ATTACHMENT B
72 HOUR FOLLOW-UP NOTIFICATION REPORT FORM
CONTRA COSTA HEALTH SERVICES

ATTENTION: Randall L. Sawyer
Hazardous Materials Programs Director
Contra Costa Health Services
4585 Pacheco Boulevard, Suite 100
Martinez, CA 94553

INCIDENT DATE: June 15, 2012

INCIDENT TIME: 07:20 AM

FACILITY: ConocoPhillips Rodeo Refinery

PERSON TO CONTACT FOR ADDITIONAL INFORMATION
James Ferris Phone number (510) 245-4517

I. **SUMMARY OF EVENT**:

At 7:20 AM on June 15, 2012, an over-pressure occurred on Tank-294 causing an approximately twenty foot separation in the roof-shell seam. Tank 294 stores "sour water" (dissolved ammonia and sulfur compounds) and light hydrocarbon. The opening released a combination of natural gas blanket, hydrocarbon and hydrogen sulfide vapors into the air. Phillips 66 initiated its emergency response procedures, which included emergency response team members responding directly to Tank 294 and activation of the Refinery Incident Management Team (IMT) and Emergency Operations Center (EOC). We also made all required agency notifications.

As part of the response, we began draining sour water from the tank and directed water streams on the roof-shell opening to mitigate emissions. We also requested the use of Chevron's Aerial Foam Truck via the Petro-Chemical Mutual Aid Organization (PMAO). Community atmospheric monitoring was initiated and direct readings were taken downwind of the release location in the town of Crockett and along I-80 between Cummings Skyway and Willow Avenue exits.

Representatives from the Contra Costa County Health Services Hazmat Division and the Bay Area Air Quality Management District participated in the ICS-201 development, Incident Objectives and strategic decisions made to manage the incident.

Throughout the day on June 15th and 16th, various actions were taken to mitigate the release and reduce odors, including:

- Providing a nitrogen supply to the tank to purge the tank vapor space with nitrogen as to replace the natural gas blanket and maintain the oxygen-free atmosphere inside the tank,
- Applying a water spray to the tank opening to suppress vapors,
- Removing the material in the tank as rapidly as possible,
- Foam was applied inside the tank to further suppress vapors,
- Materials were procured and a repair plan developed to patch the opening. The patch was completed Saturday evening.

At 8:30 am on June 17th, 2012 the Incident was downgraded to a CWS Level-0 and emergency response operations were suspended. Activities will continue to further remove sour water and hydrocarbons from the tank in a safe manner until the tank can be taken out of service and ultimately cleaned and repaired.

A formal incident investigation is complete to determine the cause(s) of the incident and corrective actions.

II. **AGENCIES NOTIFIED, INCLUDING TIME OF NOTIFICATION**:

The Community Warning System was activated for a Level 1 incident at 07:40 AM and the following agencies were notified:

- Contra Costa Health Services Department
- Bay Area Air Quality Management District
- Rodeo Hercules Fire Protection District
- Contra Costa County Sherriff's Office

At 08:00 AM the Incident was up-graded to a CWS Level-2 and the following additional agency notifications were subsequently made:

• Cal OES – control number 12-3497	06/15/12	11:17 AM
• National Response Center - Case # 1014706	06/15/12	11:25 AM
• CA Dept of Public Health	06/15/12	12:40 PM
• CARB – Office of Emergency Response	06/15/12	01:04 PM

III. **AGENCIES RESPONDING, INCLUDING CONTACT NAMES AND PHONE NUMBERS**:

Contra Costa Health Services – Hazmat	Jerry Yoshioka, Melissa Haggen, Lacey Freedman
Bay Area Air Quality Management District	John Swanson, Jeff Grove

IV. **EMERGENCY RESPONSE ACTIONS:**
The refinery Incident Management Team and the Emergency Operations Center were activated to manage the incident in conjunction with agency representatives:

- Sour Water was removed from the tank as quickly as possible. An approximate projection early in the incident was that the tank could be emptied by 1800 hrs on 6-16-12.
- Water sprays were applied to the shell-roof opening to dissipate vapors
- To maintain an inert, oxygen free, atmosphere inside the tank vapor space, nitrogen was injected into the tank instead of the normal natural gas.
- Atmospheric monitoring was conducted in the local community to assess whether the incident impacted human health and/or the environment.
- Mutual Aid was requested to bring an aerial foam truck. This truck was used to provide a water suppressing spray and then to apply foam into the tank.
- A specialty contractor and materials were mobilized to apply a patch to the roof-shell opening. The patch was completed at approximately 11:00 pm on June, 16th.

V. **IDENTITY OF MATERIAL RELEASED AND ESTIMATED OR KNOWN QUANTITIES**:

A calculated estimate of 42 pounds of H_2S was released from the tank vapor space. A report was made to the NRC

VI. **METEOROLOGICAL CONDITIONS AT TIME OF EVENT**

Clear, Warm, Sunny Wind SW @ 3-8 mph, Temperature 65^0 F

VII. **DESCRIPTION OF INJURIES**: No Injuries Occurred

VIII. **COMMUNITY IMPACT**

The refinery received approximately 100 odor complaints. The BAAQMD and Contra Costa Health Services also received numerous odor complaints.

Our refinery Ground Level Monitoring system recorded the following maximum levels: Crockett GLM Max 3-Minute Average 0.215 ppm and Max 1-Hour Average 0.068 ppm and East Refinery GLM Max 3-Minute Average 0.105 ppm and Max 1-Hour Average 0.036 ppm.

Representatives from the refinery Health & Safety Department conducted offsite monitoring using a RAE Systems Multi-RAE 5-gas meters. Odors were detected in the surrounding community; however measured levels of VOC's (Volatile Organic Compounds) and H_2S were low. Additional measurements were taken by BAAQMD and CCHS-Hazmat. All off-site measured levels of H_2S were below 1.0 ppm and were most often below 0.1 ppm. Measured levels of VOC's were below 2.0 ppm.

IX. **INCIDENT INVESTIGATION RESULTS**
Is the investigation of the incident complete at this time? ____X____Yes _____No
If the answer is no, submit a 30 day final or interim report.
If the answer is yes, complete the following:

X. **SUMMARIZE INVESTIGATION RESULTS BELOW OR ATTACH COPY OF REPORT**:

A copy of the report is attached.

XI. **SUMMARIZE PREVENTATIVE MEASURES TO BE TAKEN TO PREVENT RECURRENCE INCLUDING MILESTONE AND COMPLETION DATES FOR IMPLEMENTATION**:

Note: the incident investigation was completed on July 19th, 2012. The action items stewards and target dates/milestones have not yet been established. A follow-up to this 30-Day Report will be submitted within 30 days to provide this information.

Recommendation 1:

Review tank line-up procedures for multiple simultaneous transfers (i.e. Tank 294 to Tank 269 scenario), including an operating procedure to accurately monitor tank volume changes associated with multiple inputs and outputs during sour water tank transfers. (Root Cause 1a and b)

Recommendation 2:

Using the information learned from this incident investigation re-conduct engineering reviews to prevent light hydrocarbon carry-over to the sour water systems for all units listed below:
(Root Causes 2a, b, and c)

1) All units (MP-30, U240, U246, U250, etc) with potential light hydrocarbon sources to non-phenolic sour water tanks (Tank 269, 294).

2) All units with potential light hydrocarbon carry-over to the phenolic sour water tanks (Tank 200, 204, 205).

Recommendation 3:

Complete a thorough review of the Tank 294 pressure relief system components to verify proper operation of these components. (Root Cause 3a)

Recommendation 4:

Complete a thorough review of the Tank 294 roof to shell joint to verify if there were any contributing factors for a premature failure of this joint. (i.e. Corrosion, cracking, weld defects, etc)
(Root Cause 2b and c)

Recommendation 5:

Review the PHA risk ranking methodology to ensure previous incidents are considered (i.e. industry, corporate, and local). (Root Cause 3a)

Rodeo Refinery
Tank 294 Over-Pressure 061512-1
July 13, 2012

Incident Investigation Report

Executive Summary

Location:	**Rodeo Refinery**
Date of Incident:	**June 15, 2012**
Date Investigation Began:	**June 15, 2012**
Time of Incident:	**Approx. 7:10 a.m.**
Name of Incident:	**Tank 294 Over-Pressure**
Incident Risk Ranking:	**Category III**

A water-hydrocarbon interface level indicator did not measure a correct water level on Naphtha Splitter Overhead Accumulator (F202). This false high level measurement led to a loss of water level and resulted in the transfer of light hydrocarbons to sour water tankage.

Sour Water Tank 294 contents and the unit rundowns were lined up to Sour Water Tank 269. This line up and the failed level indicator allowed the transfer pipeline to fill with light hydrocarbons. A flow reversal in the transfer from Tank 269 to Tank 294 redirected the light hydrocarbons in the pipeline and all the unit rundowns to flow to Tank 294. This surge of light hydrocarbon material generated vapor quantities that exceeded the design capacity of the Tank 294 relief protection system.

This over-pressure caused a separation in the tank roof to shell seam. The roof to shell opening released a combination of the natural gas blanket, light hydrocarbons and hydrogen sulfide vapors to atmosphere.

Following the incident, all feed sources were blocked away from the tank, sour water transfer from Tank 294 was accelerated, and water streams were directed at the roof to shell opening to mitigate emissions.

Key Findings and High Value Learnings

The water-hydrocarbon interface level control on F202 had occurrences of false level indication in the past without major downstream impacts. These occurrences were not internally communicated in a manner that would trigger an engineering review.

This over-pressure event at Tank 294 involved a greater volume of light hydrocarbons than any previous operation due to the pipeline flow reversal and high content of light hydrocarbon material.

INCIDENT INVESTIGATION REPORT

RODEO REFINERY- Tank 294 Over-Pressure Incident

BACKGROUND

Tanks 294 and 269 are in non-phenolic sour water service and receive sour water from multiple hydro-treating units. These tanks are managed and controlled by the U40 Operator, but tank pressure alarms are received at the Sulfur Plant console in the Central Control Room. Any tank pressure alarms received by the Sulfur Plant Board Operator are relayed to the U40 Operator and the Bulk Shift Supervisor.

These two non-phenolic sour water tanks along with multiple other refinery tanks are on an odor abatement system which consists of a natural gas tank blanketing system and an associated vapor recovery compression system.

Sour water from the Naphtha Hydrotreating and Reforming complex is collected in Foul Water Surge Drum (D206). D206 has multiple sources of sour water including the Naphtha Splitter Overhead Accumulator (F202). The water-hydrocarbon interface on F202 had previous occurrences of false readings. False high readings may lead to loss of water level and subsequently to light hydrocarbon under carry from F202 into D206 and false low readings may lead to water level rising above the hydrocarbon draw standpipe and water carry over to Feed Drum (F210).

DESCRIPTION OF ACTIONS BEFORE THE EVENT

The Naphtha Splitter Overhead Accumulator (F202) sour water is collected in the Foul Water Surge Drum (D206) and then pumped on level control through a line that connects to the transfer line between Tank 269 and Tank 294. Tank 294 and unit rundowns were being transferred to Tank 269 for about 12 hours prior to the event.

At approximately 5 a.m., the flow rate increased from the Naphtha Splitter Overhead Accumulator (F202) to the Foul Water Surge Drum (D206) and was subsequently pumped at the higher rate into the transfer line between Tank 269 and Tank 294. The flow rate continued to increase from a normal rate of approximately 300 bbl/day to off scale at >1000 bbl/day by 5:30 a.m.

This off scale flow rate continued for approximately one hour. At that point, operations personnel recognized the false reading and started trouble shooting the water–hydrocarbon interface level controller on F202. The trouble shooting started by changing the controller set points from the board. These board changes did not result in the expected outcome of the water level indication in F202. Direction was given to the field Operator to trouble shoot the level bridles on F202. The F202 level controller interface was resolved at approximately 8 a.m.

The amount of light hydrocarbon material pumped from the D206 to Tank 269 began increasing at approximately 5 a.m. At first the Odor Abatement system handled the increased vapor from the light hydrocarbons. At approximately 6:30 a.m. the pressure began to rise in the tank. A high pressure alarm for Tank 269 sounded at the Sulfur Plant Operator console.

The high pressure alarm was received by the Sulfur Plant Operator, who contacted the U40 Operator and Shift Supervisor to inform them of the high pressure alarm on Tank 269 at approximately 6:40 a.m. The U40 Operator responded to the call and upon arriving at the tank noticed the tank pressure at 1.98” Water

Column. The U40 Operator immediately opened the pressure control bypass on the Odor Abatement skid to relieve excess pressure on Tank 269 to the Odor Abatement compressors.

After observing the Tank 269 pressure decrease back to normal operating range, the U40 Operator closed the pressure control bypass. Tank 269 pressure immediately began to increase again. The U40 Operator responded by opening the bypass again at 7:06 a.m. He then walked to an adjacent roadway to meet with the Shift Supervisor.

At about this same time, the transfer between Tank 294 and Tank 269 slowed down and then reversed due to the increased light hydrocarbon vaporizing in the transfer pipeline. The Process Information (PI) data trend does not accurately reflect the exact timing of flow reversal due to the 15 minute data point recording of tank levels. Other Bulk Operators reported observing erratic tank level indications during this time period. The tank gauging system did not record these erratic readings due to its design to record on 15 minute increments.

After the U40 Operator reached the roadway, his Shift Supervisor received a call informing him of a Tank 294 high pressure alarm. The Shift Supervisor immediately proceeded to Tank 294 area to respond to the alarm. The U40 Operator reported seeing the roof of Tank 294 moving and vapors above the tank. He blocked in the transfer pipeline to Tank 269 and closed the Odor Abatement bypass before responding to Tank 294. At Tank 294 both the Operator and his Shift Supervisor observed the separation in the roof to shell seam.

INCIDENT DESCRIPTION

An over-pressure event in Tank 294 caused a separation in the tank roof to shell seam at 7:10 a.m. The natural gas blanketed Tank 294 stores sour water with residual naphtha. The roof to shell opening released a combination of the natural gas blanket, light hydrocarbons and hydrogen sulfide vapors to the atmosphere. An emergency response was immediately activated, which included emergency response team members responding directly to Tank 294 and activation of the Refinery Incident Management Team (IMT) and Emergency Operations Center (EOC).

As part of the response, all rundown sources were blocked away from the tank and sour water transfer from Tank 294 to Tank 269 was reestablished and transfer rates increased. Mutual Aid was requested to bring in an aerial foam truck. This truck was used to provide a water suppressing spray and then to apply foam into the tank to mitigate emissions.

Atmospheric monitoring was conducted in the local community by the Contra Costa County Health Department to assess whether the incident impacted human health or the environment.

Throughout the day on June 15th and 16th, various actions were taken to mitigate the release and reduce odors, including the following measures:

- A nitrogen supply was provided to replace the natural gas blanket and to maintain the oxygen-free atmosphere inside the tank.
- A water spray was applied at the tank opening to suppress vapors.
- The remaining material in the tank was removed as rapidly as possible.
- Foam was applied inside the tank to further suppress vapors.
- A specialty contractor and materials were mobilized to apply a patch to the roof-shell opening. The patch was completed at approximately 11:00 p.m. on June 16th.

INCIDENT CAUSES

The initial members of the investigation team met shortly after the incident on June 15, 2012. Members of the team conducted interviews with employees, examined the scene, and reviewed the policies, procedures, and work documents related to the incident.

The team reviewed the following:

- Interviews:
  - Operating Area/Shift Supervisors and Superintendents
  - Bulk and Process Operators and Engineers
  - Maintenance Manager, Supervisors and Mechanics
  - Area Maintenance Planner
  - Inspection Lead
  - Tank Engineer
- The scene of the incident after Refinery Incident Management was complete
- Work orders on affected equipment
- Previous IMPACT and investigation reports
- Multiple process and alarm trends representing all aspects of the investigation

The team conducted training on the use of the Human Factors checklist and the use of TapRooT® prior to conducting the root cause analysis phase of the investigation.

PHYSICAL CAUSES:

The physical causes of this incident were:

1) The Light Naphtha Hydrotreater overhead accumulator (F202) water-hydrocarbon interface level indicator failed to indicate a correct level. This incorrect level indication resulted in the transfer of light hydrocarbons to Tank 294.

2) The flashed material generated vapor quantities that exceeded the design capacity of the Tank 294 relief protection system.

HUMAN CAUSES:

The human causes of this incident are:

1) The PHA team members evaluated the risk of an inadvertent transfer of light hydrocarbons to the sour water system too low based upon prior events. A more detailed engineering analysis of the system would have been done if the risk ranking was higher.

2) A Tank 294 to Tank 269 flow reversal with the transfer pipeline filled with light hydrocarbons was not considered during previous engineering evaluations.

LATENT CAUSES:

The investigation team found that the water-hydrocarbon interface level control on F202 had occurrences of false level indication in the past without major downstream impacts. These occurrences were not internally communicated in a manner that would trigger an engineering review.

This over-pressure event at Tank 294 involved a greater volume of light hydrocarbons than any previous operation due to the pipeline flow reversal and high content of light hydrocarbon material.

The root cause analysis of this incident identified three causal factors with six root causes.

1) Sour Water from process units and Tank 294 flows to Tank 269

a. Procedures- Not Used/Not Followed- No Procedure

b. Management System- Standards, Policies, or Administrative Controls Not Used- No way to implement

2) Light Hydrocarbons are pumped to Non-Phenolic Sour Water Tanks

a. Management System- Standards, Policies, or Administrative Controls Not Used- Accountability Needs Improvement

b. Management System- Corrective Action Needs Improvement

c. Management System- Corrective Action- Trending Needs Improvement

3) Tank 294 Pressure Relief System did not protect the tank

a. Equipment Difficulty- Design Review- Hazard Analysis Needs Improvement

RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Recommendation 1:

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(Root Cause 2b and c)

Recommendation 5:

Review the PHA risk ranking methodology to ensure previous incidents are considered (i.e. industry, corporate, and local). (Root Cause 3a)

INVESTIGATION TEAM

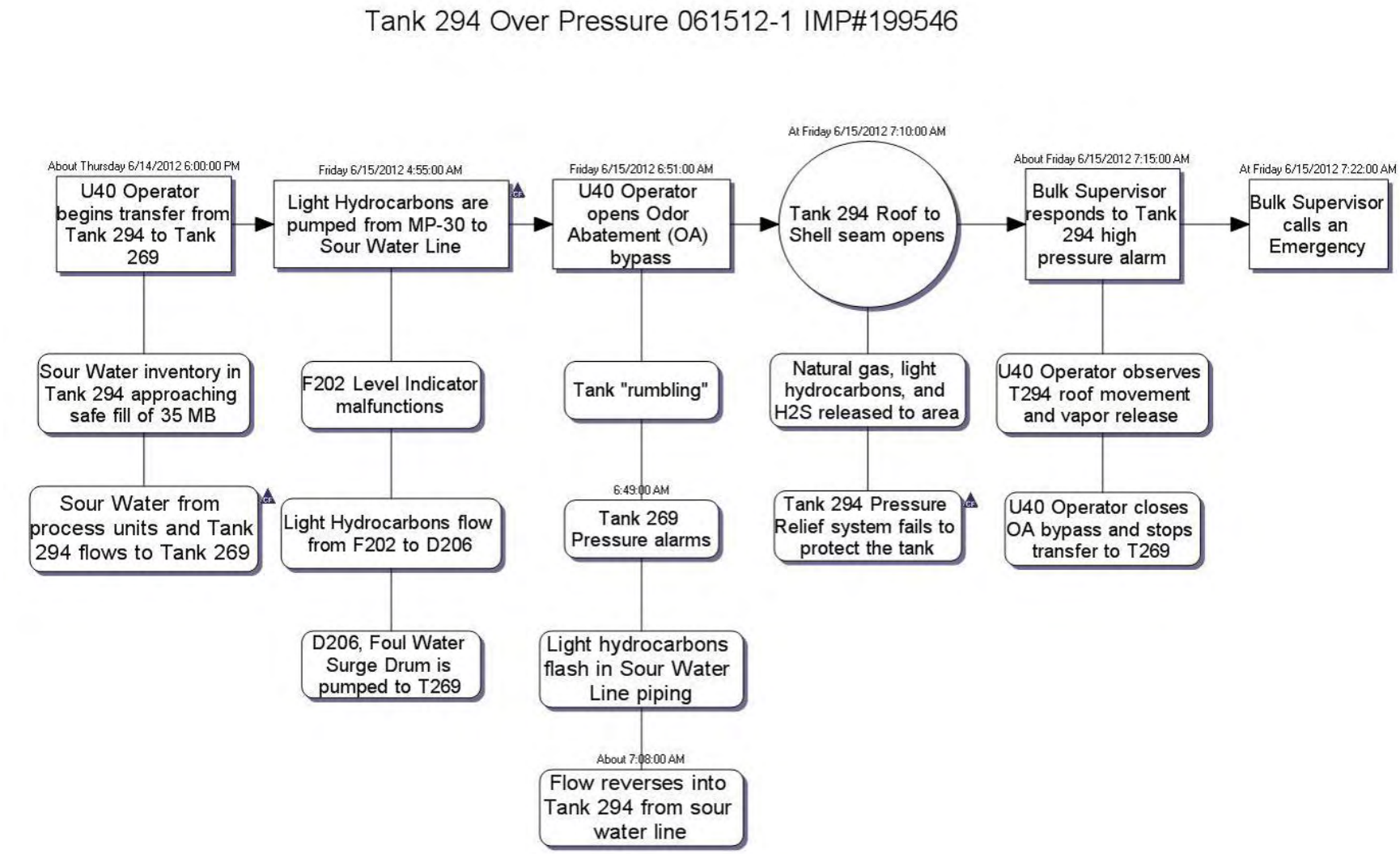
The team consisted of the following members:

LAR Maintenance & Reliability Mgr (Team Leader)
Operations Planning Supervisor
Unit 240 Operator and JH&SC Representative
Maintenance Mechanic and JH&SC Rep
HSE Special Projects Coordinator (TapRooT© Facilitator)

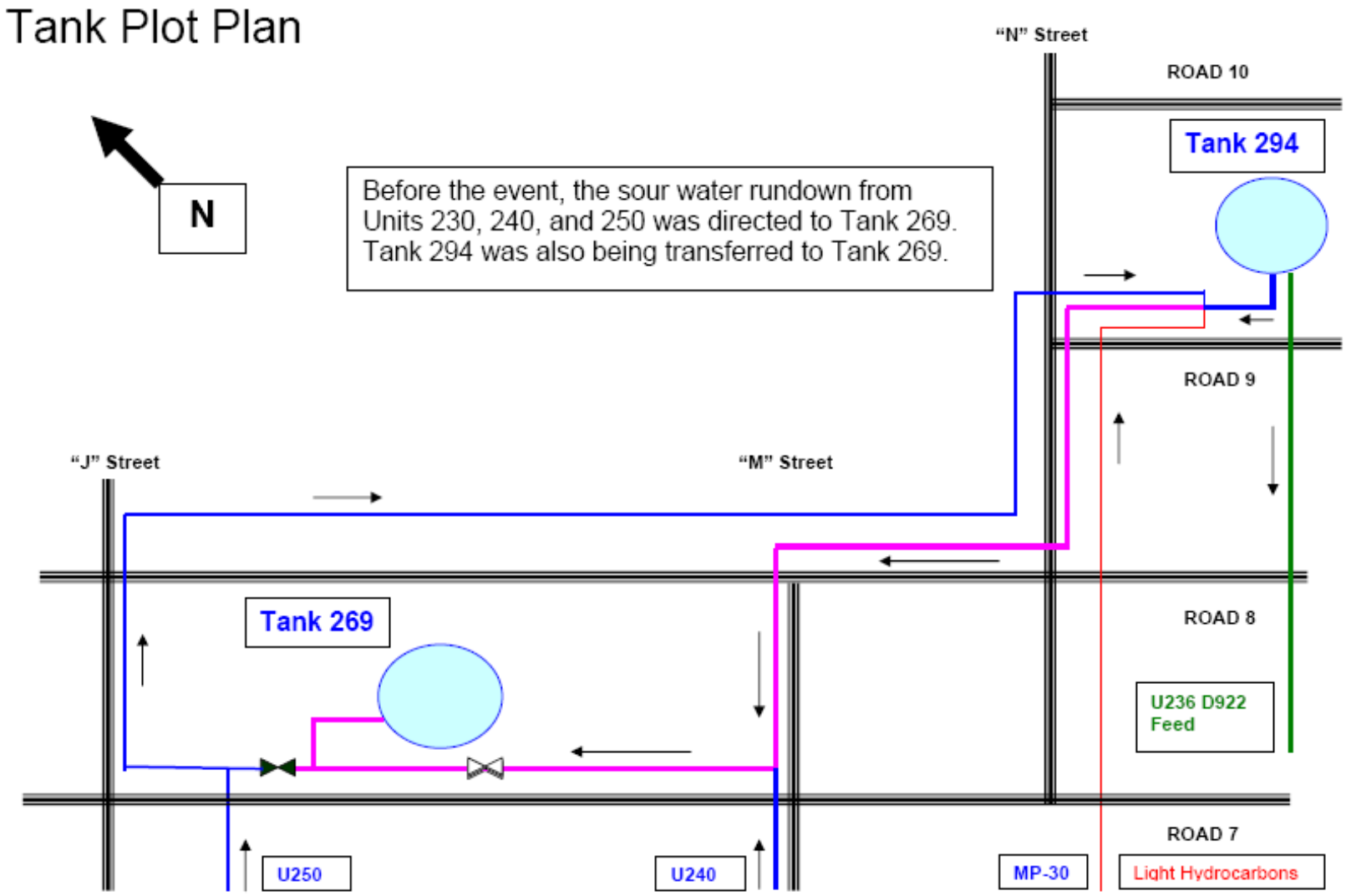
ATTACHMENTS

1. TapRoot® Root Cause Analysis SnapChart®
2. Refinery Plot Plan with Tank 294, Tank 269, and connecting piping.
3. Tank 269 and Tank 294 Pressure Trends
4. Photographs

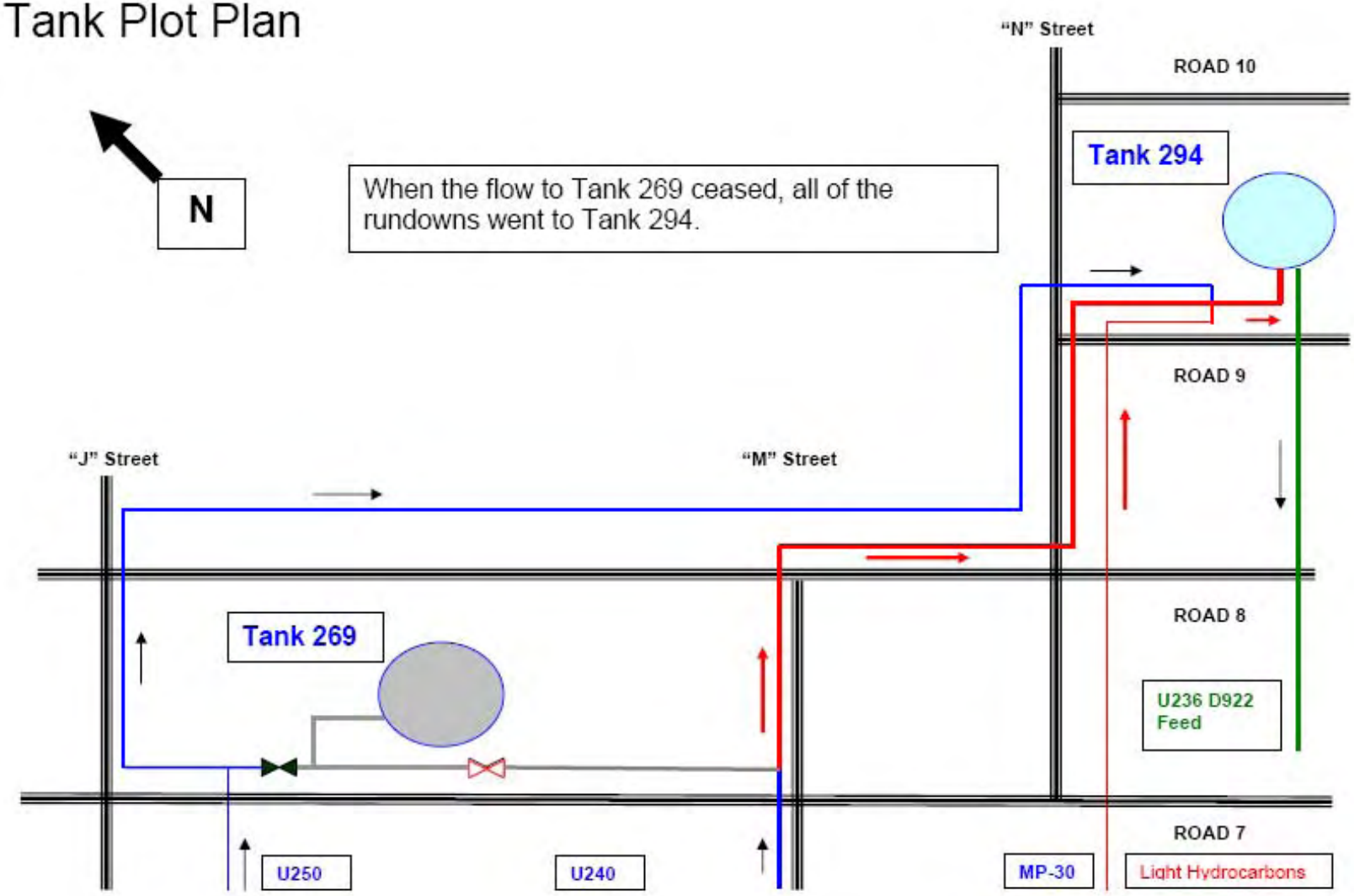
ATTACHMENT 1 - TapRoot® Root Cause Analysis SnapChart®



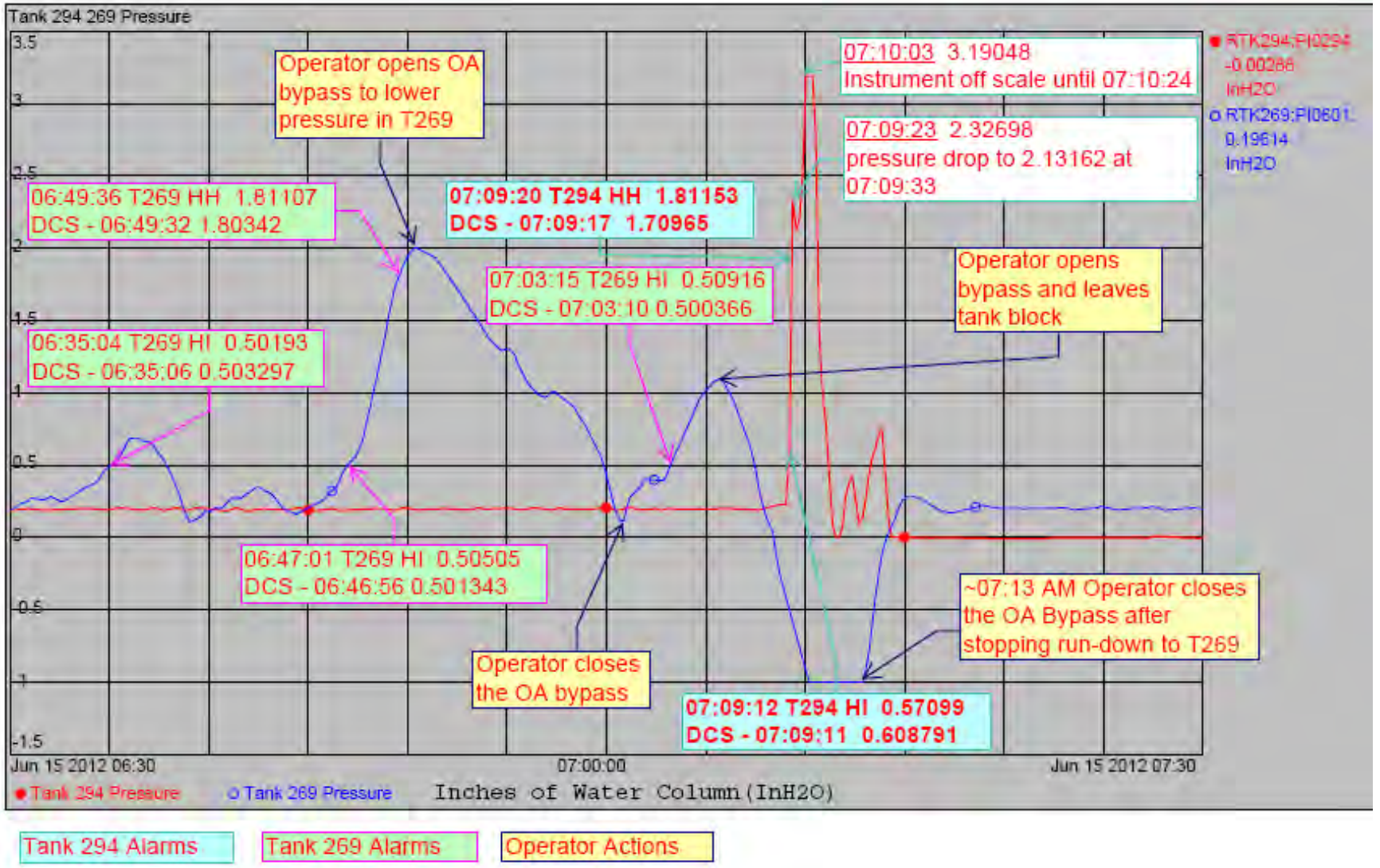
ATTACHMENT 2 - Refinery Plot Plan with Tank 294, Tank 269, and connecting piping.



Tank Plot Plan



ATTACHMENT 3 Tank 269 and Tank 294 Pressure Trends



ATTACHMENT 4 – Photographs

Tank 294 during the initial emergency response.

The Tank breather valves (PSV-294A & C) are visible to the right of the Gauger's Platform. The 20" Emergency Hatch is behind the railing at the right, near the 6" tank vent line.

The 20” Emergency Hatch (PSV-294B)

Close-up view of the Tank Breather valves (PSV-294A & C)