

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
STATE HOUSE STATION 17 AUGUSTA, MAINE 04333

DEPARTMENT ORDER

IN THE MATTER OF

DRAGON PRODUCTS COMPANY ) SOLID WASTE  
THOMASTON, KNOX COUNTY, MAINE ) SCHEDULE OF COMPLIANCE

This schedule of compliance is established pursuant to 38 M.R.S.A. Section 1310-N(6).

Based on a review of Department file materials, correspondence, and other relevant data, the Department FINDS THE FOLLOWING FACTS:

1. Dragon Products Company (Dragon) is located on the south side of Route #1 in Thomaston, Maine. Dragon manufactures Portland cement at its facility. Until 2004, Dragon manufactured portland cement using a "wet" process. In 2004, Dragon underwent a plant upgrade, which changed their manufacturing process from a "wet" process to a "dry" process. The cement manufacturing process starts with raw ingredients that include limestone, sand and iron ore. The raw materials are analyzed and blended in the proper proportion. The raw materials are then ground into a powder. These raw materials are then sent to a kiln where they are heated to temperatures that exceed 2700 degrees Fahrenheit. The high temperatures convert the calcium and silicon oxides into calcium silicates, which are the primary constituents of portland cement. The raw materials emerge from the kiln as clinker. The clinker is then interground with gypsum to form cement. Heat within the kiln runs counter to the flow of the feedstock. Material blown back with the heat currents is captured in the kiln air pollution control device (kiln baghouse). This material is known as cement kiln dust (CKD). Previously, clinker that did not meet strict quality control specification (such as strength, color and chemical composition) was removed from the process and stockpiled. This material is known as "waste clinker". Prior to 1996, all CKD captured in the kiln baghouse was removed from the process and stockpiled. Current changes in processes and installation of new equipment have eliminated the generation of new waste clinker and substantially reduced the generation of stockpiled CKD. This is described further in the subsequent paragraphs. Department records indicate that the site has been used for the manufacture of cement since as early as 1927.
2. The two stockpiles referred to in Paragraph 1, consist of one stockpile of cement kiln dust and one stockpile of waste clinker material mixed with other waste materials including waste cement, refractory and coating material, limestone and rock, and coal.

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3. The waste clinker stockpile is located on the east side of the facility site and is approximately 12 acres in size. According to Department records this area was used as a disposal site for waste clinker material as early as the 1927 when the first cement plant was constructed at the site. Dragon estimates that approximately 317,748 tons of waste clinker material and other waste materials were disposed in the area. Currently, leachate is collected within a constructed lagoon located on the southern side of the stockpile and is subsequently pumped via a piping system to Quarry #4. According to Dragon, no new waste materials have been disposed in this area for at least five years and the area will not be used in the future for disposal. To date the disposal area has not received any type of intermediate or final cover.
4. The CKD stockpile is approximately 15 acres in size and contains an estimated 845,000 tons of material. Prior to 1969, Dragon discharged CKD directly to the atmosphere. CKD is a very fine granular waste product that is generated as part of cement production. In 1969 and 1970 the facility installed a fabric filtration system for capturing airborne CKD. With the collection of CKD in the early 1970's the facility began stockpiling CKD on the western end of the site in and adjacent to Quarry #4. Leachate from the CKD stockpile is presently conveyed into Quarry #4.

In 1997, Dragon installed a dust scoop system to recycle material captured in the dust collection equipment back into the kiln. As shown below, the dust scoops have significantly reduced the amount of CKD that is stockpiled at the site. After calculating for reuse, the following annual tonnages were deposited into the CKD stockpile. Negative tonnages (noted in parentheses) indicate that the CKD was removed and recycled from the stockpile resulting in a net loss from the stockpile.

- 1995 - 65,048 Ton;
- 1996 - 49,054 tons
- 1997 - 542 tons;
- 1998 - (-701) tons;
- 1999 - (-8,061) tons;
- 2000 - (-3,831) tons
- 2001 - (-7,506) tons;
- 2002 - (-10,119) tons;
- 2003 - (-6,737) tons; and
- 2004 - (-4,243) tons

6. Since initiation of discussions with the Department and adoption of 06-096 CMR Chapter 418, Dragon has beneficially reused significant quantities of CKD. Dragon continues to diversify their beneficial use outlets in hopes of continuing this activity over the long-term. Current reuses for CKD include: incorporating waste dust back into Dragon's cement manufacturing process; a drying agent in processing oil contaminated soil; a

mineral binder in asphalt production; a component of flowable fill; and as an agricultural liming agent.

7. In 1996, Dragon upgraded the conveyance and piping system for transporting and reusing leachate from the waste clinker and CKD stockpiles and domestic facility wastewater. This project was undertaken in cooperation with the Department with the objective of retiring Dragon's wastewater license. Waste clinker leachate and facility wastewater is transported by pumps and piping to Quarry #4. Quarry #4 also receives leachate from the CKD stockpile. Quarry #4 flows (includes CKD & waste clinker leachate and facility wastewater) are pumped back to the facility mill at a rate of 80 gallons per minute and are reintroduced into the process. The remainder of the leachate and wastewater remains in Quarry #4. Since upgrading to a "dry" process, Dragon continues to utilize this leachate in the raw mill in addition to using it for gas conditioning. Dragon is storing any excess leachate in basins if necessary. Dragon will be developing a leachate management plan to identify methods for the adequate disposal of the leachate and will include an estimate of leachate generated by the stockpiles.
  
8. On December 31, 1991 Dragon submitted two special waste disposal facility license applications to the Department for review and approval. One for the waste clinker storage area and one for the CKD storage area. The applications were accepted for processing on February 4, 1992. The applications included hydrogeologic information for groundwater, surface water, and leachate monitoring locations around both stockpiles. The groundwater monitoring locations included four well clusters around the waste clinker stockpile and three well clusters around the CKD stockpile. Since that time, the Department has approved the removal of monitoring points B1a and C2a from the monitoring program. These monitoring points were considered poor sampling points due to their screen's location within silty clay material. Surface water samples are collected, one within the unnamed stream east of the waste clinker stockpile and the other at the outlet of the settling pond. Leachate samples are collected from the lagoon and Quarry #4. Groundwater, surface water and leachate samples are collected by Dragon facility staff twice per year and are analyzed for temperature, pH, specific conductance, turbidity, dissolved oxygen, sulfate, sodium, chloride, potassium, calcium, iron, manganese, total dissolved solids, bicarbonate, magnesium, and carbonate at high pH.

In the summer of 1998, Dragon installed a down gradient bedrock monitoring well adjacent to the B1 cluster on the southwest side of the CKD stockpile. In October of 1998, Department staff assisted Dragon in performing low-flow sampling for monitoring wells surrounding the CKD stockpile. Since 1990, analytical ground water monitoring data has been submitted to the Department. The Department has determined that data collected to date shows groundwater contamination at monitoring well B2. The groundwater quality at this well has deteriorated since 1998. Dragon initiated Assessment Monitoring at well B2 with the October 2004 monitoring round. Historical data and data collected during the first two rounds of Assessment Monitoring will be evaluated. If it is determined that a statistically significant change has occurred indicating contamination of groundwater, Dragon will be required to submit a Corrective

Action Plan for Department review and approval within 90 days. A final draft of the Environmental Monitoring Plan (EMP), which incorporates changes requested by the Department in a memorandum from Richard Heath, MDEP Project Geologist, dated August 12, 2003, and required changes due to the initiation of Assessment Monitoring, will be submitted for Department review and approval as described in required Action #1 of this Schedule.

9. Dragon proposes to submit the following information including:

A. **OPERATIONS MANUAL** The revised operations manual will include information such as: methods of access control; waste exclusion methods; listing of acceptable and unacceptable wastes; requirements for the supervision of operations; areas designated for the unloading of waste; types of equipment used; methods for controlling dust; and types of operational records to maintain and provisions for periodic inspections. An operations manual was provided with the licensing application submitted on December 31, 1991. The Department received a revision to the initial 1991 operations manual from Dragon on October 25, 1999. Department approval of the 1999 operations manual is currently pending. Once approved, the revised operations manual will supersede the 1991 operations manual.

B. **ENVIRONMENTAL MONITORING PROGRAM** The EMP includes a sampling and analytical plan with data validation/verification for both ground and surface water surrounding and underlying the CKD and waste clinker stockpiles. The Department has conceptually approved the EMP and the Department is awaiting final draft submittal from Dragon. This final draft must include changes requested by the Department in a memorandum from Richard Heath, MDEP Project Geologist, dated August 12, 2003, and changes required due to the initiation of Assessment Monitoring.

C. **LEACHATE MANAGEMENT PLAN** As noted above, leachate generated from the CKD and waste clinker stockpiles in addition to facility domestic wastewater is collected and transported to Quarry #4. It is not known whether there is sufficient capacity within the quarry to contain the maximum expected leachate and wastewater flows under all environmental conditions. Subsequently, Dragon will be providing water balance information and procedures for the adequate management of leachate and wastewater. Capacity estimates will include the addition of wastewater into Quarry #4.

D. **ACTIVE PHASE DEVELOPMENT PLAN** Dragon will be providing a conceptual active phase development plan, which will describe the scheme of development for the waste clinker and CKD stockpiles. Active areas will be kept open for temporary stockpiling and eventual reuse as necessary. The plan will include information for minimizing the total active area based on anticipated reuse plans. The plan will include sufficient information to assure that the active

area will have adequate controls for managing surface water and leachate, establishing and maintaining erosion control structures, maintaining stockpile stability,, and establishing other pertinent operational controls as needed.

10. Dragon intends to study the feasibility of reincorporating previously stockpiled waste clinker and CKD back into the cement-making process. Dragon has proposed to use a total of 5,000 tons of CKD during this trial, which began in June 2004. Additionally, Dragon intends to use a total of 10,000 tons of waste clinker during the trial. At the end of this trial, Dragon will assess the feasibility of reusing these wastes in the "dry" cement-making process.
11. Dragon has submitted for Department review and approval a plan for placing intermediate cover on the CKD stockpile during the summer of 2005. The plan proposes to cover all but the active portion of the pile where material is being removed for reuse. This active portion would total approximately 4 acres. The Department is currently reviewing this proposal.
12. The above-described stockpiles operated by Dragon are unlicensed solid waste facilities subject to the provisions of 38 M.R.S.A. Section 1310-N(6). 38 M.R.S.A. Section 1310-N(6) states in relevant part:

**Terms and compliance schedules.** Except as provided in subsection 6-D, licenses are issued under terms and conditions the department prescribes, and for a term not to exceed 5 years. The Department may establish reasonable time schedules for compliance with this article and rules adopted by the Board.

Based on the Findings of Fact set forth above, and pursuant to 38 M.R.S.A. Section 1310-N(6), the Department requires the following ACTIONS to be taken by Dragon:

1. Within 120 days, Dragon shall submit the information required by items 9A through 9D above to the Department for review and approval. The information shall include a revised operations manual, a revised environmental plan, a leachate management plan, and an active phase development plan.
2. By August 31, 2005, Dragon shall conclude its feasibility study for the reuse of 5,000 tons of CKD and 10,000 tons of waste clinker back into the cement-making process.
3. Within 60 days of the conclusion of the feasibility study mentioned in #2 above, Dragon shall submit to the Department for review and approval a report detailing the findings of the study.
4. If it is found that the use of previously stockpiled waste clinker in the "dry" process is not feasible, Dragon shall submit for Department review and approval a final closure plan for the waste clinker area within 210 days of the conclusion of the feasibility study mentioned in #2 above. However, if it is found that the use of previously stockpiled

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waste clinker in the "dry" process is feasible, Dragon shall submit for Department review and approval a schedule for the reuse of waste clinker within 120 days of the conclusion of the feasibility study mentioned in #2 above. This schedule shall include provisions for covering all inactive portions of the waste clinker area. Within 210 days of the conclusion of reuse of waste clinker, Dragon shall submit for Department review and approval a final closure plan for the waste clinker area.

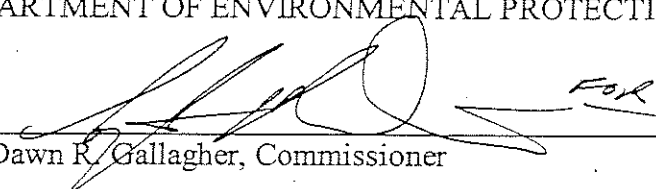
5. Within 120 days of the conclusion of the feasibility study mentioned in #2 above, submit for Department review and approval a schedule for the reuse of previously stockpiled CKD.
6. Within 30 days of the Department's approval of the intermediate closure plan for the CKD stockpile, Dragon will submit a proposed implementation plan to the Department for approval. In reviewing the implementation plan, the Department will allow flexibility to account for construction season scheduling and contractor availability. The Department will also provide for necessary modifications to the implementation schedule due to circumstances such as weather conditions that are outside of Dragon's control.
7. Dragon shall submit an annual report on October 31 of each year, documenting compliance with each of the items in Paragraph 9 above.
8. Notwithstanding any other provision of this agreement, Dragon shall immediately close in accordance with Department regulations, all portions of the stockpiles if the commissioner finds that continued operation of the stockpiles poses an immediate hazard to the public health or the environment, including, without limitation, a threat to a public or private water supply.

DONE AND DATED AT AUGUSTA, MAINE, THIS 22<sup>nd</sup> DAY

OF June, 2005.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY:

  
Dawn R. Gallagher, Commissioner

Date filed with Board of Environmental Protection:

This Schedule prepared by Carla J. Hopkins, Bureau of Remediation & Waste Management.