

UTC Incident Investigation Form

Notification ID:	3199	Investigation ID:	7508
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Inspector Name:	Dennis Ritter, Lead Scott Anderson, Derek Norwood, Dave Cullom
Date Report Submitted to Chief Engineer:	10/12/17, Dennis Ritter
Date Report Reviewed & Approved by Chief Engineer:	10/19/2017, Joe Subsits

Operator:	McChord Pipeline Company, OPID 31049
District/Unit:	McChord Pipeline Company 3001 Marshall Ave, Tacoma, WA 98421
Locations:	100 th St at A St Tacoma, WA
Incident Dates:	August 2, 2017

Description:

Summary:

A third party contractor using a directional drill, hit and punctured the six-inch McChord Pipeline causing a leak (**Photo 1-6**). The location was just outside the city limits of Tacoma in unincorporated Pierce County (known locally as Parkland) at the intersection of 100th St and A St. This was MP 8.888 on McChord's pipeline. The initial report to NRC indicated 50-100 gallons of JP8 jet fuel was released. The Accident Report submitted to PHMSA on August 30, 2017, indicated 180 barrels (bbls) (7560 gallons) leaked and 155 bbls (6510 gal) were recovered, leaving 25 bbls (1050 gal) unaccounted for. It appears this accident was preventable with the root cause being the third-party contractor failing to properly define the locate boundary.



Photo 1--Google Satellite view of Parkland area near Tacoma where accident occurred (North is top of photo).

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Photo 3—looking west on 100th St at A St. Note location of MPL damaged line in relation to pool spread (down hill).

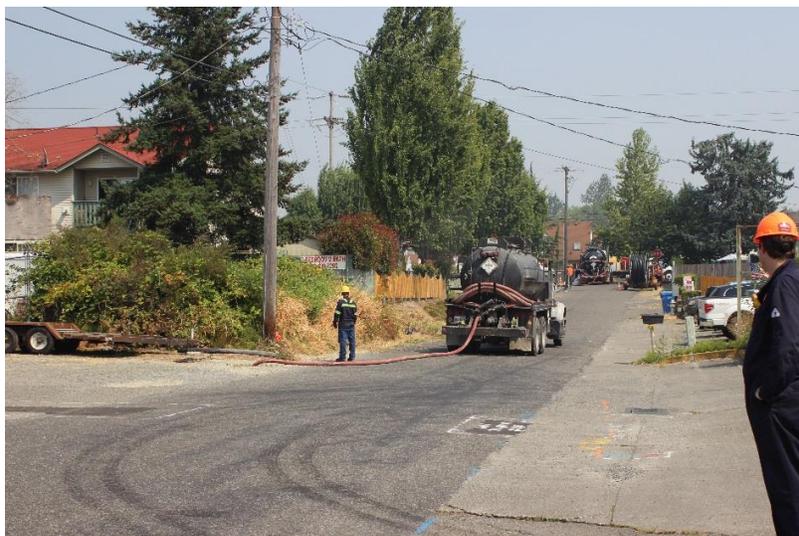


Photo 4—looking east on 100th St. Product recovery efforts using MPL's OSROs.

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Photo 5—Looking north on 100th St. Leaked product in bell hole approximately 300 feet west of leak site. Hose is removing leaked product.

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Photo 6—looking north on 100th St. Product recovery efforts in bell hole approximately 200 feet west of leak site.

Background:

The McChord Pipeline (MPL) is an intrastate, hazardous liquid pipeline 14.25 miles in length. The pipeline transports jet fuel (JP-8) from US Oil Refinery (USOR) located in Tacoma's industrial area in the tide flats to McChord Field, a US Air Force facility on Joint Base Lewis McChord (JBLM). (**Figure 1**). MPL was constructed in 1966 of 6-inch nominal diameter, grade B steel pipeline with wall thickness ranging from 0.188 inch to 0.432 inch. The pipeline has a 720 psig MOP (36% SMYS) with a normal operating pressure at 450 psig (21% SMYS). The pipeline is divided into four sections with isolation valves between each section (**Figure 2**).

The entire pipeline is within a "high consequence area" (HCA) as identified in 49 CFR 195.450. There is approximately 400 feet of elevation gain from USOR to McChord AFB (JBLM). Jurisdiction begins at the pump suction valves (P-1401) and ends at the custody

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transfer manifold valves downstream of the meters at McChord (JBLM). The pipeline was hydrostatically tested in 1996 and inline inspected by GE in 2004 and 2009 (MFL) and Baker Hughes (calibration/MFL) in 2013. There had been no accidents on this line since it was constructed.

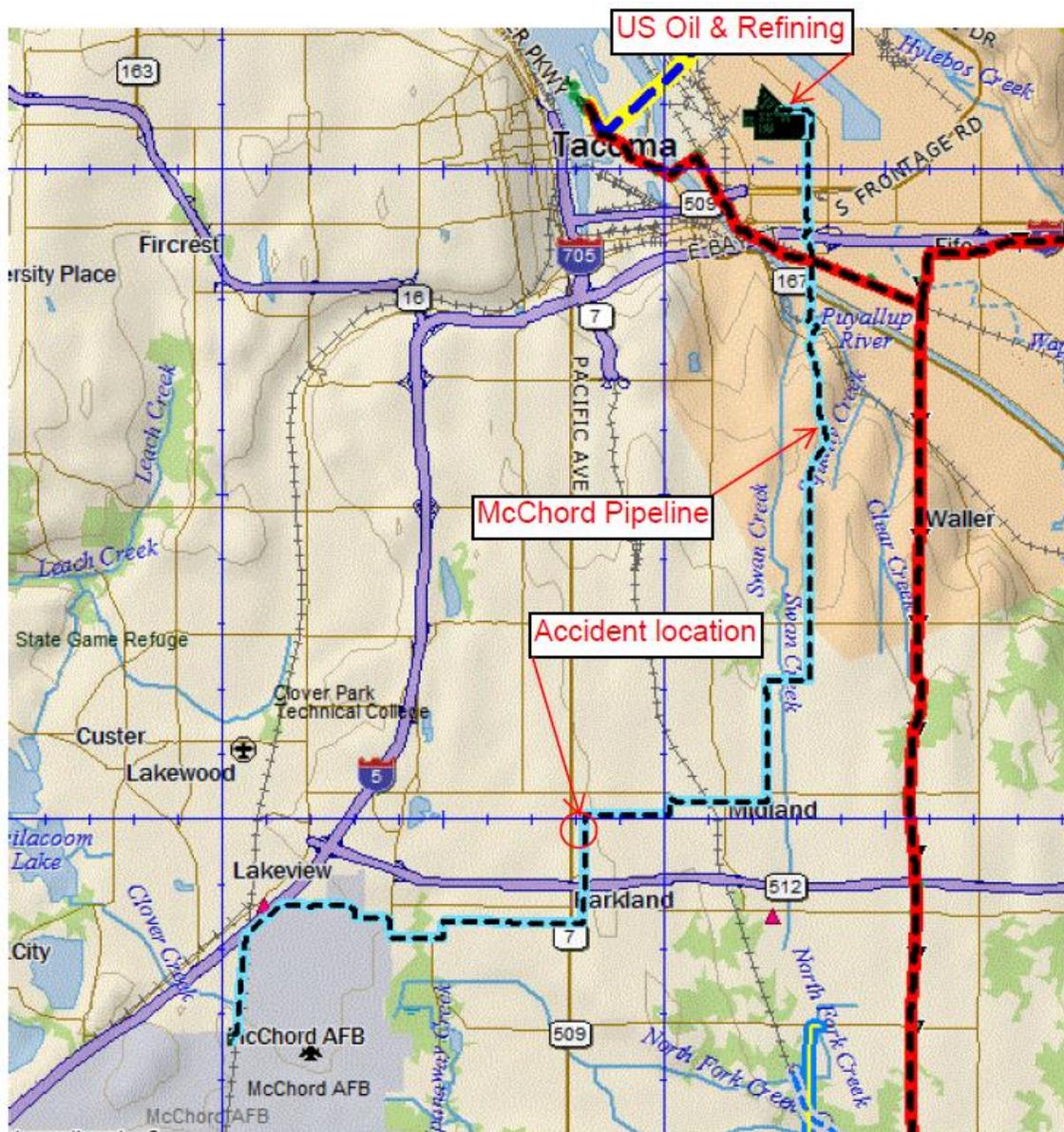


Figure 1—McChord Pipeline (blue dashed line)

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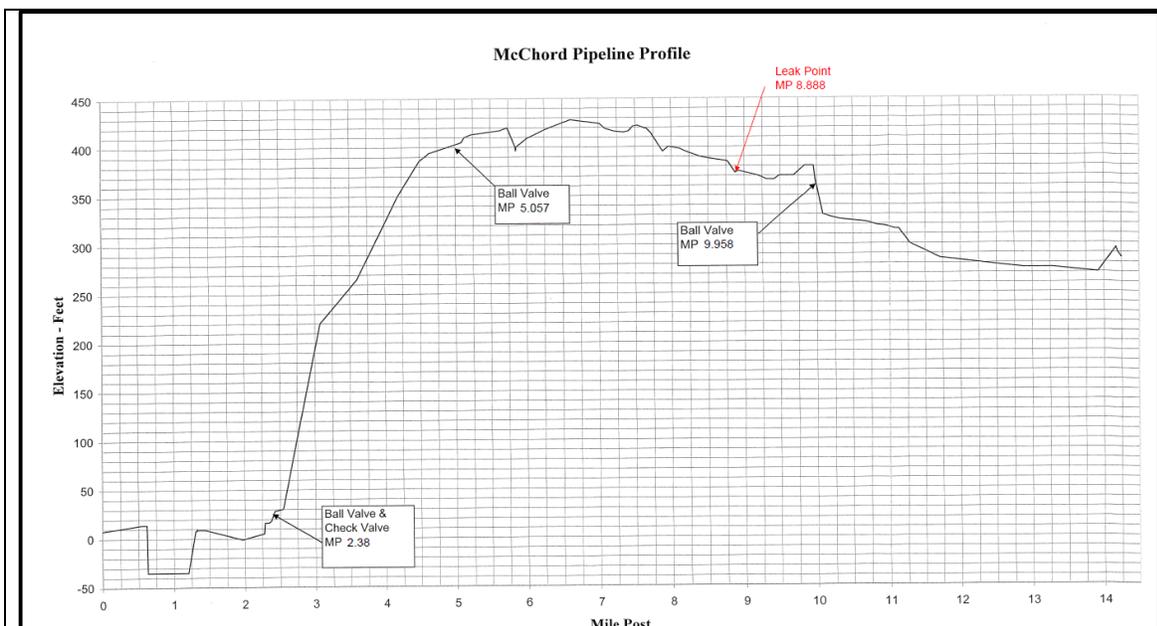


Figure 2 McChord Pipeline Elevation Profile

Investigation:

SEFNCO Communications, Inc. (SEFNCO) is a contractor for Comcast. They were drilling to install a cable line to the credit union at 9911 Pacific Ave (Sound Credit Union). Locates were called in at 0645 on July 26, 2017 by SEFNCO, Ticket No. 17284954 (**Figure 6**). The narrative description on the locate ticket was as follows:

PLEASE PLACE LOCATES FROM THE SOUTH SIDE OF BUILDING [9911 Pacific Ave Sound Credit Union] TO POLE AND THEN EAST BOUND DOWN 100TH ST TO POLE ON EASTSIDE OF INTERSECTION OF A ST AND 100TH TO THE POLE

The ticket also noted under Remarks the following:

AREA MARKED IN WHITE

The white paint, as required by RCW 19.122, delineating where to locate, was clearly visible on the west end of 100th St. adjacent to 9911 Pacific Ave (Sound Credit Union). (**Photo 7, 8**).

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Photo 7— Looking north 100th St adjacent to Sound Credit Union entrance. SEFNCO white locate boundary with painted locate marks--PSE (yellow), Tacoma Water (blue) and McChord Pipeline (yellow to left of red marks).



Photo 8— Looking west on 100th St. White SEFNCO locate boundaries with painted locate marks--PSE (yellow), Tacoma Water (blue) and McChord Pipeline (yellow to left of red marks).

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Locates from McChord Pipeline (MPL), Puget Sound Energy (PSE), and Tacoma Water were noted at this location (**Photo 7 and 8**). Other locates (**Photo 9**) were noted towards the east end of 100th St, however, these were completed the day prior to the accident when the foreman (FM) for SEFNCO called City of Tacoma Water and PSE directly as he believed these utilities were in the area of drilling activity. The FM did not call McChord Pipeline and did not call in a new locate.

According to SEFNCO Construction Supervisor, Mike Violette, who called in the original locate, the job scope changed. Originally SEFNCO was going to come overhead from Pacific Ave then go underground at the credit union—this is why white paint was originally around the credit union. The project later changed to bring cable in from the east side of A Street approximately 600 feet to the east. According to Violette, he personally put white paint on the ground at the pole near A Street. These marks were not very noticeable while on site (a pot hole was dug near this location and might have damaged marks; however, other locators did not apparently see them either as there were no locates in this area prior to August 1, 2017 (**Photo 9**)).

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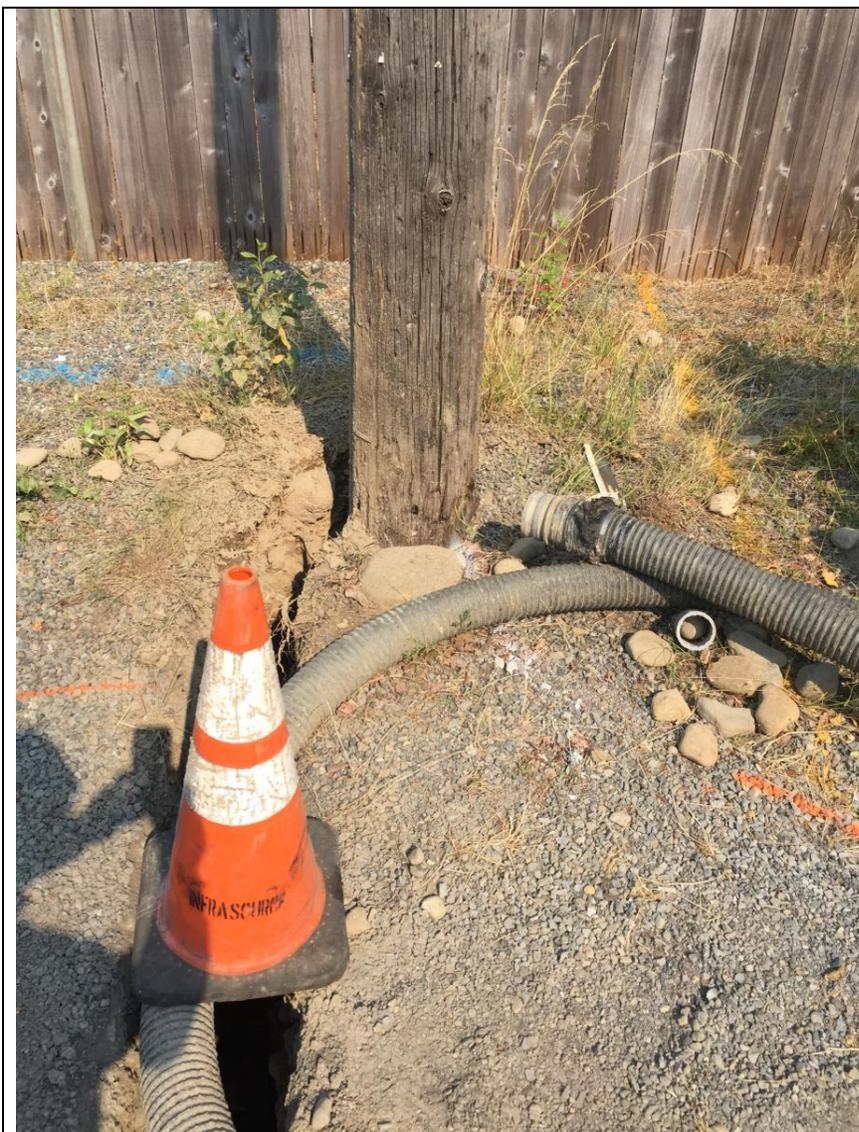
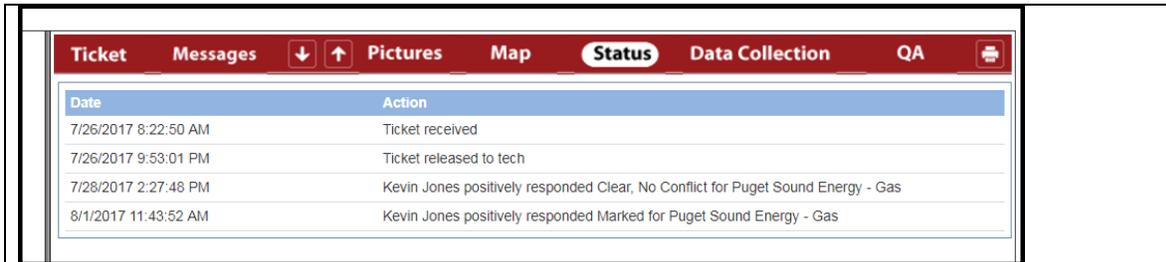


Photo 9--Looking east at A S. White paint at base of pole barely visible. Other locates were place on August 1, 2017

McChord Pipeline and the City of Tacoma Water Department responded the day they received the ticket--July 26, 2017 (**Photo 7,8**). PSE's locate contractor, ELM, responded on July 27, 2017 (**Figure 3**), Parkland Water and Light Company (Parkland Water) responded on August 1, 2017 stating they didn't receive the original ticket. No other locates were visible along 100th St., even though the locate ticket description indicates work to be done all the way to A St. The only visible white paint delineating locate boundaries appears on 100th St. adjacent to 9931 Pacific Ave (**Photo 7,8**).

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The screenshot shows a software interface with a red header bar containing navigation options: Ticket, Messages, Pictures, Map, Status, Data Collection, and QA. Below the header is a table with two columns: Date and Action. The table contains four rows of log entries.

Date	Action
7/26/2017 8:22:50 AM	Ticket received
7/26/2017 9:53:01 PM	Ticket released to tech
7/28/2017 2:27:48 PM	Kevin Jones positively responded Clear, No Conflict for Puget Sound Energy - Gas
8/1/2017 11:43:52 AM	Kevin Jones positively responded Marked for Puget Sound Energy - Gas

Figure 3—ELM (locator for PSE) log showing responding to/clearing locate ticket 17284954 on 7/28/17

On August 1, 2017, the SEFNCO FM believing that PSE had gas lines in the area they were drilling, called the ELM locator (PSE contractor) directly to have them verify locates in their work zone. The ELM contractor, Kevin Jones, came back to the site and noted to the FM that a new locate should be called in. SEFNCO was drilling towards the west (toward Pacific Ave) on August 1, 2017. The Parkland Water Company responded to Ticket No. 17284954 on August 1, 2017 (they stated they did not get a locate notice until July 29, 2017, which was a Saturday). While on site, they stated they told SEFNCO FM that City of Tacoma had a 10-inch line in their drill path. SEFNCO called Tacoma Water locator directly. Tacoma Water showed up at approximately 1630 and marked the 10-inch line. Tacoma Water locator told SEFNCO they should call in a new locate. SEFNCO completed this portion of the drill and staged to drill to the east the next day. SEFNCO did not call in a new locate.

On August 2, 2017, SEFNCO was drilling east towards A St. and the McChord Pipeline. They had locates from PSE (ELM), USIC, Tacoma Water and Parkland Water. They successfully cleared the 10-inch City of Tacoma water line at approximately 10:00 am. SEFNCO was approximately eight feet east of the 10-inch water line when they hit the McChord Pipeline (**Photo 3**). Note, according to MPL's John Williamson, the drill operator apparently thought he hit a rock. He then hammered the drill 4-5 times trying to break through. The drill head was not spinning when it punctured the line as the hole is perfectly shaped outline of the drill bit. At first SEFNCO personnel thought it was water as the liquid was so clear, then it was "pretty obvious" it was fuel.

At 12:12 pm USOR started receiving alarms at their control room (**Figure 4 and 5**). The following alarms were received shortly after the drill struck the pipeline:

- 12:12-PI-1407 USOR Pressure loss Alarm 1 (critical alarm, pressure dropped below 175 psig)
- 12:13-FQI-1438 "Gal Dif USOR-AFB 15 Min" Alarm 1 (critical alarm meters at each end of line could not reconcile volumes)
- 12:18-FQA-1436 "Jet Difference" Lo (More product went into the line than came out a McChord)
- 12:18-SDH1404 P-1401B Shutdown Alarm 1
- 12:18-PAL-1405 USOR line Low Pressure Alarm 1

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MPL Alarms from Logmate 8-2-17

Seq #	Timestamp	Content	Tag	Type	Priority	AlarmType	Area	Description
25834352	8/2/2017 13:53:02	MCORD HIGH 13:53:12 8/2/2017 PI-1407A Lo Alarm USOR PRESSURE LOSS	PI-1407A	ALARM	2	Lo Alarm	MCORD HIGH	USOR PRESSURE LOSS
25833985	8/2/2017 12:52:02	MCORD HIGH 12:52:21 8/2/2017 PI-1407A Lo Alarm USOR PRESSURE LOSS	PI-1407A	ALARM	2	Lo Alarm	MCORD HIGH	USOR PRESSURE LOSS
25833912	8/2/2017 12:19:02	MCORD HIGH 12:19:51 8/2/2017 PAL-1405 Alarm USOR LINE LOW PRESSURE	PAL-1405	ALARM	2	Alarm	MCORD HIGH	USOR LINE LOW PRESSURE
25833906	8/2/2017 12:19:02	MCORD HIGH 12:19:37 8/2/2017 PAL-1405 Alarm USOR LINE LOW PRESSURE	PAL-1405	ALARM	2	Alarm	MCORD HIGH	USOR LINE LOW PRESSURE
25833898	8/2/2017 12:19:02	MCORD HIGH 12:19:27 8/2/2017 PAL-1405 Alarm USOR LINE LOW PRESSURE	PAL-1405	ALARM	2	Alarm	MCORD HIGH	USOR LINE LOW PRESSURE
25833889	8/2/2017 12:19:02	MCORD HIGH 12:19:04 8/2/2017 PI-1407 Lo Alarm USOR LINE PRESSURE	PI-1407	ALARM	2	Lo Alarm	MCORD HIGH	USOR LINE PRESSURE
25833846	8/2/2017 12:18:02	MCORD HIGH 12:18:59 8/2/2017 PAL-1405 Alarm USOR LINE LOW PRESSURE	PAL-1405	ALARM	2	Alarm	MCORD HIGH	USOR LINE LOW PRESSURE
25833840	8/2/2017 12:18:02	MCORD HIGH 12:18:57 8/2/2017 SDH-1404 Alarm P-1401B SHUTDOWN	SDH-1404	ALARM	2	Alarm	MCORD HIGH	P-1401B SHUTDOWN
25833836	8/2/2017 12:18:02	MCORD HIGH 12:18:49 8/2/2017 FQA-1436 Lo Alarm JET DIFFERENCE	FQA-1436	ALARM	2	Lo Alarm	MCORD HIGH	JET DIFFERENCE
25833812	8/2/2017 12:13:02	MCORD HIGH 12:13:31 8/2/2017 FQI-1438 Hi Alarm GAL DIF USOR-afb FOR 15 MIN	FQI-1438	ALARM	2	Hi Alarm	MCORD HIGH	GAL DIF USOR-afb FOR 15 MIN
25833805	8/2/2017 12:12:02	MCORD HIGH 12:12:31 8/2/2017 PI-1407A Lo Alarm USOR PRESSURE LOSS	PI-1407A	ALARM	2	Lo Alarm	MCORD HIGH	USOR PRESSURE LOSS

Figure 4—MPL Alarm log from Logmate 8-2-2017. Note first alarm is at 12:12 pm

1281899	8/2/2017 12:18:59 PM	465	8/2/2017 12:18:59 PM	+	S	4	2	PAL-1405	USOR LINE LOW PRESSURE
1281898	8/2/2017 12:18:56 PM	715	8/2/2017 12:18:56 PM	+	S	4	2	SDH-1404	P-1401B SHUTDOWN
1281897	8/2/2017 12:18:56 PM	215	8/2/2017 12:18:56 PM	+	S	1	4	FQI-1436	JET FLOW DIFFERENCE
1281896	8/2/2017 12:18:49 PM	465	8/2/2017 12:18:49 PM	+	S	1	2	FQA-1436	JET DIFFERENCE
1281890		858		+	S	1	2	FQI-1438	

<http://hst052/pgimalarmanalysis/default.aspx?Style=HTML&From=2017-08-02>

Alarm Portal

	8/2/2017 12:13:30 PM		8/2/2017 12:13:30 PM						GAL DIF USOR-afb FOR 15 MIN
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Figure 5—MPL alarm log from Alarm Portal. Not first alarm is 12:13:30 for flow differential (this alarm point monitors what goes in at USOR compared with what is delivered at JBLM)

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Search and Status

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Washington One Call

Ticket No: 17284954
2 FULL BUSINESS DAYS
Original Call Date: 07/26/17 06:45 am
Work to Begin Date: 07/29/17 12:00 am

CALLER INFORMATION

Company Name: SEFNCO
Contact Name: MIKE VIOLETTE
Phone: 253-350-6417
Alt. Contact: TIM LUNDELL
Phone: 253-375-3278

Fax Phone: 866-492-9650
Caller Address: 4610 TACOMA AVE SUMNER, WA 98390
Email Address: MVIOLETTE@SEFNCO.COM

DIG SITE INFORMATION

Type of Work: INSTALL CATV MAINLINE
Work Being Done For: COMCAST

DIG SITE LOCATION

State: WA
County: PIERCE
Place: TACOMA
Address: 9911
Street: PACIFIC AVE
Intersecting Street: 100TH ST E
Location of Work: PLEASE PLACE LOCATES FROM THE SOUTH SIDE OF BUILDING TO POLE AND THEN EAST BOUND DOWN 100TH ST TO POLE ON EAST SIDE OF INTERSECTION OF A ST AND 100TH TO THE POLE
Remarks: AREA MARKED IN WHITE
Map Coord NW Lat: 47.1667525
Lon: -122.4335611
SE Lat: 47.1665617
Lon: -122.4313831

MEMBERS NOTIFIED

District	Company Name	Marking Concerns	Customer Service	Repair
CC7711	COMCAST CABLE	800-762-0592	800-266-2278	855-537-6296

Figure 6--WA One Call locate ticket called in by SEFNCO July 26, 2017

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Search and Status Page 2 of 3

District	Company Name	Marking Concerns	Customer Service	Repair
MCCHRD01	MC CHORD PIPELINE COMPANY	253-383-1651	253-383-1651	253-383-1651
PIERCE01	PIERCE COUNTY UTILITIES	253-565-3440	253-565-3440	253-565-3440
PRKLW01	PARKLAND LIGHT & WATER CO	253-531-5666	253-531-5666	253-531-5666
PUGG07	PUGET SOUND ENERGY GAS	888-728-9343	888-225-5773	888-225-5773
QLNWA24	CTLQL-CENTURYLINK	800-778-9140	800-283-4237	800-573-1311
TACDPW01	CITY OF TACOMA PUB WORKS SIG	253-591-5287	253-591-5287	253-591-5287
TACH2O01	TACOMA WATER DEPARTMENT	253-502-8398	253-502-8344	253-502-8344
TACPWR01	TACOMA PWR & CLICK NETWORK	253-502-8263	253-502-8600	253-383-0982

Legend:  Locate Polygon

Lat/Lon
47.167686 -122.426689

Figure 6 continued--WA One Call locate ticket called in by SEFNCO July 26, 2017

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Figure 6 continued-WA One Call locate ticket called in by SEFNCO July 26, 2017

The drill hit McChord's line at MP 8.888. SEFNCO called MPL's John Williamson at 12:25 stating they hit the jet fuel line. They then called 911. Central Pierce Fire and Rescue was dispatched at 12:26 pm.

At 12:45 USOR closes the downstream valve (MP 9.958) from the leak location, followed by the upstream valve (MP 5.057) at 12:54 (**Figure 2**). USOR activated their emergency response plan getting personnel and oil spill removal organizations (OSROs) organized and in route. USOR stages their clean-up crews on site and begins product recovery and assessing steps to access the line for repair (**Photo 1-6**).

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Photo 10—looking south at 100th St and A St. USOR photo showing drill head embedded in MPL pipeline. Hose is removing leaking product.

USOR excavates to damaged pipeline (**Photo 10**).

At 20:00, USOR has effectively stopped product release by installing a leak clamp over the hole **Photo 11**. Cleanup and product recovery continue.



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Photo 11--Looking east on 100th St at temporary leak clamp.

USOR repaired the damaged segment on August 4, 2017. They cut out the damaged portion and installed a new section of pre-tested pipe (**Photos 12-18**).



Photo 12--looking east on A St. Drill head removed and hose recovering product from line.



Photo 13--pretested (hydrostatic pressure test) pipe used for repair of damaged section.

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Photo 14—cut-out section of damaged pipe



Photo 15—USOR photo of hole punctured in six-inch steel line by directional drill. Note drill head shaped hole.

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Photo 16—looking west on A St. at MPL line after damaged section removed.



Photo 17—USOR photo of new pup welded in place and x-rayed

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Photo 18—USOR photo of final repair ready for backfill. Yellow wrap is for rock protection

USOR requested permission to restart the pipeline on August 14, 2017. After reviewing repair documentation ensuring USOR followed their approved procedures and records supporting code requirements. WUTC approved restarting the pipeline. USOR began operating the line on August 16, 2017.

Facts/Chronology of Events:

7/26/2017

- 0645-Locate ticket called in to One-call, Ticket No. 17284954 Mike Violette, SEFNCO
- 0900-MPL's line locator, John Williamson responds to Ticket No 17284954 at 9911 Pacific Ave. Finds white paint at driveway to credit union and marks "MPL OK". Drives to intersection of 100th St and A St and (location of MPL's line) and did not see any white paint. Did not locate here
- 1243 City of Tacoma locator responds to Ticket No 17284954 at 9911 Pacific Ave.

7/28/2017-

- 1427--ELM locator (PSE contract locator), Kevin Jones, responds to Ticket No 17284954 at 9911 Pacific Ave. Notes white paint near bank (credit union) but no white marks after walking up to A St. Stated, Mike Violette would call in another [locate] ticket

7/31/2017

- 0800 (estimated)--SEFNCO starts job drilling west toward Pacific from a point approximately midway between Pacific Avenue and A St. Completed this portion.

8/01/2017

- 0800 (estimated)-SEFNCO positions drill rig to drill east on 100th Ave towards A St. SEFNCO FM, Jesse Andrews noted no locates on east end of job. Called Mike Violette to call in new locate

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- 0900 (estimated)--Parkland Water responds to the locate ticket 17284954. Stated they did not get notice earlier (stated might be a "glitch in system"--811 system). Told SEFNCO Tacoma Water was in the area
- 0930 (estimated)--FM Andrews calls City of Tacoma directly to locate water line in area of drill. Does not wait for new locate and did not call McChord Pipeline
- 0930 (estimated)-City of Tacoma Supervisor Kendall Funk, calls Mike McAffery directly to locate 10" AC main in drill path for SEFNCO
- 0945-SEFNCO FM Andrews painted the dashed white line from their drill location to A St. to identify drill path for locators
- 1000-Tacoma Water locator, Mike McAffery, arrives and locates 10" water line. McAffery told SEFNCO that if paint was put down in the wrong area originally he should call in a new locate
- 1143--ELM Locator Jones sent back to site. Stated no white marks between A St and the original locates at the bank [credit union]. Met with SEFNCO and they verbally instructed him where the work area was. He told them other utilities had only marked behind 9911 Pacific Ave (credit union) as that's where white marks were located

8/02/2017

- 0658-MPL starts batch transfer of 10,000 bbls of JP8 jet fuel to JBLM
- 0800 (estimated)—SEFNCO starts drilling east on 100th Ave. towards A St.
- 1212 +/-MPL line hit and damaged by SEFNCO directional drill; line is compromised and leaks product into adjacent apartment complex parking lot and west down 100th St.
- 1212-USOR A Reformer operator receives alarm-PI-1407 USOR line low pressure
- 1213-USOR A Reformer operator receives alarm-FQI-1438 GAL DIF USOR-AFB FOR 15 MIN
- 1218 USOR A Reformer operator shuts down pipeline
- 1221 MPL inspector John Williamson receives phone call from USOR Shift Supervisor Mike Look reporting pressure in line had dropped drastically and line was shut down
- 1225-MPL inspector John Williamson receives phone call from SEFNCO stating they hit MPL
- 1226-SEFNCO calls 911
- 1228-Central Pierce Fire and Rescue is dispatched to scene
- 1233-Central Pierce Fire arrive on scene at 100th St and A St. in Parkland WA, evacuates several homes and apartments near leak site. Power to apartments turned off
- 1245-MPL Inspector John Williamson closes valve MP9.958 (downstream from leak point)
- 1246-MPL Inspector Joel Roppo closes valve MP2.38 (upstream from leak point-check valve at bottom of bluff)
- 1250 USOR calls NRC, No. 1186063
- 1254-MPL Inspector Steve Calton closes valve MP 5.057 (upstream from leak point closest upstream valve)
- 1254 MPL Inspector John Williamson begins air monitoring and securing site
- 1300 +/- USOR's OSROs on scene and begin clean up and product recovery efforts
- 1318-USOR calls WUTC Pipeline Safety emergency line, leaves message

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- 1328-USOR calls WUTC Pipeline Safety, Dennis Ritter, reports pipeline was hit and is leaking
- 1420-WUTC Pipeline Safety Staff arrive on scene, Dave Cullom, Scott Anderson, Derek Norwood
- 1445- WUTC Pipeline Safety Staff arrive on scene, Dennis Ritter
- 1600 +/- USOR begins excavation (Vac Trucks) to uncover damaged section of pipeline
- 1800-WUTC left site
- 2000-USOR installs temporary repair clamp and leak is stopped

8/3/17

- 0800-WUTC (Ritter and Norwood) back on site to see status and cleanup efforts
- 1000-WUTC Ritter leaves scene, Norwood continues investigation and observation

8/04/17

- 0800+/- WUTC (Norwood) arrives on site to witness repairs
- 0800 +/- General Mechanical, USOR contractor, begins repairs of damaged pipe: wheel cut out damaged portion, weld in pup
- 1800 +/-Mistras nondestructively examines repair girth welds Weld 1 and Weld 2. Finds them acceptable (after rejecting and repair of Weld 2 due to porosity and repairing)

8/14/17

- 0730-USOR calls WUTC and requests permission to re-start pipeline
- 1430-WUTC requests pipeline repair records from USOR

8/15/17

- 0900-USOR sends pipeline repair records to WUTC (via email)
- 1443-WUTC sends letter (via email) allowing USOR to restart the pipeline
- 1550-USOR calls NRC with update No. 1187344

8/16/17

- 0707 USOR re-starts McChord Pipeline

Causes/Contributing Factors:

The root cause for this accident was poor delineation of locate boundaries leading to missing locates within a portion of the project limits. Although the ticket stated:

PLEASE PLACE LOCATES FROM THE SOUTH SIDE OF BUILDING [9911 Pacific Ave Sound Credit Union] TO POLE AND THEN EAST BOUND DOWN 100TH ST TO POLE ON EASTSIDE OF INTERSECTION OF A ST AND 100TH TO THE POLE

It also noted:

AREA MARKED IN WHITE

The white paint, as required by RCW 19.122.030(1)(a), delineating where to locate, was only clearly visible on the west end of 100th St. adjacent to 9911 Pacific Ave. (**Photo 7 and 8**). McChord Pipeline, Tacoma Water, PSE (ELM), locates were clearly visible at this location and were marked within the required two business days of receipt of the notice. (Note, Parkland Water did not meet the two business day requirement--they stated they did not get the notice until August 29, 2017.

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However, they did meet SEFNCO on site on August 1, 2017 and located their facilities. They also told SEFNCO Tacoma Water was in their drill path).

SEFNCO stated the job scope changed and the white paint boundary on 100th St at 9911 Pacific Ave was wrong. SEFNCO stated they put white paint down at the east end of the job per their locate description. SEFNCO showed UTC investigators where the locate mark was put down—at a power/telephone pole on the east side of the intersection of 100th St and A St. Upon inspection, there appeared to be white paint near the pole base **Photo 9**, however it was almost unnoticeable. Clearly, if the white paint was in place, no other locator saw it as there were no painted locates on the east end of the project limits (PSE, Tacoma Water came back to the job site on August 1, 2017 to locate the east end).

SEFNCO made no attempt to correct the erroneous white painted boundary limits (**Photo 7 and 8**) nor did they call in a new locate. Unfortunately, as they did not call in a new locate, other utility operators in the area did not know the effective construction limits had changed. Instead, SEFNCO called two utilities directly, PSE and Tacoma Water, but failed to call McChord Pipeline. Had the white boundaries showing locate limits been accurate, or a new locate been called in, this incident likely would not have occurred.

Regulatory Analysis/ Violations:

After investigation, this accident is the result of a third-party dig in due to poor locate delineation of the construction limits. The investigation did not find the operator caused or contributed to the accident. The pipeline operator had code required safety systems in place as follows:

- **RCW 19.122 Underground Utilities**
030 Excavator and facility operator duties before excavation
(3) Upon receipt of the notice provided for in subsection (1) of this section, a facility operator must, with respect to:
(a) The facility operator's locatable underground facilities, provide the excavator with reasonably accurate information by marking their location;
USOR/McChord responded to One-call, Ticket No. 17284954 on July 26, 2017. The delineated area for locates was not appropriately marked in white paint by SEFNCO. Subsequently, the McChord Pipeline at the intersection of 100th St and A St, was unmarked.
- **WAC 480-75-300 Leak Detection**
(1) Pipeline companies must rapidly locate leaks from their pipeline. Pipeline companies must provide leak detection under flow and no flow conditions.
Findings:
The accident occurred at approximately 12:12 pm. McChord received a phone call at 12:25 from SEFNCO indicating they hit the pipeline with a direction drill. McChord knew exactly where this was from locate ticket response (note this was not due to leak detection system but from another safety system—call before you dig 811 system).
(2) Leak detection systems must be capable of detecting an eight percent of maximum flow leak within fifteen minutes or less.
Findings:
The accident occurred at approximately 12:12 pm. McChord (via USOR's control room) received their first alarm at 12:12 pm for low pressure. A series of other alarms caused

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the controller to believe the line was compromised and shut down the line at 12:18.
The system detected the leak.

(3) Pipeline companies must have a leak detection procedure and a procedure for responding to alarms. The pipeline company must maintain leak detection maintenance and alarm records.

Findings:

McChord's leak detection system worked as designed. The first alarm was nearly the same time as the actual damage occurred 12:12 The McChord's system keeps raw data logs are for:

- PI 1407 pump discharge pressure,
- FQI 1436 flow differential USOR sent/JBLM received in gal,
- FQI 1438 flow differential USOR sent/JBLM received 15 minute differential,

McChord's Alarm Portal receives the raw database logs to accumulate the alarms. Note: the timestamp for the first FQI-1438 GAL DIF USOR-AFB for 15 MIN occurred at 12:13 according to Alarm Portal. The raw data logs show this alarm occurred at 12:12. USOR is looking at why there is a difference.

- **195.402 Procedural manual for operations, maintenance, and emergencies**
(a)General. Each shall prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies.

Findings:

McChord Pipeline Company has a Procedural manual as required. This manual was last reviewed by the UTC in August, 2015 with no apparent violations.

(e)Emergencies. The manual required by paragraph (a) of this section must include procedures for the following to provide safety when an emergency condition occurs:

- (1) Receiving, identifying, and classifying notices of events which need immediate response by the operator or notice to fire, police, or other appropriate public officials and communicating this information to appropriate operator personnel for corrective action.**

Findings:

The third party contractor, SEFNCO, contacted McChord Pipeline's Senior Inspector directly via cell phone at 12:25, notifying him that SEFNCO had hit and damaged McChord's line and it was leaking. Concurrently, the controller, "A" Reformer, noted alarms on the pipeline (starting at 12:12) which indicated a possible leak.

Section II of the Operations Manual identifies the chain of command during pipeline transfers. Typically, the Pumper Gauger East (controller) is in charge (McChord's language is Person in Charge (PIC)) with the A Reformer as the controller. The A Reformer informed the shift supervisor and the East Pumper of the alarms and shut down the pipeline. The shift supervisor notified OM&S Zone Superintendent. The Superintendent activates USOR emergency procedures.

- (2) Prompt and effective response to a notice of each type emergency, including fire or explosion occurring near or directly involving a pipeline facility, accidental release of**

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hazardous liquid or carbon dioxide from a pipeline facility, operational failure causing a hazardous condition, and natural disaster affecting pipeline facilities.

Findings:

The emergency response to the leak was prompt and effective. USOR emergency response personnel and OSROs were on scene within an hour. OSROs were stationed at appropriate locations downhill from the leak (ditches and catch basins) for product recovery (**Photo 2-6**). An apartment complex adjacent to the leak was first priority for clean-up efforts **Photo 1 and 2**.

(3) Having personnel, equipment, instruments, tools, and material available as needed at the scene of an emergency.

Findings:

USOR emergency response personnel and OSROs were on scene within an hour. OSROs were stationed at appropriate locations downhill from the leak (ditches and catch basins) for product recovery (**photo 3-6**). An apartment complex adjacent to the leak was first priority for clean-up efforts (**photo 1-2**).

(4) Taking necessary action, such as emergency shutdown or pressure reduction, to minimize the volume of hazardous liquid or carbon dioxide that is released from any section of a pipeline system in the event of a failure.

Findings:

USOR/McChord personnel shut the line down within 6 minutes of the accident occurring. Personnel followed the operating procedures

- Section 3.7 of the Emergency Response Plan,
- Section II(1) Operator and Supervision Responsibilities
- Section II(2) Communication Plan
- Section II(4) Abnormal Operations

(5) Control of released hazardous liquid or carbon dioxide at an accident scene to minimize the hazards, including possible intentional ignition in the cases of flammable highly volatile liquid.

Findings:

USOR emergency response personnel and OSROs were on scene within an hour (12:54). OSROs were stationed at appropriate locations downhill from the leak (ditches and catch basins) for product recovery (**photo 3-6**). An apartment complex adjacent to the leak was first priority for clean-up efforts (**photo 1-2**). McChord determined that keeping the drilling head intact inside the pipe reduced the amount of product released. They also used a vacuum truck to remove fuel as it leaked once the damaged section was uncovered **Photo 10**.

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- (6) *Minimization of public exposure to injury and probability of accidental ignition by assisting with evacuation of residents and assisting with halting traffic on roads and railroads in the affected area, or taking other appropriate action.***

Findings:

USOR/McChord established a perimeter around the leak and leak pool downhill from the leak source. McChord personnel with air monitoring equipment patrolled the perimeter. Emergency response personnel vehicles effectively blocked the roadways from traffic. The temperature was approximately 90 deg F during the initial clean-up efforts. As this was jet fuel (basically kerosene), volatility and air dispersion was not a major concern (as with gasoline).

- (7) *Notifying fire, police, and other appropriate public officials of **hazardous liquid** or **carbon dioxide** pipeline emergencies and coordinating with them preplanned and actual responses during an emergency, including additional precautions necessary for an emergency involving a pipeline system transporting a highly volatile liquid.***

Findings:

The contractor, SEFNCO, called 911 to report the emergency. Central Pierce Fire and Rescue responded at 12:33. McChord called the NRC at 12:50 and WUTC at 13:15.

- (8) *In the case of failure of a pipeline system transporting a highly volatile liquid, use of appropriate instruments to assess the extent and coverage of the vapor cloud and determine the hazardous areas.***

Findings:

n/a-McChord does not transport HVLs.

- (9) *Providing for a post-accident review of **employee** activities to determine whether the procedures were effective in each emergency and taking corrective action where deficiencies are found.***

Findings:

McChord is in process of post-accident review and this report will be reviewed during the next scheduled standard inspection.

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(10)

*Actions required to be taken by a **controller** during an emergency, in accordance with § 195.446.*

It appears that McChord's controllers took appropriate actions authorized by their procedures. The A Reformer in conjunction with the East Pumper (person in charge) shut down the line after indications via alarms showed a release may have occurred. The controller shut down the line within 6 minutes of the first alarm. The controller alerted appropriate supervisory staff (shift supervisor and East Pumper) and had authority to shut down the line. Actions were appropriate and procedures appeared to have been followed. The post-accident review will provide additional detail to the actions taken.

Follow up/ Recommendations:

During the next standard inspection, review the post-accident findings and see how McChord revised their Emergency Response Plan, and Operations Manual following this accident.