February 25, 2003

Honorable Donald E. Shelton
22nd Circuit Court
Courthouse
101 E. Huron
Ann Arbor, MI 48107

Re: Attorney General v Gelman Sciences Inc.
Case No: 88-34734-CE
Our File No: 471

Dear Judge Shelton:

This letter is intended to update the Court on the status of developments that have occurred since the last status hearing in August. In particular, this letter will apprise the Court on the progress Pall Life Sciences ("Pall") has made in investigating and remediating the Unit E groundwater contamination.

I. Unit E Progress

Since the August hearing, Pall has undertaken and completed the following activities:

- Additional plume delineation. Pall installed monitoring wells MW-87s and MW-91 east of MW-81 to delineate the eastern extent of the contamination in the northern portion of the plume.

- Extraction Well Installation and Aquifer Pump Test. On August 15, 2003, Pall installed TW-16 in the Maple Village Shopping Center property, near Maple Road. Beginning on August 25, 2003, Pall conducted an aquifer pump to determine the aquifer characteristics at this location. The results of this test were then analyzed and submitted to the State. This pump test indicated that Pall would have to purge approximately 500 gallons per minute (gpm) in order to capture the entire width of the plume in this location. This volume was much higher than Pall originally believed would be necessary to capture the entire width of the plume. This volume of water outstrips the available water disposal capacity via groundwater reinjection, the only realistically available disposal option in this area.

- In-situ Oxidation Testing. Pall developed a detailed work plan for testing several oxidation technologies to determine if they could be used to treat the 1,4-dioxane contamination in the aquifer itself. Such in-situ technologies avoid the necessity of purging large volumes of groundwater and the resulting difficulties associated with post-treatment water disposal. Last fall, Pall implemented this work plan (without waiting for MDEQ approval) on its property in order to avoid delays in obtaining access. The work included installing a number of new monitoring wells and was conducted in three phases. Phase I was designed to determine if the injection of hydrogen peroxide, only, would destroy the 1,4-dioxane without creating harmful bi-products. Phase II, involved the injection of ozone gas. In Phase III, Pall injected both ozone gas and hydrogen peroxide into the aquifer.
    - Mr. Fotouhi overcame a host of engineering challenges associated with delivering these oxidants to such a deep aquifer. The test results, however, were mixed. Both of the phases that involved the injection of ozone showed dramatic reduction in the concentrations of 1,4-dioxane. Unfortunately, it appears that the ozone also reacted with naturally occurring bromide to form bromate, which is a harmful bi-product. The unusually high levels of bromide that are present in the Unit E aquifer have exacerbated this reaction. While Pall still believes that this technology is promising and that the bromate issue could, with sufficient study, be overcome, it does not appear that the necessary work can be done in time for this option to be implemented in the near term.
    - The field study also included an evaluation of whether hydrogen peroxide, the oxidizer Pall currently uses in connection with its UV treatment technology, could by itself successfully destroy 1,4-dioxane in-situ. The results of this phase of the study were positive, showing significant 1,4-dioxane destruction without the creation of bromate. The results of this phase of the study warranted additional field studies to determine if the degree and extent of 1,4-dioxane destruction justify using this technology as part of Pall's remedial strategy.

- Additional Unit E In-Situ Field Study. Based on the results from the in-situ field studies Pall conducted on its property last fall (discussed below), Pall developed a follow up work plan to further investigate the most immediately promising in-situ technology – the injection of hydrogen peroxide. Pall submitted this work plan to the State in late December. Since submittal of the work plan, Pall has met with the State several times in order to reach agreement on the scope of the work needed to evaluate this technology. The current work plan calls for the installation of over 20 monitoring wells and an injection well in the vicinity of Maple Road. Pall will implement that plan as soon as it receives approval, and as soon as access is obtained. The Court should be aware that the owner of the Maple Village Shopping Center has indicated that access for this work will not be granted. Therefore, once the State has approved the final plan, Pall may be forced to petition this Court for access (an approved plan is a prerequisite for such a petition under Part 201), although Mr. Reichel has agreed to jointly contact the owner to make one last attempt to obtain access without litigation.

- Meetings with the City of Ann Arbor. Counsel for Pall met with the City Attorney and other representatives of the City on two occasions to discuss how Pall and the City can best work together to address the multitude of issues affecting the community, including the Unit E. Given the location of the Unit E plume, Pall believes that the City and the community as a whole must support the ultimate remedial strategy that is selected for it to be successfully implemented.

- Ex-situ Treatment Unit Testing. Prior to the August hearing, Pall had designed and built a mobile treatment unit using proprietary ozone treatment technology that Mr. Fotouhi designed. Mr. Fotouhi developed this technology because it is unlikely that the current UV/hydrogen peroxide technology could be used safely off the Pall property, given the large quantities of chemicals and electrical power that technology requires. The data from the initial batch testing of the unit demonstrated that the system could achieve the same level of treatment as the existing technology. Since the August hearing Pall has prepared and submitted a report summarizing these data to the State. Pall also sought permission to operate the unit on a continual basis for a period of thirty days, which is the period of time the State has indicated would be necessary before the technology could be approved. Pall's D2/C3 aquifer purging utilizes nearly all of Pall's treatment pond capacity. Consequently, in order to operate the ozone system on a continual basis, Pall needed permission to discharge the treated effluent from the ozone unit into the "Green Pond," which contains the treated water that is discharged to the Honey Creek Tributary. Unfortunately, Pall did not receive any response from the Water Division of the MDEQ (not the division that oversees Pall's cleanup) despite several follow up requests. Finally in January, Mr. Fotouhi met personally with the Water Division staff and learned that the Water Division intended to deny permission to conduct the necessary testing. Since that conversation, Mr. Fotouhi devised a protocol for testing the system in a way that allows Pall to discharge the treated water to the Red pond (where it will be treated, again, by the UV/hydrogen peroxide treatment system before discharge). On January 27, 2004, Pall informed the Water Division that it would begin implementing this testing on February 2, 2004. Pall has run the Ozone treatment system on a continual basis since that time. The results thus far indicate that the system can continuously achieve treatment efficiencies that are consistent with the existing UV/hydrogen peroxide technology, without having to use large quantities of chemicals required by the older technology.

- Unit E Feasibility Study. On January 23, 2004 Pall submitted its Interim Feasibility Study, which analyzes all of the currently available remedial options for the Unit E contamination, and identifies the overall remedial approach Pall has proposed to address the entire plume. Pall will submit a final Feasibility Study following its analysis of the soon to be implemented hydrogen peroxide in-situ field study. The State has indicated that it will seek public comment and hold a public hearing on the Feasibility Study before taking a position on the preferred strategy.

- Interim Response Activities. It is important for the Court to realize that, while the Feasibility Study describes Pall's overall approach to the Unit E, it does not represent the totality of what Pall intends to do to address this contamination. In particular, it does not identify the more immediate measures Pall will take as "interim response actions" to address the most highly contaminated areas of contamination in the aquifer. Pall and the State have agreed that Pall should implement additional source control purging near the Pall facility. Such purging will be in addition to the existing on-site purge wells (TW-11 and TW-12) Pall installed immediately after discovering the Unit E plume. Pall has submitted an interim response plan that will include the installation of two new extraction wells and purging from Pall's property. Pall intends to purge a total of approximately 400 gpm from the four Unit E extraction wells. The water from these purge wells will then be

treated by Pall's existing treatment system and discharged to Honey Creek. Such purging may, at least temporarily, require Pall to slightly decrease its purging rate for the C_3 and D_2 aquifer cleanup. Pall and the State are also evaluating the appropriateness of additional response in the heart of the plume, between MW-72 (Michigan Inn) and the Maple Road area. Such activities may include utilization of the hydrogen peroxide in-situ technology and/or purging/reinjection using the ozone treatment system currently being tested.

II. Five year plan Cleanup Progress.

A. Overall Progress.

As indicated by the time-series isoconcentration maps previously provided to the Court, the parties have made tremendous progress in remediating the D2 and C3 aquifers. Pall has removed approximately 34,000 pounds of 1,4-dioxane since August 2000. This is approximately 8,000 pounds more than the mass the parties originally estimated needed to be removed in order to achieve the cleanup criterion. This increase in the mass reflects the additional, unanticipated, mass from Unit E that Pall's aggressive pumping has pulled up into the D2/C3 aquifers. All indications are that Pall is making satisfactory progress toward the goals of the 5-Year Plan. Pall's system of purge wells is operating at full capacity, given the declining water levels in the aquifers.

B. Western System.

As Pall previously advised the Court, there is small area of the aquifer in the Western System that contains 1,4-dioxane above the drinking water criteria. This area is cutoff from any continuing source. As a contingency plan, Pall installed a purge well in late September, 2002, near the only monitoring well with levels above the drinking water criterion, MW-53i.[1] Pall proposed to perform batch purging from this well if the data trend from this well indicated that the 5-year goal would not be met. Immediately after the purge well was installed, the levels in MW-53i briefly reversed their downward trend and began increasing for three monitoring periods.

Consequently, Pall initiated a batch-purging program at this location in February 2003. Pall has also increased the frequency of its monitoring of all three MW-53 wells to help gauge the effectiveness of this batch purging program. This program has reduced the levels in MW-53i to below the drinking water criterion. The levels found in the Ann Arbor Cleaning Supply Well (the extraction well near MW-53i) itself, however, remain above the criterion. Pall has agreed to submit a proposed work plan for additional investigation and or remediation to address this area of concern. In the future, this may be an ideal location to apply Pall's in-situ treatment technology.

C. Southwest Area.

Pall previously installed the additional monitoring wells the MDEQ requested to confirm

that this area of contamination has been delineated. Since the last hearing Pall submitted a capture zone analysis to demonstrate that the existing purge wells are successfully capturing the 1,4-dioxane in this difficult area. The MDEQ has reviewed and approved of the analysis and agreed that no further investigation in this area is needed.

III. Contested Case.

As this Court is aware, the City of Ann Arbor, Washtenaw County and a local citizens group contested Pall's NPDES permit modification, which allowed Pall to increase its discharge volume from 800 gpm to 1300 gpm. Pall sought this additional capacity so that it could speed up the rate at which it was cleaning up the groundwater. The parties reached a stipulated settlement and an order of dismissal was entered on December 5, 2003. Under the agreement, Pall can continue to discharge up to 1300 gpm of treated groundwater into the Honey Creek Tributary.

Counsel for Pall will be available to answer any additional questions this Court may have at the status hearing.

Very truly yours,

ZAUSMER, KAUFMAN, AUGUST,
& CALDWELL, P.C.

Michael L. Caldwell

cc: Robert Reichel
Sybil Kolon
Mitchell Adelman
Farsad Fotouhi
Alan Wasserman

[1]It should be noted that the monitoring wells at this same location located in the shallow and deep portions of the aquifer are both well below the drinking water criterion.