles County, California.

STANDING

11. Government Code section 7923.000, subdivision (a), provides that "[a]ny person may institute proceedings for injunctive or declarative relief or writ of mandate in any court of competent jurisdiction to enforce his or her right to inspect or to receive a copy of any public record or class of public records under this chapter."

12. "Person" is defined in Government Code section 7920.520 to include "any natural person, corporation, partnership, limited liability company, firm, or association...." The term has been interpreted broadly to include nonprofit organizations. (*North County Parents Organization for Children with Special Needs*

v. Department of Education (1994) 23 Cal.App.4th 144, 148; *Sierra Club v. Superior Court* (2013) 57 Cal.4th 157, 163.)

13. Petitioner is a nonprofit corporation and is a "person" entitled to institute proceedings for injunctive or declarative relief or writ of mandate to compel the City to disclose public records pursuant to the CPRA.

JURISDICTION AND VENUE

14. This Court has jurisdiction to issue writs of mandate pursuant to Code of Civil Procedure section 1085(a) and Government Code section 7923.000. The Court has jurisdiction to grant injunctive and declaratory relief pursuant to Code of Civil Procedure sections 525, 526, and 1060.

15. Venue is proper in the County of Los Angeles pursuant to Code of Civil Procedure section 393, subdivision (b), and Government Code section 7923.100, because the City is located within Los Angeles County, and the records and acts giving rise to the claims at issue occurred in Los Angeles County.

FACTS SUPPORTING THIS ACTION

A. Modified Hydrofluoric Acid and the Torrance Refinery Pose Catastrophic Risks to Surrounding Communities

16. Modified hydrofluoric acid ("MHF") is an extraordinarily hazardous industrial chemical used in the alkylation process to produce high-octane gasoline. MHF is essentially hydrofluoric acid ("HF")—one of the most corrosive and toxic substances in industrial use—combined with a sulfolane additive that was intended, when added in sufficient quantities, to suppress the formation of an aerosol cloud upon release. However, as the scientific and regulatory record has demonstrated, sulfolane is present in MHF at only small levels, insufficient to prevent MHF from forming a toxic, ground-hugging vapor cloud that can drift for miles at lethal concentrations upon release. (See www.traa.blog/2020/03/22/1986-hydrofluoric-acid-release-test/, last accessed on April 21, 2026; https://www.aqmd.gov/docs/default-

source/Agendas/Governing-Board/2019/2019-feb1-025.pdf?sfvrsn=6, last accessed on April 21, 2026.)

17. The U.S. Department of Homeland Security has identified hydrofluoric acid as one of the most dangerous chemicals in the country due to its potential to cause mass casualties in the event of a catastrophic release, listing it as a chemical of interest under its Chemical Facility Anti-Terrorism Standards. (See www.cisa.gov/chemical-facility-anti-terrorism-standards, last accessed on March 24, 2026.) HF and MHF are corrosive to skin, eyes, and mucous membranes, and systemic fluoride toxicity can cause cardiac arrest. In 1986, researchers at Lawrence Livermore National Laboratory released 8,300 pounds of HF in a controlled test (the "Goldfish" test) and found that 100 percent of the HF became airborne in a dense, ground-hugging cloud—none fell to the ground. Two miles downwind, the HF concentration was still more than twice the lethal concentration. (See www.nrdc.org/court-battles/hydrogen-fluoride-refineries, last accessed on March 24, 2026; www.traa.blog/2020/03/22/1986-hydrofluoric-acid-release-test/, last accessed on March 24, 2026.)

18. The Torrance Refinery sits in a densely populated community in the South Bay area of Los Angeles County. It is the only petroleum refinery in California other than the Valero Refinery in Wilmington that uses MHF in its alkylation process. The other eight California refineries that perform alkylation use sulfuric acid, which does not carry the same mass-casualty risk. (See www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2019/2019-feb1-025.pdf, last accessed on March 24, 2026.)

19. On February 18, 2015, an explosion and fire at the Torrance Refinery registered as a magnitude 1.7 earthquake, injured four workers, and covered surrounding communities with airborne catalytic dust. The explosion propelled an 80,000-pound piece of equipment that struck down approximately five feet from storage tanks containing approximately 50,000 pounds of MHF. The U.S. Chemical Safety and Hazard Investigation Board ("CSB") conducted a multi-year investigation

and determined in its 2017 report that had those tanks been struck, the resulting release of MHF would have been potentially catastrophic for the surrounding communities. The CSB report found that the community had narrowly avoided a mass-casualty disaster. (See www.csb.gov/csb-releases-final-report-into-2015-explosion-at-exxonmobil-refinery-in-torrance-california/, last accessed on March 24, 2026.)

20. The South Coast Air Quality Management District ("SCAQMD"), following the 2015 explosion, undertook an extensive rulemaking process (Proposed Rule 1410) that included over twenty public meetings from 2017 through 2019 examining the safety and viability of alternatives to MHF. The SCAQMD's own technical staff reports acknowledged that MHF, at the concentrations of sulfolane additive actually used at the refineries, would rapidly expand upon release and could travel at lethal concentrations up to two miles. While the SCAQMD ultimately required enhanced safety measures rather than a ban, the proceedings generated a substantial public record confirming the dangerous properties of MHF and the ongoing risk to surrounding communities. (See www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1410, last accessed on March 24, 2026.)

21. The ongoing threat posed by MHF use at the Torrance Refinery has prompted legislative action at both the state and federal levels. In February 2026, Representative Maxine Waters (D-CA) reintroduced the Preventing Mass Casualties from Release of Hydrofluoric Acid at Refineries Act of 2026 (H.R. 7384, 119th Congress), which would amend the Toxic Substances Control Act to prohibit the use of hydrogen fluoride at petroleum refineries. The bill is co-sponsored by Representatives Robert Garcia (D-CA), Nanette Barragán (D-CA), Ted Lieu (D-CA), and others representing communities near California's MHF refineries. (See www.congress.gov/bill/119th-congress/house-bill/7384, last accessed on March 24, 2026.) As recently as October 2025, the U.S. Environmental Protection Agency settled enforcement action against the Valero Refinery in Wilmington—the other California

refinery using MHF—fining Valero more than $270,000 for numerous safety and procedural violations in connection with its handling of MHF. (See www.epa.gov/newsreleases/epa-fines-valero-wilmington-refinery-chemical-safety-violations, last accessed on March 24, 2026.)

B. State Regulations Require the HCA Report to Be Made Public

22. California's Program 4 regulations, adopted under the California Accidental Release Prevention Program and codified at California Code of Regulations, Title 19, Chapter 4.5 ("CalARP Program 4 Regulations"), were enacted with the specific stated purpose "to prevent major incidents at petroleum refineries in order to protect the health and safety of communities and the environment." (Cal. Code Regs., tit. 19, § 2762.0.2; see also www.calepa.ca.gov/california-accidental-release-prevention/, last accessed on May 12, 2026.)

23. Among the requirements of the CalARP Program 4 Regulations is that petroleum refineries—including the Torrance Refinery—must conduct a Hierarchy of Hazard Control Analysis ("HCA") for their covered processes. (Cal. Code Regs., tit. 19, § 2762.13, renumbered to § 5110.16 as of March 2024.) An HCA is an analysis that systematically evaluates processes to determine whether hazards can be eliminated, substituted, or otherwise controlled through engineering and administrative controls, with the goal of identifying whether inherently safer technology—including the replacement of dangerous chemicals like MHF—is feasible.

24. Critically, the CalARP Program 4 Regulations expressly require that HCA reports be disclosed to the public. Specifically, California Code of Regulations, Title 19, section 2762.13(b)(4) mandates that HCA reports be made available to the public by posting them on the Unified Program Agency's website within thirty calendar days, "with appropriate protections for trade secret information." This provision is unambiguous: HCA reports must be publicly disclosed, with redactions limited only to legitimately protected trade secret information. The entire purpose of the state regulation is not only to ensure that refineries perform a robust hazard analysis, but to

ensure public transparency regarding the results of that analysis. (See www.law.cornell.edu/regulations/california/19-CCR-2762.13, last accessed on March 24, 2026.)

25. In addition to the CalARP Program 4 Regulations, California Code of Regulations, Title 8, section 5189.1 (the Cal/OSHA Process Safety Management for Petroleum Refineries regulation) also requires refineries to conduct HCA analyses and maintain documentation thereof.

C. TRAA's June 21, 2023 CPRA Request and the City's Improper Denial

26. On June 21, 2023, TRAA submitted a CPRA request to the City (Request No. W011027-062123), seeking a copy of the Hierarchy of Hazard Control Analysis (HCA) Report for the Torrance Refinery. The request stated:

> Please provide the Hierarchy of Hazard Control Analysis (HCA) report for the Torrance Refinery (3700 W 190th St, Torrance, CA 90504) or direct me to where it is posted online. Background on this request: According to your web site: The Certified Unified Program Agency for the city of Torrance is the Los Angeles County Fire Department Health Hazardous Materials Division. Torrance acts as a Participating Agency with the Los Angeles CUPA and manages the following four hazardous materials programs within the city of Torrance: The Hazardous materials disclosure program, Article 1 Chapter 6.95 Health & Safety Code, The California Accidental Release Program, Article 2 Chapter 6.95 H&SC, The Underground Storage Tank Program, Chapter 6.7 H&SC, California Fire Code dealing with Hazardous Materials Management Plans Certified Unified Program Agency (CUPA) | City of Torrance Cal. Code Regs. Tit. 19, § 2762.13 - Hierarchy of Hazard Control Analysis says: (4) During the design and review of new processes, new process units, and new facilities, and their related process equipment. An HCA report prepared for this purpose shall be provided to the UPA. The UPA shall make these HCA reports available to the public by posting them on the UPA's website within 30 calendar days, with appropriate protections for trade secret information. https://www.law.cornell.edu/regulations/california/19-CCR-2762.13

A true and correct copy of the June 21, 2023 CPRA request is attached hereto as **Exhibit A**.

27. Under the CPRA, upon receiving a CPRA request for copies of records, an agency must, "within 10 days from receipt of the request, determine whether the

request, in whole or in part, seeks copies of disclosable public records in the possession of the agency and shall promptly notify the person making the request of the determination and the reasons therefor." (Gov. Code § 7922.535(a).) The City did not comply with this statutory deadline.

28. On August 14, 2023—fifty-four days after TRAA's request—the City denied the request in its entirety. The City claimed the HCA Report was exempt from disclosure because it "contains trade secrets and other confidential information only obtained by the City in confidence, as official information, in connection with its regulatory authority over the refinery," and that "[d]isclosure of the Record would also significantly harm the Refinery's privacy and financial interests, which greatly outweighs any public interest in disclosure." The City cited Government Code sections 7924.510, 7927.300, 7927.605, and 7922.000, as well as California Labor Code sections 6322 and 6396. The denial did not set forth the names and titles of the persons responsible for the denial, and provided no specific factual basis for the claimed exemptions. A true and correct copy of the City's August 14, 2023 denial is attached hereto as **Exhibit B**.

29. The City's fifty-four day delay in responding to the CPRA request violated Government Code section 7922.535(a), which requires a determination of disclosability within ten days, with only a single permissible extension of up to fourteen days in cases of "unusual circumstances." Even accounting for the maximum permitted extension, the City's response was twenty days overdue. Moreover, the City provided no legal or factual basis to support any of the exemptions it cited, in violation of Government Code section 7922.540(c), which requires an agency to "justify withholding any record by demonstrating that the record in question is exempt under express provisions of this chapter or that on the facts of the particular case the public interest served by not disclosing the record clearly outweighs the public interest served by disclosure of the record."

D. TRAA's December 26, 2023 CPRA Request and the City's Sixteen-Month Delay

30. On December 21, 2023, Petitioner's counsel sent a detailed letter to the City Attorney challenging the denial of TRAA's first CPRA request and explaining why the claimed exemptions did not apply to the HCA Report, including detailed analysis of the inapplicability of the trade secret exemption and the compelling public interest in disclosure. A true and correct copy of that letter is attached hereto as **Exhibit C**.

31. The December 21 letter also included a second, expanded CPRA request on behalf of TRAA (Request No. W011735-122623), seeking: (1) all communications regarding TRAA or its June 21, 2023 CPRA Request from June 2023 to the present, specifically including communications with the Torrance Refinery or its agents, employees, or representatives; (2) any inspection report related to the Hierarchy of Hazard Control Analysis from 2019 to the present; (3) any communications to or from inspectors related to the HCA inspection and report from 2019 to the present; and (4) any report detailing any leaks of MHF or "near misses" at the Torrance Refinery. (**Ex. C.**)

32. Rather than responding to this second request within the statutory ten-day period, the City proceeded to issue a series of seven delay notices over the course of approximately sixteen months, repeatedly claiming it needed additional time to search for responsive records without providing any substantive update, timeline, or estimated completion date. The City issued delay notices on or about the following dates: January 5, 2024; February 5, 2024; February 16, 2024; March 12, 2024; April 16, 2024; September 17, 2024; and March 20, 2025. True and correct copies of the City's delay notices are attached hereto as **Exhibit D**.

33. Each delay notice stated only that the City needed "additional time" to search for or fulfill the request, without providing any explanation, timeline, or indication of what steps were being taken. This pattern of issuing vague, delay notices over sixteen months is not a permissible substitute for compliance with the CPRA's

requirements. (Gov. Code § 7922.530(a) [requiring prompt disclosure]; § 7922.500 [barring agencies from unreasonable delays in disclosure].)

E. The City's Extensive Communications with the Torrance Refinery Regarding the HCA and CPRA Requests

34. The records produced by the City reveal that City personnel maintained close and regular communications with Torrance Refinery personnel throughout the period covered by TRAA's CPRA requests, and that City personnel coordinated their response to TRAA's requests with Refinery personnel. These communications demonstrate that the City was allowing the regulated entity—the Torrance Refinery—to influence, participate in, or control the City's responses to TRAA's public records requests, in violation of Government Code section 7921.005. A true and correct copy of communications produced in response to TRAA's CPRA requests is attached hereto as **Exhibit E.**

35. The produced communications include an email chain in which Senior Fire Prevention Specialist Ellery Sanders corresponded extensively with Kelvin Nguyen (Process Safety Engineer, Torrance Refining Co.) and Alex Holt (Safety Superintendent, Torrance Refining Co.) regarding an MHF release incident at the Refinery's Alkylation Unit on May 3, 2023, and regarding the Refinery's HCA and CalARP compliance. Specifically, Holt and Kazandjian exchanged communications on June 14, 2023, in which Holt stated that he did not believe a May 2023 MHF release "should be classified as a major incident"—a classification that would trigger specific public reporting requirements under CalARP regulations—and requested a meeting with the City Fire Department to dispute that classification. Deputy Fire Marshal Kazandjian responded that he and Chief Dumais "both agreed that it falls under that classification by definition."

36. Additional produced communications show that on June 21, 2023—the same day TRAA submitted its first CPRA request—Senior Fire Prevention Specialist Sanders emailed Holt to discuss "the HCA/RMP completeness review," stating that the

City needed to meet given "sensitive timelines and upcoming unavailability within our staffing." This communication confirms that at the very moment TRAA submitted its CPRA request for the HCA Report, City personnel were in active communications with the Refinery about the very document being requested, with knowledge of the request and its time sensitivity.

37. The produced communications also include emails through September and October 2023 in which City fire personnel followed up with Refinery personnel regarding incident investigation reports for multiple incidents occurring at the Refinery, including: the MHF Release in the Alkylation Unit on May 3, 2023; a Butane Leak in the DIB Unit on September 26, 2023; a Pinhole Leak on a transfer line on September 27, 2023; and a "Laser Detection trigger in the Alkylation Unit (near miss incident)" on September 27, 2023. These communications confirm that responsive records regarding MHF incidents and near-misses were in the possession of the City but were not produced in response to item 4 of TRAA's December 26, 2023 CPRA request.

38. Also among the produced communications is an email from Fire Chief Dumais dated February 21, 2023, forwarding to City Fire Department personnel a Daily Breeze news article titled "Advocates renew call for MHF ban on 8th anniversary of Torrance refinery explosion," with the notation "FYI." This email demonstrates that senior City officials were closely tracking public advocacy efforts regarding MHF at the Torrance Refinery.

39. The CPRA expressly prohibits agencies from allowing third parties—including the entities being regulated—to control the disclosure of public records. (Gov. Code § 7921.005.) The City's close coordination with the Refinery regarding the content and classification of incident reports, and its adoption of the Refinery's preferred position that the HCA Report need not be disclosed, violated this prohibition.

F. The City's April 28, 2025 Partial and Heavily Redacted Production

40. On April 28, 2025—over sixteen months after TRAA's second CPRA request, and over twenty-two months after TRAA's first CPRA request—the City produced a partial response to both pending CPRA requests (Nos. W011027-062123 and W011735-122623). The City released a heavily redacted version of the 2022 Alkylation HCA Report ("HCA Report") as well as certain other documents (attached as Ex. E.) A true and correct copy of the April 28, 2025 transmittal letter is attached hereto as **Exhibit F**. A true and correct copy of the redacted 2022 HCA Report is attached hereto as **Exhibit G**.

41. In the April 28, 2025 letter, signed by Management Aide Sara Shor, the City stated that portions of the HCA Report had been redacted because they allegedly "contain trade secrets and other confidential information only obtained by the City in confidence, as official information, in connection with its regulatory authority over the refinery," and that "[d]isclosure of the redacted information would also significantly harm the Refinery's privacy and financial interests, which greatly outweigh any public interest in disclosure." The City again cited Government Code sections 7924.510, 7927.300, 7927.605, and 7922.000, as well as California Labor Code sections 6322 and 6396, and Evidence Code sections 1040 and 1060.

42. The 2022 HCA Report produced by the City is so heavily redacted that it is effectively unintelligible. Almost all substantive information in the report—including the analytical findings, conclusions, and recommendations concerning MHF hazard control options—has been redacted. The scope of the redactions goes far beyond any legitimate trade secret claim and renders the produced document useless for the very purpose that state law requires it to be made public: allowing the community to evaluate whether the Refinery is adequately addressing the hazards posed by its MHF alkylation unit.

43. The City also stated that the only records entirely withheld (not redacted) were withheld as attorney-client privileged pursuant to California Government Code section 7927.705. The City did not identify what records were withheld on attorney-

client grounds, did not provide a privilege log, and did not set forth the names and titles of the person(s) responsible for the denial, in violation of Government Code section 7922.540(a). The City's invocation of the attorney-client privilege is discussed below.

44. The City did not produce any records responsive to item 4 of TRAA's December 26, 2023 request—reports detailing MHF leaks or "near misses" at the Torrance Refinery. As described in Paragraph 40 above, the City's own produced communications confirm that responsive incident reports and near-miss records exist. The City has provided no justification for withholding these records.

CAUSE OF ACTION

FOR VIOLATIONS OF CALIFORNIA PUBLIC RECORDS ACT

(GOV. CODE §§ 7923.000 and 7923.100*; CODE CIV. PROC. §§ 1060, 1085)*

45. Petitioner hereby realleges and incorporates herein by this reference Paragraphs 1 thorough 44 of this Petition as though set forth herein in full.

46. The CPRA expressly provides that "access to information concerning the conduct of the people's business is a fundamental and necessary right of every person in this state." (Gov. Code § 7921.000.) The purpose is to "give the public access to information that enables them to monitor the functioning of their government." (*CBS, Inc. v. Block* (1986) 42 Cal.3d 646, 651; *Times Mirror Co. v. Superior Court* (1991) 53 Cal.3d 1325, 1350.)

47. Under the CPRA, all records that are prepared, owned, used, or retained by any public agency and that are not subject to the CPRA's statutory exemptions to disclosure must be made publicly available for inspection and copying upon request. (Gov. Code §§ 7920.530, 7922.525(a)-(b).) There is a "statutory presumption that all governmental records are available to any person" unless the agency demonstrates that nondisclosure is statutorily warranted. (*ACLU v. Superior Court* (2011) 202 Cal.App.4th 55, 85; § 7922.000.)

48. Upon a request for copies of records, the agency is required to make the records "promptly available" and to "within 10 days from receipt of the request, determine whether the request, in whole or in part, seeks copies of disclosable public records in the possession of the agency." (Gov. Code § 7922.535(a).) The City violated this requirement as to both TRAA's June 21, 2023 and December 26, 2023 CPRA Requests.

49. The City violated the CPRA in the following specific respects:

(a) Failing to respond to TRAA's June 21, 2023 CPRA Request within the statutory ten-day period, and instead issuing an untimely, blanket denial fifty-four days later, in violation of Government Code section 7922.535(a);

(b) Denying TRAA's June 21, 2023 CPRA Request without providing any specific factual basis for the claimed exemptions and without identifying the persons responsible for the denial, in violation of Government Code sections 7922.540(a) and (c);

(c) Failing to respond to TRAA's December 26, 2023 CPRA Request within the statutory ten-day period, instead issuing seven vague delay notices over sixteen months, in violation of Government Code sections 7922.535(a) and 7922.530(a);

(d) Delaying and obstructing the production of responsive records for over twenty-two months (as to the first request) and over sixteen months (as to the second request), in violation of Government Code sections 7922.530(a) and 7922.500;

(e) Allowing the Torrance Refinery—the regulated entity—to participate in or influence the City's responses to TRAA's public records requests, in violation of Government Code section 7921.005;

(f) Improperly redacting the 2022 HCA Report to the point of rendering it unintelligible, based on overbroad and legally unsupported claims

of trade secret and other exemptions, in violation of Government Code sections 7922.525(b) and 7922.540(c);

(g) Failing to produce records responsive to item 4 of TRAA's December 26, 2023 request—reports detailing MHF leaks and near-misses at the Torrance Refinery—without adequate justification, in violation of Government Code section 7922.530(a);

(h) Withholding records under a blanket attorney-client privilege claim without identifying the withheld records, making any specific showing of privilege as to each withheld record, or setting forth the persons responsible for the denial, in violation of Government Code sections 7922.540(a) and (c).

50. If the City determined that responsive records were exempt from disclosure for any reason, it was required to "justify withholding any record by demonstrating that the record in question is exempt under express provisions of this chapter or that on the facts of the particular case the public interest served by not disclosing the record clearly outweighs the public interest served by disclosure of the record" under Government Code section 7922.000. The City failed to provide the required justification as to any category of withheld or redacted records.

51. The CPRA requires state and local agencies to disclose public records on request unless the record falls within a specific statutory exemption. (Gov. Code §§ 7922.525, 7922.530.) The burden of proving an exemption exists falls squarely on the public agency. (Gov. Code § 7922.540(c) ["[a]n agency shall justify withholding any record..."]; *CBS Broadcasting v. Sup. Ct.* (2001) 91 Cal.App.4th 892, 908; *Long Beach Police Officers Assn. v. City of Long Beach* (2014) 59 Cal.4th 59, 67.) Exemptions to disclosure are narrowly construed. (Cal. Const., Art. 1, § 3(b)(2).)

52. A "trade secret" is defined under Civil Code section 3426.1(d) as information that (1) derives independent economic value, actual or potential, from not being generally known to the public or to other persons who can obtain economic value

from its disclosure or use; and (2) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy. The party claiming the privilege bears the burden of establishing its existence. (*Bridgestone/Firestone, Inc. v. Sup. Ct.* (1992) 7 Cal.App.4th 1384, 1393.)

53. The City has provided no factual showing—and the Torrance Refinery has provided no evidence—to support the contention that the redacted portions of the HCA Report constitute trade secrets under this definition. The City's bare recitation of the words "trade secret" without any specific factual or legal analysis does not constitute the required justification for withholding records. (*ACLU of N. Cal. v. Sup. Ct.* (2011) 202 Cal.App.4th 55, 67 [justification for nondisclosure requires a factual showing that is "specific enough to give the requester a meaningful opportunity to contest the withholding of the documents"].)

54. The HCA Report contains the results of the Torrance Refinery's analysis of hazards and hazard control options for the MHF alkylation unit. The type of information contained in an HCA Report—which processes and chemicals are used, what hazards they pose, and what controls are in place or could be implemented—does not constitute proprietary commercial information that derives economic value from its secrecy. Rather, it is precisely the type of safety-critical process information that California regulations require to be made public.

55. Much of the information contained in HCA Reports about MHF use at California refineries is already in the public domain. The SCAQMD's Rule 1410 rulemaking process, which spanned more than twenty public meetings from 2017 through 2019, involved extensive public disclosure of information about MHF use, storage quantities, safety systems, and hazard analyses at both the Torrance and Valero refineries. (See www.aqmd.gov/home/research/documents-reports/hf-at-refineries, last accessed on March 24, 2026.) The U.S. Chemical Safety Board's 2017 report on the 2015 Torrance Refinery explosion publicly disclosed significant information about the MHF alkylation unit and its safety vulnerabilities. (See www.csb.gov/csb-releases-

final-report-into-2015-explosion-at-exxonmobil-refinery-in-torrance-california/, last accessed on March 24, 2026.) Information that is already in the public domain cannot constitute a trade secret. (*Amgen Inc. v. Health Care Servs.* (2020) 47 Cal.App.5th 716, 735.)

56. Additionally, the HCA Report was prepared not by the Torrance Refinery for commercial exploitation, but as a regulatory compliance document required by California law and submitted to the City as the Unified Program Agency for the express purpose of public disclosure. The Refinery had no reasonable expectation that a document it was legally required to prepare and submit to a government agency for public posting would be kept confidential. Any claim that such a document constitutes a trade secret is without merit. (*Amgen Inc. v. Health Care Servs.*, supra, 47 Cal.App.5th at 735 [finding no trade secret where recipient of information had no contractual confidentiality obligation imposed upon it].)

57. Even assuming arguendo that some limited portions of the HCA Report contained legitimately protected trade secret information, the City is not permitted to redact entire sections of the report or to withhold it wholesale. Under Government Code section 7922.525(b), "[a]ny reasonably segregable portion of a record shall be available for inspection by any person requesting the record after deletion of the portions that are exempted by law." Courts have held that "[t]he fact that parts of a requested document fall within the terms of an exemption does not justify withholding the entire document." (*Los Angeles Cty. Bd. of Supervisors v. Sup. Ct.* (2016) 2 Cal.5th 282, 292.) This "requires public agencies to use the equivalent of a surgical scalpel to separate those portions of a record subject to disclosure from privileged portions." (*Id.*)

58. The state regulations governing the HCA Report specifically contemplate that the report will be publicly posted "with appropriate protections for trade secret information." (Cal. Code Regs., tit. 19, § 2762.13(b)(4).) This means that only specifically identified trade secret material may be redacted—not entire sections of analytical findings, conclusions, or recommendations. The City's redactions, which

effectively conceal almost all substantive content of the 2022 HCA Report, go far beyond any legitimate trade secret claim and violate the segregability requirements of the CPRA.

59. Even if some material in the HCA Report were arguably subject to a trade secret claim, disclosure is nonetheless required when the public interest in disclosure outweighs the interest in confidentiality. California courts have consistently held that any trade secret privilege in the CPRA context "should be applied conditionally on a clear showing that disclosure is against the public's interest." (*San Gabriel Tribune v. Superior Court* (1983) 143 Cal.App.3d 762, 777.) Similarly, Evidence Code section 1060 does not protect trade secrets from disclosure where such protection "would work injustice." (*Uribe v. Howie* (1971) 19 Cal.App.3d 194, 207-211.)

60. In *San Gabriel Tribune*, the court rejected the agency's argument that disclosure would harm a private company's privacy and financial interests, finding that this "misstate[d] what the public's interest is as serving the privacy interests of a private contractor, rather than in serving the public's interest in participating in local government." (143 Cal.App.3d at 777.) The same analysis applies here: the City's stated rationale—protecting the Refinery's "privacy and financial interests"—does not serve the public interest and cannot legally justify withholding safety-critical information mandated for public disclosure by state regulation.

61. In *Uribe v. Howie*, the Court of Appeal held that the catchall exemption did not apply to disclosure of "pesticide applicator spray reports" given the compelling public interest in information concerning impacts on public health. The analogy to MHF hazard analysis reports—which directly bear on the risk of a chemical catastrophe affecting hundreds of thousands of California residents—is even more compelling.

62. The public interest in the full disclosure of the HCA Report is exceptional. The Torrance Refinery stores and uses tens of thousands of pounds of one of the most dangerous chemicals in industrial use, in the middle of a densely populated community

in earthquake-prone Los Angeles County. (See www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2019/2019-feb1-025.pdf, last accessed on March 24, 2026.) The community has already experienced one near-catastrophe. (See www.csb.gov/csb-releases-final-report-into-2015-explosion-at-exxonmobil-refinery-in-torrance-california/, last accessed on March 24, 2026.) Federal legislators, state regulators, and community members have spent years seeking greater transparency about MHF safety practices at this refinery. (See www.congress.gov/bill/119th-congress/house-bill/7384, last accessed on March 24, 2026; www.aqmd.gov/home/rules-compliance/rules/scaqmd-rule-book/proposed-rules/rule-1410, last accessed on March 24, 2026.) The HCA Report contains the results of the very analysis that California law requires to be performed and disclosed for precisely this situation—to ensure that public safety is being protected and that the community can meaningfully participate in oversight. There is no legitimate public interest in keeping this information secret that comes close to outweighing the extraordinary public interest in transparency.

63. The City's citation to Government Code sections 7924.510, 7927.300, 7927.605, and 7922.000, and California Labor Code sections 6322 and 6396, as additional bases for withholding the HCA Report are legally insufficient and inapplicable. California Code of Regulations, Title 19, section 2762.13(b)(4) specifically mandates disclosure of the HCA Report (with limited trade secret redactions). A specific statutory mandate to disclose controls over a general discretionary exemption. (Cal. Const., Art. 1, § 3(b)(2) [exemptions from disclosure are narrowly construed].)

64. Government Code section 7924.510 (financial interest exemptions) does not apply because the HCA Report is not a financial record and the Refinery has no protected financial interest in concealing safety hazard analyses from the public. Government Code sections 7927.300 (official information acquired in confidence) and 7927.605 (preliminary notes and drafts) are similarly inapplicable: the HCA Report is a final regulatory compliance document—not confidential official information or a

preliminary draft—required by regulation to be submitted to the City and publicly disclosed. The California Labor Code provisions cited apply to records in Cal/OSHA's possession, not records in the possession of local fire departments or CUPA agencies.

65. The City's claimed reliance on Evidence Code section 1040 (official information privilege) is also unavailing. The City cannot establish that there is a "necessity for preserving the confidentiality of the information" that "outweighs the necessity for disclosure in the interest of justice." (Evid. Code § 1040(b)(2).) Given the express state regulatory mandate for public disclosure of HCA reports and the compelling public safety interests at stake, the necessity for disclosure plainly outweighs any need for confidentiality.

66. In its April 28, 2025 response, the City stated that the only records entirely withheld—as opposed to redacted—were withheld as attorney-client privileged pursuant to Government Code section 7927.705, which exempts records whose disclosure is prohibited by the Evidence Code's privilege provisions. While the attorney-client privilege is recognized under California law, the City's invocation of it here is legally insufficient.

67. To withhold records on grounds of attorney-client privilege, the agency must establish that the specific communications at issue constitute confidential communications between attorney and client for the purpose of seeking or obtaining legal advice. The City has made no such showing. It has not identified what records were withheld, has not described the nature of the communications, and has not explained how each withheld record satisfies the elements of the privilege. A blanket claim of attorney-client privilege, applied to an unidentified set of records without any specific showing, does not satisfy the agency's burden of justifying withholding under Government Code section 7922.540(c). (*ACLU of N. Cal. v. Sup. Ct.*, 202 Cal.App.4th at 67.)

68. While TRAA acknowledges that the CPRA does not independently require agencies to provide a privilege log, and that the City may raise attorney-client

privilege as a defense before this Court, the City's failure to make any specific showing in its pre-litigation response does not preclude this Court from requiring a proper privilege determination. This Court has authority to require the City to identify the withheld records with particularity and to demonstrate, as to each withheld record, that the attorney-client privilege applies to that specific communication. If the City cannot make that showing for any given record, that record must be produced.

69. Moreover, to the extent any withheld communications were between City personnel and representatives of the Torrance Refinery—rather than between City employees and City attorneys—the attorney-client privilege would not apply to those communications at all, as the Refinery is not the City's client. The City's close coordination with Refinery personnel documented in the produced records raises significant questions about whether records claimed as attorney-client privileged actually involve communications with the Refinery rather than with City counsel.

70. The City's improper withholding of specified public records has impaired Petitioner's ability to carry out its mission of protecting the communities surrounding the Torrance Refinery from the risks posed by MHF, and has prevented Petitioner and the public from obtaining information essential to understanding the hazards of MHF use and the measures being taken—or not taken—to address those hazards, all in violation of Petitioner's rights under the CPRA.

71. Government Code section 7923.000 provides: "Any person may institute proceedings for injunctive or declarative relief or writ of mandate in any court of competent jurisdiction to enforce his or her right to inspect or to receive a copy of any public record or class of public records under this chapter."

72. An actual controversy exists between the parties regarding whether the City has improperly delayed, denied, and obstructed the production of disclosable public records in response to Petitioner's June 21, 2023 and December 26, 2023 CPRA Requests.

73. Petitioner has exhausted available administrative remedies. Petitioner requested copies of disclosable public records from the City and challenged the City's denial in writing. Despite Petitioner's repeated attempts to procure the City's compliance with the CPRA, the City has failed to produce all responsive public records and has improperly redacted portions of the HCA Report. The only plain, speedy, and adequate remedy available to Petitioner is the relief provided by Government Code section 7923.000.

74. When a verified petition shows that records are being improperly withheld, "the court shall order the officer or person charged with withholding the records to disclose the public record or show cause why he or she should not do so." (Gov. Code § 7923.100(a).)

75. The City has a ministerial duty to perform according to the laws of the State of California, including the CPRA. The City has a present legal duty and present ability to perform its ministerial duties, as required by the CPRA. The City has failed to perform its ministerial duties.

76. Petitioner has an interest in having the laws executed and public duties enforced and, therefore, has a beneficial interest in the outcome of the proceedings. Petitioner has a clear, present, and legal right to the City's performance of its ministerial duties, as required by the CPRA.

WHEREFORE, PETITIONER PRAYS AS FOLLOWS:

1. This Court issue a peremptory writ of mandate, without a hearing or further notice, directing the City to immediately:

(a) produce all responsive records to Petitioner's June 21, 2023 and December 26, 2023 CPRA Requests, including all records documenting MHF leaks and near-misses at the Torrance Refinery;

(b) produce the full, unredacted 2022 HCA Report, or in the alternative, produce the HCA Report with only those specific redactions that are lawfully justified by a specific and particularized showing that the

redacted portions constitute trade secrets as defined by Civil Code section 3426.1(d);

(c) identify with particularity every record withheld on attorney-client privilege grounds and demonstrate, as to each such record, that the privilege applies; and

(d) produce any records claimed as attorney-client privileged for which no adequate showing of privilege is made.

2. This Court issue a declaratory judgment that the public records requested by Petitioner are disclosable public records and that the City violated the California Public Records Act by:

(a) failing to properly and timely respond to Petitioner's CPRA Requests;

(b) failing to "promptly" produce responsive records;

(c) delaying and obstructing the production of responsive records;

(d) not identifying the person(s) responsible for the denial of the records;

(e) allowing the Torrance Refinery to participate in or influence its public records determinations;

(f) improperly withholding and/or heavily redacting the HCA Report based on claims of exemptions that are inapplicable to the requested records;

(g) failing to justify any redactions or privilege claims with the required specificity; and

(h) withholding MHF incident and near-miss records without adequate justification.

3. This Court set "times for responsive pleadings and for hearings in these proceedings ... with the object of securing a decision as to these matters at the earliest possible time," as provided in Government Code section 7923.005.

4. This Court enter an order allowing Petitioner to recover attorneys' fees and costs incurred in this action pursuant to Government Code section 7923.115 and/or Code of Civil Procedure section 1021.5; and,

5. This Court award such further relief as is just and proper.

DATED: June 1, 2026

LAW OFFICES OF KELLY AVILES

By: _____
Kelly Aviles
Attorneys for Petitioner/Plaintiff TRAA

VERIFICATION
(C.C.P. §§ 446 and 2015.5)

I, Ian Patton, am the Coordinator of Public Records for Torrance Refinery Action Alliance, Inc., Petitioner/Plaintiff in the above-entitled action or proceeding. I have read the foregoing **VERIFIED PETITION FOR WRIT OF MANDATE AND COMPLAINT FOR DECLARATORY RELIEF FOR VIOLATIONS OF THE CALIFORNIA PUBLIC RECORDS ACT WITH EXHIBITS A THROUGH G** and know the contents thereof, and I certify that the same is true and correct of my own knowledge, except as to those matters which are therein stated upon my information and belief, and as to those matters I believe them to be true.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this Verification was executed on June 1, 2026 at Long Beach, California.

Ian Patton

Exhibit A

Public Records Request :: W011027-062123

From: City of Torrance Public Records Center (torranceca@mycusthelp.net)

To: ispatton@yahoo.com

Date: Wednesday, June 21, 2023 at 03:09 PM PDT

Dear Requester,

This is confirmation that your Public Records Act request has been received on **6/21/2023** and is being processed. You requested **Fire** records, which you described as **"Please provide the Hierarchy of Hazard Control Analysis (HCA) report for the Torrance Refinery (3700 W 190th St, Torrance, CA 90504) or direct me to where it is posted online. Background on this request: According to your web site: The Certified Unified Program Agency for the city of Torrance is the Los Angeles County Fire Department Health Hazardous Materials Division. Torrance acts as a Participating Agency with the Los Angeles CUPA and manages the following four hazardous materials programs within the city of Torrance: The Hazardous materials disclosure program, Article 1 Chapter 6.95 Health & Safety Code, The California Accidental Release Program, Article 2 Chapter 6.95 H&SC, The Underground Storage Tank Program, Chapter 6.7 H&SC, California Fire Code dealing with Hazardous Materials Management Plans https://www.torranceca.gov/government/fire/community-risk-reduction-division/hazardous-materials-management/certified-unified-program-agency-cupa Cal. Code Regs. Tit. 19, § 2762.13 - Hierarchy of Hazard Control Analysis says: (4) During the design and review of new processes, new process units, and new facilities, and their related process equipment. An HCA report prepared for this purpose shall be provided to the UPA. The UPA shall make these HCA reports available to the public by posting them on the UPA's website within 30 calendar days, with appropriate protections for trade secret information. https://www.law.cornell.edu/regulations/california/19-CCR-2762.13."**

Thank you for your interest in the City of Torrance. We will be contacting you with a prepared response in regards to your request. If you have any questions, or wish to discuss this further, please contact the Office of the City Clerk at (310) 618-2870 or cityclerk@torranceca.gov.

There may be a delay in processing your request due to digital impacts. If you have questions, please call us.

Sincerely,

Office of the City Clerk
City of Torrance

Track the issue status and respond at: https://torranceca.mycusthelp.com/WEBAPP//_rs/RequestEdit.aspx?rid=11027

Exhibit B

Public Records Act Request :: W011027-062123

From: City of Torrance Public Records Center (torranceca@mycusthelp.net)

To: ispatton@yahoo.com

Date: Monday, August 14, 2023 at 03:11 PM PDT

--- Please respond above this line ---

08/14/2023
Ian Patton

RE: Public Records Act Request: W011027-062123
Date Submitted: 6/21/2023

Dear Requester,

In response to your Public Records Act request received on 6/21/2023, asking for "***Please provide the Hierarchy of Hazard Control Analysis (HCA) report for the Torrance Refinery (3700 W 190th St, Torrance, CA 90504) or direct me to where it is posted online.***

Background on this request:

According to your web site:

The Certified Unified Program Agency for the city of Torrance is the Los Angeles County Fire Department Health Hazardous Materials Division. Torrance acts as a Participating Agency with the Los Angeles CUPA and manages the following four hazardous materials programs within the city of Torrance:

The Hazardous materials disclosure program, Article 1 Chapter 6.95 Health & Safety Code,
The California Accidental Release Program, Article 2 Chapter 6.95 H&SC,
The Underground Storage Tank Program, Chapter 6.7 H&SC,
California Fire Code dealing with Hazardous Materials Management Plans
https://www.torranceca.gov/government/fire/community-risk-reduction-division/hazardous-materials-management/certified-unified-program-agency-cupa

Cal. Code Regs. Tit. 19, § 2762.13 - Hierarchy of Hazard Control Analysis says:

(4) During the design and review of new processes, new process units, and new facilities, and their related process equipment. An HCA report prepared for this purpose shall be provided to the UPA. The UPA shall make these HCA reports available to the public by posting them on the UPA's website within 30 calendar days, with appropriate protections for trade secret information.

https://www.law.cornell.edu/regulations/california/19-CCR-2762.13"

The City Attorney's office has determined that the requested Hierarchy of Hazard Control Analysis (HCA) report for the Torrance Refinery (3700 W 190th St, Torrance, CA 90504) ("Record") is exempt from disclosure under the California Public Records Act, because it contains trade secrets and other confidential information only obtained by the City in confidence, as official information, in connection with its regulatory authority over the refinery. Disclosure of the Record would also significant harm the Refinery's privacy and financial interests, which greatly outweigh any

public interest in disclosure. Thus, the requested Record is exempt from disclosure pursuant to Government Code sections 7924.510, 7927.300, 7927.605, and 7922.000. (See also, Cal. Labor Code §§ 6322 and 6396.)

Thank you for your interest in the City of Torrance. Your request is now **CLOSED.** If you have any questions, please contact our office at (310) 618-2870

Sincerely,
Zachary Elliott
Deputy City Clerk II

Exhibit C

LAW OFFICES OF KELLY A. AVILES

December 21, 2023

VIA EMAIL ONLY TO PSULLIVAN@TORRANCECA.GOV

Patrick Sullivan
City Attorney
City of Torrance

Re: Improper Denial of CPRA Request for Hierarchy of Hazard Control Report
Request No. W011027-062123

Dear Mr. Travis:

Our office represents Torrance Refinery Action Alliance, Inc. ("TRAA") in regards to its June 21, 2023 California Public Records Act ("CPRA") Request, No. W011027-062123. Please direct all further communications regarding this matter to our office.

TRAA advocates for the replacement of an extremely dangerous chemical, modified hydrofluoric acid (MHF), at the Torrance Refinery and the Valero Wilmington refinery, the only California refineries where it is stored onsite and unnecessarily used for the alkylation process.[1] The public interest in this issue cannot be understated. Release of the chemical could cause catastrophic health consequences to those in the vicinity.[2]

California regulations require "the owner or operator [of a petroleum refinery] to conduct a Hazard Control Analysis, reporting information about the use of various chemicals, including MFH. (Cal. Code Regs., tit. 19, § 2762.13.) The regulations were adopted under Program 4, the purpose of which is to "to prevent major incidents at petroleum refineries in order to protect the health and safety of communities and the environment." (Cal. Code Regs., tit. 19, § 2762.0.2.) Those regulations also require that

[1] See https://laist.com/news/modified-hydrifluoric-acid-sothern-california-refineries; https://www.dailybreeze.com/2023/02/18/advocates-renew-call-for-mhf-ban-on-8th-anniversary-of-torrance-refinery-explosion/; https://www.dailybreeze.com/2022/03/07/local-battle-over-toxic-chemical-at-torrance-wilmington-refineries-continues/

[2] See https://www.youtube.com/watch?v=rdTEzgkkTmU&t=5156s at 1:26:00.

1502 Foothill Boulevard, Suite 103-140 • La Verne, California 91750
Phone: (909) 991-7560 • Fax: (909) 991-7594 • Email: kaviles@opengovlaw.com

"[t]he owner or operator [ ] provide documents or information developed or collected pursuant to this Article to the UPA upon request and specifically requires that HCA reports are made available to the public by posting them on the UPA's website within 30 calendar days, with appropriate protections for trade secret information. (Cal. Code Regs., tit. 19, § 2762.13(b)(4).)

Thus, the entire purpose of the state regulation is not only to ensure the refineries perform a robust hazards analysis, but to ensure public transparency with regard to the results of that analysis.

The City of Torrance acts as a Participating Agency with the Los Angeles County CUPA and manages the following four hazardous materials programs within the city of Torrance: The Hazardous materials disclosure program, Article 1 Chapter 6.95 Health & Safety Code, The California Accidental Release Program, Article 2 Chapter 6.95 H&SC, The Underground Storage Tank Program, Chapter 6.7 H&SC, California Fire Code dealing with Hazardous Materials Management Plans.

On June 21, 2023, TRAA requested a copy of the "Hierarchy of Hazard Control Analysis (HCA) report for the Torrance Refinery 3700 W 190th St, Torrance, CA 90504."

On August 14, 2023[3], the City improperly denied the request, claiming that it is exempt from disclosure:

> because it contains trade secrets and other confidential information only obtained by the City in confidence, as official information, in connection with its regulatory authority over the refinery. Disclosure of the Record would also significant harm the Refinery's privacy and financial interests, which greatly outweigh any public interest in disclosure. Thus, the requested Record is exempt from disclosure pursuant to Government Code sections 7924.510, 7927.300, 7927.605, and 7922.000. (See also, Cal. Labor Code §§ 6322 and 6396.)

The California Public Records Act ("CPRA") requires state and local agencies to disclose any public record on request to any member of the public unless the record falls within a

---

[3] This delay violates the CPRA, which mandates a determination of whether the agency is going to release records within 10 days. (Gov. Code, § 7922.535). It appears the City took an extension, even though none of the "extraordinary circumstances" which would justify a maximum 14-day extension appear to be present here. Regardless, the City's denial was well beyond the 24-day maximum time permitted under the CPRA. Moreover, the CPRA prohibits delays in disclosure and allowing third parties to control the disclosure of public records. (§§ 7922.530(a) [require prompt disclosure of public records], § 7922.500) [barring agencies from unreasonable delays in disclosure], § 7921.005 [prohibiting agencies from allowing third parties to control disclosure of public records].)

specific statutory exemption from disclosure. (Gov. Code §§ 7922.525, 7922.530.) The burden of proving an exemption exists falls squarely on the public agency. burden of proof falls squarely on the City, and failure to submit any evidence in support of this contention does not meet that heavy burden. (Gov. Code § 7922.540(c) ["[a]n agency shall justify withholding any record…"]; *CBS Broadcasting. v. Sup. Ct.* (2001) 91 Cal.App.4th 892, 908; *Long Beach Police Officers Assn. v. City of Long Beach* (2014) 59 Cal.4th 59, 67.) Exemptions to disclosure are narrowly construed. (Cal. Const., Art. 1, § 3(b)(2)).

While the City has not provided sufficient information about its claims of exemptions for our office to independently determine if they actually apply to parts of the report, because the regulations specifically require the disclosure of the report with redactions only for trade secret information, the City's citations to Government Code sections 7924.510, 7927.300, 7927.605, and 7922.000 are, per se, not applicable here as disclosure is specifically mandated.

Moreover, even if some of the material in the report were exempt, it is well-settled law that any documents that contain both disclosable and non-disclosable information must be redacted and produced. "Any reasonably segregable portion of a record shall be available for inspection by any person requesting the record after deletion of the portions that are exempted by law." (Gov. Code § 7922.525(b).) Thus, "'[t]he fact that parts of a requested document fall within the terms of an exemption does not justify withholding the entire document.'" (*Los Angeles Cty. Bd. of Supervisors v. Sup. Ct.* (2016) 2 Cal.5th 282, 292.) This "requires public agencies to use the equivalent of a surgical scalpel to separate those portions of a record subject to disclosure from privileged portions." (*Id.*) Disclosure is also specifically required by California Code of Regulations, Title 19, section 2762.13(b)(4).

Therefore, even if the City continues to claim that the report contains exempt material, the City is required to produce the remainder of the record with redactions of the alleged exempt material, along with the legal and factual basis for any redactions. (Gov. Code § 7922.000; *ACLU of N. Cal.* (2011) 202 Cal.App.4th at 55, 67 [justification for nondisclosure requires a factual showing that is "specific enough to give the requester a meaningful opportunity to contest the withholding of the documents"].)

While redactions may be made for trade secret information, it is important for the City to consider the case law related to trade secrets in making its determination about what to redact.

First, Civil Code section 3426.1(d) defines a trade secret as:

> information … that: [¶] (1) Derives independent economic value, actual or potential, from not being generally known to the public or to other persons who can obtain economic value from its disclosure or use; and [¶]

> (2) Is the subject of efforts that are reasonable under the circumstances to maintain its secrecy.

"In short, the test for a trade secret is whether the matter sought to be protected is information [that] (1) is valuable because it is unknown to others and (2) ... the owner has attempted to keep secret." (*DVD Copy Control Assn., Inc. v. Bunner* (2004) 116 Cal.App.4th 241, 251.) This test "recognizes the self-evident principle that a trade secret must, in fact, be secret." (*Amgen Inc. v. Health Care Servs.* (2020) 47 Cal.App.5th 716, 734.) "[T]he party claiming the privilege has the burden of establishing its existence." (*Bridgestone/Firestone, Inc. v. Sup. Ct.* (1992) 7 Cal.App.4th 1384, 1393.)

Any trade secret privilege incorporated in the CPRA "should be applied conditionally on a clear showing that disclosure is against the public's interest." (*San Gabriel Tribune v. Superior Court* (1983) 143 Cal.App.3d 762, 777.) Similarly, Evidence Code section 1060 does not allow the owner of a trade secret to claim this privilege if it would "work injustice." (*Ur Uribe v. Howie* (1971) 19 Cal. App. 3d 194, 207, 210-211 [interpreting Evid. Code § 1060 to require an analysis of whether the interests of justice are served by nondisclosure].)

In *San Gabriel Tribune*, 143 Cal.App.3d at 777, the agency asserting trade secret privilege argued "disclosure will invade a private company's privacy interests, as well as hav[e] a chilling effect on obtaining information in similar future transactions," and "such a threat to future dealings constitutes a sufficient reason to withhold disclosure in the name of the public's interest." (*Id.*) The court rejected these claims, finding they "misstate[] what the public's interest is as serving the privacy interests of a private contractor, rather than in serving the public's interest in participating in local government." (*Id.*) Similar to the agency in *San Gabriel Tribune*, the City has offered no factual or legal basis as to the claim of trade secret information here, which does not serve the public interest.

In *Amgen Inc. v. Health Care Servs.* (2020) 47 Cal.App.5th 716, Amgen invoked the trade secret privilege under Evidence Code section 1060 to prevent the disclosure of a price increase notice it sent (as required by statute) to California Correctional Health Care Services and more than a hundred of its other purchasers under the CPRA. The Court held that the notice was not a trade secret and thus was not exempt from disclosure under the CPRA, finding that "Amgen provided no evidence that the recipients of the price increase information ... were under any contractual obligation to maintain its confidentiality, nor does [the statute requiring notice of the price increase] impose any confidentiality obligations." (*Id.* at 735.)

Finally, in *Uribe v. Howie*, 19 Cal. App. 3d at 214, the Court of Appeal also held that the catchall exemption did not apply to disclosure of "pesticide applicator spray reports" given the compelling public interest in disclosure of information concerning impacts on public health.

Thus, claims of trade secret that would undermine the public's rights are heavily scrutinized and often not a sufficient basis to withhold information essential to public health and safety. Here, given the immense public interest in ensuring proper oversight of these deadly chemicals, as well as the multiple previous leaks and near misses, any claims by the refinery attempting to keep this crucial information secret on the basis of its own economic interests would be greatly outweighed by the clear public interest in disclosure. Additionally, much of the information about the use of this chemical by various refineries is already in the public domain and therefore cannot constitute a trade secret.

Therefore, please produce the Report and any information supporting any redactions, no later than the closed of business on January 5, 2024.

Additionally, please consider this a request for the following additional public records:

1. All communications regarding TRAA or its June 21, 2023 CPRA Request from June 2023 to the present, specifically including those with the Torrance Refinery or its agents, employees, or representatives.

2. Any inspection report related to the "Hierarchy of Hazard Control Analysis" from 2019 to present;

3. Any communications to or from inspectors related to the "Hierarchy of Hazard Control Analysis" inspection and report from 2019 to present; and,

4. Any report detailing any leaks of MHF or "near misses" at the Torrance Refinery.

If the City continues to withhold the report and my client is required to obtain a court order compelling the City to comply with the requirements of the CPRA, my clients will seek recovery its attorneys' fees and costs. (*See Filarsky v. Superior Court* (2002) 28 Cal. 4th 419, 431 [noting that the CPRA's attorney-fee "provision contemplates that the public agency always will pay any costs and attorney fees should the plaintiff prevail"]; *Los Angeles Times Communications LLC v. Alameda Corridor Transp. Auth.* (2001) 88 Cal. App. 4th 1381, 1390 [prevailing party must be awarded fees under the CPRA].)

Sincerely,

Kelly Aviles

cc: Ian Patton & Steven Goldsmith, TRAA (via email only)

Exhibit D

Subject: Public Records Act Request :: W011735-122623
Date: Monday, February 5, 2024 at 2:13:06 PM Pacific Standard Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

02/05/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
La Verne CA 91750

Dear Requester:

In response to your records request received on 12/26/2023 for Fire records, the City of Torrance **needs additional time** to fulfill your request for responsive records. Unfortunately, I am unable to provide you with a status update at this time. I apologize for any inconvenience this delay may cause.

Thank you for your interest in the City of Torrance. Your request is still **OPEN**.

Sincerely,
Leticia Garcia
Records Management Specialist

09/17/2024

Kelly Aviles
1502 Foothill Blvd, Suite 103-140
La Verne CA 91750

Dear Requester:

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Thank you for your interest in the City of Torrance. Your request is still **OPEN**.

Sincerely,
Leticia Garcia
Records Management Specialist

Subject: Public Records Act Request :: W011735-122623
Date: Thursday, March 20, 2025 at 9:52:12 AM Pacific Daylight Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

03/20/2025

Kelly Aviles
1502 Foothill Blvd, Suite 103-140
La Verne CA 91750

Dear Requester:

In response to your records request received on 12/26/2023 for Fire records, the City of Torrance **needs additional time** to search for your records. Unfortunately, I am unable to provide you with a status update at this time. I apologize for any inconvenience this delay may cause.

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Sincerely,
Susan Velasquez
Deputy City Clerk II

Subject: Public Records Act Request :: W011735-122623
Date: Tuesday, March 12, 2024 at 12:02:08 PM Pacific Daylight Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

03/12/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
La Verne CA 91750

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In response to your records request received on 12/26/2023 for Fire records, the City of Torrance Fire Department has informed us that they **need additional time** to search for your records. Unfortunately, I am unable to provide you with a status update at this time. I apologize for any inconvenience this delay may cause.

Thank you for your interest in the City of Torrance. Your request is still **OPEN**.

Sincerely,
Leticia Garcia
Records Management Specialist

Subject: Public Records Act Request :: W011735-122623
Date: Friday, February 16, 2024 at 4:37:07 PM Pacific Standard Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

02/16/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
La Verne CA 91750

Dear Requester:

In response to your records request received on 12/26/2023 for Fire records, the City of Torrance Fire Department has notified our office that they **need additional time** to search for your records. Unfortunately, I am unable to provide you with a status update at this time. I apologize for any inconvenience this delay may cause.

Thank you for your interest in the City of Torrance. Your request is still **OPEN**.

Sincerely,
Leticia Garcia
Records Management Specialist

Subject: Public Records Act Request :: W011735-122623
Date: Friday, January 19, 2024 at 4:44:07 PM Pacific Standard Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>
CC: SVelasquez@TorranceCA.Gov <SVelasquez@TorranceCA.Gov>

--- Please respond above this line ---

01/19/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
La Verne CA 91750

Dear Requester:

In response to your records request received on 12/26/2023 for Fire records, the City of Torrance **needs additional time** to fulfill your request for responsive records. Unfortunately, I am unable to provide you with a status update at this time. I apologize for any inconvenience this delay may cause.

Thank you for your interest in the City of Torrance. Your request is still **OPEN**.

Sincerely,
Leticia Garcia
Records Management Specialist

Subject: Public Records Act Request :: W011735-122623 Time Extension
Date: Friday, January 5, 2024 at 3:28:11 PM Pacific Standard Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

01/05/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
La Verne CA 91750

Dear Requester:

In response to your records request received on 12/26/2023 4:13:10 PM for Fire records, the City

of Torrance **needs additional time** to search for your records.

The City Clerk's Office will contact you within fourteen (14) days as to whether the City of Torrance is in possession of records responsive to your request.

Thank you for your interest in the City of Torrance. If you have any questions, or wish to discuss this further, please contact the City Clerk's Office at (310) 618-2870.

Sincerely,
City Clerk's Office
City of Torrance

Subject: Public Records Act Request :: W011735-122623
Date: Monday, February 5, 2024 at 2:13:06 PM Pacific Standard Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

02/05/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
La Verne CA 91750

Dear Requester:

In response to your records request received on 12/26/2023 for Fire records, the City of Torrance **needs additional time** to fulfill your request for responsive records. Unfortunately, I am unable to provide you with a status update at this time. I apologize for any inconvenience this delay may cause.

Thank you for your interest in the City of Torrance. Your request is still **OPEN**.

Sincerely,
Leticia Garcia
Records Management Specialist

Subject: Welcome to the City of Torrance Public Records Center

Date: Tuesday, December 26, 2023 at 4:14:38 PM Pacific Standard Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

Thank you for registering with the City of Torrance Public Records Center!
Please log in to the City of Torrance Public Records Center using the link below to update any contact or password information and to track the progress of your request!

To access the system, please click on the following link: The City of Torrance Public Record Center.

Thanks again for registering with the Public Records Center, we look forward to assisting in your requests!

City of Torrance

This is an auto-generated email and has originated from an unmonitored email account. Please DO NOT REPLY.

Subject: Public Records Act Request :: W011735-122623
Date: Tuesday, April 16, 2024 at 10:59:08 AM Pacific Daylight Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

04/16/2024

Kelly Aviles
1502 Foothill Blvd, Suite 103-140
La Verne CA 91750

Dear Requester:

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Records Management Specialist

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From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

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This is confirmation that your Public Records Act request has been received on **12/26/2023** and is being processed. You requested **Fire** records, which you described as **"1. All communications regarding TRAA or its June 21, 2023 CPRA Request from June 2023 to the present, specifically including those with the Torrance Refinery or its agents, employees, or representatives. 2. Any inspection report related to the "Hierarchy of Hazard Control Analysis" from 2019 to present; 3. Any communications to or from inspectors related to the "Hierarchy of Hazard Control Analysis" inspection and report from 2019 to present; and, 4. Any report detailing any leaks of MHF or "near misses" at the Torrance Refinery.."**

Thank you for your interest in the City of Torrance. We will be contacting you with a prepared response in regards to your request. If you have any questions, or wish to discuss this further, please contact the Office of the City Clerk at (310) 618-2870 or cityclerk@torranceca.gov.

There may be a delay in processing your request due to digital impacts. If you have questions, please call us.

Sincerely,

Office of the City Clerk

09/17/2024

Kelly Aviles
1502 Foothill Blvd, Suite 103-140
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Date: Thursday, March 20, 2025 at 9:52:12 AM Pacific Daylight Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

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Kelly Aviles
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La Verne CA 91750

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Susan Velasquez
Deputy City Clerk II

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Date: Tuesday, March 12, 2024 at 12:02:08 PM Pacific Daylight Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
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Records Management Specialist

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From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
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--- Please respond above this line ---

02/16/2024

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From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>
CC: SVelasquez@TorranceCA.Gov <SVelasquez@TorranceCA.Gov>

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01/19/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
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Sincerely,
Leticia Garcia
Records Management Specialist

Subject: Public Records Act Request :: W011735-122623 Time Extension
Date: Friday, January 5, 2024 at 3:28:11 PM Pacific Standard Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

01/05/2024

Kelly Aviles
1502 Foothill BlvdSuite 103-140
La Verne CA 91750

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City of Torrance

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Date: Monday, February 5, 2024 at 2:13:06 PM Pacific Standard Time
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To: Kelly Aviles <kaviles@opengovlaw.com>

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02/05/2024

Kelly Aviles
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To: Kelly Aviles <kaviles@opengovlaw.com>

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City of Torrance

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Subject: Public Records Act Request :: W011735-122623
Date: Tuesday, April 16, 2024 at 10:59:08 AM Pacific Daylight Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

--- Please respond above this line ---

04/16/2024

Kelly Aviles
1502 Foothill Blvd, Suite 103-140
La Verne CA 91750

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Records Management Specialist

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From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

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There may be a delay in processing your request due to digital impacts. If you have questions, please call us.

Sincerely,

Office of the City Clerk

Exhibit E

From: **Dumais, David** DDumais@TorranceCA.Gov
Subject: FW: Public Records request for Hierarchy of Hazard Control Analysis
Date: May 10, 2023 at 1:23 PM
To: Kazandjian, Richard RKazandjian@TorranceCA.Gov, Sanders, Ellery ESanders@TorranceCA.Gov

DD

Good afternoon
Please see the email below from Royce Long, LAFD CUPA Mgr. re public records request for P4 HCA documents.
I spoke to Royce and advised him of our stance that the HCA is not a public record we request and therefore in not a Public record we can provide

Respectfully,

DAVID A. DUMAIS
Fire Chief - Fire Department
City of Torrance | 1701 Crenshaw Blvd. | Torrance CA 90501 | 310.781-7000 | 310.781-7030 fax |
DDumais@TorranceCA.Gov | www.TorranceCA.Gov | www.TorranceCA.Gov/SocialMedia |
www.TorranceCA.Gov/COVID19 |

From: Royce Long <royce.long@lacity.org>
Sent: Wednesday, May 10, 2023 12:53 PM
To: Elkins, John@EPA <John.Elkins@calepa.ca.gov>
Cc: John Paine <john.paine@calepa.ca.gov>; Jason Boetzer (Jason.Boetzer@calepa.ca.gov) <jason.boetzer@calepa.ca.gov>; Dumais, David <ddumais@TorranceCA.gov>; Minh Le <minh.u.le@lacity.org>; Alvin Dong <alvin.dong@lacity.org>
Subject: Public Records request for Hierarchy of Hazard Control Analysis

Good Afternoon John,

The LA City Mayor's office recently received a request from an EJ group for a copy of the Hazard Control Analysis (HCA) from all Wilmington and Torrance refineries. We have never had this specific type of request before and as part of our due diligence I reached out to Chief Dumais who also had a similar request. I also had Alvin research what is public record in the CalARP program and this was his response:

I am more than willing to allow the public to peruse the RMP at our office at a mutually agreed date and time as outlined in (2775 19 CCR). Unfortunately, the specific information as requested is not part of the RMP submissions and the LA City CUPA does not have possession of the HCA as requested. Only the date of the most recent HCA is in the RMP submitted to the (CUPA 2745.7.5. 19 CCR).

To [illegible] the CUPA [illegible] with [illegible] of all RMP [illegible] the Off[illegible]

Technically, the CUPA may provide the public with copies of all RMPs without the Offsite Consequence data (2775(a) 19 CCR)

The Offsite Consequence Analysis data may be reviewed by the public but may not be removed, copied, photographed, scanned, or imaged (2775(b) 19 CCR.)

In a nutshell, we do not store the HCA at our offices and do not have a record to provide to the public. The requestor may request it from the refinery but then I'm assuming it's the refineries decision to provide the document or not. From what I understand the requestor has approached the refineries and has been denied access to the document.

The question we are bringing forward is:

Is the HCA a public record?
If so, who is responsible for providing the record?

I have included Chief Dumais so that we can provide a consistent response to the requestor.

Thank you
Royce

From: **Sanders, Ellery** ESanders@TorranceCA.Gov
Subject: FW: Torrance Refinery MHF Release
Date: June 13, 2023 at 7:33 AM
To: Kazandjian, Richard RKazandjian@TorranceCA.gov

ES

Good morning sir,

The highlighted sentence is an update on the MHF Release Incident Report.

Respectfully,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Sanders, Ellery
Sent: Tuesday, June 13, 2023 7:31 AM
To: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Subject: RE: Torrance Refinery MHF Release

Good morning Kelvin,

Thank you for the update.

Respectfully,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Sent: Tuesday, June 13, 2023 7:25 AM
To: Sanders, Ellery <ESanders@TorranceCA.gov>
Subject: RE: Torrance Refinery MHF Release

Hi Ellery

Hi Ellery,
Sorry for the late response. I talked to Alex yesterday (he was on PTO last week) and he informed me that the Unit Superintendent is finalizing the report by this week. I will send you the report when I have it. Thank you!

Regards,
Kelvin Nguyen
Process Safety Engineer
Office: 310-212-3733
Cell: 714-890-2286

From: Sanders, Ellery <ESanders@TorranceCA.gov>
Sent: Wednesday, June 7, 2023 2:37 PM
To: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Cc: Holt, Alex M <ALEX.HOLT@pbfenergy.com>; rkazansjian <rkazandjian@torranceca.gov>
Subject: Re: Torrance Refinery MHF Release

Good afternoon Alex and Kelvin,

Do we have an update on the investigation for the MHF Release?

Thank you in advance,

Ellery Sanders

Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Sent: Thursday, May 18, 2023 7:45 AM
To: Sanders, Ellery <ESanders@TorranceCA.gov>
Cc: Holt, Alex M <ALEX.HOLT@pbfenergy.com>
Subject: RE: Torrance Refinery MHF Release

Hi Ellery,
As we discussed, there is an informal investigation on the Alky incident at our site. I will send you a report when the investigation is completed. Thank you.

Regards,
Kelvin Nguyen
Process Safety Engineer
Office: 310-212-3733
Cell: 714-890-2286

From: Sanders, Ellery <ESanders@TorranceCA.gov>
Sent: Thursday, May 11, 2023 2:06 PM
To: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Subject: Fw: Torrance Refinery MHF Release

From: Sanders, Ellery
Sent: Thursday, May 4, 2023 10:24 AM
To: Holt, Alex M <ALEX.HOLT@pbfenergy.com>; Yoshimura, Akira <Akira.Yoshimura@pbfenergy.com>; joe.alvarez@pbfenergy.com <joe.alvarez@pbfenergy.com>
Cc: Kazandjian, Richard <RKazandjian@TorranceCA.gov>; Brown, Adam <ABrown@TorranceCA.gov>; Dumais, David <ddumais@TorranceCA.gov>
Subject: Torrance Refinery MHF Release

Good morning,

Due to yesterday's incident of MHF release at the Alky Unit, I'm following up on a Post-Incident report per Program-4 incident documentation. To my understanding, the following description of the incident was reported:

On May 3rd at 1449 hours Torrance Refinery Company experienced a small MHF release within the Alkylation Unit. The Automatic water mitigation system was activated 10 seconds upon activation of the laser detection system.
The release was then quickly controlled by the Automatic water suppression system. TFD responded on the property resulting in a single engine response from TFD. Upon arrival the crew of E93 made contact with Captain Phil Barnes who stated "acid sample was being taken and there was a leak from a pipe union. Laser detection picked up the leak and water spray was activated. Operators closed the valves, stopped the sample and stopped the leak".
There was no off site impact as a result of this release. AQMD has been notified and a report to the Cal OES Warning will be made by TORC.

For the next two (2) weeks I will be attending an upcoming PHA for Unit 28/29 SRU. I will make myself availability for discussion and details for a determination if this is categorized

make myself available for discussion and details for a determination if this is categorized as a “Major Incident”.

19 CCR § 2762.9

§ 2762.9. Incident Investigation.

https://govt.westlaw.com/calregs/Document/I2C26EE365BE511EC98C8000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default) [govt.westlaw.com]

Thank you all and we’ll be in contact.

Respectfully,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

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From: **Sanders, Ellery** ESanders@TorranceCA.Gov
Subject: RE: Torrance Refinery MHF Release
Date: June 21, 2023 at 11:43 AM
To: Holt, Alex M ALEX.HOLT@pbfenergy.com, Kazandjian, Richard RKazandjian@TorranceCA.Gov

ES

Good afternoon Alex,

Due to sensitive timelines and upcoming unavailability within our staffing, would you be available for discussion on this subject and talking about the HCA/RMP completeness review tomorrow, 06/22/23?
We're open from 0900 hours to noon or 1:30 pm to 3:00 pm.

Thank you for your flexibility,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Holt, Alex M <ALEX.HOLT@pbfenergy.com>
Sent: Friday, June 16, 2023 10:35 AM
To: Kazandjian, Richard <RKazandjian@TorranceCA.gov>
Cc: Sanders, Ellery <ESanders@TorranceCA.gov>
Subject: RE: Torrance Refinery MHF Release

Richard,

Thanks for sharing the departments position. I appreciate the opportunity to continue the discussion about the event. I will be out of the office next week, taking my volleyball players to Arizona for a tournament, however, I will be back in the office on Tuesday, June 27th. Can we meet in the early afternoon after lunch?

Regards,

Alex M. Holt
Safety Superintendent
3700 W. 190th Street Torrance, Ca. 90504
Office 310.212.4261 / Cell 310.953.2743

"Make safety *personal*, *relevant*, and *important* so that it impact your choices."

From: Kazandjian, Richard <RKazandjian@TorranceCA.gov>
Sent: Wednesday, June 14, 2023 4:38 PM
To: Holt, Alex M <ALEX.HOLT@pbfenergy.com>
Cc: Sanders, Ellery <ESanders@TorranceCA.gov>
Subject: Re: Torrance Refinery MHF Release

Hello Alex,

I am in training this week so we can meet next week. But just so we are on the same page Chief Dumais and I both agreed that it falls under that classification by definition. I am always happy to discuss with you. Let me check my calendar and I will give you some dates.

Respectfully,

RICHARD KAZANDJIAN
Deputy Fire Marshal – Torrance Fire Department
City of Torrance | 3031 Torrance Boulevard | Torrance CA 90503 | 310.618.2973 | 310.618.5891 fax | rkazandjian@TorranceCA.Gov | www.TorranceCA.Gov | www.TorranceCA.Gov/SocialMedia [torranceca.gov] | www.TorranceCA.Gov/COVID19 [torranceca.gov]

From: Holt, Alex M <ALEX.HOLT@pbfenergy.com>
Sent: Wednesday, June 14, 2023 2:38:30 PM
To: Kazandjian, Richard <RKazandjian@TorranceCA.gov>
Cc: Sanders, Ellery <ESanders@TorranceCA.gov>
Subject: RE: Torrance Refinery MHF Release

Richard,

Can I come and meet with you and Ellery this Friday. I do not believe this should be classified as a major incident and would like to discuss with the TFD team. I am available to come by anytime.

Thanks for your consideration.

Regards,

Alex M. Holt
Safety Superintendent
3700 W. 190th Street Torrance, Ca. 90504
Office 310.212.4261 / Cell 310.953.2743

"Make safety *personal*, *relevant*, and *important* so that it impact your choices."

From: Kazandjian, Richard <RKazandjian@TorranceCA.gov>
Sent: Tuesday, June 13, 2023 8:06 AM
To: Holt, Alex M <ALEX.HOLT@pbfenergy.com>
Cc: Sanders, Ellery <ESanders@TorranceCA.gov>
Subject: Re: Torrance Refinery MHF Release

Hello Alex,

We need to post an investigation report to comply with CalARP program 4 requirements. Can you please forward us an investigation report, thank you.

Respectfully,

RICHARD KAZANDJIAN
Deputy Fire Marshal – Torrance Fire Department
City of Torrance I 3031 Torrance Boulevard I Torrance CA 90503 I 310.618.2973 I 310.618.5891 fax Irkazandjian@TorranceCA.Gov I www.TorranceCA.Gov [torranceca.gov] I www.TorranceCA.Gov/SocialMedia [torranceca.gov] I www.TorranceCA.Gov/COVID19 [torranceca.gov]

> On Jun 13, 2023, at 7:33 AM, Sanders, Ellery <ESanders@torranceca.gov> wrote:
>
> Good morning sir,
>
> The highlighted sentence is an update on the MHF Release Incident Report.
>
> Respectfully,
>
> **Ellery Sanders**
> Senior Fire Prevention Specialist
> City of Torrance Fire Department, Community Risk Reduction Division

City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Sanders, Ellery
Sent: Tuesday, June 13, 2023 7:31 AM
To: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Subject: RE: Torrance Refinery MHF Release

Good morning Kelvin,

Thank you for the update.

Respectfully,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Sent: Tuesday, June 13, 2023 7:25 AM
To: Sanders, Ellery <ESanders@TorranceCA.gov>
Subject: RE: Torrance Refinery MHF Release

Hi Ellery,
Sorry for the late response. I talked to Alex yesterday (he was on PTO last week) and he informed me that the Unit Superintendent is finalizing the report by this week. I will send you the report when I have it. Thank you!

Regards,
Kelvin Nguyen
Process Safety Engineer
Office: 310-212-3733
Cell: 714-890-2286

From: Sanders, Ellery <ESanders@TorranceCA.gov>

Sent: Wednesday, June 7, 2023 2:37 PM
To: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Cc: Holt, Alex M <ALEX.HOLT@pbfenergy.com>; rkazansjian <rkazandjian@torranceca.gov>
Subject: Re: Torrance Refinery MHF Release

Good afternoon Alex and Kelvin,

Do we have an update on the investigation for the MHF Release?

Thank you in advance,

Ellery Sanders

Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Sent: Thursday, May 18, 2023 7:45 AM
To: Sanders, Ellery <ESanders@TorranceCA.gov>
Cc: Holt, Alex M <ALEX.HOLT@pbfenergy.com>
Subject: RE: Torrance Refinery MHF Release

Hi Ellery,
As we discussed, there is an informal investigation on the Alky incident at our site. I will send you a report when the investigation is completed. Thank you.

Regards,
Kelvin Nguyen
Process Safety Engineer
Office: 310-212-3733
Cell: 714-890-2286

From: Sanders, Ellery <ESanders@TorranceCA.gov>
Sent: Thursday, May 11, 2023 2:06 PM
To: Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Subject: Fw: Torrance Refinery MHF Release

From: Sanders, Ellery
Sent: Thursday, May 4, 2023 10:24 AM
To: Holt, Alex M <ALEX.HOLT@pbfenergy.com>; Yoshimura, Akira <Akira.Yoshimura@pbfenergy.com>; joe.alvarez@pbfenergy.com <joe.alvarez@pbfenergy.com>
Cc: Kazandjian, Richard <RKazandjian@TorranceCA.gov>; Brown, Adam <ABrown@TorranceCA.gov>; Dumais, David <ddumais@TorranceCA.gov>
Subject: Torrance Refinery MHF Release

Good morning,

Due to yesterday's incident of MHF release at the Alky Unit, I'm following up on a Post-Incident report per Program-4 incident documentation. To my understanding, the following description of the incident was reported:

On May 3rd at 1449 hours Torrance Refinery Company experienced a small MHF release within the Alkylation Unit. The Automatic water mitigation system was activated 10 seconds upon activation of the laser detection system. The release was then quickly controlled by the Automatic water suppression system. TFD responded on the property resulting in a single engine response from TFD. Upon arrival the crew of E93 made contact with Captain Phil Barnes who stated "acid sample was being taken and there was a leak from a pipe union. Laser detection picked up the leak and water spray was activated. Operators closed the valves, stopped the sample and stopped the leak". There was no off site impact as a result of this release. AQMD has been notified and a report to the Cal OES Warning will be made by TORC.

For the next two (2) weeks I will be attending an upcoming PHA for Unit 28/29 SRU. I will make myself availability for discussion and details for a determination if this is categorized as a "Major Incident".

19 CCR § 2762.9

§ 2762.9. Incident Investigation.

https://govt.westlaw.com/calregs/Document/I2C26EE365BE511EC98C8000D3A7C4BC3?viewType=FullText&originationContext=documenttoc&transitionType=Category

PageItem&contextData=(sc.Default) [govt.westlaw.com]

Thank you all and we'll be in contact.

Respectfully,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

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From: **Steve Goldsmith** sgoldsmith84@gmail.com
Subject: Re: FW: Public Records Request for HCA TRC
Date: June 16, 2023 at 10:01 AM
To: Kazandjian, Richard RKazandjian@TorranceCA.Gov

SG

> You don't often get email from sgoldsmith84@gmail.com. Learn why this is important

Dear Deputy Fire Marshall Richard Kazandjian:

This request was directed to Chief Dumais in his role of Co-Chair for the California Inter-agency Refinery taskforce (IRTF) Training workgroup and as part of the LA County CUPA and in his role as safety advisor to the Torrance Refinery. We are confident that the Chief can obtain this document and request that he make it public.

I apologize for overlooking the previous email from May 31st and we will take steps to make sure that doesn't happen again.

Thank you for your response,
Steven Goldsmith -

Steven Goldsmith, President, Torrance Refinery Action Alliance

www.TRAA.website (310) 542-6782 – home office (preferred)

(310) 227-3111 – cell sgoldsmith84@gmail.com

San Pedro Rotary Club, PP Hawthorne 2006-07

HF release video at now closed Philly refinery [Link]

---------- Forwarded message ---------
From: **Kazandjian, Richard** <RKazandjian@torranceca.gov>
Date: Fri, Jun 16, 2023 at 9:11 AM
Subject: FW: Public Records Request for HCA TRC
To: info@TRAA.Website <info@traa.website>

Good Morning,

This is a follow up to see if you have received the email below. We do not have any other contact information to utilize. Feel free to contact me with any questions, thank you.

Respectfully,

RICHARD KAZANDJIAN
Deputy Fire Marshal – Torrance Fire Department

City of Torrance | 3031 Torrance Boulevard | Torrance CA 90503 | 310.618.2973 | 310.618.5891 fax |rkazandjian@TorranceCA.Gov | www.TorranceCA.Gov | www.TorranceCA.Gov/SocialMedia |

From: Kazandjian, Richard
Sent: Wednesday, May 31, 2023 10:34 AM
To: info@TRAA.Website
Subject: Public Records Request for HCA TRC

Good Afternoon Mr. Goldsmith,

Please contact the Torrance City Clerk's Office to process a City Records request (See link below). Once we are notified from the City Clerk's office of the records request we will process, thank you.

Research City Records I City of Torrance (torranceca.gov)

Respectfully,

RICHARD KAZANDJIAN
Deputy Fire Marshal – Torrance Fire Department

City of Torrance | 3031 Torrance Boulevard | Torrance CA 90503 | 310.618.2973 | 310.618.5891 fax |rkazandjian@TorranceCA.Gov | www.TorranceCA.Gov | www.TorranceCA.Gov/SocialMedia |

From: **Sanders, Ellery** ESanders@TorranceCA.Gov
Subject: Re: Follow up on incidents
Date: October 6, 2023 at 3:20 PM
To: Holt, Alex M ALEX.HOLT@pbfenergy.com, Nguyen, Kelvin Kelvin.Nguyen@pbfenergy.com
Cc: Kazandjian, Richard RKazandjian@TorranceCA.Gov

ES

Thank you for the upcoming follow-ups, sir.

Respectfully,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: Holt, Alex M <ALEX.HOLT@pbfenergy.com>
Sent: Wednesday, October 4, 2023 6:13 AM
To: Sanders, Ellery <ESanders@TorranceCA.gov>; Nguyen, Kelvin <Kelvin.Nguyen@pbfenergy.com>
Cc: Kazandjian, Richard <RKazandjian@TorranceCA.gov>
Subject: RE: Follow up on incidents

Good morning Ellery,

I will follow up on all these and assemble the appropriate information for each event.

Regards,

Alex M. Holt
Safety Superintendent
3700 W. 190th Street Torrance, Ca. 90504
Office 310.212.4261 / Cell 310.953.2743

"Make safety *personal*, *relevant*, and *important* so that it impact your choices."

From: Sanders, Ellery <ESanders@TorranceCA.gov>
Sent: Friday, September 29, 2023 9:34 AM
To: Holt, Alex M <ALEX.HOLT@pbfenergy.com>; Nguyen, Kelvin

<Kelvin.Nguyen@pbfenergy.com>
Cc: rkazansjian <rkazandjian@torranceca.gov>
Subject: Follow up on incidents

Good morning Alex and Kelvin,

I'm following up on a few items and incidents that have recently occurred and past reports/investigations. The CalArp Program 4 standards and guidelines state that the AHJ shall review major chemical accidents or release root cause analyses and incident investigation reports. In the past four (4) months, there have been approximately 5-6 Release Notification Reports recorded and sent to Torrance Fire Department by Torrance Refinery and Air Products. We also appreciated and recognized the transparency with open communication of every incident and attending PHA's and CalArp-related training and education.

Please provide any updates, reports, and investigation statements of the following incidents:

- MHF Release in Alkylation Unit on May 3, 2023
- Butane Leak in DIB Unit on September 26, 2023
- Pinhole lease on a transfer line East of 900X2 on September 27, 2023
- Laser Detection trigger in the Alkylation Unit (near miss incident) on September 27, 2023

Thank you,

Ellery Sanders
Senior Fire Prevention Specialist
City of Torrance Fire Department, Community Risk Reduction Division
3031 Torrance Boulevard, Torrance CA 90503/Direct 310-618-2914/Cell 424-360-4144
esanders@torranceca.gov

From: **Dumais, David** DDumais@TorranceCA.Gov
Subject: FW: INFORM: DAILY BREEZE - Advocates renew call for MHF ban on 8th anniversary of Torrance refinery explosion
Date: February 21, 2023 at 7:42 AM
To: Kazandjian, Richard RKazandjian@TorranceCA.Gov, Sanders, Ellery ESanders@TorranceCA.Gov, Brown, Adam ABrown@TorranceCA.Gov

DD

FYI

DAVID A. DUMAIS
Fire Chief - Fire Department
City of Torrance | 1701 Crenshaw Blvd. | Torrance CA 90501 | 310.781-7000 | 310.781-7030 fax |
DDumais@TorranceCA.Gov | www.TorranceCA.Gov | www.TorranceCA.Gov/SocialMedia |
www.TorranceCA.Gov/COVID19 |

From: Chaparyan, Aram <AChaparyan@TorranceCA.gov>
Sent: Monday, February 20, 2023 8:19 AM
To: Chaparyan, Aram <AChaparyan@TorranceCA.gov>
Subject: INFORM: DAILY BREEZE - Advocates renew call for MHF ban on 8th anniversary of Torrance refinery explosion

FOR INFORMATION ONLY! PLEASE DO NOT REPLY.
BCC: Council2

PDF Attached

https://www.dailynews.com/2023/02/18/advocates-renew-call-for-mhf-ban-on-8th-anniversary-of-torrance-refinery-explosion/

ARAM CHAPARYAN
City Manager – Office of the City Manager
City of Torrance | 3031 Torrance Boulevard | Torrance CA 90503 | 310.618.5880 voice | 310.618.5891 fax |
AChaparyan@TorranceCA.gov | www.TorranceCA.gov |www.TorranceCA.gov/SocialMedia |
www.TorranceCA.gov/COVID19

Advocates renew call for MHF ban on 8th anniversary of Torrance...
2.6 MB

Exhibit F

Subject: Public Records Act Request :: W011735-122623
Date: Monday, April 28, 2025 at 5:00:38 PM Pacific Daylight Time
From: City of Torrance Public Records Center <torranceca@mycusthelp.net>
To: Kelly Aviles <kaviles@opengovlaw.com>

Attachments:
Full_Release_4-28-2025.zip
2022_Alky_HCA_Report_Redacted.pdf

--- Please respond above this line ---

04/28/2025

Kelly Aviles
1502 Foothill Blvd Suite 103-140
La Verne CA 91750

RE: Public Records Act Request: W011735-122623
Date Submitted: 12/26/2023

Dear Requester,

In response to your Public Records Act request received on 12/26/2023 asking for "***1. All communications regarding TRAA or its June 21, 2023 CPRA Request from June 2023 to the present, specifically including those with the Torrance Refinery or its agents, employees, or representatives.***

2. Any inspection report related to the "Hierarchy of Hazard Control Analysis" from 2019 to present;

3. Any communications to or from inspectors related to the "Hierarchy of Hazard Control Analysis" inspection and report from 2019 to present; and,

4. Any report detailing any leaks of MHF or "near misses" at the Torrance Refinery."

The City of Torrance Fire Department has reviewed their files and has located records responsive to your request. Please find the records requested attached along with this message. If you created an Account using the online Torrance Public Records Center, you may also log in and download your documents using the request number provided above.

This message and the records attached along with this message are in response to both this request (#W011735-122623) and the previous request (#W011027-062123).

Portions of the requested Hierarchy of Hazard Control Analysis (HCA) report for the Torrance Refinery (3700 W 190th St, Torrance, CA 90504) ("Record") have been redacted as they are exempt from disclosure under the California Public Records Act, because it contains trade secrets and other confidential information only obtained by the City in confidence, as official information, in connection with its regulatory authority over the refinery. Disclosure of the redacted information would also significantly harm the Refinery's privacy and financial interests, which greatly outweigh any public interest in disclosure. Thus, the redacted portions of the Record are exempt from disclosure pursuant to Government Code sections 7924.510, 7927.300, 7927.605, and 7922.000. (See also, Cal. Labor Code §§ 6322 and 6396 and Evidence Code 1040 and 1060.)

The only records that have been withheld were withheld as attorney/client privileged pursuant to California Government Code Section 7927.705 which states as follows: "Except as provided in Sections 7924.510, 7924.700, and 7929.610, this division does not require disclosure of records, the disclosure of which is exempted or prohibited pursuant to federal or state law, including, but not limited to, provisions of the Evidence Code relating to privilege."

Thank you for your interest in the City of Torrance. Your request is now **CLOSED**. If you have any questions, or wish to discuss this further, please contact our office at (310) 618-2870.

Sincerely,
Sara Shor
Management Aide

Exhibit G

HIERARCHY OF
HAZARD CONTROLS ANALYSIS (HCA)
OF THE
UNIT 5 Alky

FOR

TORRANCE REFINING COMPANY LLC

Completed

September 21st, 2022

[redacted]

TABLE OF CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

This report describes the results of a Hierarchy of Hazard Controls Analysis (HCA) on Unit 5 Alky, at the Torrance Refinery on 5/17/22, 5/18/22, and 9/21/22. The 5-Year PHA was finalized on December 22nd, 2017.

2.0 SCOPE AND OBJECTIVES

The scope of this study is to conduct a Hierarchy of Hazard Controls Analysis and is limited to the Unit 5 Alky. The analysis uses the existing 5-Year PHA as the basis.

This work process includes:

1. Breaking the unit/system into Nodes, similar to the HAZOP process, rather than discussing the Unit as a single piece. However, the HCA groups equipment in larger subsystems rather than utilize P&ID level node determination [redacted] This allows for a middle ground between the 3 Inherently Safer Technologies mentioned by CCPS (Checklist/Independent PHA/Integrated into PHA) to allow for greater detail than the standard checklist HCA, but less time than an Independent Analysis/Integration into the PHA.
2. For each node, materials within each node will be detailed out, along with the process hazard of concern for the material along with a review of the process conditions discussed in the PHA (if necessary).
3. For each node, the Contra Costa County Guidewords (Raw Material, In-Process Storage, Product Inventory, Process Chemistry, Process Controls, Process Piping, Process Equipment, Process Conditions, Maintenance, Siting, Transportation, Misc. Material (solvents) will be applied. A checklist has been generated based on the Contra Costa ISO Guidance Document ISS Checklist, with additional questions added based on input from site SMEs.
4. For each prompt, the HCA Team evaluated the existing/proposed process and determined if there are alternatives used within the petroleum refining industry or recommended/required by the industry/federal agency/state agency/local agency to the knowledge of the Team. This was documented within the respective columns. After evaluation of the system and alternatives, the team will develop recommendations to eliminate hazards to the greatest extent feasible using first order inherent safety measures, to reduce any remaining hazards to the greatest extent feasible using second order inherent safety measures. And to address any remaining risks in the following sequence and priority order:
    a) Effectively reduce remaining risks using passive safeguards;
    b) Effectively reduce remaining risks using active safeguards;

c) Effectively reduce remaining risks using procedural safeguards.

5. As part of this, the HCA Team documented their rationale for each recommendation generated as part of the process

In addition, the HCA Team reviewed the recommendations generated from the PHA/SPA Process and determined if a HCA was applicable or not depending on the type of recommendation. If an HCA was determined to be appropriate, the recommendation was evaluated for options to reduce the risk through first order inherent safety measures, second order inherent safety measures, passive safeguards, active safeguards, and procedural safeguards. These options were listed out and provided to the BTL during the initial management review and options were selected to move forward for detailed engineering work.

2.1 Review Team

The HCA was led by [redacted], [redacted] with team participation [redacted] Personnel attending hazard analysis meetings (in person or through teleconference) are listed below along with their title and the experience they brought to the study.

First Name	Last Name	Title	Years Experience
[redacted]	[redacted]	[redacted]	5
[redacted]	[redacted]	[redacted]	9
[redacted]	[redacted]	[redacted]	10
[redacted]	[redacted]	[redacted]	30+

A management review of the HCA findings took place on 9/21/22. Personnel attending the management review are listed below along with their title.

First Name	Last Name	Title	Years Experience
[redacted]	[redacted]	[redacted]	5
[redacted]	[redacted]	[redacted]	9
[redacted]	[redacted]	[redacted]	30+

First Name	Last Name	Title	Years Experience
[redacted]	[redacted]	[redacted]	10
[redacted]	[redacted]	[redacted]	30+
[redacted]	[redacted]	[redacted]	30+
[redacted]	[redacted]	[redacted]	30+

3.0 STUDY RESULTS

3.1 Findings Summary

Appendices contain the findings and worksheet results obtained during the study. [redacted] Recommendations were identified during the unit HCA. Resolution of Findings and the associated Recommendations are required as described in the Process Hazard Analysis Standard.

Number of Findings

Type of Recommendation	Number of Recommendations
PHA/SPA Recommendations	[redacted]
HCA	[redacted]
Total	[redacted]

APPENDIX A

HCA WORKSHEETS

HCA Nodes

HCA Node	Design Conditions/Parameters	Drawing	Material Name	Process Hazard of Concern
[redacted]	Refer to PHA Nodes	Engineering PFD	[redacted]	[redacted]
	Refer to PHA Nodes	Engineering PFD		
	Refer to PHA Nodes	Engineering PFD		
	Refer to PHA Nodes	Engineering PFD	[redacted]	[redacted]

Contains Trade Secret/Business Confidential Information

HCA Node	Design Conditions/Parameters	Drawing	Material Name	Process Hazard of Concern
			[redacted]	
[redacted]	Refer to PHA Nodes	Engineering PFD		

Contains Trade Secret/Business Confidential Information

HCA Worksheets

HCA Node: [redacted]

Strategy	Prompt	[redacted]
1.1. First Order - Eliminate	1.1.1. Is this (hazardous) raw material necessary?	
1.2. First Order - Substitute	1.2.1. Is it possible to substitute less hazardous raw materials? *Noncombust bles for flammable *Less volatile *Less reactive *More stable *Less toxic *Low pressure steam rather than flammable heat transfer fluid (i.e. operated above flash point)	
1.3. Second Order - Minimize	1.3.1. Can hazardous raw materials inventory be reduced? * Just in time deliveries based on production needs * Supplier management including strategic alliance * On-site generation of hazardous material (including in situ) from less hazardous raw materials * Hazardous raw material inventory management system based on production forecast	

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HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
1.4. Second Order - Moderate	1.4.1. Is it possible to limit the supply pressure of (hazardous) raw materials to less than the maximum allowable working pressure of the vessels to which they are delivered?	
	1.4.2. Is it possible to use less concentrated hazardous raw materials to reduce the hazard potential? *Aqueous ammonia and/or HCL instead of anhydrous *Sulfuric acid instead of oleum *Dilute nitric acid instead of concentrated fuming nitric acid *Wet benzoyl peroxide instead of dry	
1.5. Second Order - Simplify		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
1.6. Passive Safeguards		
1.7. Active Safeguards		
1.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.1. First Order - Eliminate	2.1.1. Is this (hazardous) process/product necessary?	
2.2. First Order - Substitute	2.2.1. Is it possible to completely eliminate hazardous process intermediates, or byproducts by using an alternative process or chemistry?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.3. Second Order - Minimize	2.3.1. Can in-process storage and inventory be reduced? *Direct coupling of process elements *Eliminating or reducing size of in process storage *Designing process equipment involving hazardous material with the smallest feas ble inventory	
2.4. Second Order - Moderate		
2.5. Second Order - Simplify	2.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
2.6. Passive Safeguards	2.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	*Fireproofing insulation vs. fixed/portable fire protection	
2.7. Active Safeguards		
2.8. Procedural Safeguards		

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HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.1. First Order - Eliminate	3.1.1. Is this (hazardous) process/product necessary?	
3.2. First Order - Substitute		
3.3. Second Order - Minimize	3.3.1. Can hazardous finished product inventory be reduced? *Improving production scheduling/sales forecasting *Improving communication with transporters/material handlers *Hazardous finished product inventory management system based on sales forecast	
3.4. Second Order - Moderate		
3.5. Second Order - Simplify	3.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
3.6. Passive Safeguards	3.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.7. Active Safeguards		
3.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
4.1. First Order - Eliminate	4.1.1. Is it possible to completely eliminate hazardous raw materials, process intermediates, or byproducts by using an alternative process or chemistry?	
4.2. First Order - Substitute	4.2.1. Is an alternative process available for this product that eliminates or substantially reduces the need for hazardous raw materials or production of hazardous intermediates?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
4.3. Second Order - Minimize		
4.4. Second Order - Moderate	4.4.1. Is it possible to use larger particle size/reduced dust forming solids to minimize potential for dust explosions? *Use particles configuration with higher Minimum Ignition Energy (MIE) or surface treat particles to change conductivity and resistivity properties that reduce the chance of a static charge buildup	
	4.4.2. Are all process materials (e.g., heating/cooling media) compatible with process materials in event of inadvertent contamination (e.g., due to a tank coil or heat exchanger tube failure)?	
	4.4.3. Is it possible to add an ingredient to volatile hazardous materials that will reduce its vapor pressure?	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
4.5. Second Order - Simplify	4.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Carrying out several process steps in separate processing vessels rather than a single multi-purpose vessel (to reduce the complexity and number of raw materials, utilities, and auxiliary equipment connected to a specific vessel)	
4.6. Passive Safeguards		
4.7. Active Safeguards		
4.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
5.1. First Order - Eliminate		
5.2. First Order - Substitute		
5.3. Second Order - Minimize		
5.4. Second Order - Moderate		
5.5. Second Order - Simplify	5.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Specifying fail-safe operation on utility failure (e.g., air , power) *Allocating redundant inputs and outputs to separate modules of the programmable electronic system to minimize common cause failures *Provide continuous pilots (independent, reliable source) for burner management systems *Using independent power buses for redundant equipment to minimize consequences of partial power failures *Check valves with easy to identify direction of flow *Gate valves with rising spindles to clearly indicate open or closed position *Manual quarter-turn block valves with handles that clearly indicate position *For automated block valves, display actual valve position in addition to the output to the valve	
	5.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of round valve handles for open ended quarter-turn valves to	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	minimize potential for bumping open *Improving valve seating reliability (e.g., using system pressure to seal valve seats where poss ble, using valve seat geometry, valve operations, and flow to eliminate or reduce seat damage)	
5.6. Passive Safeguards		
5.7. Active Safeguards		
5.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
6.1. First Order - Eliminate		
6.2. First Order - Substitute		
6.3. Second Order - Minimize		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
6.4. Second Order - Moderate		
6.5. Second Order - Simplify	6.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Avoiding use of threaded connections in hazardous service *Using double walled pipe *Minimizing number of bends in piping (potential erosion points) *Using expansion loops in piping rather than bellows for thermal expansion	
	6.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Blowout resistant gaskets (e.g., spiral wound) *Increasing wall strength of piping and equipment *Maximize use of all welded pipe *Using fewer pipe seams and joints *Providing extra corrosion/erosion allowance (e.g., Sch. 80 vs. 40) *Using incompatible hose connections to prevent misconnection (e.g., air/nitrogen, raw materials) *Eliminating the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) in hazardous service *Eliminating vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary expansion joints, hoses, and rupture disks *Minimizing the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) *Reducing vibration (e.g., through vibration dampening or equipment balancing)	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	*Eliminating unnecessary sight glasses/glass rotameters; use high pressure/armored sight glasses as needed *Eliminate use of glass, plastic or other brittle material as material of construction *Minimizing the number of different gaskets, nuts, bolts, etc. used to reduce potential for error	
6.6. Passive Safeguards		
6.7. Active Safeguards		
6.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
7.1. First Order - Eliminate		
7.2. First Order - Substitute		
7.3. Second Order - Minimize		
7.4. Second Order - Moderate	7.4.1. For equipment containing materials that become unstable at elevated temperature or freeze at low temperature, is it possible to use heating/cooling media which limit the maximum and minimum temperatures attainable (i.e., self limiting electric heat tracing or hot water at atmospheric pressure)?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	7.4.2. Is equipment designed to totally contain the materials that might be present inside at ambient temperature or the maximum attainable process temperature (i.e., higher maximum allowable working temperature to accommodate loss of cooling, simplified reliance on external system l ke refrigeration to control temperature such that vapor pressure is less than equipment design pressure)?	
	7.4.3. Can process units (for hazardous materials) be designed to limit the magnitude of process deviations? *Selecting pumps with maximum capacity lower than safe rate of addition for the process *For gravity-fed systems, limiting maximum feed rate to be within safe limits by pipe size or fixed orifice *Minimum flow recirculation line for pumps/compressors (with orifice to control flow) to ensure minimum flow in event of deadheading or surging	
7.5. Second Order - Simplify	7.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Designing temperature-limited heat transfer equipment to prevent exceeding maximum process or equipment design temperatures *Use of corrosion resistant materials for process equipment, piping and Components *Minimizing equipment wall area to minimize corrosion/fire exposure *Minimizing connections, paths and number of flanges in hazardous processes *Designing vessels for full vacuum to eliminate risk of vessel collapse *Designing both shell and-tube side	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	of heat exchangers to contain the maximum attainable pressure, eliminating the need for pressure relief (may still be needed to meet fire safety requirements) *Designing/selecting equipment which makes incorrect assembly impossible *Using equipment that clearly identifies status: *Use of dedicated hoses and compatible couplings for reactants where hose connections are used *Use of mixing feed nozzle instead of agitator for vessel mixing *Designing equipment with an MAWP to contain the maximum pressure generated without reliance on pressure relief systems even if the "worst cred ble event" occurs *Use open vent or overflow line to secondary containment for overpressure, overfill and vacuum protection *Eliminate utility connections above pressure rating of vessel	
	7.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of seal-less pumps (e.g., canned, magnetic drive)	
7.6. Passive Safeguards		
7.7. Active Safeguards		
7.8. Procedural Safeguard		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
s		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
8.1. First Order (Eliminate/ Substitute)	8.1.1. Is this (hazardous) process/product necessary?	
8.2. First Order - Eliminate	8.2.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
	8.2.2. Are there any other alternatives for substituting or eliminating the use of hazardous materials in this process?	
8.3. First Order - Substitute		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
8.4. Second Order - Minimize	8.4.1. Can alternate equipment with reduced hazardous material inventory requirement be used? *Centrifugal extractors in place of extraction columns *Flash dryers in place of tray dryers *Continuous reactors in place of batch *Plug flow or loop reactors in place of continuous stirred tank reactors *Continuous in-line mixers (e.g., static mixer) in place of mixing vessels or reactors *Intensive mixers to minimize size of mixing vessel of reactor *High heat-transfer reactors (e.g., micro reactor, HEX reactor) *Spinning-disk reactor (especially for high heat-flux or viscous liquids) *Compact heat exchangers (higher heat transfer area per unit volume, e.g., spiral, plate & frame, plate-fin) in place of shell-and-tube) *More hazardous material on the tube side in shell-and-tube exchangers *Use water or other non flammable heat transfer medium, a vapor-phase medium, or a medium below its boiling point *Wiped film stills in place of continuous still pots (distillation columns) *Combine unit operations (such as reactive distillation or extraction in place of separate reactor with multi-column fractionation train or extractor; installing internal reboilers or heat exchangers) to reduce overall system volume *Use of acceleration fields (e.g., rotating packed bed for gas/liquid or liquid/liquid contacting for absorption, stripping, distillation, extraction, etc.) *Use solid catalyst in place of a more hazardous liquid catalyst *Alternate energy sources (such as lasers, UV light, microwaves, or ultrasound) to control reaction or	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	direct heat to the unit operation	
	8.4.2. Has the length of hazardous material piping runs been minimized?	
	8.4.3. Has hazardous material piping been designed for minimum pipe diameter?	
	8.4.4. Can pipeline inventory be reduced by using the hazardous material as a gas rather than a liquid?	
	8.4.5. Can process conditions be changed to reduce production of hazardous waste or byproducts?	
	8.4.6. Are there any other alternatives for minimizing the inventory of hazardous materials in this process?	
8.5. Second Order - Moderate	8.5.1. Is it possible to make reaction conditions (for hazardous reactants or products) (temperature, pressure) less severe by using a catalyst, or a better catalyst (e.g., structured or monolithic vs. packed bed)?	
	8.5.2. Can the process be operated at less severe conditions (for hazardous reactants or products) by considering: * Improved kinetics or thermodynamics to reduce operating temperatures or pressures * Changes in reaction phase (e.g., liquid/liquid, gas/liquid, or gas/gas) *Raw material recycle to compensate for reduced yield or conversion *Operating at a lower temperature to prevent runaway reactions or material failure	
	8.5.3. Can process conditions be changed to avoid handling flammable liquids above their flash points?	
	8.5.4. Are there any other alternatives for moderating the use of hazardous materials in this process?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
8.6. Second Order - Simplify	8.6.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Operating at a higher temperature to avoid cryogenic effects such as embrittlement failures *Using alternative agitation methods (e.g., external circulation using sealless pump which eliminates potential releases due to agitator seal failures)	
	8.6.2. Are there any other alternatives for simplifying operations involving hazardous materials in this process?	
8.7. Passive Safeguards	8.7.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	
8.8. Active Safeguards		
8.9. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
9.1. First Order - Eliminate		
9.2. First Order		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
- Substitute		
9.3. Second Order - Minimize		
9.4. Second Order - Moderate		
9.5. Second Order - Simplify	9.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Easy access and operability of valves to prevent inadvertent errors *Elimination of all unnecessary cross connections *Using underground or shielded tanks *Designing equipment isolation mechanisms for maintenance in the process *Limiting manual operations such as filter cleaning, manual sampling, hose handling for loading/unloading operations, etc. *Spectacle (or figure- 8) blinds instead of slip plates	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
9.6. Passive Safeguards		
9.7. Active Safeguards		
9.8. Procedural		

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HCA Node: [redacted]

Strategy	Prompt	[redacted]
Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
10.1. First Order - Eliminate	10.1.1. Can hazardous process units be located to eliminate: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	
10.2. First Order - Substitute		
10.3. Second Order - Minimize	10.3.1. Can the plant be located to minimize the need for transportation of hazardous materials? (e.g., co-located with supplier/customer, onsite production of hazardous raw materials)	
	10.3.2. Can hazardous process units be located to minimize: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	
10.4. Second Order -	10.4.1. For processes handling flammable materials, is it poss ble to design	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
Moderate	the layout to minimize the number and size of confined areas and to limit the potential for serious overpressure in the event of a loss of containment and subsequent ignition?	
	10.4.2. Can hazardous material liquid spills be prevented from entering drainage system/sewer (if potential for fire or hazardous reaction exists, e.g., water reactive material)?	
	10.4.3. For flammable materials, can spills be directed away from the storage vessel to reduce the risk of a boiling liquid expanding vapor explosion (BLEVE) in the event of a fire?	
10.5. Second Order - Simplify		
10.6. Passive Safeguards		
10.7. Active Safeguards		
10.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
11.1. First Order - Eliminate	11.1.1. Can a multi-step process, where the steps are done at separate sites, be divided up differently to eliminate the need to transport hazardous materials?	
11.2. First Order - Substitute		
11.3. Second Order - Minimize		
11.4. Second Order - Moderate	11.4.1. Can materials be transported: *In a less hazardous form (e.g., refrigerated liquid vs. pressurized) * In a safer transport method (e.g., via pipeline, top-vs. bottom-unloaded, rail vs. truck) *Along a safer route (e.g., avoiding high risk areas such as high population areas, tunnels, or high accident-rate sections of roadway)?	
11.5. Second Order - Simplify		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
11.6. Passive Safeguards	11.6.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	
11.7. Active Safeguards		
11.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
12.1. First Order - Eliminate	12.1.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
12.2. First Order - Substitute	12.2.1. Is it possible to substitute less hazardous final product solvents?	
	12.2.2. Is it possible to use a nonflammable refrigerant instead of a flammable one (or minimize inventory)?	
12.3. Second		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
Order - Minimize		
12.4. Second Order - Moderate		
12.5. Second Order - Simplify		
12.6. Passive Safeguards		
12.7. Active Safeguards		
12.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
1.1. First Order - Eliminate	1.1.1. Is this (hazardous) raw material necessary?	
1.2. First Order - Substitute	1.2.1. Is it possible to substitute less hazardous raw materials? *Noncombustibles for flammable *Less volatile *Less reactive *More stable *Less toxic *Low pressure steam rather than flammable heat transfer fluid (i.e. operated above flash point)	
1.3. Second Order - Minimize	1.3.1. Can hazardous raw materials inventory be reduced? * Just in time deliveries based on production needs * Supplier management including	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	strategic alliance * On-site generation of hazardous material (including in situ) from less hazardous raw materials * Hazardous raw material inventory management system based on production forecast	
1.4. Second Order - Moderate	1.4.1. Is it possible to limit the supply pressure of (hazardous) raw materials to less than the maximum allowable working pressure of the vessels to which they are delivered?	
	1.4.2. Is it possible to use less concentrated hazardous raw materials to reduce the hazard potential? *Aqueous ammonia and/or HCL instead of anhydrous *Sulfuric acid instead of oleum *Dilute nitric acid instead of concentrated fuming nitric acid *Wet benzoyl peroxide instead of dry	
1.5. Second Order - Simplify		
1.6. Passive Safeguards		
1.7. Active Safeguards		
1.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
2.1. First Order - Eliminate	2.1.1. Is this (hazardous) process/product necessary?	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
2.2. First Order - Substitute	2.2.1. Is it possible to completely eliminate hazardous process intermediates, or byproducts by using an alternative process or chemistry?	
2.3. Second Order - Minimize	2.3.1. Can in-process storage and inventory be reduced? *Direct coupling of process elements *Eliminating or reducing size of inprocess storage *Designing process equipment involving hazardous material with the smallest feas ble inventory	
2.4. Second Order - Moderate		
2.5. Second Order - Simplify	2.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
2.6. Passive Safeguards	2.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	
2.7. Active Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.1. First Order - Eliminate	3.1.1. Is this (hazardous) process/product necessary?	
3.2. First Order - Substitute		
3.3. Second Order - Minimize	3.3.1. Can hazardous finished product inventory be reduced? *Improving production scheduling/sales forecasting *Improving communication with transporters/material handlers *Hazardous finished product inventory management system based on sales forecast	
3.4. Second Order - Moderate		
3.5. Second Order - Simplify	3.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
3.6. Passive Safeguards	3.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	
3.7. Active Safeguard		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
s		
3.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
4.1. First Order - Eliminate	4.1.1. Is it possible to completely eliminate hazardous raw materials, process intermediates, or byproducts by using an alternative process or chemistry?	
4.2. First Order - Substitute	4.2.1. Is an alternative process available for this product that eliminates or substantially reduces the need for hazardous raw materials or production of hazardous intermediates?	
4.3. Second Order - Minimize		
4.4. Second Order - Moderate	4.4.1. Is it possible to use larger particle size/reduced dust forming solids to minimize potential for dust explosions? *Use particles configuration with higher Minimum Ignition Energy (MIE) or surface treat particles to change conductivity and resistivity properties that reduce the chance of a static charge buildup	
	4.4.2. Are all process materials (e.g., heating/cooling media) compatible	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	with process materials in event of inadvertent contamination (e.g., due to a tank coil or heat exchanger tube failure)?	
	4.4.3. Is it possible to add an ingredient to volatile hazardous materials that will reduce its vapor pressure?	
4.5. Second Order - Simplify	4.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Carrying out several process steps in separate processing vessels rather than a single multi-purpose	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	vessel (to reduce the complexity and number of raw materials, utilities, and auxiliary equipment connected to a specific vessel)	
4.6. Passive Safeguards		
4.7. Active Safeguards		
4.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
5.1. First Order - Eliminate		
5.2. First Order - Substitute		
5.3. Second Order - Minimize		
5.4. Second Order - Moderate		
5.5. Second Order - Simplify	5.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Specifying fail-safe operation on utility failure (e.g., air , power) *Allocating redundant inputs and outputs to separate modules of the programmable electronic system to minimize common cause failures *Provide continuous pilots	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	(independent, reliable source) for burner management systems *Using independent power buses for redundant equipment to minimize consequences of partial power failures *Check valves with easy to identify direction of flow *Gate valves with rising spindles to clearly indicate open or closed position *Manual quarter-turn block valves with handles that clearly indicate position *For automated block valves, display actual valve position in addition to the output to the valve	
	5.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of round valve handles for open ended quarter-turn valves to minimize potential for bumping open *Improving valve seating reliability (e.g., using system pressure to seal valve seats where poss ble, using valve seat geometry, valve operations, and flow to eliminate or reduce seat damage)	
5.6. Passive Safeguards		
5.7. Active Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
5.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
6.1. First Order - Eliminate		
6.2. First Order - Substitute		
6.3. Second Order - Minimize		
6.4. Second Order - Moderate		
6.5. Second Order - Simplify	6.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Avoiding use of threaded connections in hazardous service *Using double walled pipe *Minimizing number of bends in piping (potential erosion points) *Using expansion loops in piping rather than bellows for thermal expansion	
	6.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Blowout resistant gaskets (e.g., spiral wound) *Increasing wall strength of piping and equipment *Maximize use of all welded pipe *Using fewer pipe seams and joints	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	*Providing extra corrosion/erosion allowance (e.g., Sch. 80 vs. 40) *Using incompatible hose connections to prevent misconnection (e.g., air/nitrogen, raw materials) *Eliminating the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) in hazardous service *Eliminating vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary expansion joints, hoses, and rupture disks *Minimizing the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) *Reducing vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary sight glasses/glass rotameters; use high pressure/armored sight glasses as needed *Eliminate use of glass, plastic or other brittle material as material of construction *Minimizing the number of different gaskets, nuts, bolts, etc. used to reduce potential for error	
6.6. Passive Safeguards		
6.7. Active Safeguards		
6.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
7.1. First Order - Eliminate		
7.2. First Order - Substitute		
7.3. Second Order - Minimize		
7.4. Second Order - Moderate	7.4.1. For equipment containing materials that become unstable at elevated temperature or freeze at low temperature, is it possible to use heating/cooling media which limit the maximum and minimum temperatures attainable (i.e., self limiting electric heat tracing or hot water at atmospheric pressure)?	
	7.4.2. Is equipment designed to totally contain the materials that might be present inside at ambient temperature or the maximum attainable process temperature (i.e., higher maximum allowable working temperature to accommodate loss of cooling, simplified reliance on external system like refrigeration to control temperature such that vapor pressure is less than equipment design pressure)?	
	7.4.3. Can process units (for hazardous materials) be designed to limit the magnitude of process deviations? *Selecting pumps with maximum capacity lower than safe rate of addition for the process *For gravity-fed systems, limiting maximum feed rate to be within safe limits by pipe size or fixed orifice *Minimum flow recirculation line for pumps/compressors (with orifice to control flow) to ensure minimum flow in event of deadheading or surging	
7.5. Second Order -	7.5.1. Can equipment be designed such that it is difficult or impossible to	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
Simplify	create a potential hazardous situation due to an operating or maintenance error? *Designing temperature-limited heat transfer equipment to prevent exceeding maximum process or equipment design temperatures *Use of corrosion resistant materials for process equipment, piping and Components *Minimizing equipment wall area to minimize corrosion/fire exposure *Minimizing connections, paths and number of flanges in hazardous processes *Designing vessels for full vacuum to eliminate risk of vessel collapse *Designing both shell and-tube side of heat exchangers to contain the maximum attainable pressure, eliminating the need for pressure relief (may still be needed to meet fire safety requirements) *Designing/selecting equipment which makes incorrect assembly impossible *Using equipment that clearly identifies status: *Use of dedicated hoses and compatible couplings for reactants where hose connections are used *Use of mixing feed nozzle instead of agitator for vessel mixing *Designing equipment with an MAWP to contain the maximum pressure generated without reliance on pressure relief systems even if the "worst cred ble event" occurs *Use open vent or overflow line to secondary containment for overpressure, overfill and vacuum protection *Eliminate utility connections above pressure rating of vessel	
	7.5.2. Can passive leak limiting technology be used to limit potential loss of	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	containment? *Use of seal-less pumps (e.g., canned, magnetic drive)	
7.6. Passive Safeguards		
7.7. Active Safeguards		
7.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
8.1. First Order (Eliminate/ Substitute)	8.1.1. Is this (hazardous) process/product necessary?	
8.2. First Order - Eliminate	8.2.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
	8.2.2. Are there any other alternatives for substituting or eliminating the use of hazardous materials in this process?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
8.3. First Order - Substitute		
8.4. Second Order - Minimize	8.4.1. Can alternate equipment with reduced hazardous material inventory requirement be used? *Centrifugal extractors in place of extraction columns *Flash dryers in place of tray dryers *Continuous reactors in place of batch *Plug flow or loop reactors in place of continuous stirred tank reactors *Continuous in-line mixers (e.g., static mixer) in place of mixing vessels or reactors *Intensive mixers to minimize size of mixing vessel of reactor *High heat-transfer reactors (e.g., micro reactor, HEX reactor) *Spinning-disk reactor (especially for high heat-flux or viscous liquids) *Compact heat exchangers (higher heat transfer area per unit volume, e.g., spiral, plate & frame, plate-fin) in place of shell-and-tube) *More hazardous material on the tube side in shell-and-tube exchangers *Use water or other non flammable heat transfer medium, a vapor-phase medium, or a medium below its boiling point *Wiped film stills in place of continuous still pots (distillation columns) *Combine unit operations (such as reactive distillation or extraction in place of separate reactor with multi-	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	column fractionation train or extractor; installing internal reboilers or heat exchangers) to reduce overall system volume *Use of acceleration fields (e.g., rotating packed bed for gas/liquid or liquid/liquid contacting for absorption, stripping, distillation, extraction, etc.) *Use solid catalyst in place of a more hazardous liquid catalyst *Alternate energy sources (such as lasers, UV light, microwaves, or ultrasound) to control reaction or direct heat to the unit operation	
	8.4.2. Has the length of hazardous material piping runs been minimized?	
	8.4.3. Has hazardous material piping been designed for minimum pipe diameter?	
	8.4.4. Can pipeline inventory be reduced by using the hazardous material as a gas rather than a liquid?	
	8.4.5. Can process conditions be changed to reduce production of hazardous waste or byproducts?	
	8.4.6. Are there any other alternatives for minimizing the inventory of hazardous materials in this process?	
8.5. Second Order - Moderate	8.5.1. Is it possible to make reaction conditions (for hazardous reactants or products) (temperature, pressure) less severe by using a catalyst, or a better catalyst (e.g., structured or monolithic vs. packed bed)?	
	8.5.2. Can the process be operated at less severe conditions (for hazardous reactants or products) by considering: * Improved kinetics or thermodynamics to reduce operating temperatures or pressures * Changes in reaction phase (e.g., liquid/liquid, gas/liquid, or gas/gas) *Raw material recycle to compensate	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	for reduced yield or conversion *Operating at a lower temperature to prevent runaway reactions or material failure	
	8.5.3. Can process conditions be changed to avoid handling flammable liquids above their flash points?	
	8.5.4. Are there any other alternatives for moderating the use of hazardous materials in this process?	
8.6. Second Order - Simplify	8.6.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Operating at a higher temperature to avoid cryogenic effects such as embrittlement failures *Using alternative agitation methods (e.g., external circulation using sealless pump which eliminates potential releases due to agitator seal failures)	
	8.6.2. Are there any other alternatives for simplifying operations involving hazardous materials in this process?	
8.7. Passive Safeguards	8.7.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	
8.8. Active Safeguards		
8.9. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
9.1. First Order - Eliminate		
9.2. First Order - Substitute		
9.3. Second Order - Minimize		
9.4. Second Order - Moderate		
9.5. Second Order - Simplify	9.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Easy access and operability of valves to prevent inadvertent errors *Elimination of all unnecessary cross connections *Using underground or shielded tanks *Designing equipment isolation mechanisms for maintenance in the process *Limiting manual operations such as filter cleaning, manual sampling, hose handling for loading/unloading operations, etc. *Spectacle (or figure- 8) blinds instead of slip plates	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
9.6. Passive Safeguards		
9.7. Active Safeguards		

Contains Trade Secret/Business Confidential Information

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
9.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
10.1. First Order - Eliminate	10.1.1. Can hazardous process units be located to eliminate: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	
10.2. First Order - Substitute		
10.3. Second Order - Minimize	10.3.1. Can the plant be located to minimize the need for transportation of hazardous materials? (e.g., co-located with supplier/customer, onsite production of hazardous raw materials)	
	10.3.2. Can hazardous process units be located to minimize: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	
10.4. Second	10.4.1. For processes handling flammable	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
Order - Moderate	materials, is it poss ble to design the layout to minimize the number and size of confined areas and to limit the potential for serious overpressure in the event of a loss of containment and subsequent ignition?	
	10.4.2. Can hazardous material liquid spills be prevented from entering drainage system/sewer (if potential for fire or hazardous reaction exists, e.g., water reactive material)?	
	10.4.3. For flammable materials, can spills be directed away from the storage vessel to reduce the risk of a boiling liquid expanding vapor explosion (BLEVE) in the event of a fire?	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
10.5. Second Order - Simplify		
10.6. Passive Safeguards		
10.7. Active Safeguards		
10.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
11.1. First Order - Eliminate	11.1.1. Can a multi-step process, where the steps are done at separate sites, be divided up differently to eliminate the need to transport hazardous materials?	
11.2. First Order - Substitute		
11.3. Second Order - Minimize		
11.4. Second Order - Moderate	11.4.1. Can materials be transported: *In a less hazardous form (e.g., refrigerated liquid vs. pressurized) * In a safer transport method (e.g., via pipeline, top-vs. bottom-unloaded, rail vs. truck) *Along a safer route (e.g., avoiding high risk areas such as high population areas, tunnels, or high accident-rate sections of roadway)?	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
11.5. Second Order - Simplify		
11.6. Passive Safeguards	11.6.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	
11.7. Active Safeguards		
11.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
12.1. First Order - Eliminate	12.1.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
12.2. First Order - Substitute	12.2.1. Is it possible to substitute less hazardous final product solvents?	
	12.2.2. Is it possible to use a nonflammable refrigerant instead of a flammable one (or minimize inventory)?	
12.3. Second Order - Minimize		

HCA Node: [redacted]

Strategy	Prompt
12.4. Second Order - Moderate	
12.5. Second Order - Simplify	
12.6. Passive Safeguards	
12.7. Active Safeguards	
12.8. Procedural Safeguards	

HCA Node: [redacted]

Strategy	Prompt
1.1. First Order - Eliminate	1.1.1. Is this (hazardous) raw material necessary?
1.2. First Order - Substitute	1.2.1. Is it possible to substitute less hazardous raw materials? *Noncombustibles for flammable *Less volatile *Less reactive *More stable *Less toxic *Low pressure steam rather than flammable heat transfer fluid (i.e.

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	operated above flash point)	
1.3. Second Order - Minimize	1.3.1. Can hazardous raw materials inventory be reduced? * Just in time deliveries based on production needs * Supplier management including strategic alliance * On-site generation of hazardous material (including in situ) from less hazardous raw materials * Hazardous raw material inventory management system based on production forecast	
1.4. Second Order - Moderate	1.4.1. Is it possible to limit the supply pressure of (hazardous) raw materials to less than the maximum allowable working pressure of the vessels to which they are delivered?	
	1.4.2. Is it possible to use less concentrated hazardous raw materials to reduce the hazard potential? *Aqueous ammonia and/or HCL instead of anhydrous *Sulfuric acid instead of oleum *Dilute nitric acid instead of concentrated fuming nitric acid *Wet benzoyl peroxide instead of dry	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
1.5. Second Order - Simplify		
1.6. Passive Safeguards		
1.7. Active Safeguards		
1.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.1. First Order - Eliminate	2.1.1. Is this (hazardous) process/product necessary?	
2.2. First Order - Substitute	2.2.1. Is it possible to completely eliminate hazardous process intermediates, or byproducts by using an alternative process or chemistry?	
2.3. Second Order - Minimize	2.3.1. Can in-process storage and inventory be reduced? *Direct coupling of process elements *Eliminating or reducing size of inprocess storage *Designing process equipment involving hazardous material with the smallest feas ble inventory	
2.4. Second Order - Moderate		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.5. Second Order - Simplify	2.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
2.6. Passive Safeguards	2.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	
2.7. Active Safeguards		
2.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.1. First Order - Eliminate	3.1.1. Is this (hazardous) process/product necessary?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.2. First Order - Substitute		
3.3. Second Order - Minimize	3.3.1. Can hazardous finished product inventory be reduced? *Improving production scheduling/sales forecasting *Improving communication with transporters/material handlers *Hazardous finished product inventory management system based on sales forecast	
3.4. Second Order - Moderate		
3.5. Second Order - Simplify	3.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.6. Passive Safeguards	3.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.7. Active Safeguards		
3.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
4.1. First Order - Eliminate	4.1.1. Is it possible to completely eliminate hazardous raw materials, process intermediates, or byproducts by using an alternative process or chemistry?	
4.2. First Order - Substitute	4.2.1. Is an alternative process available for this product that eliminates or substantially reduces the need for hazardous raw materials or production of hazardous intermediates?	
4.3. Second Order - Minimize		
4.4. Second Order - Moderate	4.4.1. Is it possible to use larger particle size/reduced dust forming solids to minimize potential for dust explosions? *Use particles configuration with higher Minimum Ignition Energy (MIE) or surface treat particles to change conductivity and resistivity	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	properties that reduce the chance of a static charge buildup	
	4.4.2. Are all process materials (e.g., heating/cooling media) compatible with process materials in event of inadvertent contamination (e.g., due to a tank coil or heat exchanger tube failure)?	
	4.4.3. Is it possible to add an ingredient to volatile hazardous materials that will reduce its vapor pressure?	
4.5. Second Order - Simplify	4.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Carrying out several process steps in separate processing vessels rather than a single multi-purpose vessel (to reduce the complexity and number of raw materials, utilities, and auxiliary equipment connected to a specific vessel)	
4.6. Passive Safeguards		
4.7. Active Safeguards		
4.8. Procedural		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
5.1. First Order - Eliminate		
5.2. First Order - Substitute		
5.3. Second Order - Minimize		
5.4. Second Order - Moderate		
5.5. Second Order - Simplify	5.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Specifying fail-safe operation on utility failure (e.g., air , power) *Allocating redundant inputs and outputs to separate modules of the programmable electronic system to minimize common cause failures *Provide continuous pilots (independent, reliable source) for burner management systems *Using independent power buses for redundant equipment to minimize consequences of partial power failures *Check valves with easy to identify direction of flow *Gate valves with rising spindles to clearly indicate open or closed position *Manual quarter-turn block valves with handles that clearly indicate	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	position *For automated block valves, display actual valve position in addition to the output to the valve	
	5.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of round valve handles for open ended quarter-turn valves to minimize potential for bumping open *Improving valve seating reliability (e.g., using system pressure to seal valve seats where poss ble, using valve seat geometry, valve operations, and flow to eliminate or reduce seat damage)	
5.6. Passive Safeguard		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
s		
5.7. Active Safeguards		
5.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
6.1. First Order - Eliminate		
6.2. First Order - Substitute		
6.3. Second Order - Minimize		
6.4. Second Order - Moderate		
6.5. Second Order - Simplify	6.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Avoiding use of threaded connections in hazardous service *Using double walled pipe *Minimizing number of bends in piping (potential erosion points) *Using expansion loops in piping rather than bellows for thermal expansion	
	6.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Blowout resistant gaskets (e.g.,	

HCA Node: [redacted]

Strategy	Prompt
	spiral wound) *Increasing wall strength of piping and equipment *Maximize use of all welded pipe *Using fewer pipe seams and joints *Providing extra corrosion/erosion allowance (e.g., Sch. 80 vs. 40) *Using incompatible hose connections to prevent misconnection (e.g., air/nitrogen, raw materials) *Eliminating the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) in hazardous service *Eliminating vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary expansion joints, hoses, and rupture disks *Minimizing the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) *Reducing vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary sight glasses/glass rotameters; use high pressure/armored sight glasses as needed *Eliminate use of glass, plastic or other brittle material as material of construction *Minimizing the number of different gaskets, nuts, bolts, etc. used to reduce potential for error
6.6. Passive Safeguards	
6.7. Active Safeguards	
6.8. Procedural Safeguards	

[redacted]

HCA Node: [redacted]

[redacted]

Strategy	Prompt
7.1. First Order - Eliminate	
7.2. First Order - Substitute	
7.3. Second Order - Minimize	
7.4. Second Order - Moderate	7.4.1. For equipment containing materials that become unstable at elevated temperature or freeze at low temperature, is it possible to use heating/cooling media which limit the maximum and minimum temperatures attainable (i.e., self limiting electric heat tracing or hot water at atmospheric pressure)?
	7.4.2. Is equipment designed to totally contain the materials that might be present inside at ambient temperature or the maximum attainable process temperature (i.e., higher maximum allowable working temperature to accommodate loss of cooling, simplified reliance on external system like refrigeration to control temperature such that vapor pressure is less than equipment design pressure)?
	7.4.3. Can process units (for hazardous materials) be designed to limit the magnitude of process deviations? *Selecting pumps with maximum capacity lower than safe rate of addition for the process *For gravity-fed systems, limiting maximum feed rate to be within safe limits by pipe size or fixed orifice *Minimum flow recirculation line for pumps/compressors (with orifice to control flow) to ensure minimum flow in event of deadheading or surging

[redacted]

HCA Node: [redacted]

Strategy	Prompt	[redacted]
7.5. Second Order - Simplify	7.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Designing temperature-limited heat transfer equipment to prevent exceeding maximum process or equipment design temperatures *Use of corrosion resistant materials for process equipment, piping and Components *Minimizing equipment wall area to minimize corrosion/fire exposure *Minimizing connections, paths and number of flanges in hazardous processes *Designing vessels for full vacuum to eliminate risk of vessel collapse *Designing both shell and-tube side of heat exchangers to contain the maximum attainable pressure, eliminating the need for pressure relief (may still be needed to meet fire safety requirements) *Designing/selecting equipment which makes incorrect assembly impossible *Using equipment that clearly identifies status: *Use of dedicated hoses and compatible couplings for reactants where hose connections are used *Use of mixing feed nozzle instead of agitator for vessel mixing *Designing equipment with an MAWP to contain the maximum pressure generated without reliance on pressure relief systems even if the "worst cred ble event" occurs *Use open vent or overflow line to secondary containment for overpressure, overfill and vacuum protection *Eliminate utility connections above	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	pressure rating of vessel	
	7.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of seal-less pumps (e.g., canned, magnetic drive)	
7.6. Passive Safeguards		
7.7. Active Safeguards		
7.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
8.1. First Order (Eliminate/ Substitute)	8.1.1. Is this (hazardous) process/product necessary?	
8.2. First Order - Eliminate	8.2.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
	8.2.2. Are there any other alternatives for substituting or eliminating the use of	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	hazardous materials in this process?	
8.3. First Order - Substitute		
8.4. Second Order - Minimize	8.4.1. Can alternate equipment with reduced hazardous material inventory requirement be used? *Centrifugal extractors in place of extraction columns *Flash dryers in place of tray dryers *Continuous reactors in place of batch *Plug flow or loop reactors in place of continuous stirred tank reactors *Continuous in-line mixers (e.g., static mixer) in place of mixing vessels or reactors *Intensive mixers to minimize size of mixing vessel of reactor *High heat-transfer reactors (e.g., micro reactor, HEX reactor) *Spinning-disk reactor (especially for high heat-flux or viscous liquids) *Compact heat exchangers (higher heat transfer area per unit volume, e.g., spiral, plate & frame, plate-fin) in place of shell-and-tube)	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	*More hazardous material on the tube side in shell-and-tube exchangers *Use water or other non flammable heat transfer medium, a vapor-phase medium, or a medium below its boiling point *Wiped film stills in place of continuous still pots (distillation columns) *Combine unit operations (such as reactive distillation or extraction in place of separate reactor with multi-column fractionation train or extractor; installing internal reboilers or heat exchangers) to reduce overall system volume *Use of acceleration fields (e.g., rotating packed bed for gas/liquid or liquid/liquid contacting for absorption, stripping, distillation, extraction, etc.) *Use solid catalyst in place of a more hazardous liquid catalyst *Alternate energy sources (such as lasers, UV light, microwaves, or ultrasound) to control reaction or direct heat to the unit operation	
	8.4.2. Has the length of hazardous material piping runs been minimized?	
	8.4.3. Has hazardous material piping been designed for minimum pipe diameter?	
	8.4.4. Can pipeline inventory be reduced by using the hazardous material as a gas rather than a liquid?	
	8.4.5. Can process conditions be changed to reduce production of hazardous waste or byproducts?	
	8.4.6. Are there any other alternatives for minimizing the inventory of hazardous materials in this process?	
8.5. Second Order - Moderate	8.5.1. Is it possible to make reaction conditions (for hazardous reactants or products) (temperature, pressure)	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	less severe by using a catalyst, or a better catalyst (e.g., structured or monolithic vs. packed bed)?	
	8.5.2. Can the process be operated at less severe conditions (for hazardous reactants or products) by considering: * Improved kinetics or thermodynamics to reduce operating temperatures or pressures * Changes in reaction phase (e.g., liquid/liquid, gas/liquid, or gas/gas) *Raw material recycle to compensate for reduced yield or conversion *Operating at a lower temperature to prevent runaway reactions or material failure	
	8.5.3. Can process conditions be changed to avoid handling flammable liquids above their flash points?	
	8.5.4. Are there any other alternatives for moderating the use of hazardous materials in this process?	
8.6. Second Order - Simplify	8.6.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Operating at a higher temperature to avoid cryogenic effects such as embrittlement failures *Using alternative agitation methods (e.g., external circulation using sealless pump which eliminates potential releases due to agitator seal failures)	
	8.6.2. Are there any other alternatives for simplifying operations involving hazardous materials in this process?	
8.7. Passive Safeguards	8.7.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	

HCA Node: [redacted]

[redacted]

Strategy	Prompt
8.8. Active Safeguards	
8.9. Procedural Safeguards	

HCA Node: [redacted]

[redacted]

Strategy	Prompt
9.1. First Order - Eliminate	
9.2. First Order - Substitute	
9.3. Second Order - Minimize	
9.4. Second Order - Moderate	
9.5. Second Order - Simplify	9.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Easy access and operability of valves to prevent inadvertent errors *Elimination of all unnecessary cross connections *Using underground or shielded tanks *Designing equipment isolation mechanisms for maintenance in the process *Limiting manual operations such as

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	filter cleaning, manual sampling, hose handling for loading/unloading operations, etc. *Spectacle (or figure- 8) blinds instead of slip plates	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
9.6. Passive Safeguards		
9.7. Active Safeguards		
9.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
10.1. First Order - Eliminate	10.1.1. Can hazardous process units be located to eliminate: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
10.2. First Order - Substitute		
10.3. Second Order - Minimize	10.3.1. Can the plant be located to minimize the need for transportation of hazardous materials? (e.g., co-located with supplier/customer, onsite production of hazardous raw materials)	
	10.3.2. Can hazardous process units be located to minimize: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	
10.4. Second Order - Moderate	10.4.1. For processes handling flammable materials, is it poss ble to design the layout to minimize the number and size of confined areas and to limit the potential for serious overpressure in the event of a loss of containment and subsequent ignition?	
	10.4.2. Can hazardous material liquid spills be prevented from entering drainage system/sewer (if potential for fire or hazardous reaction exists, e.g., water reactive material)?	
	10.4.3. For flammable materials, can spills be directed away from the storage vessel to reduce the risk of a boiling liquid expanding vapor explosion (BLEVE) in the event of a fire?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
10.5. Second Order - Simplify		
10.6. Passive Safeguards		
10.7. Active Safeguards		
10.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
11.1. First Order -	11.1.1. Can a multi-step process, where the steps are done at separate	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
Eliminate	sites, be divided up differently to eliminate the need to transport hazardous materials?	
11.2. First Order - Substitute		
11.3. Second Order - Minimize		
11.4. Second Order - Moderate	11.4.1. Can materials be transported: *In a less hazardous form (e.g., refrigerated liquid vs. pressurized) * In a safer transport method (e.g., via pipeline, top-vs. bottom-unloaded, rail vs. truck) *Along a safer route (e.g., avoiding high risk areas such as high population areas, tunnels, or high accident-rate sections of roadway)?	
11.5. Second Order - Simplify		
11.6. Passive Safeguards	11.6.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	
11.7. Active Safeguards		
11.8. Procedur		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
al Safeguar ds		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
12.1. First Order - Eliminate	12.1.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
12.2. First Order - Substitute	12.2.1. Is it possible to substitute less hazardous final product solvents?	
	12.2.2. Is it possible to use a nonflammable refrigerant instead of a flammable one (or minimize inventory)?	
12.3. Second Order - Minimize		
12.4. Second Order - Moderate		
12.5. Second Order - Simplify		
12.6. Passive Safeguar ds		
12.7. Active Safeguar ds		
12.8. Procedur		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
al Safeguar ds		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
1.1. First Order - Eliminate	1.1.1. Is this (hazardous) raw material necessary?	
1.2. First Order - Substitute	1.2.1. Is it possible to substitute less hazardous raw materials? *Noncombust bles for flammable *Less volatile *Less reactive *More stable *Less toxic *Low pressure steam rather than flammable heat transfer fluid (i.e. operated above flash point)	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
1.3. Second Order - Minimize	1.3.1. Can hazardous raw materials inventory be reduced? * Just in time deliveries based on production needs * Supplier management including strategic alliance * On-site generation of hazardous material (including in situ) from less hazardous raw materials * Hazardous raw material inventory management system based on production forecast	
1.4. Second Order - Moderate	1.4.1. Is it possible to limit the supply pressure of (hazardous) raw materials to less than the maximum allowable working pressure of the vessels to which they are delivered?	
	1.4.2. Is it possible to use less concentrated hazardous raw materials to reduce the hazard potential? *Aqueous ammonia and/or HCL instead of anhydrous *Sulfuric acid instead of oleum *Dilute nitric acid instead of concentrated fuming nitric acid *Wet benzoyl peroxide instead of dry	
1.5. Second Order - Simplify		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
1.6. Passive Safeguards		
1.7. Active Safeguards		
1.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.1. First Order - Eliminate	2.1.1. Is this (hazardous) process/product necessary?	
2.2. First Order - Substitute	2.2.1. Is it possible to completely eliminate hazardous process intermediates, or byproducts by using an alternative process or chemistry?	
2.3. Second Order - Minimize	2.3.1. Can in-process storage and inventory be reduced? *Direct coupling of process elements *Eliminating or reducing size of inprocess storage *Designing process equipment involving hazardous material with the	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	smallest feas ble inventory	
2.4. Second Order - Moderate		
2.5. Second Order - Simplify	2.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
2.6. Passive Safeguards	2.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.7. Active Safeguards		
2.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.1. First Order - Eliminate	3.1.1. Is this (hazardous) process/product necessary?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.2. First Order - Substitute		
3.3. Second Order - Minimize	3.3.1. Can hazardous finished product inventory be reduced? *Improving production scheduling/sales forecasting *Improving communication with transporters/material handlers *Hazardous finished product inventory management system based on sales forecast	
3.4. Second Order - Moderate		
3.5. Second Order - Simplify	3.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
3.6. Passive Safeguards	3.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	*Fireproofing insulation vs. fixed/portable fire protection	
3.7. Active Safeguards		
3.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
4.1. First Order - Eliminate	4.1.1. Is it possible to completely eliminate hazardous raw materials, process intermediates, or byproducts by using an alternative process or chemistry?	
4.2. First Order - Substitute	4.2.1. Is an alternative process available for this product that eliminates or substantially reduces the need for hazardous raw materials or production of hazardous intermediates?	
4.3. Second Order - Minimize		
4.4. Second Order - Moderate	4.4.1. Is it possible to use larger particle size/reduced dust forming solids to minimize potential for dust explosions? *Use particles configuration with higher Minimum Ignition Energy (MIE) or surface treat particles to	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	change conductivity and resistivity properties that reduce the chance of a static charge buildup	
	4.4.2. Are all process materials (e.g., heating/cooling media) compatible with process materials in event of inadvertent contamination (e.g., due to a tank coil or heat exchanger tube failure)?	
	4.4.3. Is it possible to add an ingredient to volatile hazardous materials that will reduce its vapor pressure?	
4.5. Second Order - Simplify	4.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Carrying out several process steps in separate processing vessels rather than a single multi-purpose vessel (to reduce the complexity and number of raw materials, utilities, and auxiliary equipment connected to a specific vessel)	
4.6. Passive Safeguards		
4.7. Active Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
4.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
5.1. First Order - Eliminate		
5.2. First Order - Substitute		
5.3. Second Order - Minimize		
5.4. Second Order - Moderate		
5.5. Second Order - Simplify	5.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Specifying fail-safe operation on utility failure (e.g., air , power) *Allocating redundant inputs and outputs to separate modules of the programmable electronic system to minimize common cause failures *Provide continuous pilots (independent, reliable source) for burner management systems *Using independent power buses for redundant equipment to minimize consequences of partial power failures *Check valves with easy to identify direction of flow *Gate valves with rising spindles to clearly indicate open or closed position *Manual quarter-turn block valves	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	with handles that clearly indicate position *For automated block valves, display actual valve position in addition to the output to the valve	
	5.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of round valve handles for open ended quarter-turn valves to minimize potential for bumping open *Improving valve seating reliability (e.g., using system pressure to seal valve seats where poss ble, using valve seat geometry, valve operations, and flow to eliminate or reduce seat damage)	
5.6. Passive Safeguards		
5.7. Active Safeguards		
5.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
6.1. First Order - Eliminate		
6.2. First Order - Substitute		
6.3. Second Order - Minimize		
6.4. Second Order - Moderate		
6.5. Second Order - Simplify	6.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Avoiding use of threaded connections in hazardous service *Using double walled pipe *Minimizing number of bends in piping (potential erosion points) *Using expansion loops in piping rather than bellows for thermal expansion	
	6.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Blowout resistant gaskets (e.g., spiral wound) *Increasing wall strength of piping and equipment *Maximize use of all welded pipe *Using fewer pipe seams and joints *Providing extra corrosion/erosion allowance (e.g., Sch. 80 vs. 40) *Using incompatible hose connections to prevent misconnection (e.g., air/nitrogen, raw materials) *Eliminating the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) in hazardous service *Eliminating vibration (e.g., through vibration dampening or equipment	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	balancing) *Eliminating unnecessary expansion joints, hoses, and rupture disks *Minimizing the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) *Reducing vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary sight glasses/glass rotameters; use high pressure/armored sight glasses as needed *Eliminate use of glass, plastic or other brittle material as material of construction *Minimizing the number of different gaskets, nuts, bolts, etc. used to reduce potential for error	
6.6. Passive Safeguards		
6.7. Active Safeguards		
6.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
7.1. First Order - Eliminate		
7.2. First Order - Substitute		
7.3. Second Order - Minimize		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
7.4. Second Order - Moderate	7.4.1. For equipment containing materials that become unstable at elevated temperature or freeze at low temperature, is it possible to use heating/cooling media which limit the maximum and minimum temperatures attainable (i.e., self limiting electric heat tracing or hot water at atmospheric pressure)?	
	7.4.2. Is equipment designed to totally contain the materials that might be present inside at ambient temperature or the maximum attainable process temperature (i.e., higher maximum allowable working temperature to accommodate loss of cooling, simplified reliance on external system I ke refrigeration to control temperature such that vapor pressure is less than equipment design pressure)?	
	7.4.3. Can process units (for hazardous materials) be designed to limit the magnitude of process deviations? *Selecting pumps with maximum capacity lower than safe rate of addition for the process *For gravity-fed systems, limiting maximum feed rate to be within safe limits by pipe size or fixed orifice *Minimum flow recirculation line for pumps/compressors (with orifice to control flow) to ensure minimum flow in event of deadheading or surging	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
7.5. Second Order - Simplify	7.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Designing temperature-limited heat transfer equipment to prevent exceeding maximum process or equipment design temperatures *Use of corrosion resistant materials for process equipment, piping and Components *Minimizing equipment wall area to minimize corrosion/fire exposure *Minimizing connections, paths and number of flanges in hazardous processes *Designing vessels for full vacuum to eliminate risk of vessel collapse *Designing both shell and-tube side of heat exchangers to contain the maximum attainable pressure, eliminating the need for pressure relief (may still be needed to meet fire safety requirements) *Designing/selecting equipment which makes incorrect assembly impossible *Using equipment that clearly identifies status: *Use of dedicated hoses and compatible couplings for reactants where hose connections are used *Use of mixing feed nozzle instead of agitator for vessel mixing *Designing equipment with an MAWP to contain the maximum pressure generated without reliance on pressure relief systems even if the "worst cred ble event" occurs *Use open vent or overflow line to secondary containment for overpressure, overfill and vacuum protection *Eliminate utility connections above pressure rating of vessel	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	7.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of seal-less pumps (e.g., canned, magnetic drive)	
7.6. Passive Safeguards		
7.7. Active Safeguards		
7.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
8.1. First Order (Eliminate/ Substitute)	8.1.1. Is this (hazardous) process/product necessary?	
8.2. First Order - Eliminate	8.2.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
	8.2.2. Are there any other alternatives for substituting or eliminating the use of hazardous materials in this process?	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
8.3. First Order - Substitute		
8.4. Second Order - Minimize	8.4.1. Can alternate equipment with reduced hazardous material inventory requirement be used? *Centrifugal extractors in place of extraction columns *Flash dryers in place of tray dryers *Continuous reactors in place of batch *Plug flow or loop reactors in place of continuous stirred tank reactors *Continuous in-line mixers (e.g., static mixer) in place of mixing vessels or reactors *Intensive mixers to minimize size of mixing vessel of reactor *High heat-transfer reactors (e.g., micro reactor, HEX reactor) *Spinning-disk reactor (especially for high heat-flux or viscous liquids) *Compact heat exchangers (higher heat transfer area per unit volume, e.g., spiral, plate & frame, plate-fin) in place of shell-and-tube) *More hazardous material on the tube side in shell-and-tube exchangers *Use water or other non flammable	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	heat transfer medium, a vapor-phase medium, or a medium below its boiling point *Wiped film stills in place of continuous still pots (distillation columns) *Combine unit operations (such as reactive distillation or extraction in place of separate reactor with multi-column fractionation train or extractor; installing internal reboilers or heat exchangers) to reduce overall system volume *Use of acceleration fields (e.g., rotating packed bed for gas/liquid or liquid/liquid contacting for absorption, stripping, distillation, extraction, etc.) *Use solid catalyst in place of a more hazardous liquid catalyst *Alternate energy sources (such as lasers, UV light, microwaves, or ultrasound) to control reaction or direct heat to the unit operation	
	8.4.2. Has the length of hazardous material piping runs been minimized?	
	8.4.3. Has hazardous material piping been designed for minimum pipe diameter?	
	8.4.4. Can pipeline inventory be reduced by using the hazardous material as a gas rather than a liquid?	
	8.4.5. Can process conditions be changed to reduce production of hazardous waste or byproducts?	
	8.4.6. Are there any other alternatives for minimizing the inventory of hazardous materials in this process?	
8.5. Second Order - Moderate	8.5.1. Is it possible to make reaction conditions (for hazardous reactants or products) (temperature, pressure) less severe by using a catalyst, or a better catalyst (e.g., structured or monolithic vs. packed bed)?	
	8.5.2. Can the process be operated at less	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	
	severe conditions (for hazardous reactants or products) by considering: * Improved kinetics or thermodynamics to reduce operating temperatures or pressures * Changes in reaction phase (e.g., liquid/liquid, gas/liquid, or gas/gas) *Raw material recycle to compensate for reduced yield or conversion *Operating at a lower temperature to prevent runaway reactions or material failure	[redacted]
	8.5.3. Can process conditions be changed to avoid handling flammable liquids above their flash points?	
	8.5.4. Are there any other alternatives for moderating the use of hazardous materials in this process?	
8.6. Second Order - Simplify	8.6.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Operating at a higher temperature to avoid cryogenic effects such as embrittlement failures *Using alternative agitation methods (e.g., external circulation using sealless pump which eliminates potential releases due to agitator seal failures)	
	8.6.2. Are there any other alternatives for simplifying operations involving hazardous materials in this process?	
8.7. Passive Safeguards	8.7.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	
8.8. Active Safeguards		
8.9. Procedural		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
9.1. First Order - Eliminate		
9.2. First Order - Substitute		
9.3. Second Order - Minimize		
9.4. Second Order - Moderate		
9.5. Second Order - Simplify	9.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Easy access and operability of valves to prevent inadvertent errors *Elimination of all unnecessary cross connections *Using underground or shielded tanks *Designing equipment isolation mechanisms for maintenance in the process *Limiting manual operations such as filter cleaning, manual sampling, hose handling for loading/unloading operations, etc. *Spectacle (or figure- 8) blinds instead of slip plates	
9.6. Passive Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
9.7. Active Safeguards		
9.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
10.1. First Order - Eliminate	10.1.1. Can hazardous process units be located to eliminate: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	
10.2. First Order - Substitute		
10.3. Second Order - Minimize	10.3.1. Can the plant be located to minimize the need for transportation of hazardous materials? (e.g., co-located with supplier/customer, onsite production of hazardous raw	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
	materials)	
	10.3.2. Can hazardous process units be located to minimize: *Adverse effects from adjacent hazardous installations *Off-site impacts *On-site impacts on employees and other plant facilities including control rooms, fire protection systems, emergency response and communication facilities, and maintenance and administrative facilities	
10.4. Second Order - Moderate	10.4.1. For processes handling flammable materials, is it poss ble to design the layout to minimize the number and size of confined areas and to limit the potential for serious overpressure in the event of a loss of containment and subsequent ignition?	
	10.4.2. Can hazardous material liquid spills be prevented from entering drainage system/sewer (if potential for fire or hazardous reaction exists, e.g., water reactive material)?	
	10.4.3. For flammable materials, can spills be directed away from the storage vessel to reduce the risk of a boiling liquid expanding vapor explosion (BLEVE) in the event of a fire?	
10.5. Second Order - Simplify		
10.6. Passive Safeguards		
10.7. Active Safeguards		
10.8. Procedural Safeguar		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
ds		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
11.1. First Order - Eliminate	11.1.1. Can a multi-step process, where the steps are done at separate sites, be divided up differently to eliminate the need to transport hazardous materials?	
11.2. First Order - Substitute		
11.3. Second Order - Minimize		
11.4. Second Order - Moderate	11.4.1. Can materials be transported: *In a less hazardous form (e.g., refrigerated liquid vs. pressurized) * In a safer transport method (e.g., via pipeline, top-vs. bottom-unloaded, rail vs. truck) *Along a safer route (e.g., avoiding high risk areas such as high population areas, tunnels, or high accident-rate sections of roadway)?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
11.5. Second Order - Simplify		
11.6. Passive Safeguards	11.6.1. Can gases be transported and stored at low or atmospheric pressure on a high capacity adsorbent instead of using pressurized gas cylinders?	
11.7. Active Safeguards		
11.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
12.1. First Order - Eliminate	12.1.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
12.2. First Order - Substitute	12.2.1. Is it possible to substitute less hazardous final product solvents?	
	12.2.2. Is it possible to use a nonflammable refrigerant instead of a flammable one (or minimize inventory)?	
12.3. Second Order - Minimize		
12.4. Second Order - Moderate		
12.5. Second Order - Simplify		
12.6. Passive Safeguards		
12.7. Active Safeguards		
12.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
1.1. First Order - Eliminate	1.1.1. Is this (hazardous) raw material necessary?	
1.2. First Order - Substitute	1.2.1. Is it possible to substitute less hazardous raw materials? *Noncombust bles for flammable *Less volatile *Less reactive *More stable *Less toxic *Low pressure steam rather than flammable heat transfer fluid (i.e. operated above flash point)	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
1.3. Second Order - Minimize	1.3.1. Can hazardous raw materials inventory be reduced? * Just in time deliveries based on production needs * Supplier management including strategic alliance * On-site generation of hazardous material (including in situ) from less hazardous raw materials * Hazardous raw material inventory management system based on production forecast	
1.4. Second Order - Moderate	1.4.1. Is it possible to limit the supply pressure of (hazardous) raw materials to less than the maximum allowable working pressure of the vessels to which they are delivered?	
	1.4.2. Is it possible to use less concentrated hazardous raw materials to reduce the hazard potential? *Aqueous ammonia and/or HCL instead of anhydrous *Sulfuric acid instead of oleum *Dilute nitric acid instead of concentrated fuming nitric acid *Wet benzoyl peroxide instead of dry	
1.5. Second Order - Simplify		
1.6. Passive Safeguards		
1.7. Active Safeguards		
1.8. Procedural Safeguard		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
s		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.1. First Order - Eliminate	2.1.1. Is this (hazardous) process/product necessary?	
2.2. First Order - Substitute	2.2.1. Is it possible to completely eliminate hazardous process intermediates, or byproducts by using an alternative process or chemistry?	
2.3. Second Order - Minimize	2.3.1. Can in-process storage and inventory be reduced? *Direct coupling of process elements *Eliminating or reducing size of inprocess storage *Designing process equipment involving hazardous material with the smallest feas ble inventory	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
2.4. Second Order - Moderate		
2.5. Second Order - Simplify	2.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
2.6. Passive Safeguards	2.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	

HCA Node: [redacted]

Strategy	Prompt
2.7. Active Safeguards	
2.8. Procedural Safeguards	

[redacted]

HCA Node: [redacted]

Strategy	Prompt
3.1. First Order - Eliminate	3.1.1. Is this (hazardous) process/product necessary?
3.2. First Order - Substitute	
3.3. Second Order - Minimize	3.3.1. Can hazardous finished product inventory be reduced? *Improving production scheduling/sales forecasting *Improving communication with transporters/material handlers *Hazardous finished product inventory management system based on sales forecast

[redacted]

HCA Node: [redacted]

Strategy	Prompt	[redacted]
3.4. Second Order - Moderate		
3.5. Second Order - Simplify	3.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Using refrigerated storage vs. pressurized storage	
3.6. Passive Safeguards	3.6.1. Can passive designs, such as the following, be implemented? *Secondary containment (e.g., dikes, curbing, buildings, enclosures) *Use of properly vented blowdown tank for dumping of runaway reaction mass *Permanent bonding and grounding systems for process equipment, tanks, and vessels *Use of gas inerting systems for handling flammables and explosive dusts (e.g.,nitrogen, CO2) *Use of dip legs with anti-siphon openings for feed to flammable liquid storage tanks *Fireproofing insulation vs. fixed/portable fire protection	
3.7. Active Safeguards		
3.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
4.1. First Order - Eliminate	4.1.1. Is it possible to completely eliminate hazardous raw materials, process intermediates, or byproducts by using an alternative process or	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	chemistry?	
4.2. First Order - Substitute	4.2.1. Is an alternative process available for this product that eliminates or substantially reduces the need for hazardous raw materials or production of hazardous intermediates?	
4.3. Second Order - Minimize		
4.4. Second Order - Moderate	4.4.1. Is it possible to use larger particle size/reduced dust forming solids to minimize potential for dust explosions? *Use particles configuration with higher Minimum Ignition Energy (MIE) or surface treat particles to change conductivity and resistivity properties that reduce the chance of a static charge buildup	
	4.4.2. Are all process materials (e.g., heating/cooling media) compatible with process materials in event of inadvertent contamination (e.g., due to a tank coil or heat exchanger tube failure)?	
	4.4.3. Is it possible to add an ingredient to volatile hazardous materials that will reduce its vapor pressure?	

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
4.5. Second Order - Simplify	4.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Carrying out several process steps in separate processing vessels rather than a single multi-purpose vessel (to reduce the complexity and number of raw materials, utilities, and auxiliary equipment connected to a specific vessel)	
4.6. Passive Safeguards		
4.7. Active Safeguards		
4.8. Procedural Safeguards		

HCA Node: [redacted]

[redacted]

Strategy	Prompt	[redacted]
5.1. First Order - Eliminate		
5.2. First Order - Substitute		
5.3. Second Order - Minimize		
5.4. Second Order - Moderate		
5.5. Second Order - Simplify	5.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	maintenance error? *Specifying fail-safe operation on utility failure (e.g., air , power) *Allocating redundant inputs and outputs to separate modules of the programmable electronic system to minimize common cause failures *Provide continuous pilots (independent, reliable source) for burner management systems *Using independent power buses for redundant equipment to minimize consequences of partial power failures *Check valves with easy to identify direction of flow *Gate valves with rising spindles to clearly indicate open or closed position *Manual quarter-turn block valves with handles that clearly indicate position *For automated block valves, display actual valve position in addition to the output to the valve	
	5.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of round valve handles for open ended quarter-turn valves to minimize potential for bumping open *Improving valve seating reliability (e.g., using system pressure to seal valve seats where poss ble, using valve seat geometry, valve operations, and flow to eliminate or reduce seat damage)	

HCA Node: [redacted]

Strategy	Prompt
5.6. Passive Safeguards	
5.7. Active Safeguards	
5.8. Procedural Safeguards	

HCA Node: [redacted]

Strategy	Prompt
6.1. First Order - Eliminate	
6.2. First Order - Substitute	
6.3. Second Order - Minimize	
6.4. Second Order - Moderate	
6.5. Second Order - Simplify	6.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Avoiding use of threaded connections in hazardous service *Using double walled pipe *Minimizing number of bends in piping (potential erosion points) *Using expansion loops in piping rather than bellows for thermal expansion

HCA Node: [redacted]

Strategy	Prompt
	6.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Blowout resistant gaskets (e.g., spiral wound) *Increasing wall strength of piping and equipment *Maximize use of all welded pipe *Using fewer pipe seams and joints *Providing extra corrosion/erosion allowance (e.g., Sch. 80 vs. 40) *Using incompatible hose connections to prevent misconnection (e.g., air/nitrogen, raw materials) *Eliminating the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) in hazardous service *Eliminating vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary expansion joints, hoses, and rupture disks *Minimizing the use of open-ended (bleed or vent), quick - opening valves (for example, quarter-turn ball or plug valves) *Reducing vibration (e.g., through vibration dampening or equipment balancing) *Eliminating unnecessary sight glasses/glass rotameters; use high pressure/armored sight glasses as needed *Eliminate use of glass, plastic or other brittle material as material of construction *Minimizing the number of different gaskets, nuts, bolts, etc. used to reduce potential for error
6.6. Passive Safeguards	
6.7. Active Safeguards	

[redacted]

HCA Node: [redacted]

Strategy	Prompt	[redacted]
6.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
7.1. First Order - Eliminate		
7.2. First Order - Substitute		
7.3. Second Order - Minimize		
7.4. Second Order - Moderate	7.4.1. For equipment containing materials that become unstable at elevated temperature or freeze at low temperature, is it possible to use heating/cooling media which limit the maximum and minimum temperatures attainable (i.e., self limiting electric heat tracing or hot water at atmospheric pressure)?	
	7.4.2. Is equipment designed to totally contain the materials that might be present inside at ambient temperature or the maximum attainable process temperature (i.e., higher maximum allowable working temperature to accommodate loss of cooling, simplified reliance on external system I ke refrigeration to control temperature such that vapor pressure is less than equipment design pressure)?	
	7.4.3. Can process units (for hazardous materials) be designed to limit the magnitude of process deviations? *Selecting pumps with maximum capacity lower than safe rate of	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	addition for the process *For gravity-fed systems, limiting maximum feed rate to be within safe limits by pipe size or fixed orifice *Minimum flow recirculation line for pumps/compressors (with orifice to control flow) to ensure minimum flow in event of deadheading or surging	
7.5. Second Order - Simplify	7.5.1. Can equipment be designed such that it is difficult or impossible to create a potential hazardous situation due to an operating or maintenance error? *Designing temperature-limited heat transfer equipment to prevent exceeding maximum process or equipment design temperatures *Use of corrosion resistant materials for process equipment, piping and Components *Minimizing equipment wall area to minimize corrosion/fire exposure *Minimizing connections, paths and number of flanges in hazardous processes *Designing vessels for full vacuum to eliminate risk of vessel collapse *Designing both shell and-tube side of heat exchangers to contain the maximum attainable pressure, eliminating the need for pressure relief (may still be needed to meet fire safety requirements) *Designing/selecting equipment which makes incorrect assembly impossible *Using equipment that clearly identifies status: *Use of dedicated hoses and	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	compatible couplings for reactants where hose connections are used *Use of mixing feed nozzle instead of agitator for vessel mixing *Designing equipment with an MAWP to contain the maximum pressure generated without reliance on pressure relief systems even if the "worst cred ble event" occurs *Use open vent or overflow line to secondary containment for overpressure, overfill and vacuum protection *Eliminate utility connections above pressure rating of vessel	
	7.5.2. Can passive leak limiting technology be used to limit potential loss of containment? *Use of seal-less pumps (e.g., canned, magnetic drive)	
7.6. Passive Safeguards		
7.7. Active Safeguards		
7.8. Procedural Safeguards		

HCA Node: [redacted]

Strategy	Prompt	[redacted]
8.1. First Order (Eliminate/ Substitute)	8.1.1. Is this (hazardous) process/product necessary?	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
8.2. First Order - Eliminate	8.2.1. Is it possible to completely eliminate in-process solvents and flammable heat transfer media by changing chemistry or processing conditions?	
	8.2.2. Are there any other alternatives for substituting or eliminating the use of hazardous materials in this process?	
8.3. First Order - Substitute		
8.4. Second Order - Minimize	8.4.1. Can alternate equipment with reduced hazardous material inventory requirement be used? *Centrifugal extractors in place of extraction columns *Flash dryers in place of tray dryers *Continuous reactors in place of batch *Plug flow or loop reactors in place of continuous stirred tank reactors *Continuous in-line mixers (e.g., static mixer) in place of mixing vessels or reactors *Intensive mixers to minimize size of mixing vessel of reactor *High heat-transfer reactors (e.g., micro reactor, HEX reactor) *Spinning-disk reactor (especially for	

HCA Node: [redacted]

Strategy	Prompt	[redacted]
	high heat-flux or viscous liquids) *Compact heat exchangers (higher heat transfer area per unit volume, e.g., spiral, plate & frame, plate-fin) in place of shell-and-tube) *More hazardous material on the tube side in shell-and-tube exchangers *Use water or other non flammable heat transfer medium, a vapor-phase medium, or a medium below its boiling point *Wiped film stills in place of continuous still pots (distillation columns) *Combine unit operations (such as reactive distillation or extraction in place of separate reactor with multi-column fractionation train or extractor; installing internal reboilers or heat exchangers) to reduce overall system volume *Use of acceleration fields (e.g., rotating packed bed for gas/liquid or liquid/liquid contacting for absorption, stripping, distillation, extraction, etc.) *Use solid catalyst in place of a more hazardous liquid catalyst *Alternate energy sources (such as lasers, UV light, microwaves, or ultrasound) to control reaction or direct heat to the unit operation	
	8.4.2. Has the length of hazardous material piping runs been minimized?	
	8.4.3. Has hazardous material piping been designed for minimum pipe diameter?	
	8.4.4. Can pipeline inventory be reduced by using the hazardous material as a gas rather than a liquid?	
	8.4.5. Can process conditions be changed to reduce production of hazardous waste or byproducts?	
	8.4.6. Are there any other alternatives for minimizing the inventory of	