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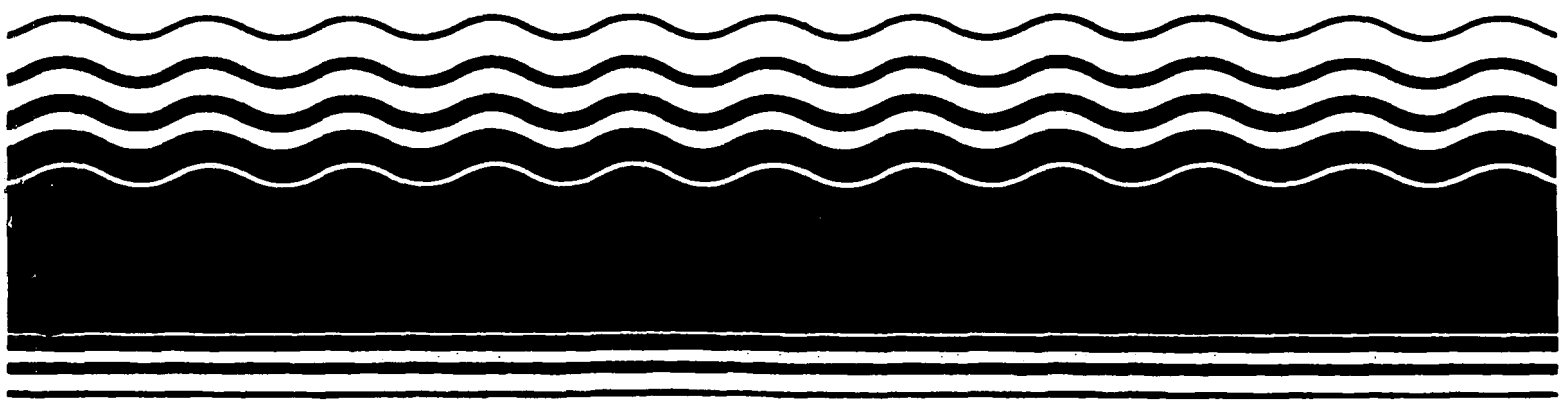
EPA Superfund
Explanation of Significant Difference for the Record of Decision:

Pester Refinery Co.
El Dorado, KS
9/29/1998



EXPLANATION OF SIGNIFICANT DIFFERENCE

Pester Refinery Co./Pester Burn Pond Site
Soil and Sludge Operable Unit
El Dorado, Kansas

for - Dennis Grams. P.E.
Regional Administrator

9/29/98
Date

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PESTER REFINERY CO./PESTER BURN POND SITE
SOIL AND SLUDGE OPERABLE UNIT

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EXPLANATION OF SIGNIFICANT DIFFERENCES

Pester Refinery Co. Soil and Sludge Operable Unit
El Dorado, Kansas

1.0 INTRODUCTION

The Pester Refinery Co. Site (the "Site") is located on a 10-acre tract located to the north and west of the City of El Dorado, Butler County, Kansas. The Site is located in the southwest quarter of Section 25, Township 25, South, Range 5 East, Butler County, Kansas.

The Kansas Department of Health and Environment (KDHE) is the lead agency for investigation and remediation activities at the Site. The U.S. Environmental Protection Agency (EPA) is also involved as the support agency for activities at the Site. The Site was placed on the National Priorities List (NPL) on May 1, 1989 by the EPA pursuant to its authority under the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42, U.S.C. §9601 et seq, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA). The Record of Decision (ROD) which describes the Soil and Sludge Operable Unit (Operable Unit 1, or OU1) remedy selected for the Site was signed by EPA on September 30, 1992, and modified by an Explanation of Significant Differences in September 1993.

Section 117(c) of CERCLA requires the lead agency to address post-ROD significant changes:

> After adoption of a final remedial action plan (1) if any remedial action is taken [under sections 104 or 120], (2) if any enforcement action under section 106 is taken, or (3) if any settlement or consent decree under section 106 or section 122 is entered into, and if such action, settlement, or decree differs in any significant respects from the final plan, the President or the State shall publish any explanation of the significant differences and the reasons such changes were made.

The remedy for OU1, as described in the 1992 ROD and an earlier 1993 Explanation of Significant Differences (ESD), has been modified in several significant but not fundamental aspects. Oily sludge in the ponds has successfully been dredged from the ponds, treated and disposed of consistent with the 1993 ESD. The *in situ* flushing and bioremediation of stained soils beneath the ponds is underway; the findings of the pilot study phase of the bioremediation/flushing phase have resulted in some operational changes in that portion of the remedy. Consistent with the ROD, stained soil is still being treated *in situ* by flushing with water, aerated to promote biodegradation of organic contaminants in the soil and pond water, and seepage from the ponds is being collected in an underground interceptor trench, treated and reintroduced to the ponds for continued flushing and bioremediation; however, the nature and location of some of the treatment elements have been changed to improve the performance and cost-effectiveness of the remedy. FINA has also forwarded a proposal to consolidate the stained soil within the operable unit, close a portion of the ponds, and begin operating the pilot batch

treatment areas as a continuous-feed bioreactor system to bioremediate the contaminated soil in the remainder of OU1.

EPA has also determined that several aspects of the OU1 ROD were not described in sufficient detail in the original ROD. Specifically, this ESD will address final closure requirements for the impoundments. The ESD will also expand on the operation and maintenance requirements for the interceptor trench, provide a basis for discontinuing the operation of the interceptor trench, and describe final closure requirements for the trench. Finally, the ESD will establish the ARARs for disposal of water generated by operation of the interceptor trench or by periodic dewatering of the ponds. This ESD is necessary to provide a means to make a formal record of and to inform the public of these significant differences in the selected remedy for OU1.

The Ground Water Operable Unit (Operable Unit 2 or OU2) of the Pester Refinery Co. Site is being addressed under a separate Proposed Plan which is being offered for public comment concurrent with this OU1 ESD.

The ESD will become part of the Administrative Record file for the Site. The Administrative Record file is available for public review at the following information repositories during normal business hours:

Bradford Memorial Library
611 South Washington St.
El Dorado, Kansas 67042
Contact: Front Desk, (316) 321-3363

Kansas Department of Health and Environment
Bureau of Environmental Remediation
Forbes Field, Building 740
Topeka, Kansas
Contact: Kurt Limesand, (785) 296-1671

United States Environmental Protection Agency
Region VII Docket Room
726 Minnesota Avenue
Kansas City, Kansas
Contact: Catherine Barrett, (913) 551-7704

2.0 SUMMARY OF SITE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY

The refinery occupying the area immediately west of the Site was constructed in 1917, soon after the discovery of oil at El Dorado in 1915. The refinery and surrounding area were purchased by FINA in 1958. The burn pond was built by FINA around the time of the purchase. FINA

disposed of petroleum waste products generated by normal refinery operations by running a pipe from the refinery to the burn pond. The pond was used to store various refinery byproducts such as slop oil emulsion solids, API separator sludge, and heat exchanger bundle cleaning sludge. When the waste products were of a very gaseous nature, FINA would ignite the waste product as it came out of the pipe. Whatever did not burn was discharged out of the pipe into the pond.

On January 1, 1977 Pester purchased the refinery from FINA and continued refinery operations. Pester filed for bankruptcy on February 25, 1985. Subsequent to Pester's bankruptcy, Coastal Derby Refining Company (now Coastal Refining and Marketing, Inc.) purchased the refinery with the exception of the tract of land containing the burn pond. The tract occupied by the burn pond is still owned by Pester.

The Site historically contained a burn pond, a stormwater pond, and a smaller settling pond (see Figure 4). The dike separating the burn pond and the larger stormwater pond was breached, resulting in an U-shaped pond. Eventually the dike between the stormwater pond and the settling pond also was breached, creating common water between all three ponds. Except for the historical references, all references to the "burn pond" in this document refer to all three interconnected ponds at the Site.

The first Remedial Investigation/Feasibility Study (RI/FS) for the Site was completed in August 1992. The RI concluded that the sludge contained in the burn ponds was the principal source of contamination at the Site. Polycyclic aromatic hydrocarbons (PAHs) have leached from the burn pond sludge into the surrounding soils at the Site.

An EPA Record of Decision (ROD) was issued for the Site in September 1992. The ROD split the Site into two operable units, a soil and sludge operable unit (OU1) and a ground water operable unit (OU2), because ground water contamination at the Site had not been adequately characterized at the time. The main remedial elements specified in the ROD for OU1 included: excavation and dewatering of sludge from the three interconnected ponds; processing of the sludge into petroleum product at an off-site refinery, and bioremediation of the contaminated soils in the ponds with aeration of the ponds and flushing with water from the subsurface seepage interceptor trench at the Site. A cleanup goal for stained soils of 13.0 milligrams per kilogram total carcinogenic polycyclic aromatic hydrocarbons (carcinogenic PAHs) was established in the ROD. EPA subsequently determined that remedy was not implementable because no refineries were permitted to accept off-site RCRA hazardous materials for recycling at the time. In September 1993 an ESD was issued that modified the remedy for the sludge to include separation of the sludge into Recovered Refinery Feedstock (RRF oil), water, and residual solids, treatment, transportation, and off-site disposal of the residual solids, and transportation of the RRF oil for incorporation into the refining process at an active refinery. The ROD and ESD did not elaborate on final closure requirements for OU1; those requirements will be addressed by this ESD.

KDHE, Fina, and Pester entered into a Consent Order to complete a Remedial Design/Remedial Action (RD/RA) for OU1 of the Site in September 1993. The treatability study for the soil was

completed in the fall of 1994. The pond sludge dredging and treatment and removal and recycling of oil contained in the sludge began in December 1995 and continued through March 1996. The bioremediation design document for the soil portion of OU1 establishes the organization and technical basis for the bioremediation of the pond soils. Bioremediation of the pond soils is being conducted in a phased approach: Phase I is underway and is focused on remediating half of the stormwater pond while simultaneously gathering bioremediation performance data; Phase II will address the remainder of the stained soil in the ponds. Modifications to the bioremediation approach have been made as necessary based upon operating data gathered during Phase I. Proposed modifications to the bioremediation system have in part prompted the issuance of this ESD.

During late March 1992 a subsurface interceptor trench was constructed on the north and east sides of the burn pond between the pond and the West Branch Walnut River to prevent the seepage of contamination from the burn pond into the river in those areas. This trench extended east and south of the existing open interceptor trench. The subsurface interceptor trench was dug into weathered bedrock and sloped to a central collection point. Appreciable thicknesses of oil that accumulate at the central collection point are periodically skimmed off of the water in the trench and disposed as hazardous waste or recycled. Water extracted from the subsurface trench system is discharged back to the burn pond. In August 1996 Fina requested that KDHE permit the construction of an extension of the northwestern end of the subsurface interceptor trench at the Site to replace the existing open interceptor trench. The open trench is subject to flooding by the West Branch Walnut River and has overflowed on several occasions, releasing wastes into the river. KDHE approved the interim measure and the trench extension has been completed. While the OU1 ROD and the first ESD alluded to the trench and its use in the bioremediation/soil flushing portion of the remedy, it did not contain any explanation of the operation and maintenance or closure requirements for the trench system; this ESD will also address those requirements.

In December 1993 KDHE and FINA entered into a Consent Order to conduct Remedial Investigation/Feasibility Study activities for the Ground Water Operable Unit (OU2) of the Site. The remedy selection process for OU2 is being addressed under a separate Proposed Plan. The OU2 Proposed Plan will be issued for public review and comment concurrent with this ESD.

3.0 DESCRIPTION OF SIGNIFICANT DIFFERENCES AND THE BASIS FOR THOSE DIFFERENCES

The 1992 ROD and ESD for OU1 specified the removal, treatment, and disposal of sludge from the ponds and the subsequent *in situ* flushing and bioremediation of the contaminated soil left in the ponds. The *in situ* flushing and bioremediation was to consist of filling the ponds with water, capturing effluent from the ponds in the subsurface interceptor trench, treatment of the effluent from the interceptor trench, and reintroduction of the treated water to the ponds in a continuous recirculation process. The treatment process was to include oil/water separation and

filtration followed by chemical conditioning and aeration in a tank to enhance biological activity prior to returning the treated water to the ponds. Aeration was also to be provided to the ponds via perforated pipes placed on the bottoms of the ponds to enhance the rate and efficacy of biodegradation of organic contaminants.

In the Remedial Design stage for the *in situ* flushing and bioremediation phase of the project, KDHE and FINA concluded that aeration of the subsurface interceptor trench effluent in a tank would result in minimal enhancement of the biodegradation process, since the rate at which the trench is pumped is insignificant relative to the volume of water contained in the ponds. FINA also felt that the use of perforated pipes in the ponds to provide aeration to the bioremediation system would have limited benefit in enhancing the performance of the system relative to the capital and operation and maintenance costs. FINA initially performed a pilot-scale bioremediation treatability study in the northern half of one of the ponds (the "Storm Pond"); the northern half of the pond was separated from the southern half with an anchored diversion curtain. The pilot study consisted of installing and operating one 75-horsepower surface aerator and four 20-horsepower aspirating mixers in the pond, periodically adjusting the mixture of nutrient and other additives, and collecting verification samples of the soil and water to monitor the performance of the system. FINA demonstrated that the surface aerator was most effective at aerating the pond and stimulating microbial activity, and subsequently replaced the four aspirating mixers with seven additional surface aerators to bring the pilot study portion of the site to full operational status. As presently constructed, the *in situ* flushing/bioremediation operation now consists of extracting effluent from the underground interceptor trench, oil/water separation and mechanical filtration of the effluent, and discharge of the treated water back to the ponds for recirculation. The contaminated soils are undergoing aeration and enhanced biodegradation in the northern half of one of the ponds. FINA has estimated that a total of 3,300 cubic yards of solid organic contaminants out of an estimated total of 18,870 cubic yards for the entire Site have been biodegraded in the pilot system to date. While the nature of the *in situ* flushing/bioremediation system is consistent with the ROD, aeration of the contaminated material is being performed via surface aerators in the treatment area rather than in the trench effluent treatment train and via perforated pipes in the ponds as originally described in the ROD. KDHE believes that this modification is appropriate, essentially consistent with the intent of the ROD, and will optimize the performance of the remedy.

FINA had intended to expand the enhanced biodegradation operation to encompass the entire Site, but has since concluded that feeding the contaminated soil into the existing treatment area in the Storm Pond will optimize performance and be more cost-effective. Toward that end, FINA has submitted a proposal to modify the bioremediation system from its pilot batch operation to a full-scale system by implementing a continuous feed bioreactor system. This modification will require using the southern half of the storm pond and the northern half of the adjacent Burn Pond as holding areas for the stained soils requiring treatment. The change from a batch to a continuous system is expected to increase the rate of the bioremediation by giving the microbes a more consistent and well-mixed environment of nutrients and organic contaminants that will reduce the possibility of creating a toxic environment and will maximize remedial activity.

FINA will transfer the stained soil from the southern half of the Site to the ponds on the north half and feed the stained soil into the treatment area in the Storm Pond on a daily basis. After dredging the contaminated soils out of the south half of the Site and performing a final cleaning to remove residues from the dikes, sidewalls, and bases of the impoundments, FINA will perform sampling to verify that the cleanup goal for soil has been achieved in that area and will initiate closure activities. Treatment will continue in the north half of the Storm Pond until the cleanup goal has been achieved throughout the remainder of the ponds, at which point that portion of the Site will also be closed. If EPA and KDHE determine on the basis of performance that the carcinogenic PAHs cannot be effectively biodegraded to meet the remediation goal, the reduced volume of contaminated material remaining in the ponds may be transported off site and disposed of as hazardous waste in compliance with RCRA. KDHE has approved the proposal, and the transfer of contaminated soils from the south half of the ponds to the north half is under way. Consolidation of these soils does not trigger any RCRA land-ban requirements, given that the entire impoundment as well as the trench and connecting areas constitute a single "Area of Contamination" or "AOC", as previously stated in a letter from EPA to KDHE dated October 17, 1997.

Upon successful remediation of the ponds and surrounding soil, final closure for the ponds on site will consist of collapsing the dikes, regrading the site to promote drainage to the river, revegetating the site, and periodic maintenance and inspection of the vegetative cover. The grading will be designed to function with minimum maintenance, promote drainage, and minimize erosion and abrasion of the vegetative cover. The vegetative cover will be inspected during quarterly sampling events for the first two years and semi-annually thereafter to verify that the vegetative cover is complete and intact and has been maintained, and repairs will be made as necessary to correct the effects of settling, subsidence, erosion, and other events.

The subsurface interceptor trench was incorporated into the OU1 remedy to extract seepage from the ponds and maintain hydraulic control, preventing the discharge of separate-phase hydrocarbons and dissolved-phase contaminants into the adjacent river while simultaneously maintaining the water level in the aqueous bioremediation system. Treatment of the trench effluent prior to reintroduction of the effluent to the ponds also serves to reduce the mass of contaminants in the ponds and seepage through oil/water separation and filtration. Oil recovered from the trench and the oil/water separator will either be recycled in accordance with 40 C.F.R. Section 261.4(a)(12) or will be manifested, transported, and disposed of in accordance with RCRA. Filtrate from the treatment system will manifested, transported, and disposed of as hazardous waste in accordance with RCRA. While the bioremediation system is active in the ponds, the subsurface interceptor trench will be periodically washed with surfactant to remove hydrocarbon residues; liquids generated by the washing will be redirected to the ponds for bioremediation.

The interceptor trench will operate for a period after closure of the ponds to capture any seepage in transit between the ponds and the trench. Periodic monitoring of the treatment system influent and effluent will be conducted to gauge the effectiveness of the *in situ* soil flushing/

bioremediation remedy and the trench effluent treatment system. After monitoring and visual observation of the trench contents have verified to the satisfaction of EPA and KDHE that the residues of the soil flushing operation have been effectively captured and removed by the trench, the interceptor trench will be decommissioned. Closure of the trench will include removing the interceptor trench pump and the treatment equipment, cleansing the trench as practicable to remove any buildup of residues, proper disposal of residuals generated by the cleansing operation, and, finally, filling the manholes with concrete, entombing the trench in place.

The treated effluent from the trench is returned currently to the ponds. The ponds may periodically require some dewatering to maintain freeboard on the dikes, and the trench effluent will need to be redirected for disposal after closure of the ponds. FINA has the option of discharging the effluent on site to the West Branch Walnut River in compliance with the substantive requirements of the National Pollutant Discharge Elimination System (NPDES), or off site through an existing NPDES permit. Currently, the applicable water quality standards for discharges to surface water in Kansas are governed by 40 CFR Part 131 *et seq.* and by state requirements consistent with the Clean Water Act. The ARAR for surface water discharge of arsenic at the site is given by 40 CFR Part 131.36. Other methods of disposal that are compliant with ARARs (on site), or applicable laws and regulations (off site), may also be acceptable subject to KDHE and EPA review.

As required by CERCLA, reviews of the remedial action must be conducted by KDHE and EPA at least every five years after the initiation of the remedial action to verify that human health and the environment are being protected by the remedial action. For sites with multiple operable units, one five-year review will be conducted for the combined operable units; consequently, the first five-year review for OU1 and OU2 of the Site will be conducted no later than five years from the initiation of the remedial action for OU1, and an additional five-year review will be conducted at least every five years thereafter until KDHE and EPA certify that the cleanup is completed. The five-year review would continue as long as ground water monitoring indicates that hazardous substances remain on site in the alluvial and upper bedrock aquifers

4.0 SUPPORT AGENCY COMMENTS

The EPA and KDHE support the selected remedy.

5.0 AFFIRMATION OF THE STATUTORY DETERMINATIONS

This ESD describes some modifications to the soil flushing/bioremediation aspect of the OU1 remedy and elaborates on some of the aspects of the remedy that were not presented in sufficient detail in the original ROD and ESD for OU1. Considering the new information that has been developed and the modifications that have been made to the selected remedy, KDHE and EPA believe that the remedy remains protective of human health and the environment, complies with

Federal and State requirements that were identified in the ROD and this ESD as applicable or relevant and appropriate to this remedial action at the time this ESD was signed, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and innovative treatment technologies to the maximum extent practicable for this Site.

6.0 PUBLIC PARTICIPATION ACTIVITIES

This ESD document summarizes information that can be found in greater detail in the OU1 RI/FS and RD/RA reports and other documents located in the Administrative Record file for the Site. KDHE and EPA encourage the public to review these documents in order to know more about the Site and the Superfund activities that have taken place at the Site. The Administrative Record file is available for review at the locations listed in Section 1.0 of this ESD.

The public is invited to review and comment on this Explanation of Significant Differences for OU1 of the Pester Refinery Co. Site. A notice of the availability of this ESD, the OU2 Proposed Plan and the Administrative Record file for public review and comment will be placed in the El Dorado newspaper, the *El Dorado Times*. The public comment period for this ESD and the OU2 Proposed Plan will last for 30 days following the publication of the public notice in the *El Dorado Times*. During the public comment period, written comments may be submitted to:

Kurt Limesand
Kansas Department of Health and Environment
Bureau of Environmental Remediation
Forbes Field, Building 740
Topeka, Kansas 66620-0001
Telephone (913) 296-1671

In addition, oral and written comments on this ESD and the OU2 Proposed Plan will be accepted at a public meeting which will be held on September 2, 1998 at 6 P.M. at the Bradford Memorial Library in El Dorado, Kansas. KDHE and EPA will review the comments and respond to them before finalizing the ESD, and may make changes in the document in response to the comments received during the comment period.