

ATTACHMENT D

ATTACHMENT D: HAZARDOUS WASTE MANAGEMENT UNIT CLOSURE AND POST-CLOSURE CARE PLANS

The HollyFrontier Navajo Refining Company LLC (the Permittee) Artesia Refinery (Facility) RCRA Post-Closure Permit includes the following three inactive hazardous waste management units (HWMUs): the North Colony Landfarm (NCL), the Tetraethyl Lead Impoundment (TEL), and Evaporation Ponds (EPs) 1 through 6. The NCL and TEL have completed closure and are currently in post-closure care. The EPs are currently in closure. Applicable closure and post-closure plans are discussed below.

D.1 NORTH COLONY LANDFARM (NCL)

D.1.a Unit Description and History

The NCL is an approximately four-acre land treatment unit located in the northwestern portion of the Facility to the north of aboveground diesel storage tanks 834 and 838. The location of the NCL is shown on Figure 5-2 in Attachment I (*Figures*). The NCL is located at the former site of the “North Colony,” a housing complex constructed in the early 1930s to the north of the original refinery for company workers and their families during the era that Conoco owned and operated the first North Plant (City of Artesia 2012: p. 7; Dunn and Florez 2011: p. 70).

From May 1980 to September 1990, the unit (divided into four cells, A-D) was used to land treat approximately 55,000 gallons (NRC 2001: p. F-25, Attachment A [1988 NCL Closure/Post-Closure Plan] in Attachment B-4 [Revised NCL Closure/Post-Closure Plan, March 2001]) of hazardous wastes (slop oil emulsion solids [K049], heat exchanger bundle cleaning solids [K050], API separator sludges [K051], and leaded tank bottoms [K052]) (NRC 2001: p. F-25, Attachment A [1988 NCL Closure/Post-Closure Plan] in Attachment B-4 [Revised NCL Closure/Post-Closure Plan, March 2001]), (NMED 2011).

On January 22, 1988, the New Mexico Environment Department (NMED) issued a two-phased RCRA land treatment demonstration (LTD) permit for the NCL. This Permit was amended in December 1988 and January 1989, and went into effect on August 21, 1989. An August 24, 1989, letter from NMED clarified that the NCL status under RCRA was “permitted,” as opposed to “interim status.” The application for the 1988 Permit included a Closure/Post-Closure Plan, which was approved as part of the operating Permit effective in August 1989.

The Permittee ceased operation of the NCL in response to an NMED administrative order in September 1990 resulting from the detection of constituents of concern in the NCL groundwater monitoring system. A Phase I LTD, which had been rescheduled for August 8, 1990, was never conducted, and a Phase II operating permit was never issued. Closure activities began at the NCL in 1990.

A Phase I RCRA Facility Investigation (RFI) was completed at the NCL in 1994 and a Phase II RFI was completed in 1996. Supplemental Phase II RFI information was submitted to NMED in November 1997. These reports concluded that the releases to the subsurface soil and the shallow saturated zone likely originated from the tank farm to the south. However, the reports concluded that the NCL could not be ruled out as a contributing source. Current groundwater monitoring

and corrective action efforts associated with the NCL are discussed in Permit Section IV (*Corrective Action*).

D.1.b Tank 815

In 2005, Tank 815, an 80,000-barrel tank used to store ultra-low sulfur diesel (ULSD) fuel, associated tank secondary containment berms, and ancillary tank equipment were installed at the NCL without NMED's prior approval on the eastern half of the NCL. Tank 815 was incorporated into the Permittee's Permit through a Permit Modification completed in a December 2010 (effective January 14, 2011). The location of Tank 815 within the NCL is shown on Figure 5-2 in Attachment I (*Figures*).

D.1.c Tank Construction

Soil was excavated from a circular area 127 feet in diameter to a depth of five feet. A concrete ring wall was constructed within the excavation and the excavation was backfilled with engineered fill to provide a solid foundation for the tank. The engineered fill extends approximately five to six inches above the surrounding grade of the NCL. The soil excavated at the NCL to construct the tank foundation was used to construct a transition with a 1.5 percent slope from the engineered fill (five to six inches above existing grade) to the existing grade (NRC 2007, revised 2008 and 2009).

D.1.d Tank 815 Secondary Containment

Berms were constructed around Tank 815 to provide secondary containment for the contents of Tank 815 in case of a release. Soils excavated from the NCL during the tank foundation construction were used to increase the height of the eastern, southern, and northern berms, and to build the western berm for secondary containment. The western berm is a north-south berm located approximately halfway between the eastern and western boundaries of the NCL. The berms were built to provide secondary containment for Tank 815. The Tank 815 berm construction details are included in the *Revised Class 3 RCRA Permit Modification Request* submitted in November 2007 (NRC 2007, revised 2008 and 2009). Piping (one 8-inch line and one 14-inch line) was installed above ground and through the secondary containment berm to connect Tank 815 to pumps located south of the NCL (NRC 2007, revised 2008 and 2009).

D.1.e. Leak Detection

Leak detection was constructed beneath the tank by filling the ring wall with engineered fill to a high point at the center of the tank. An impermeable liner was installed above the fill and sloped to the ring wall. "Tell-tale" holes were installed at regular intervals around the ring wall so that, in the event that the floor of the tank should leak, liquid will migrate to the tell-tale holes so that a release can be observed.

All piping associated with Tank 815 within the boundary of the NCL is located above ground except for a short (less than 20 feet) length of piping running through the secondary containment berm located to the south of the tank. The pipe is wrapped for corrosion protection along this length. In the event of a release of product from the pipeline where it passes through the berm, the release would be expected to surface or be expressed on the side slope or surface of the berm and be amenable to visual detection. The Permittee conducts visual inspections of the locations

where piping penetrates the secondary containment berm located south of Tank 815 as part of the daily Tank 815 area inspections.

In addition, the following security measures are in place specifically to prevent leaks and spills from Tank 815:

- i. emergency cut-off capability is provided by manual operation of product line valving. The flow is monitored by pipeline control systems that are capable of determining if an emergency exists. Upon detection, personnel are directed to close the appropriate valves;
- ii. tank master flow and drain valves with outward flow of storage tank contents to the surrounding surface area are locked in the non-operating or stand-by status; and
- iii. tank loading or unloading connections are securely capped or blind flanged when not in service for a period of six months (NRC 2007, revised 2008, 2009).

D.1.f NCL Secondary Containment

Berms are constructed and maintained at the NCL for the purposes of secondary containment of Tank 815 contents, prevention of run-on onto the unit, and prevention of run-off of any potentially impacted stormwater from the unit. Tank 815 is enclosed within a separate compacted earthen berm enclosure that provides secondary containment for the tank in the event of a catastrophic failure. The western portion of the NCL is surrounded by the previous compacted earthen berm designed to contain the rainfall from the 24-hour, 100-year storm and to withstand the impacts of a 100-year flood event (note that the 100-year floodplain no longer includes the location of the NCL) (NRC 2001).

D.1.g Closure Status

The final waste volume was applied to the NCL in September 1990 and upon the cessation of waste application, closure activities were initiated under the approved 1988 *NCL Closure/Post-Closure Plan*. Closure consisted of three phases: (1) decontamination of the general facility, including removal of the drum storage pad located within the NCL boundaries; (2) in-place treatment of final waste applications; and, (3) establishment of a vegetative cover. The first two phases were completed in 1991 shortly after ceasing waste application, but establishment of the vegetative cover was delayed awaiting results of the multiple-phase RFI conducted at the NCL (NRC 2001 and ARCADIS 2009h) and the vegetative cover was not established until January 30, 2010.

The vegetative cover was established on the western portion of the NCL using native plants. Tank 815 and the area surrounding the tank within the secondary containment serves as cover for the eastern portion of the NCL during their operation of the tank on the unit. In the event Tank 815 is removed in the future, the area covered by the tank and the secondary containment area will be treated in accordance with the cover and revegetation protocol described in the *Revised NCL Closure and Post-Closure Plan* (ARCADIS 2009h).

NRC filed a deed recordation notice and survey plat in the real property records of the Eddy County Clerk in 1989 (dated April 19, 1989, certified filed on April 21, 1989, Book 43, Pages 413-416) for both the NCL and TEL. Copies of the deed recordation notice and survey plat are

provided in Appendix 10-1 of the Permit Application. In accordance with Condition 3.2.3.a.a of the 2010 Permit, the Permittee submitted the NCL Closure Certification on January 30, 2010 which is also provided in Appendix 10-1 of the Permit Application.

D.1.h Closure and Post-Closure Plans

The following Closure and Post-Closure Plans have been submitted and approved by NMED for the NCL, and are hereby incorporated into this Permit by reference:

- i. *NCL Closure and Post-Closure Plan (1988)*;
- ii. *Revised NCL Closure and Post-Closure Plan (2001, revised 2009)*.

Modifications to the 2001 *Revised NCL Closure and Post-Closure Plan* were proposed as part of the *Revised Class 3 Permit Modification Request* submittal in November 2007 (NRC 2007, revised 2008 and 2009) to incorporate Tank 815 into the 2010 Permit. The modifications primarily addressed inspection and other requirements related to Tank 815 and establishment of the vegetative cover and were approved by NMED in December 2010 (effective January 14, 2011). These closure/post-closure plans meet the requirements of 40 CFR Subpart G and 40 CFR § 264.280.

D.1.i Post-Closure Schedule

All treatment cells at the NCL ceased receiving wastes in 1990, and are closed. The Facility commenced post-closure care of the NCL on January 30, 2010 when the placement of the vegetative cover was completed. Because Tank 815 remains in operation, the NCL will remain on the Permit and in post-closure care until Tank 815 has been removed and the Permittee has demonstrated that Tank 815 has not contributed to site contamination at the Facility.

The Permittee maintains the vegetative cover, signage, and fence, and conduct current inspection and maintenance activities as part of institutional controls of the CAP. Groundwater monitoring and phase-separate hydrocarbons (PSH) and total fluids recovery in this area of the Facility will continue under the Facility Wide Groundwater Monitoring Work Plan (FWGMWP).

D.1.j Post-Closure Care Activities

The Permittee conducts maintenance and inspections of the NCL and Tank 815 as detailed in Attachment C (*Inspection Plan*). Groundwater monitoring related to the NCL and groundwater corrective action for impacted groundwater likely associated with the North Tank Farm area on the south side of the NCL are part of the FWGMWP.

As part of the post-closure care requirements and in accordance with 40 CFR § 264.280(c), the Permittee completes the following maintenance activities at the NCL:

- i. maintain the integrity and effectiveness of the final cover;
- ii. prevent run-on and run-off from eroding or otherwise damaging the vegetative cover;

- iii. comply with any prohibitions or conditions concerning growth of food-chain crops under 40 CFR § 264.276;
- iv. protect and maintain surveyed benchmarks used in complying with the surveying and record keeping requirements of 40 CFR §§ 264.279 and 264.309;
- v. maintain and monitor the groundwater monitoring system and comply with other applicable requirements of 40 CFR § 264, Subpart F;
- vi. inspect Tank 815 daily for signs of deterioration, leaks, or accumulation inside the containment area; and
- vii. conduct visual inspections of the locations where the piping penetrates the secondary containment berm.

Inspections are conducted and documented as described in Attachment C (*Inspection Plan*) and will continue to be conducted as part of the Permittee's CAP.

Inspections for Tank 815 are conducted in accordance with the OCD Discharge Permit (and any modifications thereto) for Tank 815, the Permittee's *SPCC* and *FRP*, as applicable, and as described in Attachment C (*Inspection Plan*).

D.1.k Soil Sampling

Soil sampling of the treatment zone (the non-native soils present in the NCL at depths above the contact with native soils) and of the native soils immediately beneath the treatment zone will commence in accordance with Permit Sections III.B.3.a(5) and III.B.3.a(6) throughout the operation of Tank 815.

D.1.l Groundwater Monitoring

Groundwater monitoring is conducted as part of the FWGMWP and is discussed further in Permit Section IV.C.2 (*Facility-Wide Groundwater Monitoring Plan*). The most recent comprehensive description of wells, the analyte list, and groundwater sampling and analysis (including Quality Assurance/Quality Control) procedures can be found in the *Facility-Wide Groundwater Monitoring Work Plan* (as updated) and/or the most recent *Facility-Wide Annual Groundwater Report*.

D.1.m Post-Closure Care Costs

Updates to estimated post-closure care costs and financial assurance are addressed in Permit Section II.E.1 (*Cost Estimate for Facility Closure and Post-Closure*) and closure and post-closure cost estimate tables are in Attachment G (*Closure and Post-Closure Cost Estimate*) of the Permit. Note that the post-closure costs provided in Table G-2 (*Post-Closure Cost Estimate - North Colony Landfarm*) in Attachment G are consistent with the Facility's most recent financial assurance submittal and will be updated as needed.

D.2 TETRAETHYL LEAD (TEL) IMPOUNDMENT

D.2.a Unit Description and History

The TEL Site is an approximately 0.9-acre surface impoundment historically used to treat oily wastes and other hazardous materials. The TEL Site was in use in 1969 when Navajo Refining Company purchased the Facility. The location of the TEL Site is shown in Figure 5-2 in Attachment I (*Figures*). The unit was also used historically for weathering of pipe and other materials generated in refinery tetraethyl lead processes. The piping and other process materials were removed from the site after weathering. The TEL Site was subsequently used to treat, but not dispose of, approximately 12.4 tons of oily wastes (lead-contaminated API separator sludge [K051], leaded tank bottoms [K052], and unleaded tank bottoms [D018]). Hazardous waste service ceased in 1980 and non-hazardous waste receipts ceased on January 26, 1983.

Inspections are conducted and documented as described in Attachment C (*Inspection Plan*) of this Permit and will continue to be conducted as part of the Permittee's CAP.

D.2.b Closure Status

The TEL Site was capped with crushed and compacted caliche and revegetated in 1989. Closure was approved by NMED in June 1989 and post-closure care is currently being implemented.

The 1998 *TEL Surface Impoundment Closure and Post-Closure Plan* was approved by NMED on June 17, 1988 (with an effective date of July 11, 1988); closure construction was completed on November 11, 1988; and the unit was initially certified closed on February 13, 1989. This closure certification was modified by NRC on February 17, 1989, March 9, 1989 (for completion of the cap permeability study), and April 19, 1989 (demonstrating compliance with the required permeability limit for the cap and submitting to NMED the survey plat required by 40 CFR § 265.116). NMED approved the closure certification on June 20, 1989 and authorized initiation of the post-closure care plan for this unit.

An institutional control in the form of a deed recordation notice was filed in Book 43, Pages 413-416 of the real property records of the Eddy County Clerk on April 21, 1989, thereby notifying all prospective future owners of the property that the closed site is permanently restricted in use. A copy of the closure certification, NMED approval letter, and deed recordation notice are provided in Appendix 10-3 of the Permit Application.

D.2.c Post-Closure Care Schedule

Placement of waste in the TEL Site was discontinued in 1983, and closure of the TEL Site was approved by NMED in June 1989. Arsenic, benzene, MTBE, naphthalene, GRO, and DRO have been in groundwater samples obtained from monitoring wells TEL-1, TEL-2, TEL-3, and TEL-4. Groundwater monitoring is ongoing at the TEL.

D.2.d Closure and Post-Closure Plans

The following two Closure and Post-Closure Plans have been submitted and approved by NMED for the TEL Site, and are hereby incorporated into the Permit by reference:

- i. *TEL Surface Impoundment Closure and Post-Closure Plan* (April 1988); and

- ii. *Tetraethyl Lead (TEL) Weathering Area Post-Closure Plan* (June 2001).

These plans meet the requirements of 40 CFR Part 264, Subpart G and 40 CFR § 264.228.

D.2.e Post-Closure Care Activities

The Permittee conducts maintenance and inspection of the TEL Site as detailed in Attachment C (*Inspection Plan*) of this Permit. These activities will be managed as part of the Permittee's CAP. Groundwater monitoring and groundwater corrective measures for impacted groundwater related to the TEL Site are part of the FWGMWP for the Facility.

As part of the post-closure care requirements and in accordance with 40 CFR § 264.228(b), the Permittee completes the following maintenance activities at the TEL Site:

- i. maintain the integrity and effectiveness of the final cover;
- ii. prevent run-on and run-off from eroding or otherwise damaging the vegetative cover;
- iii. comply with any prohibitions or conditions concerning growth of food-chain crops under 40 CFR § 264.276;
- iv. protect and maintain surveyed benchmarks used in complying with the surveying and record keeping requirements of 40 CFR §§ 264.279 and 264.309; and
- v. maintain and monitor the groundwater monitoring system and comply with other applicable requirements of 40 CFR 264, Subpart F.

Inspections are conducted and documented as described in Attachment C (*Inspection Plan*) and will continue to be conducted as part of the Permittee's CAP.

D.2.f Soil Sampling

No post-closure care soil sampling is conducted at the TEL.

D.2.g Groundwater Monitoring

Groundwater monitoring is conducted pursuant to the FWGMWP and is discussed further in Permit Section IV.C.2 (*Facility-Wide Groundwater Monitoring Plan*). The most recent comprehensive description of wells, the analyte list, and groundwater sampling and analysis (including Quality Assurance/Quality Control) procedures is found in the *Facility-Wide Groundwater Monitoring Work Plan* (as updated) and/or the most recent *Facility-Wide Annual Groundwater Report*.

D.2.h Post-Closure Care Costs

Updates to estimated post-closure care costs and financial assurance are addressed in Permit Section II.E.1 and closure and post-closure cost estimate tables are in Attachment G (*Closure and Post-Closure Cost Estimates*) of this Permit. Note that the post-closure costs provided in

Table G-3 (*Post-Closure Cost Estimate – Tetraethyl Lead Site*) in Attachment G are consistent with the Permittee's most recent financial assurance submittal and will be updated as needed.

D.3 EVAPORATION PONDS

D.3.a Unit Description and Operational History

The five evaporation ponds (EPs) are located adjacent to the Pecos River approximately three miles east of the Facility as shown on Figures 5-1 and 5-3 in Attachment I (*Figures*). EP1 (15.76 acres) and Three Mile Ditch, (TMD), a conveyance ditch connecting to the refinery, were constructed in the early 1930s and operated until they were removed from service in 1987. An effluent pipeline was installed over the TMD in 1987 to replace the TMD. Discharge from the pipeline that replaced the TMD was to EP2 (constructed in 1966, 17.5 acres) until 1994. In 1994, discharge of refinery wastewater was moved from EP2 to EP5 (constructed in 1984, 9.4 acres), which continued until the use of the EPs was discontinued in 1999. EP3 (constructed in 1974, 44.8 acres) and EP6 (constructed in 1988, 19.5 acres) received overflow from EPs 2 and 5. EP4 was never constructed. The combined surface area of EPs 1 through 6 is approximately 107 acres.

After removal from service in 1987, EP1 was allowed to dry and was subsequently periodically turned and disced in an attempt to promote biodegradation of organic constituents. Initially it was classified as a non-hazardous waste management unit, as was the TMD. EP1 received untreated refinery wastewater after July 26, 1982 and is now included as part of the EPs HWMU.

The EPs received untreated refinery wastewater after July 26, 1982 and therefore are considered to be hazardous waste management units. In addition, in 1993 the EPs 2 through 6 were determined to have received hazardous wastewater (benzene) after the effective date of the TC amendments promulgated in March 1990. Pursuant to a federal administrative enforcement action initiated on July 16, 1993, a preliminary closure approach for these four ponds was submitted to NMED and EPA in Fall 1993, which included continuing groundwater investigations as part of the corrective action program for EP1 (ENSR, 1993).

The federal enforcement action regarding the EPs was resolved in November 1998 when a consent decree was executed.

D.3.b Current Status

The USEPA's Consent Decree was terminated in 2013. EP1 will be grouped with EPs 2 through 6 for the purpose of HWMU closure. The Evaporation Ponds are currently undergoing investigation as part of the Permittee's closure activities. Upon receipt of approval from NMED that impacts have been appropriately delineated, a revised Closure Plan will be developed and submitted as a permit modification.

D.3.c Corrective Action Investigation History

Site investigation activities regarding the EPs are discussed in Part IV (*Corrective Action*) of the Permit. The lateral and vertical extent of impacts from hydrocarbons has mostly been defined with the exception of some areas south of the EPs. A more detailed history of the investigations

conducted to date is provided in the *Evaporation Ponds Phase IV Corrective Action Investigation Workplan* (Arcadis 2011j).

D.3.d Corrective Action Management Unit (CAMU)

If the Permittee finds the need to dispose of remediation waste generated as part of corrective action activities at the Facility, the Permittee may submit a request to establish a corrective action management unit (CAMU) at the EPs pursuant to 20.4.1.500 NMAC incorporating 40 CFR § 264.552 and the final CAMU Rule (USEPA 2002). The design and siting of the CAMU shall be approved by NMED prior to the construction of the CAMU and placement of any waste materials in the CAMU. Permit Section III.B.3.d (*Corrective Action Management Unit*) of the Permit provides that NMED will impose specific monitoring requirements, if a CAMU is constructed at the Ponds.

D.3.e Closure Plan

Once site investigations are completed at EPs 1 through 6, the Permittee shall evaluate remedial options to complete closure of the HWMU. As part of the remedy selection process, the Permittee will develop an appropriate closure approach based on the available data. A Closure Plan shall be submitted to NMED as a Class 3 permit modification request.

D.3.f Post-Closure Plan

Upon completion of closure, the Permittee must submit a Post-Closure Care Plan that meets the requirements of 40 CFR §§ 264.117 through 264.219, § 264.228 and the applicable provisions of 40 CFR Subpart H.

D.3.g Post-Closure Inspection and Maintenance

As part of the post-closure care requirements and in accordance with 40 CFR § 264.228(b), the Permittee shall complete the following maintenance activities at EPs 1 through 6:

- i. maintain the integrity and effectiveness of the final cover;
- ii. prevent run-on and run-off from eroding or otherwise damaging the vegetative cover;
- iii. comply with any prohibitions or conditions concerning growth of food-chain crops under 40 CFR § 264.276;
- iv. protect and maintain surveyed benchmarks used in complying with the surveying and record keeping requirements of 40 CFR §§ 264.279 and 264.309; and
- v. maintain and monitor the groundwater monitoring system and comply with other applicable requirements of 40 CFR § 264, Subpart F.

Inspections are conducted and documented as described in Attachment C (*Inspection Plan*).

D.3.h Soil Sampling

Soil sampling activities shall be conducted in accordance with NMED-approved Work Plans and the closure plan for the EPs.

D.3.i Groundwater Monitoring

Groundwater monitoring is conducted pursuant to the FWGMWP and is discussed further in Permit Section IV.C.2 (*Facility-Wide Groundwater Monitoring Plan*). The current groundwater monitoring program for EPs 1 through 6 is discussed in the Permittee's *Facility-Wide Groundwater Monitoring Work Plan* (as updated) and the most recent *Annual Groundwater Report*.

D.3.j Closure and Post-Closure Care Costs

Updates to estimated closure and post-closure care costs and financial assurance are addressed in Permit Section II.E and closure and post-closure cost estimate tables are in Attachment G (*Closure and Post-Closure Cost Estimates*) of this Permit. Note that the closure and post-closure costs provided in Tables G-1 (*Closure Cost Estimate – Evaporation Ponds*) and G-4 (*Post-Closure Cost Estimate – Evaporation Ponds*) in Attachment G are consistent with the Permittee's most recent financial assurance submittal and will be updated as needed.

D.4 References

Navajo Refining Company. June 2001. *RCRA Post-Closure Permit Application for the Navajo Refining Company Artesia, New Mexico Refinery, Final*.

Navajo Refining Company. November 28, 2007, revised February 12, 2008, revised June 30, 2008, revised November 16, 2009. *Class 3 Permit Modification Request*.

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