PPC 9551.1991(02)

NO-MIGRATION PETITION FOR SUN REFINING, OK

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

JAN 17 1991

Mr. W. Thomas McCollough
Refinery Manager
Sun Refining and Marketing Company
P.O. Box 2039
Tulsa, Oklahoma 74102

Re: No-Migration Petition submitted for Sun Refining and Marketing Company's Tulsa, Oklahoma Land Treatment Facility (F-90-NMSP-FFFFF)

Dear Mr. McCollough:

I am writing in regard to your March 16, 1990 "no-migration" petition, which requests a variance under 40 CFR §268.6 to allow sun Refining and Marketing Company (Sun) to continue the land treatment of restricted wastes at Sun's Tulsa, Oklahoma land treatment facility (LTF). After a careful review of your petition, we have concluded that your facility does not meet the standard for a no-migration variance. Therefore, we will recommend to the Assistant Administrator for Solid Waste and Emergency Response that the petition be denied.

Our decision to recommend denial of the petition is based on the following concerns:

- Soil-pore monitoring indicates that benzene has already migrated beyond the unit boundary.

- Ground-water monitoring indicates that hazardous constituents have already migrated beyond the unit boundary.

- The required minimum separation between the bottom of the treatment unit and the top of the seasonally high water table has not been demonstrated.

- Air modeling shows concentrations of arsenic at the unit boundary that exceed the allowable health-based

standard.

The details of our concerns are described below.

Presence of Hazardous Constituents Below the Treatmentment Zone (BTZ)

Soil-pore liquids monitoring data collected from lysimeter 14 indicate the presence of benzene (33.4 ppb) beneath the treatment zone at concentrations above the health-based level (HBL) of 5 ppb used in no-migration decision-making. Sun explained that during the installation of lysimeter 14 (in March 1987), the borehole had been contaminated by a load of spent jet fuel filter clay dumped nearby. We, however, question whether the contamination can be attributed to nearby applied spent jet fuel filter clay for the following reasons.

First, it stands to reason that if the borehole were contaminated during the installation process, then the firstquarter soil pore-water sample taken between March and April of 1987 should have shown high levels of benzene (which is very mobile). However, elevated levels showed up only after the third-quarter samples were taken in October 1987. (No secondquarter data was provided in the tables.) Thus, the contamination occurred at a later date rather than during initial installation.

Secondly, the results from analyses of the spent jet fuel filter clay reported benzene as "NP" (not present) and the petition stated that "the other [non-hazardous, including the spent jet fuel filter clay] wastes, in comparison, are insignificant in oil/organic content and/or annual quantity disposed of; the presence of various specific organic compounds in these wastes would have little or no impact on the overall soil/waste system at the LTF" (V.1, pages 4-11 and 4-15). Therefore, Sun, in one instance claimed that they did not have to analyze the non-hazardous wastes for organic constituents, yet in another instance, claimed that the bore hole was contaminated by the spent jet fuel filter clay.

Lastly, benzene has been detected in both background and active LTF area lysimeters. (See Attachment I.) The continuous detection of low levels of benzene, especially at lysimeter 15, indicate that benzene has migrated below the treatment zone. We, therefore, believe both that Sun has failed to demonstrate that the benzene detected at lysimeter 14 is due to contamination and that the presence of benzene in the soil-pore liquids clearly demonstrates that this constituent has migrated below the LTF at hazardous concentrations.

Ground-Water Monitoring and Detecting Releases at the Earliest Extent Practicable

As shown in Attachment II, ground-water monitoring between May 1984 and January 1990 indicate that barium, chromium, mercury, lead, and benzene were detected at concentrations above their respective health-based levels. Sun claims that these exceedances are attributable to naturally occurring levels, laboratory error, or broken product lines running beneath the LTF. We believe that Sun has failed to prove conclusively that the migration did not, in part, result from LTF operations.

Additionally, we believe that Sun has failed to meet the requirements of 40 CFR §268.6(a)(4). Specifically, Sun has not demonstrated that the ground-water monitoring system at the LTF is capable of detecting (and differentiating) releases at the earliest extent practicable. Sun's 1990 annual report on ground-water monitoring (dated July 19, 1990) presented a map showing three pipelines buried approximately three feet below the ground surface within the treatment zone of the Central treatment area of the LTF. These pipelines transport a wide range of petroleum products from crude oil to gasoline, jet fuel, and diesel. The map also showed that the downgradient wells of the Central and West areas are located adjacent to these pipelines. Sun stated that these pipelines could leak and that several leaks, which were indeed identified during 1989, could have influenced ground-water monitoring results, as with MW32 where the concentration of total organic carbon (TOC) has consistently increased from 20 ppm in 1986 to 79 ppm in 1988.

The ramifications of the contamination from ruptured product lines in regard to ground-water monitoring of the LTF are unclear. Sun has not provided detailed analytical results that describe the known contamination, nor have they proposed an adequate plan whereby releases from the LTF can be differentiated from the known contamination. Because of the constituents of a weathered petroleum product plume would be very similar to a release from a LTF that contains petroleum wastes (e.g., benzene, toluene, and xylene), it will be difficult to differentiate between the two releases and therefore, conclude that Sun's ground-water monitoring system will be able to detect constituent releases at the earliest extent practicable.

Maintaining Minimum Separation

Federal regulations require that he depth-to-ground water at land treatment facilities be no less than three feet from the bottom of the treatment zone to the seasonal high water table (40 CFR 264.271(c)(2)). Based on the discussion below, we do not believe that Sun has demonstrated that he required minimum separation is maintained throughout the entire year.

Sun stated that the ground-water table can fluctuate up to four feet in

elevation in a year, and that the seasonal high water table is more than eight feet below ground surface at he LTF. Although Sun supported its claim by providing the ground-water elevation profiles in Exhibits 3.3-1 to 3.3-3 (V.1, pages 3-28 to 3-30), the changes in ground-water table, as reported in Exhibit 3.3-1, were based on observations recorded in a periodfrom 1983 to 1984. We believe that data taken in this relatively short period is not sufficient to represent the long-term, temporal variation of the water table beneath the LTF. In addition, the average depths to ground-water table at MW15 and NW17 were shown to be 8.2 feet and 8.5 feet, respectively (V.1, Exhibit 3.3-2, page 3-29). Since Sun has stated that the potential fluctuations of the water table could be four feet over the course of a year (or roughly +/- two feet from the mean), it is possible for the water table at these two wells to rise to an elevation within six feet of the ground surface.

Furthermore, Exhibit 3.3-2 (V.1, page 3-29) presents average depths to ground water using measurements made in August 1984, May 1985, and December 1986. As stated above, the depth to ground water during this period in the East LTF ranges between 8.2 and 8.5 feet. We note, however, that the petition stated that the ground-water table is at the highest levels during April - June (V.1, page 3-27). The petition also stated that the level of the ground-water table fluctuates with rainfall. Because the greatest amount of precipitation generally occurs during May, June, and September, ground-water table elevation measurements collected during these three months may show that the minimum required separation of three feet between the bottom of the treatment unit and the top of the seasonal high water table is not maintained (V.1, page 3-33).

We are also concerned that the aquifer beneath the LTF is hydraulically linked to the Arkansas River, and the ground-water table can be further affected by the water level variations in the river. A 100-year flood could cause "underground flooding" at the LTF due to its proximity to the river and the moderately permeable alluvial soils in the unsaturated zone. That is, the excessive hydraulic head generated outside the levee by flood waters could reverse the ground-water flow direction and cause the water table to further rise beneath the LTF. Our concerns are supported by Sun's acknowledgment that during heavy flooding in October of 1986, the Arkansas River level was at the same elevation as an abandoned waste site adjacent to the West unit for at least a week, temporarily reversing the ground-water flow. We, therefore, conclude that the minimum separation between the treatment zone and the water table is affected by water level variations occurring in the Arkansas River.

Air Modeling for Arsenic

Sun performed air modeling to predict the airborne concentrations of arsenic at the unit boundary. This modeling, based on historic and projected data,

showed that arsenic would be found at the unit boundary at a concentration of 1.2 X 10-4 ug/m3 and 1.0 x 10-3 ug/m3, respectively. Sun compared these predicted concentrations to a health-based level (HBL) for arsenic of 2.3 x 10-3 ug/m3 (for inhalation) as reported in Table 9.5-3 of the petition. However, the HBL value cited in the petition by Sun, is higher than that found in EPA's IRIS database (7.0 x 10-5 ug/m3). Since both the historic and projected concentrations modeled for arsenic exceed the HBL of 7.0 x 10-5 ug/m3, Sun has failed to demonstrate that this constituent will not migrate at hazardous concentrations beyond the unit boundary.

Incomplete Petition

Finally, our review indicates that the petition is incomplete and that information and clarification in areas beyond those highlighted above would be needed to complete the petition. However, because of the problems discussed above, we believe we have sufficient information at this time to move toward a denial of your petition.

It is our practice to give petitioners the option of withdrawing their petitions to avoid a negative publication in the Federal Register. If you prefer this option, you must send us a letter withdrawing your petition and acknowledging that the petitioned wastes are still considered to be restricted wastes subject to the Third Third Land Disposal prohibitions. This letter should be forwarded to the following address within two weeks of the date of receipt of today's correspondence:

Patricia Cohn, Acting Chief
Assistance Branch (OS-343)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

If you choose not to withdraw your petition, we will recommend that a proposed denial decision be published in the Federal Register.

Any questions regarding our findings may be submitted in writing to Mr. James Michael of my staff.

Sincerely,

Jeffery D. Denit, Deputy Director
Office of Solid Waste

Attachments

cc: Patricia Cohn, PSPD, OSW
James Michael, PSPD, OSW
Fenton Rood, Oklahoma State Department of Health
Bill Honker, Region VI