APPENDIX G

ICF
CONSULTING GROUP

ICF Incorporated
9300 Lee Highway
Fairfax, VA 22031-1207
703/934-3000 Fax 703/934-9740

June 5, 1996

MEMORANDUM

To: Bill Kline, EPA

From: Raghu Raghavan, Mario Kerby, and Jim Laurenson

Subject: Completeness of FMC Corporation's Request for Two-Year National Capacity Variance from the Phase IV Land Disposal Restrictions

---

This memorandum summarizes our preliminary assessment of the completeness of the request made by FMC Corporation (FMC) for a two-year national capacity variance (NCV) from the Phase IV LDRs for the company's elemental phosphorus mineral processing wastes. FMC made this request as part of its comments on the Supplemental Proposal to Phase IV LDRs (Comment # 70, submitted on April 24, 1996). Briefly, we still have the following questions concerning the FMC request for NCV:

(1) Will planned onsite treatment and waste minimization allow less than a two-year NCV?
(2) Will capacity shortfalls affect only FMC – thus, perhaps only a case-by-case extension is needed – or will other facilities (e.g., Monsanto) be affected?
(3) Will exemptions from the definition of solid waste reduce the required capacity?

If a case-by-case extension is desired, we believe other questions may need to be answered. The following provides additional details concerning our review of the FMC data.

FMC submitted a 106-page document commenting on the proposed rule and four additional volumes of information (Appendices 1-15) to support its comments. The first and largest section of the main document with FMC's comments is the request for a two-year NCV. Also, most of the appendices provide information supporting the NCV application. The supporting information includes copies of completed phone surveys and survey confirmation letters for 168 commercial treatment facilities that were contacted by a consultant of FMC to determine the availability of capacity for off-site treatment of four wastestreams generated during elemental phosphorus mineral processing operations at FMC. Any follow-up of the NCV survey conducted by FMC's technical staff is also documented.

Because FMC's request for an NCV (including attachments) is approximately 1,000 pages, we could perform only a preliminary examination of their contents. In brief, however, it seems that the proposed Phase IV LDR rule will uniquely affect the current operations of FMC for manufacture of elemental phosphorus in Pocatello, Idaho. Suitable alternative treatment capacity may not be readily available for at least three large-volume hazardous wastewater streams that are now being generated at this facility and land disposed (probably in Subtitle D surface

impoundments) on site. These three wastewater streams – Medussa scrubber blowdown, Andersen filter media rinsate, and furnace building washdown – are generated at a rate of 148 million gallons per year. Alternative treatment of these wastewaters will require pH adjustment for removal of cadmium, lead, and/or selenium from the wastewater streams, followed by dewatering and stabilization of the metal-containing treatment sludges. Also, the wastewaters are contaminated with normally occurring radioactive materials (NORM) that must also be removed during treatment. The pH adjustment step must take into consideration the generation of phosphine gas due to the presence of elemental phosphorus in the wastewaters. Transportation of wastewaters is estimated to require 30 rail tanks per day, and a special loading station would have to be constructed. Special safety requirements are associated with the transportation and other handling of elemental-phosphorus containing wastes. FMC has proposed management plans for these wastestreams that will include on-site waste minimization efforts, treatment technology development, and installation of treatment capacity by June 1998.

We believe that FMC's plans to build onsite treatment capacity and conduct waste minimization may mean less than a two-year NCV can be possible. The onsite treatment capacity will include a wastewater treatment plant and stabilization facility that appears to have been planned already. FMC's plans for alternative treatment of wastewaters on site, however, are based on an assumption that Andersen filter media rinsate will be eliminated by the end of the year 1996. This wastewater stream contains selenium, and FMC's past experience in technology development shows that stabilization of its wastewater treatment residuals cannot treat selenium below UTS. Therefore, if the plans to eliminate Andersen filter media rinsate fails, FMC will have to pursue a case-by-case extension to the NCV or alternate treatment standards after the end of an NCV.

Our review of the background document – "Identification and Description of Mineral Processing Sectors and Waste Streams" – developed to support the proposed Phase IV LDR rule indicates that there are two domestic producers of elemental phosphorus: FMC's facility in Pocatello, Idaho and Monsanto's facility in Soda Springs, Idaho. Monsanto did not submit comments on the proposed Supplemental Phase IV LDR rule. As FMC Corporation is the world's largest producer of elemental phosphorus, EPA's identification and description of this mineral processing sector and these wastestreams was based mainly on the FMC process. However, we believe that EPA may need to obtain and review information on waste generation and management at the Monsanto facility before granting an NCV – rather than a case-by-case variance – for mineral processing wastewater streams that contain elemental phosphorus. In particular, it may be necessary to confirm that the proposed Phase IV LDR rule will uniquely affect the current manufacturing operations of both FMC and Monsanto.

We also reviewed our capacity analysis for the newly-identified mineral processing wastes to determine if the information provided with FMC's request for an NCV would change either the methodology or assumptions used. Exhibit 3-1 of the background document identifies and characterizes the hazardous mineral processing wastes by commodity sector. In this exhibit, we identify two facilities (FMC and Monsanto) with processes to manufacture elemental phosphorus generate three wastewater streams with an estimated maximum quantity of 782,000 metric tons (206 million gallons) per year. This estimate is comparable with FMC's report that it generates

148 million gallons of hazardous wastewater. We also noted that the capacity analysis had assumed that two out of the three wastewater streams (over 99% of total quantity) may be recycled or decharacterized. This assumption also seems to be consistent with the report of FMC that a waste minimization effort is in progress at the facility. Thus, before granting a NCV for mineral processing wastewaters containing elemental phosphorus, we believe that EPA may need to rule out the possibility of these wastewater streams being exempt from classification as RCRA solid waste, and therefore exempt from LDR requirements.

In addition to assessing whether FMC's comments were sufficient for making a determination regarding an NCV, we conducted a preliminary evaluation whether FMC could meet the requirements for a case-by-case extension to the rule (40 CFR 268.5). However, a complete request for a capacity variance on a case-by-case basis must include an additional demonstration of the commitment of the applicant to construct or otherwise provide alternative treatment, recovery, or disposal capacity that meets with LDR standards. The request for a capacity variance must also describe in greater detail the technical and practical difficulties in providing the alternative capacity. In addition, the application for a capacity variance must confirm that the planned alternative capacity would be adequate for all the wastes affected by the proposed rule. Finally, the applicant must demonstrate that hazardous wastewater management units that will be in use at the facility until the development of alternative treatment capacity would be in full compliance with other regulations under RCRA Subtitle C. Although we have not been able to evaluate whether the information provided by FMC meets with all the requirements of 40 CFR 268.5, we believe that if FMC were requesting a case-by-case extension, they should be required at least to provide more information on the design and operation of surface impoundments or other units being used at present to manage the wastewater streams affected by the proposed rule. In addition, EPA would need to follow other procedures normally followed in applications for a capacity variance on a case-by-case basis (e.g., consulting with appropriate State agencies).

Please feel free to call Raghu Raghavan at (703)934-3417 or Jim Laurenson at (703)934-3648 if you have any questions or comment concerning this memorandum.

ICF
CONSULTING GROUP

ICF Incorporated
9300 Lee Highway
Fairfax, VA 22031-1207
703/934-3000 Fax 703/934-9740

June 26, 1996

MEMORANDUM

To: Bill Kline, EPA

From: Raghu Raghavan and Jim Laurenson

Subject: Follow-up on FMC Corporation's Request for Two-year National Capacity Variance (NCV) from the Phase IV Land Disposal Restrictions (LDRs)

This memorandum is a follow-up to our June 5, 1996 memo assessing the request made by FMC Corporation (FMC) for a two-year NCV from Phase IV LDRs on the company's elemental phosphorus mineral processing wastewaters. This memo provides additional information that we obtained from FMC, and it updates our previous assessment of the subject request made by FMC.

FMC conducted a national survey of commercial treatment, storage, and disposal (TSD) facilities to argue that required capacity is not available off site if their "large volume" mineral processing wastewaters will be affected by the Phase IV LDRs. Alternatively, FMC plans to conduct waste minimization and build onsite treatment capacity by June 1998. The waste management plans were submitted by FMC with its request for an NCV provided with their comments to the supplemental Phase IV LDR rule. EPA invited comments on a potential capacity variance for FMC in the May 10, 1996 Notice of Data Availability (NODA). In response to the NODA, FMC commented that the construction of onsite treatment facilities would be one of the options that FMC will evaluate during the NCV period. FMC plans to continue to explore the possibility of providing offsite treatment of the process waters affected by Phase IV LDRs at its elemental phosphorus manufacturing plant in Pocatello, Idaho. A second commenter on the NODA, Environmental Defense Fund (EDF), represented by the law office of David J. Lennett, believes that FMC's request for a capacity variance is more properly a request for a case-by-case capacity variance subject to the procedures given in 40 CFR 268.5, and that the information provided is insufficient for a case-by-case variance.

To determine if two years are required to implement FMC's waste management plans, as well as to assess the readiness of these plans for implementation, it was necessary to start obtaining the following types of additional information:

- How are the wastewater streams that will be affected by the Phase IV LDRs currently managed by FMC? Is any treatment of wastewaters performed now? Which land-based units receive these wastewaters now?

- As FMC continues to explore the possibility of providing offsite treatment of these wastewaters, is the company planning to set up the infrastructure necessary for

shipping the wastewaters off site (e.g., building a special loading dock and purchasing/leasing rail cars)?

- Because of the difficulties in stabilizing wastewater treatment residuals containing selenium, is FMC planning to construct a separate facility for onsite treatment of Andersen filter media rinsate (which is reported to be the only stream containing selenium)?

- Is FMC aware of other facilities that are manufacturing elemental phosphorus and generating hazardous wastes that are affected by Phase IV LDRs?

We contacted Mr. Arnold Feldman, Regulatory Compliance Manager, Environmental Services Department, FMC Corporation to discuss these topics. The information obtained by us during a phone conversation with Mr. Feldman is given below.

Current wastewater management practices. Mr. Feldman told us that the three wastewater streams affected by the Phase IV LDRs are currently received by a large surface impoundment (capacity over 100 acre-feet) onsite and then recycled to the process. This surface impoundment was RCRA permitted two or three years ago and meets with minimum technology requirements (MTR) as given in 40 CFR 264/265. The surface impoundment is located approximately 3/4 mile from the plant generating the wastewaters. A small tank (5,000 to 6,000 gallons capacity) receives the wastewaters near the plant before they are pumped to the surface impoundment. In addition to the three wastewater streams, some "contaminated solids" are currently disposed of in the surface impoundment. The disposal of solids will be terminated after the Phase IV LDRs become effective, however. The wastewater overflows from the surface impoundment to a series of ponds before it is recycled (after some clarification of the effluent) to the plant. Although there appears to be no other treatment of the wastewater taking place before it is recycled, it seems that the main role of the surface impoundment is to separate elemental phosphorus from the wastewater generated in the plant. (Analytical data on the three wastewater streams that will be affected by the Phase IV LDRs were submitted by FMC with its request for an NCV.) In order to maintain a minimum level of water at all times in the surface impoundment, water from the ponds is sometimes returned back to the surface impoundment. The retention period of the wastewater in the surface impoundment therefore varies with the level of production and the time of year. There is only a minimal release of phosphine gas taking place in the surface impoundment (mainly because the elemental phosphorus is always stored under water). It seems that the surface impoundment and ponds will continue to be used even in the future after installing wastewater treatment capacity on site. However, it is not known at present if the surface impoundment will be receiving wastewaters before or after treatment to precipitate toxic metals. (The main benefit of using the surface impoundment to receive wastewater before treatment is that the current practice of separating out elemental phosphorus before recycling the wastewater may continue without any change. However, it is not clear whether the final Phase IV LDR rule will permit the use of the surface impoundment in its current role despite the fact that the surface impoundment is permitted under RCRA Subtitle C and meets the MTR.) It seems that the final concept design for integrating the new wastewater treatment facility with other land-based units on site can be completed only after reviewing the final LDR rule.

Preparing for commercial treatment as an alternative. Based on the results of the national survey of commercial TSD facilities conducted by FMC, Mr. Feldman felt that offsite treatment of wastewaters cannot probably replace the need for building treatment capacity on site. Even the projected schedule for purchasing the rail cars by January 1998 (as mentioned in FMC's request for a two-year NCV) cannot really be achieved. It is necessary to first locate commercial facilities willing to consider treating FMC's wastewaters. Then, according to Mr. Feldman, these commercial facilities must agree to install special loading docks (at their expense) to receive the wastewaters for treatment. These investigations and negotiations cannot be completed within the next several months. Therefore, Mr. Feldman said, it is not possible to develop an alternative to onsite treatment of wastewaters within a period of two years.

Designing wastewater treatment onsite. As noted earlier, Mr. Feldman believes that the concept design of the onsite treatment facility can be completed only after knowing what the final Phase IV LDR standards are. (In particular, the final LDR standards will affect the selection of treatment methods for Andersen filter media rinsate. This wastewater stream has been generated only since 1991 when it became necessary to wash the filter media due to the presence of naturally occurring radioactive materials. Currently, FMC is hoping to eliminate this wastewater stream as an alternative to onsite treatment.) Even after the finalization of LDR standards and if it becomes necessary to treat Andersen filter media rinsate, it may be more cost-effective to treat all the wastewater streams at the same new facility. (The construction of two or more smaller wastewater treatment facilities instead of one combined facility might reduce the time required for designing and constructing each facility.) Mr. Feldman also noted that construction of a treatment facility cannot progress during five months (December through April) every year because of weather. The schedule provided by FMC in its request for a two-year NCV also did not take into consideration the time required for obtaining any permits for installing and operating the treatment facility. Mr. Feldman indicated that a complete schedule for building onsite treatment capacity is possible only after reviewing the final LDR rule and finalizing the concept for treating the wastewaters on site.

Other facilities manufacturing elemental phosphorus. Mr. Feldman stated that one other company manufactures elemental phosphorus using another proprietary process that does not generate hazardous wastes affected by the Phase IV LDRs.

Based on the additional information described above, it appears that FMC does not have a final concept design of the onsite treatment facility for the wastewater streams generated at its plant in Pocatello, Idaho. First, the need for treatment of wastewaters prior to discharging them to the existing permitted surface impoundment will depend on the applicability of the new definition of solid waste to these recycled materials and the treatment standards given in the final LDR rule. (Universal treatment standards (UTS) may apply to one or more of the following metal constituents found in the wastewaters: cadmium, lead, selenium, thallium, zinc and/or vanadium.) Second, the final concept design for treating wastewaters will depend on the results of FMC's current efforts to eliminate Andersen filter media rinsate. (It appears that the wastewater treatment needs may be reduced substantially if the Andersen filter media rinsate is eliminated or managed otherwise.) In addition, the weather conditions in Idaho will make it difficult to consider an accelerated construction of the wastewater treatment facilities after making progress in the engineering design of the facilities. Under these circumstances, it would be difficult to prepare a more detailed and complete schedule for

building onsite treatment capacity. Thus, based on the information provided by FMC, there seems to be little chance for finding offsite treatment capacity in the next two years and less than a two-year NCV does not appear to be sufficient for providing the alternative treatment capacity required by the wastewater streams affected by the Phase IV LDRs at FMC's plant in Pocatello, Idaho.

Please feel free to call Raghu Raghavan at (703)934-3417 or Jim Laurenson at (703)934-3648 if you have any questions or comment concerning this memorandum.