



Minnesota Pollution Control Agency

February 24, 1998

Mr. Mitchell Brouman
Beazer East, Inc.,
436 Seventh Avenue
Pittsburgh, Pennsylvania 15219-1822

Ground Water & Solid Waste Division
Site Response Section

Site Name

Category

Subcategory

Initials

RE: February 1998 Explanation of Significant Difference for the Koppers Coke Site
St. Paul, Minnesota

Dear Mr. Brouman:

Enclosed is copy of the Minnesota Pollution Control Agency February 1998 Explanation of Significant Difference (ESD) for the Koppers Coke site (Site). The ESD explains changes to the April 21, 1994, Record of Decision. No comments to the proposed changes were received during the open comment period. Therefore, the remedy has been changed to include a more integrated approach consisting of source reduction by continuation of in-situ bioremediation in the immediate vicinity of the Phase I pilot system, natural attenuation, and institutional controls.

If you have any questions regarding the enclosed ESD, please contact me at (612) 296-7813.

Sincerely,

Brenda Winkler
Project Manager
Response Unit 1
Site Response Section
Ground Water and Solid Waste Division

BW:ch

Enclosure

cc: Kurt Geiser, Remediation Technologies Inc.

February 1998
Explanation of Significant Differences
for the April 21, 1994, Record of Decision
Koppers Coke Site
St. Paul, Minnesota

Introduction

The Koppers Coke site (Site) is located in St. Paul, Ramsey County, Minnesota. The Site is triangular in shape and includes an approximately 38 acre track of land in Section 27, T29N, R23W, located west of Lexington Parkway and south of Energy Lane, in the Midway Area/Energy Park District of St. Paul. The location of the Site is shown in Figure 1.

The Site is currently in the U.S. Environmental Protection Agency (EPA) Enforcement Deferral Pilot Project which gives the Minnesota Pollution Control Agency (MPCA) the lead agency responsibility for the Site. The MPCA is overseeing the Site cleanup conducted by Beazer East.

The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the 1986 Superfund Amendments and Reauthorization Act (SARA) states, at Section 117 (c), that:

[a]fter adoption of a final remedial action plan--

- (1) if any remedial action is taken,
- (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 an explanation of the significant differences and the reasons such changes were made.

The April 21, 1994, Record of Decision (ROD) calls for in-situ bioremediation of the ground water and stipulates that the ground water remedy be implemented in a phased approach as follows:

- Pre-design laboratory and field work (monitoring well decommissioning and replacement, LNAPL investigation, soil and ground water characterization, microbial characterization, bench scale nutrient study, and slurry/respirometry study);
- Phase 1 Remedial Design/Remedial Action (RD/RA) (ground water pilot study); and
- Phase 2 RD/RA (full scale ground water treatment system)

The predesign activities were completed in July 1994 and the Phase I RD/RA was completed in February 1997. Following the Phase I RD/RA an evaluation of the nature and extent of the ground water plume migrating off site indicated that the contaminant plume generated from the Site was stable. Ground water monitoring parameters were enhanced to evaluate whether natural attenuation would be an effective component in remediating the plume. Evaluation of the data as presented in the Phase II RD/RA Work Plan (May 5, 1997) indicates that natural attenuation may be an effective mechanism in the development of a cost-effective ground water corrective action strategy for the Site. The scope of the Phase II RD/RA was altered to include an integrated Site remedy consisting of source reduction by continuation of in-situ bioremediation in the immediate vicinity of the Phase I pilot system, natural attenuation, and institutional controls as approved in the Phase II RD/RA Work Plan (May 5, 1997).

This Explanation of Significant Differences (ESD) will become part of the permanent Administrative Record file for the Site, and will be kept at the repository which is available for public inspection. The repository is located at:

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

If you need further information, you may contact the Site Project Manager, Brenda Winkler, of the Site Response Section at (612) 296-7813. For commenting please refer to the section on Public Participation Activities.

Summary of Site History and Contamination Problems

The Koppers Company, Inc. (Koppers) operated a coking facility (Facility) at the Site from 1917 to 1979. In 1988, Koppers was acquired by BNS, Inc. (BNS), a Delaware Corporation. BNS is a wholly owned subsidiary of Beazer PLC. In 1989, Koppers name was changed to Beazer Materials and Services, Inc. In 1990, Beazer Material and Services, Inc. name was changed to Beazer East, Inc. (Beazer). Beazer is the Responsible Party (RP) for the cleanup of the Site.

The Facility operated 24 hours per day seven days per week producing foundry coke and various by-products such as coal tars and coal tar distillates (creosote and pitch), various oils and greases, and liquid and semi-solid wastes. The Site investigations identified the primary source areas where the storage of by-products and wastes, and releases occurred at the Facility. The storage and disposal practices along with the dumping of wastes on the land surface and various leaks and spills resulted in contamination of both soil and ground water. The primary contaminants detected as a result of this contamination include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polynuclear aromatic hydrocarbons (PAHs), metals, and cyanide compounds.

✓ On February 1, 1977, and May 2, 1978, Koppers and the MPCA entered into Stipulation Agreements (Agreements) in order to correct air quality problems and investigate contamination at the Facility. Koppers decided to cease operations at the Facility and demolish the structures rather than make costly investments in air pollution control equipment as required in the February 1, 1977, Agreement. The May 2, 1978, Agreement required Koppers to investigate the extent and magnitude of soil and ground water contamination at the Site. Investigation, demolition, and soil remedial activities began. In October 1982, the St. Paul Port Authority purchased the Site for redevelopment.

On July 30, 1982, the Site received Hazardous Ranking System (HRS) score of 55. In September 1983 the Site was placed on the National Priority List, and the State Permanent list of Priorities in October 1984.

On March 25, 1986, the MPCA Citizen's Board issued a Request for Response Action (RFRA) to Koppers to conduct a Remedial Investigation/Feasibility Study (RI/FS) and implementation of a RD/RA Plan regarding contamination at the Site. The RFRA described a series of actions necessary to further evaluate the ground water contamination and to gather information in order to identify, assess, select, design, and implement response actions. Although soil remediation was conducted during the demolition and redevelopment of the property, the RFRA recognized the necessity for limited actions to gather additional information on contaminated soils at the Site.

On April 21, 1994, the MPCA issued a ROD presenting the selected remedial action for Operable Unit 1 (OU1): ground water (presented below). The remedy was selected based on the current and proposed future land use for the Site which will remain commercial land use. Additional investigations for the Soil (OU2), were also required as part of the implementation of the ground water remedial action. Based on the outcome of these investigations, a ROD for OU2 was determined not to be necessary. This decision was documented in an MPCA letter to Beazer on August 6, 1996.

Selected Remedy

The following is the description of the selected remedy as presented in the April 21, 1994, ROD (referenced tables and figures are not included but can be found in the ROD):

The remedy selected to remediate ground water contamination at the former Koppers Coke facility is Alternative 12M, as previously discussed. The RP shall implement this remedy in a phased approach as follows:

- *Pre-design laboratory and field work (monitoring well decommissioning and replacement, LNAPL investigation, soil and ground water characterization, microbial characterization, bench scale nutrient study, and slurry/respirometry study);*
- *Phase 1 RD/RA (ground water pilot study); and*
- *Phase 2 RD/RA (full scale ground water treatment system)*

The purpose of this phased approach is to optimize the final remedial design. The laboratory and field studies shall be conducted by the RP, as approved by the MPCA staff, to determine if addition of nutrients is necessary and, if so, the types and loading rates required to promote in-situ bioremediation. The RP shall obtain variances, if necessary, from MPCA and the Minnesota Department of Health (MDH) if nutrient addition is required. The final system design will be dependent on the MPCA staff's review of the results of pre-design laboratory and field work, and pilot study. As part of the full scale ground water treatment system, the RP shall install approximately 45 injection wells to deliver oxygen and, if necessary, nutrients to the surficial glacial aquifer to promote the biological breakdown of contaminants. The injection wells shall be placed in systematic arrays throughout the Site in areas where the MPCA staff determines that contamination is highest. Additionally, the RP shall place injection wells at the downgradient edge of the Site that will provide a zone of enhanced biological activity to ensure that contaminants do not migrate off-Site. Figure 2 shows the tentative locations for the injection wells. The RP shall deliver oxygen to the aquifer using sparging techniques. The MPCA staff will review performance monitoring data to determine if this alternative by itself is preventing contaminants from moving off-Site at concentrations exceeding the cleanup levels. If the MPCA staff determine that the performance monitoring data shows that this alternative is not adequate and ground water extraction is necessary, the RP shall implement, as approved by the MPCA staff, ground water extraction, treatment, and discharge options, similar to those in Alternatives 13, 14, and 15.

Table 3, Ground Water COIs and Cleanup Levels, presents the remediation levels to be attained by the ground water treatment system. The remediation levels for individual contaminants are based on the federal MCLs or the MDH criteria, HRLs or RALs. For contaminants that have both a HRL and RAL, the HRL shall be used. Water quality cleanup levels will be consistent with MCLs and HRLs/RALs, whichever is lower for a specific contaminant. Additionally, any discharge to storm or sanitary sewers will require compliance with NPDES permit conditions or MWCC pretreatment levels, respectively. The RP shall monitor ground water quality for a minimum of four years beyond the final termination of operation of this system. The RP shall resume system operation if ground water quality is found not to comply with the remediation levels for ground water.

The estimated capital cost of the selected remedy is \$1,565,880. The annual operating and maintenance costs are estimated to be \$135,762 over a six-year period. The estimated net present-worth cost of this alternative is \$2,255,000. These costs are broken down in Table 6. The RP shall take responsibility for all costs associated with implementation of this alternative.

The selected remedy is intended to incorporate flexibility in its implementation so that the best and most cost-effective means of achieving the remediation levels is used. Because of this, changes to the remedy may occur during its implementation, based on remedial design, construction processes, and monitoring data. No changes shall be made without MPCA staff approval. If the MPCA staff determines that the selected remedy is not reducing contaminant concentrations, within two full years of full scale implementation, as indicated by ground water quality data, the MPCA staff will re-evaluate the selected remedy against other remedial options. In addition, if biodegradation rates fall to asymptotic levels and contaminant concentrations continue to exceed MCL, HRL, or RAL standards, the MPCA staff will re-evaluate the selected remedy and consider implementation of one of the following alternatives:

- Continuation of the bioremediation effort without changes;*
- Stimulation of the microbial population through the addition of an alternative microbial energy source, thereby enabling further reduction of the contaminants through biodegradation;*
- Reconsideration of bioremediation as the selected remedy.*

Finally, if within two to five years, the ground water quality data indicate that the selected remedy is not preventing off-site migration of contaminated ground water, the RP shall install a ground water extraction system to meet this objective. The RP shall evaluate and propose the ground water extraction, treatment and disposal options as described in Alternatives 13, 14, and 15, to determine the best ground water alternative method for disposing the water. The RP shall implement an MPCA approved ground water treatment system.

Current efforts have not identified any additional users of ground water potential impacted by the Site. However, the MDH is evaluating whether the such users may exist. The RPs shall assist MDH in their efforts to identify all users that may be impacted by Site releases. The RPs shall identify the use and sample all wells identified in the well, search that may be impacted by the Site. Based on the results of the sampling the MDH will determine whether actions are necessary to prevent exposure above health based limits and notify well owners of their exposure. If necessary, the RPs shall implement actions as directed by the MDH such as abandonment of the well and implementation of an alternative water supply such as city hookup. Since at this time it has been determined that well water in the area is not used for drinking purposes, the only potential human exposure to contaminated ground water would be through the use of nonpotable water for watering lawns and gardens.

Description of Significant Differences and the Basis for those Differences

In the period since the ROD was signed, the EPA and the MPCA have advanced initiatives that support the consideration of natural attenuation mechanisms in the development of cost-effective ground water corrective action strategies. Natural attenuation is recognized as the sum of the naturally occurring attenuation mechanisms (biodegradation, sorption, dilution, dispersion, and volatilization) that result in the reduction of organic chemical in the ground water environment. A number of technical groups, including the EPA National Research Council (NRC), the American Society for Testing Materials (ASTM), and the Air Force Center for Environmental Excellence have developed guidance for demonstrating natural attenuation. The primary lines of evidence for demonstrating natural attenuation include: monitoring data showing stable or declining concentrations of the compounds of concern (COC) in ground water, direct microbiological evidence of natural attenuation from laboratory treatability or field pilot studies, and a relationship between ground water geochemical parameters and COC concentrations.

The data discussed in the Phase II RD/RA Work Plan (May 5, 1997) demonstrates that natural attenuation is limiting the transport of the dissolved COCs at the Site and, consequently, is an appropriate component of the final Site remedy. The predesign laboratory treatability studies and the Pilot Study have focused on evaluations in-situ biodegradation and have shown that indigenous subsurface microbial populations are capable of degrading COCs when oxygen is available. Ground water monitoring data has shown a significant decreased in dissolved COCs in most areas of the Site indicating that natural attenuation mechanisms are causing the area of impacted ground water to shrink or remain static.

The MPCA will work cooperatively with the Minnesota Department of Health (MDH) to establish institutional controls as an additional component of the Site remedy to limit future use of ground water on and downgradient of the Site. Institutional controls will limit future use of ground water from the property by placing deed notifications/restrictions prohibiting the installation of ground water extraction wells on the Site and; control the installation of ground water wells on the Site and downgradient of the Site by establishing a Special Well Construction Area through MDH.

On the basis of the data stated above, the original Site remedy identified in the ROD, Alternative 12M, has been changed to include a more integrated approach to remediation consisting of source reduction on Site by continuation of in-situ bioremediation in the immediate vicinity of the Phase I pilot system, natural attenuation, and institutional controls. Using this integrated remedy is expected to substantially reduce Site remediation costs by approximately \$1,000,000.

Table 3 of the ROD specified ground water cleanup levels for all COCs identified for the site. The cleanup levels were established consistent with the maximum contaminant levels (MCLs), health risk limits/recommended allowable limits (HRLs/RALs), whichever was lower for the specific contaminant. Since the ROD, the RALs have been eliminated by MDH as ground water standards in lieu of the HRLs. The MCLs, which were established by EPA as maximum permissible level of a contaminant in water delivered to any user of a public water system, are not considered appropriate cleanup standards because there are no public water systems downgradient of the Site. Therefore, the HRLs, as presented in Table 3 of the ROD, will be adapted as the cleanup standards for ground water at the Site. The cleanup standard for naphthalene shall also be based on the HRL, 300 micrograms per liter ($\mu\text{g/L}$), which was established by MDH after the production of the ROD.

Affirmation of Statutory Determinations

Considering the new information that has been developed and the changes that have been made to the selected remedy, the MPCA believes that the remedy remains protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this Site.

Public Participation Activities

A public comment period for the Proposed Plan was held from November 30, 1993, to December 31, 1993. In addition, an availability session was held on December 16, 1993. No one attended this session. The ROD was issued on April 21, 1994.

The notice of changes was published in the St. Paul Pioneer Press on January 18, 1998, and in the Midway Como Monitor on February 12, 1998. Comments were accepted through February 18, 1998. No comments were received.