2100.26.085

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BUILDING A BETTER WORLD

August 1, 2013

Anastasia Duarte, RS
Retail Environmental Remediation Administrator
Tesoro Refining and Marketing Company
3450 South 344th Way, Suite 201
Auburn, WA 98001-5931

10502025.010102

Reviewed Report 8-12-13 for Paul Horwath and prepared a Summary for his review and oversight.

RE: June 2013 Decommissioning Report
Former Tesoro Northstore # 11, 317 Muldoon Road, Anchorage, Alaska
Lot 2 Nevilla Park Subdivision
ADEC Facility ID #1502; ADEC File #2100.26.085

Dear Ms. Duarte:

This letter report provides the notice of completion of decommissioning 12 ground water monitoring wells, five soil vapor extraction (SVE) wells and piping, three vapor stripping and circulation (VSC) wells, and three circulation wells at the above referenced site. The Alaska Department of Environmental Conservation (ADEC) issued a corrective action complete determination document for this site on August 3, 2012.

The site location, location of the decommissioned monitoring wells, and location of the decommissioned remediation system (SVE, VSC, and circulation wells/piping) are shown on **Figures 1, 2**, and **3**, respectively. Photographs of decommissioning activities are provided as an attachment to this report.

Charles Larson, Health and Safety Coordinator with MWH, supervised the June 18, 19, and 20, 2013, decommissioning activities at this site conducted by Discovery Drilling Company of Anchorage, Alaska. The ADEC guidance document, *Recommended Practices for Well Design, Installation, and Decommissioning*, dated November 2011, was used as a reference during well decommissioning. The decommissioning processes are briefly described below.

Monitoring Wells MW-1 through MW-8 and MW-14 through MW-17 (Figure 2) were decommissioned as follows (Photos 3 through 33):

- A tee bracket and the drill rig's hydraulic rams were used to remove the protective vault cover. In some instances a 580M Case backhoe was used to remove the 48-inch, high-density polyethylene (HDPE) vaults.
- The casing was typically lifted 12 inches using a threaded bell cap or a double taper tap. A pointed drill rod was lowered into the well to break out the well casing bottom. In some cases, the drill rig's 300-pound hammer was used to drive the drill rod through the casing bottom.
- The well casings were filled with Casing Seal™ bentonite grout. This grout was hydrated and mixed in a 240-gallon, hydraulically-driven grout plant (Photos 1 and 2).

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- As the wells were pulled, they were periodically topped off with grout. The grout level was allowed to stabilize after the casing was removed.
- Bentonite chips were used to stabilize the grout at the top of the well for placement of pea gravel.
- An 8-inch layer of pea gravel was added and compacted to within 4 inches of the surrounding surface.
- The wells were finish by adding a 4-inch layer of asphalt cold patch or native soil to match the surrounding surface.

Circulation Wells CW-1, CW-2, and CW-3 (Figure 3) were decommissioned as follows (Photos 34 through 41):

- The 4-inch casing was lifted with a threaded bell cap or a puller sleeve with self-tapping screws.
- The bottom of the well casing was broken out with a section of drill rod.
- The well casing was filled with bentonite grout and pulled.
- The casing void was topped off with grout and allowed to stabilize.
- Bentonite chips were used to stabilize the top of the former well annulus.
- An 8-inch layer of pea gravel was added and compacted to within 4 inches of the surrounding surface.
- A John Deer backhoe was used to remove the associated vaults and ABS conduit that housed the circulation piping.
- The former vaults were filled from a spoils pile onsite.

SVE piping runs and wells SVE-1 through SVE-5 (Figure 3) were decommissioned as follows (Photos 42 through 50, Appendix A):

- The piping runs were pressure grouted at the Remediation Shed with bentonite slurry until the grout levels stabilized in the pipes. The piping was then cut off at ground level.
- The protective cover plate was removed at the well head.
- Each SVE well was filled with grout and pulled with a taper tap.
- The screened sections of two wells (SVE-2 and SVE-4) were buried with no surface connection. When these two wells were pressure grouted, a pool of grout formed on the ground surface, indicating that the wells screened sections were filled with grout (Photos 46 and 48).
- Bentonite chips were used to stabilize the top of the well annulus for the pea gravel.
- An 8-inch layer of pea gravel was added and compacted in the void left by the protective vault.
- The well was finished by adding surrounding native soil.

VSC Wells VSC-1, VSC-2, and VSC-3 (Figure 3) were decommissioned as follows (Photos 51 through 60):

- Eductor piping for circulating water was removed from each of the 4-inch wells. Air and water circulation lines were pulled from the ABS conduit.
- The casing was lifted with a threaded bell cap, or sleeve with self-tapping screws, and then pulled with the drill rig's hydraulic rams.
- Drill rig's center rod was lowered and the drill rigs hydraulic hammer was used to break out the bottom of the well casing.
- The well casing was then filled with bentonite slurry and lifted.
- After the casing was removed, the void was refilled with grout and allowed to stabilize.
- The 48-inch vaults and the remaining ABS conduits were removed with a John Deer 310 backhoe.
- The former vault was filled from a spoils pile onsite.
- The aboveground airlines to VSC-2 and VSC-3 were removed while moving equipment offsite. The 2-inch underground airline to VSC-1 was plugged and grouted.

Table 1 provides the quantities of calculated and actual amount of grout that was used to fill the well/piping voids.

Table 1 Well and Piping Volumes

Well/Piping Identification	Pipe Length/ Diameter (feet/inches)	Well Depth/ Diameter (feet/inches)	Total Calculated Volume (gallons)	Actual Volume of Pumped Grout (gallons)
MW-1	na	25.0/4	14.0	50.0
MW-2	na	29.5/4	16.5	75.0
MW-3	na	29.5/4	16.5	120.0
MW-4	na	27.5/4	15.4	75.0
MW-5	na	27.5/4	15.4	120.0[1]
MW-6	na	27.5/4	15.4	80.0[1]
MW-7	na	28.0/4	15.7	50.0
MW-8	na	27.5/4	15.4	60.0[1]
MW-14	na	28.0/2	4.5	12.0
MW-15	na	28.0/2	4.5	20.0
MW-16	na	28.0/2	4.5	25.0[1]
MW-17	na	28.0/2	4.5	35.0
SVE-1	10.0/2	19.0/4	12.2	65.0
SVE-2	135.0/2	12.5/2	24.0	Day Lighted

Table 1 (Cont.) Well and Piping Volumes

Well/Piping Identification	Pipe Length/ Diameter (feet/inches)	Well Depth/ Diameter (feet/inches)	Total Calculated Volume (gallons)	Actual Volume of Pumped Grout (gallons)
SVE-3	50.0/2	15.0/2	10.0	10.0
SVE-4	65.0/2	14.5/2	13.0	Day Lighted
SVE-5	115.0/2	15.0/2	21.0	10.0
SVE Piping (all)	na	na	na	325.0[2]
CW-1	na	24.0/4	13.5	120.0
CW-2	na	24.0/4	13.5	90.0
CW-3	na	24.0/4	13.5	60.0
VSC-1	na	40.0/4	22.5	100.0
VSC-2	na	40.0/4	22.5	80.0
VSC-3	na	40.0/4	22.5	140.0

Key:
1 – Additional bags of bentonite granules were used to stabilize the top of the well void.
2 – Total amount of grout pumped into the four piping runs at the remediation shed.
CW – circulation well
MW – monitoring well
na – not applicable
SVE – soil vapor extraction
VSC – vapor striping circulation

The volume of grout pumped into the monitoring wells, SVE wells/piping, circulation wells, and VSC wells indicated that the former wells and piping runs were completely filled with grout.

If you have any questions about the information presented in this report, please contact me at 266-1149.

Sincerely,

Charles Larson
Health and Safety Coordinator

Attachments: Figure 1 – Location and Vicinity Map
Figure 2 – Site Plan with Decommissioned Monitoring Wells
Figure3 – Site Plan with Decommissioned Remediation System
June 2013 Decommissioning Photos

ATTACHMENTS

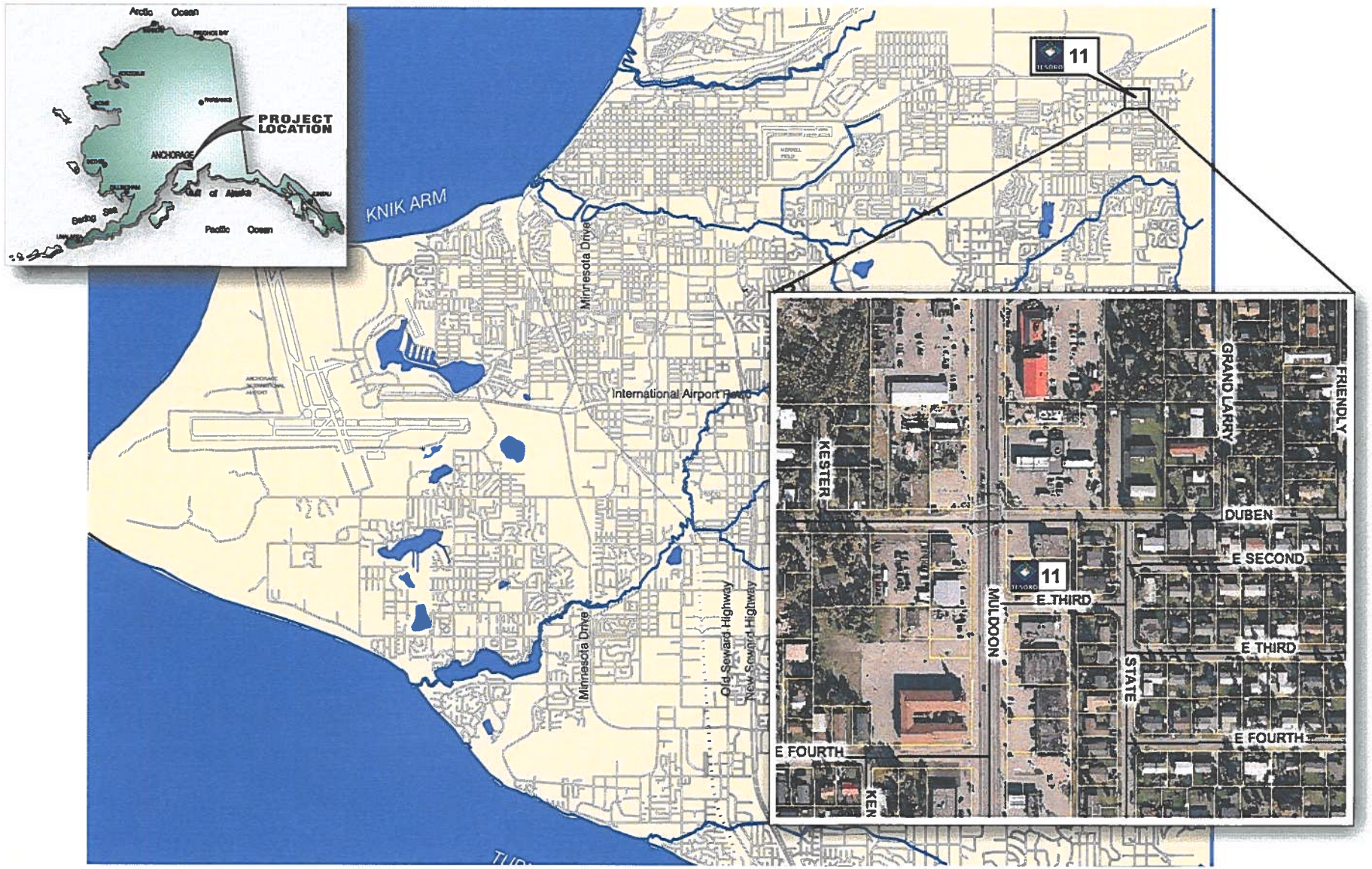

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FIGURE 1

TESORO COMPANY – FORMER TESORO NORTHSTORE #11
JUNE 2013 DECOMMISSIONING REPORT

LOCATION AND VICINITY MAP

JOB No. 10502025.010102 TIME: 31-JUL-2013 13:26 FILE: D:\CAD\Proj\Tesoro\NrthStr011\2013 Decom Report\FINAL\FIG02.dgn

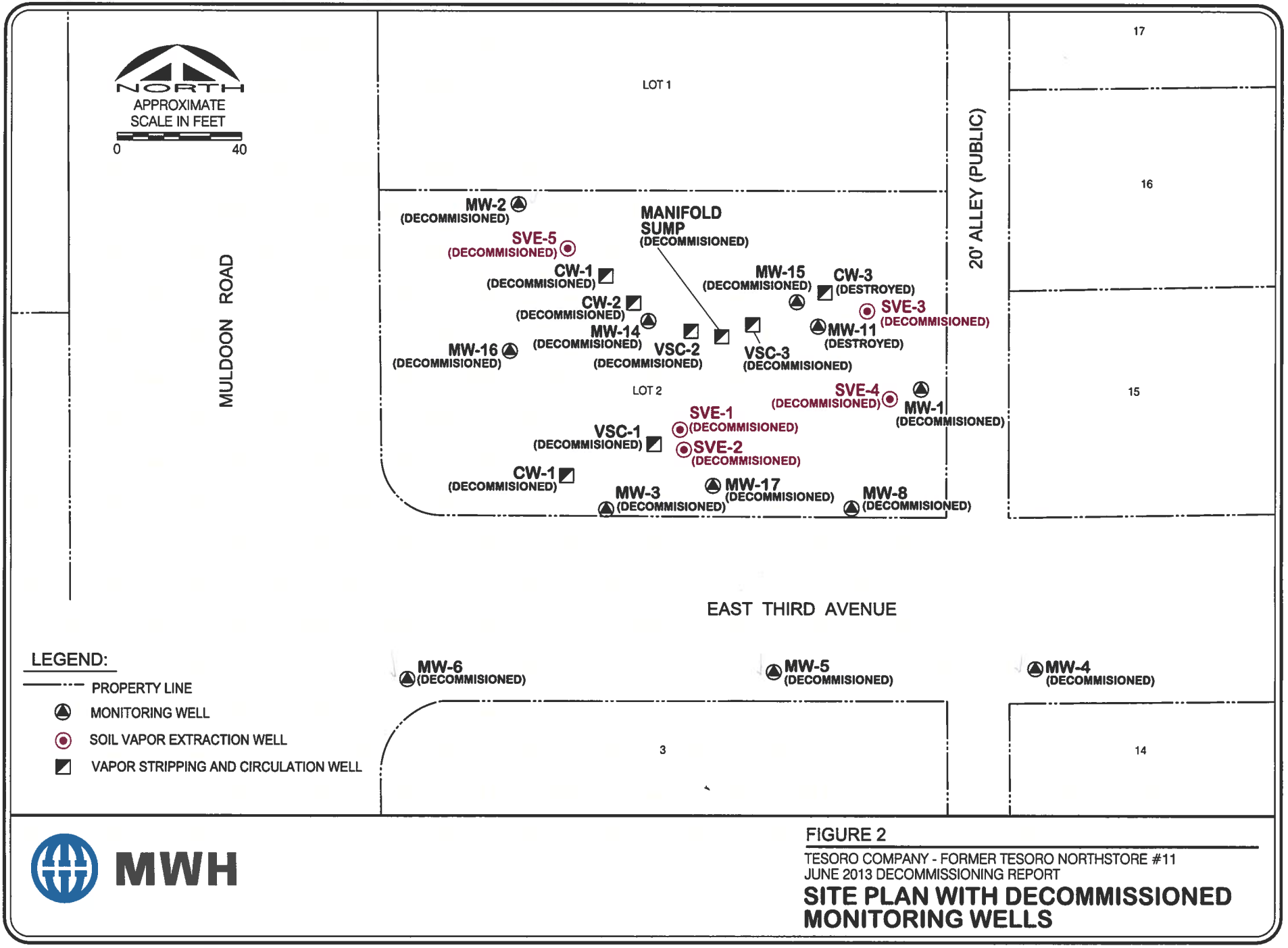

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FIGURE 2

TESORO COMPANY - FORMER TESORO NORTHSTORE #11
JUNE 2013 DECOMMISSIONING REPORT

SITE PLAN WITH DECOMMISSIONED MONITORING WELLS

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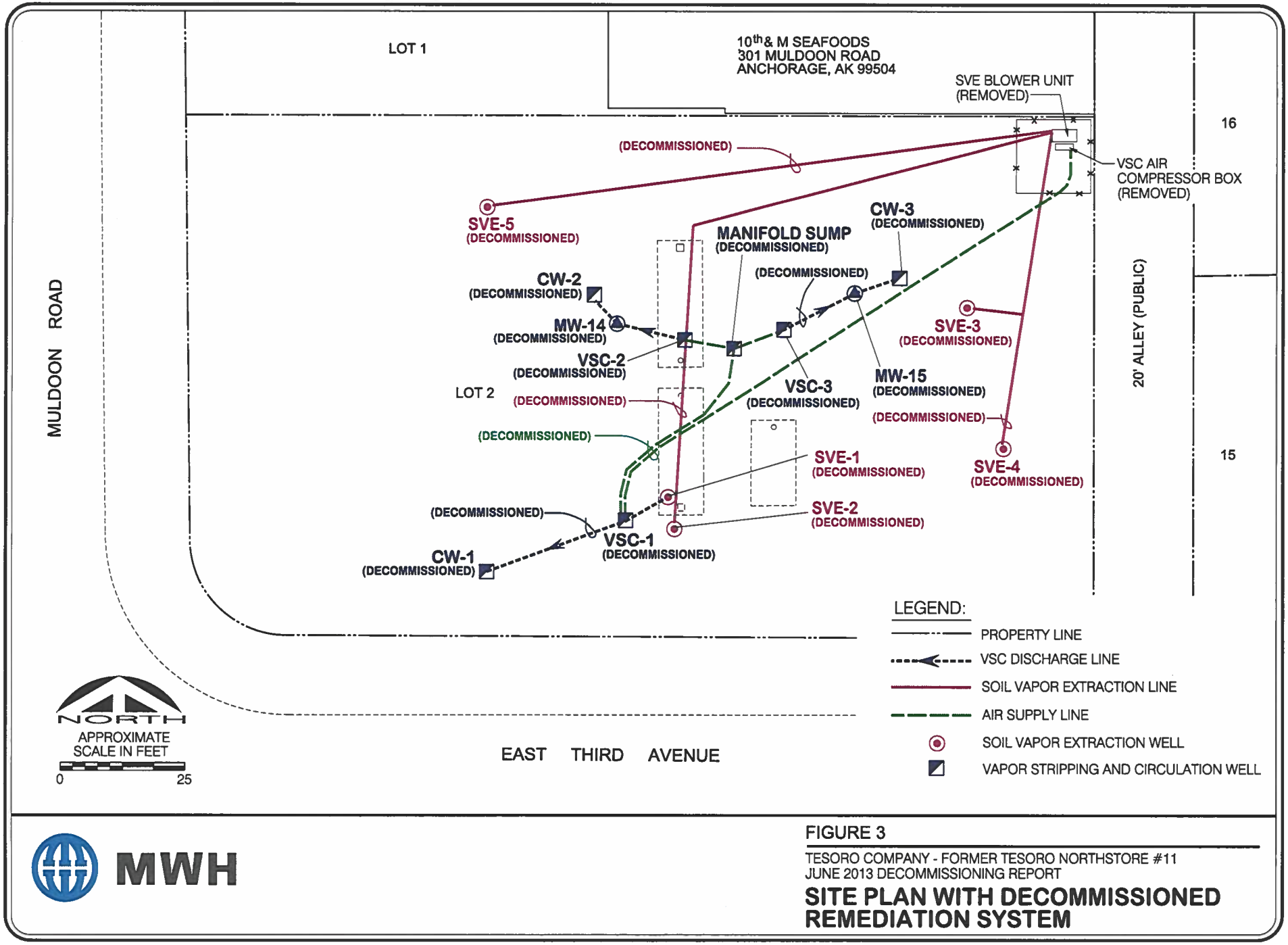

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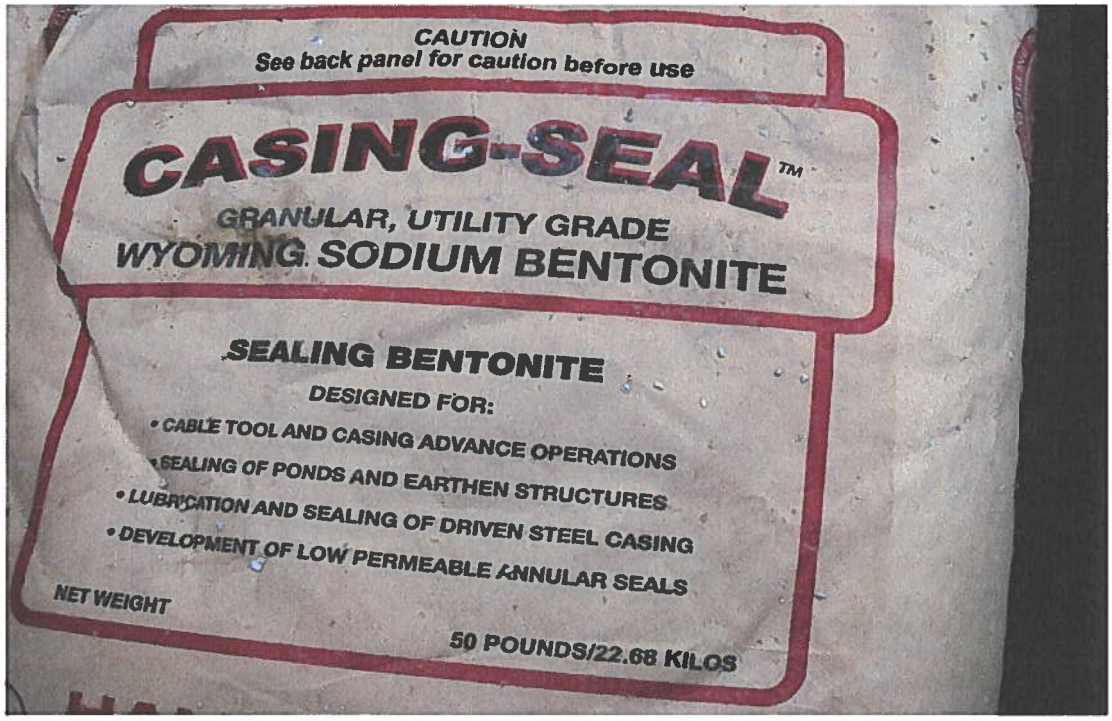
FIGURE 3

TESORO COMPANY - FORMER TESORO NORTHSTORE #11
JUNE 2013 DECOMMISSIONING REPORT

SITE PLAN WITH DECOMMISSIONED REMEDIATION SYSTEM

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

1. Grout plant with 240-gallon hopper that was used for mixing bentonite during decommissioning of TNS-11.



2. Bentonite granules used to seal wells at TNS-11.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

3. MW-1 Due to the close proximity of overhead power lines, the drill rig's mast could not be raised to pull the well.

4. MW1 Pulling well casing with mast down.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

5. MW-3 Pulled well casing.

6. MW-3 Stabilized grout in bore hole.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

7. MW-4 Stabilized grout in bore hole.

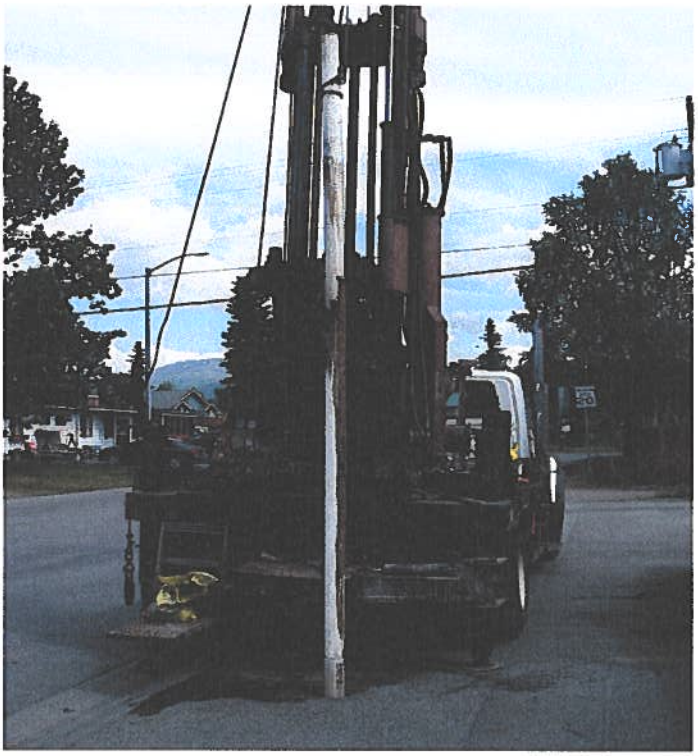
8. MW-4 Pulling well casing .

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

9. MW-4 Removing cement encased protective vault with drill rig's auger.

10. MW-5 Using the drill rig's center rod to knock out the bottom of the well casing.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos



11. MW-5 Pulling the well casing.

12. MW-5 Using the drill rig to compact the asphalt cold patch.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

13. MW-6 Pulling the well casing with a threaded bell cap .

14. MW-6 Showing the well casing bottom cap knocked out.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

15. MW-7 Pulling well casing with a boom truck.

16. MW-7 Showing the grout plant in position .

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

17. MW-7 Topping off the well bore with grout.

18. MW-8 Pulling the well casing.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

19. MW-8 Topping off the well bore with grout.

20. MW-8 Pulled well casing with bottom knocked out.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

21. MW-14 Pulling the well casing with a taper tap.

22. MW-14 Pulled well casing.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

23. MW-14 Former well topped off with grout.

24. MW-14 Removing the protective vault; Circulation Well CW-2 vault to left.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

25. MW-15 Pulling the well casing with a taper tap.

26. MW-15 Topping off the well with grout.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

27. MW-15 Removing the protective vault and associated conduit.

28. MW-16 Pulling the well casing with a taper tap.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

29. MW-16 Removed well casing with bottom broken out.

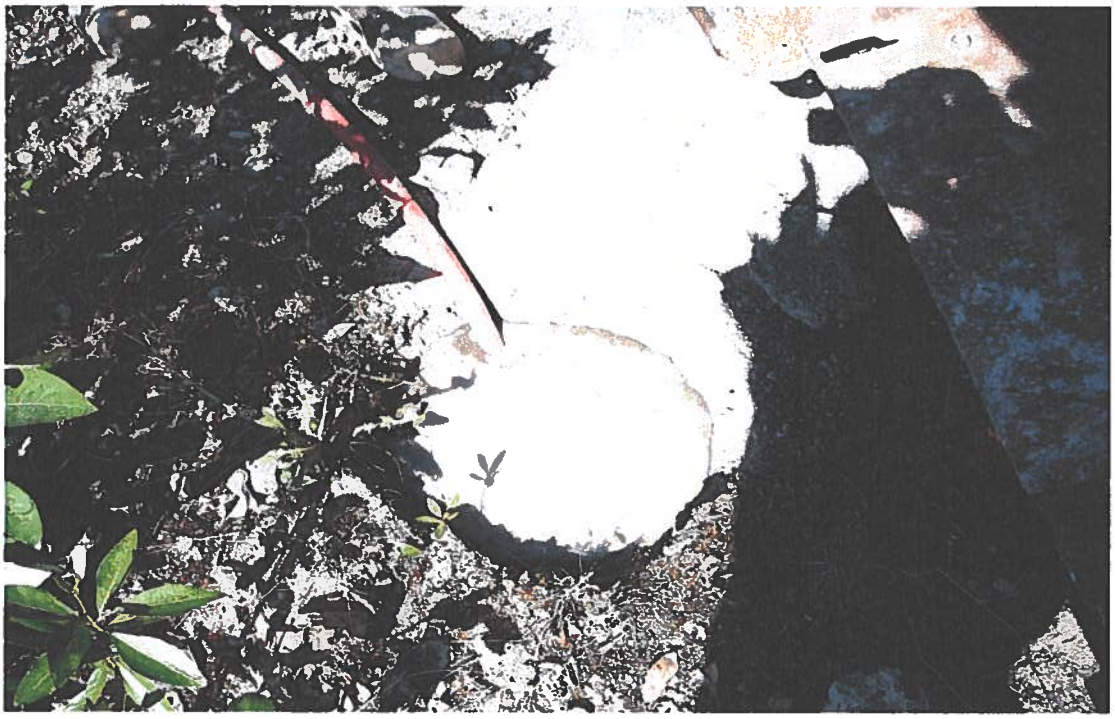
30. MW-16 Topped off well with grout.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

31. MW-17 Driving a taper tap in preparation of pulling.

32. MW-17 Walking out well casing, grout line in the foreground.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos



33. MW-17 Filling the the former well with grout.

34. CW-1 Pulling the well casing with a fabricated metal sleeve and self tapping screws .

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

35. CW-1 Grouting the former well.

36. CW-2 Knocking the bottom out of well casing with a drill rod.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

37. CW-2 Casing broke off at screen, 12 feet below ground surface.

38. CW-2 Former well void filled with grout.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

39. CW-3 Breaking out the bottom of the well casing.

40. CW-3 Removed well casing being walked out.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

41. CW-3 Grouting the former well.

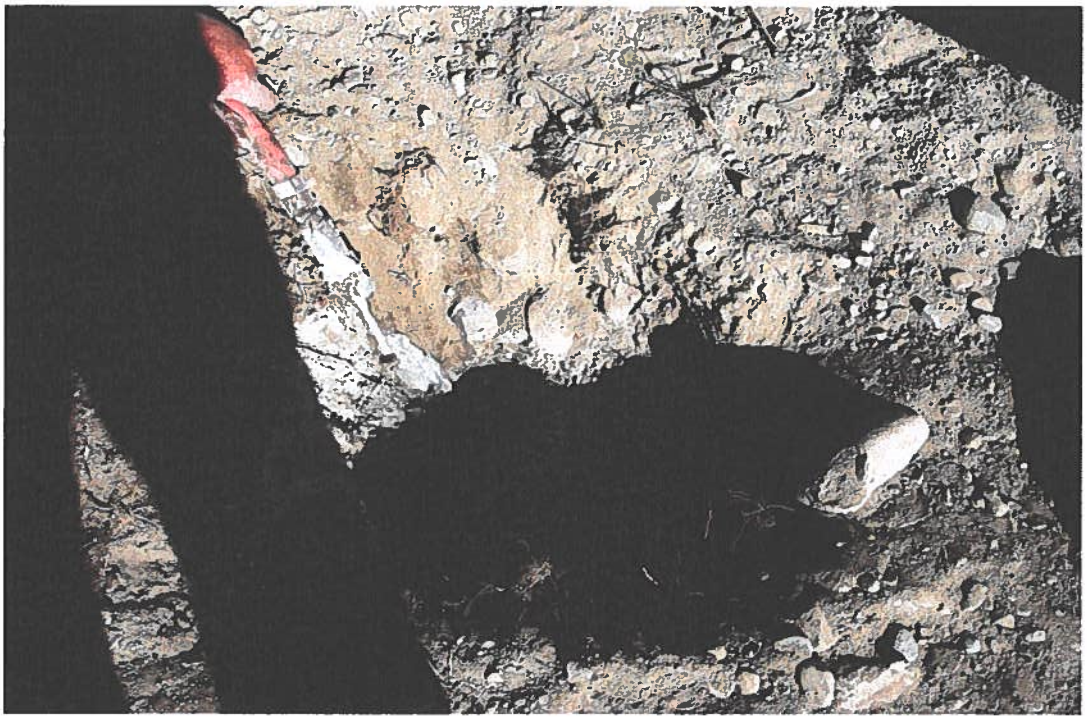
42. Pressure grouting the SVE lines next to the Remediation Shed.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

43. SVE lines stabilized; these lines were later cut off flush with the ground surface.

44. SVE-1 Pulling well casing with threaded bell cap .

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos



45. SVE-1 Grout settled in former location.

46. SVE-2 Location of horizontal well where grout daylighted by pressure.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

47. SVE-3 Pulling well casing with a taper tap, protective vault to left.

48. SVE-4 Location of horizontal well where grout daylighted by pressure.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

51. VCS-1 Pressure grouting air line from the vault to Remediation Shed.

52. VSC-1 Grout-filled air line at Remediation Shed.

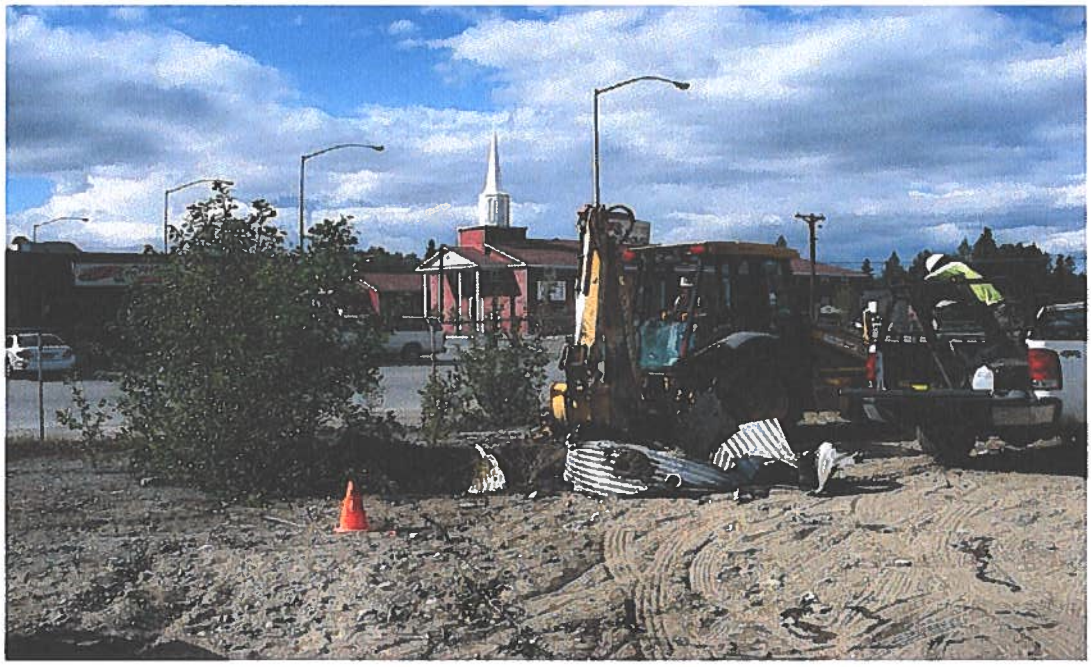
Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

53. VSC-1 Pulling eductor piping with a boom crane.

54. VSC-1 Pulling well casing.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

55. VSC-1 Grout stabilized after removing well casing.



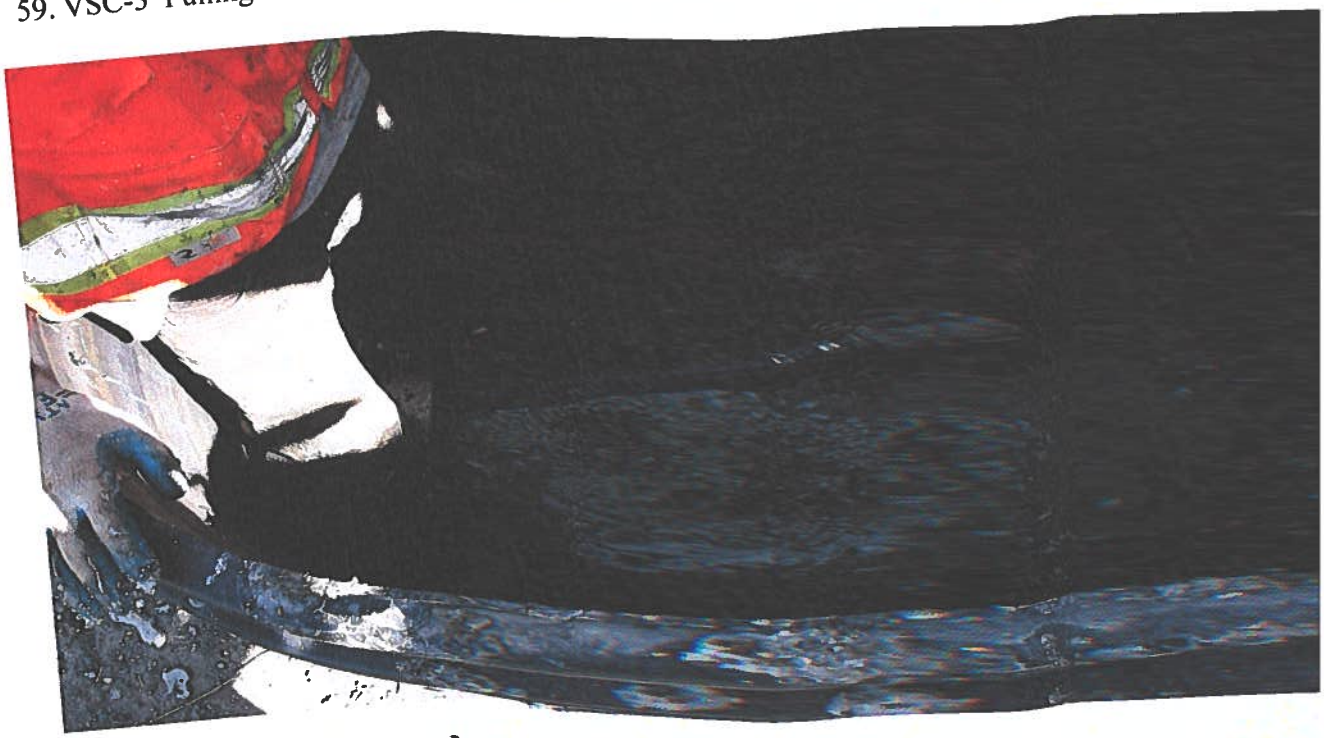
56. VSC-1 Removing the vault that housed VSC-1.

Former Tesoro Northstore #11 – June 2013 Decommissioning Photos

57. VSC-2 Pulled well casing.

58. VSC-2 Grout stabilized in bore hole .

59. VSC-3 Pulling the well casing.



60. VSC-3 Stabilized grout in vault.