

## **Pall Life Sciences Comments To DEQ Remedial Proposal Gelman Science/Pall Life Sciences Site**

### **I. Introduction**

On June 1, 2004, Pall Life Sciences (PLS) submitted its Final Feasibility Study (FS). The FS was intended to provide a framework for evaluating the need for, and the potential benefit of, various response action alternatives for addressing the Unit E contamination. DEQ has reviewed the FS and in its July 7, 2004 Fact Sheet has tentatively proposed a different remedial alternative than that recommended by PLS. Specifically, DEQ's proposal requires interception of the Unit E plume in three locations (Wagner Road, Maple Road, and the leading edge, located in a residential neighborhood east of Veterans Park). Approximately 1150 gpm of contaminated groundwater would, under DEQ's alternative, be piped to a treatment plant to be constructed in the vicinity of Maple Road, and then pumped to the Huron River via a pipeline. The path and length of that pipeline was not proposed. An undetermined additional volume would be purged from the Wagner Road area and transported via pipeline to PLS' existing treatment system.

DEQ retained Weston Solutions (Weston) to provide technical advice and comments on PLS' FS. Those comments were provided in a letter report dated July 14, 2004. PLS provides this summary of its comments along with additional responses to specific aspects of the DEQ Fact Sheet and Weston's Letter Report, which are attached as Appendix A and B respectively.

### **II. Background**

PLS purchased Gelman Sciences Inc. (Gelman) in 1997. In so doing, PLS assumed Gelman's legal obligations under the 1992 Consent Judgment between Gelman and the State of Michigan. Since 1997, PLS has continuously operated a comprehensive groundwater remediation system – one of the largest groundwater purging remediations in the State – to address the known groundwater contamination present in underground aquifers addressed by the Consent Judgment. PLS has removed and treated over 2.2 billion gallons of groundwater and removed over 56,000 pounds of 1,4-dioxane from the affected aquifers.

In addressing the groundwater contamination, PLS has brought a great deal of technical expertise to the table. As DEQ is aware, 1,4-dioxane is a very difficult compound to remove from groundwater. At great expense, PLS developed and refined its own UV treatment technology to address this technical challenge. PLS is recognized as the leader in treatment technology for 1,4-dioxane, even though it does not actively market, or profit from, its expertise. When the Unit E contamination was discovered and the potential need for off-site treatment arose, PLS developed, from scratch, an entirely different treatment system utilizing ozone – one that could safely be used in non-industrial areas. Other vendors of similar ozone treatment systems – including the vendor Weston has contacted – have consulted with PLS to improve their technology. Again, PLS has shared much of its expertise with such vendors without seeking to profit from it.

PLS has also been in the forefront in utilizing state-of-the-art remedial technologies in the area of groundwater purging. In 1999, PLS installed what at the time was the longest horizontal remediation well in the country to address the D2 aquifer contamination. The National Groundwater Association (NGWA) recognized PLS' horizontal well as one of the best remedial projects in the country that year. PLS expended approximately \$1.5 million just to install the horizontal well and associated transmission pipeline. Despite PLS' willingness to make such an expenditure and the technical achievement that the well represented, PLS was opposed at every turn by the City of Ann Arbor and, for a time, even DEQ. Fortunately, the Court removed the various obstacles placed in the way, and PLS was able to begin purging from the well in late 2000.

Since 2000 when PLS was allowed to fully implement its groundwater purge program, PLS has made significant progress in remediating the aquifers addressed by the Consent Judgment. A time-series of iso-concentration maps is attached as Exhibit 1. These maps graphically demonstrate the progress that PLS has made in this regard.

This kind of effort and progress has not been cheap. When PLS purchased Gelman in 1997, the estimate of the costs to clean the remaining contamination in the affected aquifers was \$10 million. PLS has reserved \$48 million for this cleanup and has already spent \$30 million to address (primarily) the aquifers that were known to be contaminated at the time of the purchase. Despite the fact that the Unit E contamination had not been discovered in 1997 and not accounted for in the purchase price of Gelman, PLS has stepped up and investigated this aquifer in a responsible manner and has committed to spend millions of additional dollars to remediate the contamination.

PLS provides this background not to pat itself on the back or to suggest that it has done enough. Rather, PLS wishes to point out to DEQ that PLS has been the only entity that has demonstrated the technical expertise, financial resources, and sheer willpower needed to address this complex and politically charged situation. DEQ should keep in mind PLS' demonstrated willingness to commit substantial financial resources to the problem and ability to overcome technical challenges when considering PLS' comments on DEQ's tentative remedial proposal.

As set forth below, PLS has reviewed DEQ's tentative proposal and concluded that it is not even remotely feasible or necessary.

## **II. The DEQ Plan**

### **A. There is no legal basis for DEQ's Plan.**

While PLS will address the legal aspects of DEQ's plan in subsequent court filings, if necessary, PLS will briefly comment on the legal authority DEQ cites for its proposal. DEQ's plan would require the party implementing the cleanup to capture the entire width of the plume in three locations: at Wagner Road; at Maple Road; and at the leading edge, located in the middle of highly congested residential neighborhoods east of Veterans Park. In addition to the 650 gallons per minute (gpm) that would need to be purged from the leading edge, DEQ suggests

that additional interim response/source control be implemented by purging at least 500 gpm from extraction wells near Maple Road and by purging an undetermined volume from Wagner Road.

DEQ has taken the position that PLS is required to remediate the Unit E under the 1992 Consent Judgment. PLS takes no position at this time as to whether that agreement covers the Unit E. But even assuming the Consent Judgment applies to this new area of contamination, it provides no support for a plan that requires three separate capture zones. At most, the Consent Judgment would require containment of the leading edge. The only interim response/source control required by the Consent Judgment relates to the “Core Area,” which is defined as the portion of the C3 aquifer that contains contamination above 500 ppb. There is no remedial objective or other requirement in the Consent Judgment that could even remotely be construed to require the type of program envisioned by DEQ.

DEQ also claims that its proposal is supported by Part 201.<sup>1</sup> Part 201, to the extent it applies, does not require interim response on the grand scale suggested by DEQ. The releases at issue all took place well before 1995. Therefore, the source control measures suggested by DEQ would not be required by Section 14(1)(d), MCL 324.20114(1)(d), even if they were “technically practical, cost effective, and [protective of] the environment” (and as explained below, DEQ’s proposal does not satisfy these criteria). This is particularly true where PLS has already proposed appropriate interim response measures. In addition, Part 201’s requirements are of course subject to various statutory defenses.<sup>2</sup>

But PLS is not interested in engaging in legal battles. PLS believes that the technical arguments against DEQ’s tentative proposal provide a sufficient basis for withdrawal.

## **B. DEQ’s plan is not feasible.**

### **1. Pipelines**

Given the history of this site, it is rather shocking that DEQ would even suggest a remedial alternative that requires construction of three to four miles of pipeline (about 1.5 miles of which would be installed within congested neighborhoods). As documented in the FS, these pipelines would cause tremendous disruption in the community, without any corresponding environmental or human health benefit. Recent public hearings/meetings have made clear that there is no public support for such construction among the affected homeowners (to the extent they even received notice of the project). Nor does it appear that DEQ has considered the cost to area businesses along the eventual pipeline route.

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<sup>1</sup> PLS notes that Part 201 gives a party to a consent judgment entered prior to the 1995 amendments the right to proceed under the consent judgment or under Part 201. Thus, Part 201 would only be relevant to the extent the Consent Judgment does not apply to the Unit E or, if it does, only to the extent PLS chooses to proceed under that statute.

<sup>2</sup> This is not to say that PLS would not implement appropriate interim response measures even in the absence of a legal requirement to do so. A prime example of that is PLS’ initiation of the horizontal well project, which was in no way required under the Consent Judgment. Under its current proposal PLS has committed to implementing interim response in two locations in connection with the Unit E.

DEQ's Fact Sheet asserts that directional drilling of the pipelines will help alleviate the disruption to the neighborhoods. First, it is not even clear that this boring technique could be used in the neighborhoods, as evidenced by the fact that Weston's cost estimates assume open trench techniques. But even if directional drilling could be utilized, it is hardly the panacea DEQ makes it out to be. Installing pipelines large enough to accomplish DEQ's remedial objectives along with the associated heavy machinery, drilling related vibrations and displacement, would still be very disruptive and would pose significant health and safety concerns.

It is also incredibly naive to think that the City of Ann Arbor will make the pipeline installation process easy. In the Evergreen subdivision, PLS was forced to sue the City to obtain access to City right of ways to install approximately 1000 feet of pipe. Even though this took place in a situation that demanded the utmost urgency, and even with the Court's intervention, it took over a year to get that 1000 feet of pipe installed. DEQ's proposal would require approximately 16,000 feet of pipeline to be installed in front of hundreds of homes and businesses, through right of ways owned by at least three different governmental units. It should be clear from the City's current suit that any promise of cooperation from the City is illusory. Indeed, the City is on record during recent public hearings/meetings as confirming that the City would sue PLS over any perceived noise or dust ordinance violations. Clearly, the City has no intention of working cooperatively with PLS on this project.

There is also no readily apparent legal authority for the entity implementing DEQ's remedial alternative to obtain access for the required pipelines. Section 35a, MCL 324.20135a, which has provided PLS with authority to petition the Court for access in the past, would not provide authority for obtaining access to much of the proposed pipeline route. Section 35a only provides a party that is liable under Section 26a with the ability to petition the court for "access to the facility in order to conduct response activities approved by the department." MCL 324.20135a(1) (emphasis added). DEQ's proposal contemplates miles of pipelines through properties that are, to date, unaffected by the contamination and most assuredly are not part of the "facility." It is instructive that the legislature did not even consider granting liable parties the ability to petition a court for access to unaffected properties. This limitation is evidence of just how far afield DEQ's proposal is.

The bottom line is that the contemplated pipeline construction is not feasible or legally enforceable. Even if such a series of pipelines were feasible and access to pipelines voluntarily granted, the construction would take years to complete.

## 2. Treatment System

DEQ's proposal, which would require a Maple Road-based treatment system approximately the same size as the one PLS operates at its facility, has brought a number of feasibility issues into focus. To give DEQ some perspective on the scale of operation its proposal would require, the operational requirements of PLS' current system are instructive.

At the PLS facility, the UV-H202 system occupies a dedicated building that is 60 X 115

ft. and can treat 1300 gpm of groundwater contaminated with 1,4-dioxane. It receives shipments via truck every three to four days of sulfuric acid, sodium bisulfite, caustic, and hydrogen peroxide in approximately 20-ton lots. The facility has its own transformer, which consumes approximately 530,000-kilowatt hours of electricity every month. PLS utilizes two 1,000,000-gallon equalization ponds to insure continuous operation and compliance with its stringent NPDES permit requirements. While an ozone/H<sub>2</sub>O<sub>2</sub> system would consume a somewhat smaller volume of chemicals, a system sized to meet DEQ's requirements can be expected to be on a scale of the one that is located already at PLS and, in any event, to be far larger and to consume far more raw materials than the system proposed by PLS for its IR at Maple Road.

It is not feasible to place a treatment system large enough to accommodate 1150 gpm required by DEQ's plan in a commercial area. (Indeed, PLS' FS significantly understated the feasibility issues associated with placing any treatment system in the Maple Road area that would be large enough to capture the leading edge under a surface water discharge scenario). Installing and operating a system that could accommodate 1150 gpm anywhere in the vicinity of Maple Road is infeasible primarily because of two factors: a) the significant health and safety issues associated with liquid oxygen; and b) simply the physical size of the system.

A treatment system of this size would require liquid oxygen. PLS does not believe that it is safe to use and store the volume of liquid oxygen that would be needed to treat 1150 gpm of contaminated groundwater in the Maple Road area. PLS estimates that such a treatment unit would require 40,000 cubic feet of liquid oxygen per day. This usage would require construction of a large liquid oxygen storage tank and frequent refilling by a liquid oxygen tanker truck. This use is not appropriate for a highly utilized commercial area. That is precisely why PLS designed the mobile ozone treatment unit to utilize an oxygen generator rather than liquid oxygen. PLS opted for this design even though it would have been much cheaper to implement its proposed interim response with a liquid oxygen-based treatment system. (Compare the FS unit cost of treating 1000 gallons for the mobile unit (\$2.64/1000gallons) with the on-site treatment costs (\$0.91/1000 gallons)).

Nor is it feasible to generate enough oxygen (with an oxygen generator) from the atmosphere to reliably treat 1150 gpm. PLS' current **200 gpm** system already utilizes the second biggest oxygen generator on the market. It is not technically feasible to string together six or seven of these units to generate the oxygen needed to treat 1150 gpm. Each oxygen generator would require its own compressor, air dryers, and other associated equipment. From an engineering standpoint, it is not possible to reliably operate such a system on anything approaching a continuous basis.

### 3. Ponds

For a host of engineering reasons, a system sized to accomplish DEQ's proposed remedial objectives would require the construction of both an equalization ("Red") pond and a discharge ("Green") pond. Without such ponds it would be impossible to continuously purge the groundwater (as required to capture) or to meet the stringent discharge requirements of a NPDES

permit. Again, this point is driven home by the fact that the treatment system would be essentially the same size as the system PLS operates on site. PLS currently utilizes two 1,000,000-gallon ponds. While it would not be absolutely necessary to have ponds with that volume at an off-site location, it would be prudent to have ponds with a volume of at least 500,000 gallons to accommodate a treatment volume of 1150 gpm (based on approximately six hours of continuous operation).

These ponds would be necessary to meet the technical challenges associated with operating a treatment system that would have to meet NPDES discharge limits, 24 hours a day, 7 days a week, and 365 days a year – challenges with which PLS is well familiar. For example, the equalization or “Red” pond would be required so that the entity operating the system could precipitate out the iron in the water. If the iron is not removed prior to treatment, the treatment process causes the iron to precipitate. In that condition, the iron would readily adhere to the interior of the lengthy pipelines associated with DEQ’s proposal. It would not be practical to “pig” the approximately three miles of pipeline (to the River as proposed by the City) in order to remove the large amount of iron that would build up if the iron were not settled out before treatment.

Much of PLS’ success in operating a continuous purging/treatment operation – which, ironically Weston lauds – is achieved because of the stability its on-site ponds provide. With such ponds, it is possible to maintain the steady volume of water needed to avoid constantly readjusting the calibration of the system, which would prevent the operator from meeting the discharge criteria. An equalization pond is particularly necessary under DEQ’s proposal since water will be purged from multiple locations with varying concentrations and water chemistry. Finally, if the performance objective is to capture the entire width of the plume, such a pond would also be needed to allow for continuous purging during maintenance of the treatment system.

It would also be prudent to have a discharge or “Green” pond to provide assurance that stringent NPDES permit requirements could be met by the treatment system. If effluent sampling shows that limit not satisfied, the operator would be able to re-circulate through the treatment system. Consistent compliance with a hypothetical NPDES permit could not be achieved without such a pond. The Green pond also allows for further iron removal prior to being placed in a three-mile long pipeline.

#### 4. Footprint

Under DEQ’s proposal, the resulting footprint of the required 1150 gpm treatment system would be far too large to be placed on any property in the vicinity of Maple Road, with the exception of Veterans Park. The treatment unit (even if it was feasible to configure a system that could generate the required amount of oxygen from the atmosphere) would at a minimum replicate PLS’ current treatment building, which is approximately 60 X 115 ft. Treatment ponds would require at least 120 X 140 ft. Therefore, even if it was safe to locate a system big enough to accommodate DEQ’s remedial objectives it would not be possible to do so without occupying one of the City’s prime and most heavily utilized parks.

### **C. Conclusion.**

It appears that DEQ has felt tremendous pressure from the City to force PLS to implement a remedial alternative that closely resembles the one described in the City's comments to PLS' initial FS. In the rush to accommodate this request, DEQ has floated a remedial proposal that fails to consider a number of significant issues, including: a) the tremendous community disruption that would be caused by attempting to capture the leading edge in its current location; b) the health and safety issues associated with installing the pipelines from the leading edge and to the River; c) the health and safety issues associated with operating a treatment unit that is big enough to accommodate DEQ's proposed flow rate in a commercial area; d) the absence of legal authority to obtain access to "non-facility" properties and right of ways; e) the physical infeasibility of placing a treatment unit with a footprint as large as would be required under DEQ's proposal in a commercial area.

DEQ also ignores a very crucial fact – none of the risks, disruptions, or the incredible level of effort is needed to protect human health or the environment. PLS' plan is every bit as protective without placing such an overwhelming burden on the community.

### **III. PLS' Plan**

PLS has carefully reviewed Weston's Letter Report and DEQ's Fact Sheet, and it appears that everyone agrees that the available data indicate that the plume would migrate to the Huron River without reaching any receptors at unacceptable levels. The only substantive issue identified by DEQ and Weston regarding the protectiveness of PLS' preferred alternative is the belief that additional monitoring would be necessary to confirm the correctness of the downgradient migration pathway predicted by the City's Wellhead Protection Study. PLS is confident that the projected migration pathway, which is based data that the City developed and DEQ approved, is correct. Nevertheless, PLS is currently preparing an investigation work plan to obtain addition data to confirm this projection. This investigation work plan will be submitted to DEQ shortly.

The real issue is not whether there is currently enough information to irretrievably commit to PLS' plan, but rather whether it is appropriate commit irretrievably to a plan that imposes significant burdens on the community, involves significant safety risks, and is not technically feasible, when all available data indicate that these burdens and risks need not be incurred in order to protect the human health and the environment.

PLS' plan is far less risky and can be efficiently implemented. PLS has already built and tested a treatment unit that that can reliably treat the volume of water needed to reduce concentrations in the aquifer sufficiently to insure that the plume will never reach any receptor at unacceptable levels. Limited pipelines will be required, so access issues are minimized and can be easily managed.

PLS' plan has the additional advantage of being timely. In addition to avoiding the

multi-year effort needed to build pipelines three to four miles long, PLS' proposed plan incorporates the only discharge method that would not require a discharge permit. Weston, in addition to applying a double standard with regard to the amount of information needed to determine the viability of various discharge methods, overlooks this critical fact. PLS' proposed groundwater reinjection is authorized under R 323.2210(u)(ii) and does not require a NPDES, deepwell injection, or groundwater discharge permit. DEQ's proposal, and any other discharge scenario, requires issuance of a permit that can, and given the history of this site, will be challenged in a contested case proceeding.

Without saying reinjection will not work, Weston has questioned whether there is sufficient data in the Maple Road area to show that it will. As noted in the attached comments to Weston's Letter Report, it is not appropriate or necessary to incorporate a detailed analysis of such issues into a FS. But having said that, PLS has numerous monitoring wells in the Maple Village area and has conducted two aquifer pump tests to determine aquifer characteristics. All of this data was provided to DEQ, although Weston may not have had sufficient time to review it. PLS also provides the modeling report attached as Exhibit 2 to further support its reinjection discharge method. The modeling report confirms that none of the potential concerns raised by Weston are valid. The modeling also shows that the proposed extraction will significantly reduce the contaminant levels that might otherwise migrate past Maple Road.

#### **IV. Waiver**

Although DEQ's tentative proposal would require the party implementing the plan to purge an a significantly larger volume of water than PLS' plan, DEQ acknowledges that PLS' proposed alternative would meet the requirements of Part 201 if six conditions were met.

PLS' FS addressed and incorporated conditions 3, 5 and 6, although they may not have been addressed in the context of its request for a waiver. Consequently, these conditions would be satisfied under PLS' current proposal.

PLS questions the technical basis for condition 2 (containment of the 2800 ppb contour at Maple Road). The purported reason for this requirement is to ensure that the plume will be below the 2800 ppb GSI cleanup standard by the time it reaches the Huron River. The plume will, however, be subject to natural attenuation/dispersion as it migrates to the Huron River. As confirmed by the modeling presented in the FS, the plume will naturally attenuate to levels far below the GSI cleanup standard by the time it gets to the River, even without PLS' proposed interim response (See Appendix C to FS). Consequently, this requirement is overly conservative. As a practical matter, however, this condition may not be an issue, since it appears from PLS' groundwater extraction/reinjection modeling (Exhibit 2, hereto) that this proposed performance objective will be easily met.

PLS disagrees with DEQ's conclusion that conditions 1 (abandonment of the Northeast Supply Well) and 4 (additional institutional control) are legal barriers to approval of PLS' proposed alternative.

Abandonment of the City's northeast supply well should not be considered a condition of approving PLS' plan for the simple reason that it has been effectively (if not physically) abandoned already. The City of Ann Arbor discontinued operation of this well as soon as it detected concentrations of 2 ppb of 1,4-dioxane. Given the City's very public position that any detectable levels of 1,4-dioxane are not acceptable, it cannot reasonably be expected that the City will ever use that well. The only question is whether PLS should be required to compensate the City with regard to the well. As DEQ is aware, the City has indeed sued PLS and is contending that PLS must pay to replace the well. The issue of proper compensation, if any, will be resolved shortly in the current litigation. DEQ should not reject a proposed remedial alternative that is otherwise protective based on the existence of a well that has in fact been abandoned. Certainly, DEQ should refrain from attempting to implement a draconian and risky remedial alternative before the significance of this well is decided in the pending litigation.

Another reason that the existence of the City well should not drive DEQ's remedial decisions is that it is already contaminated with naturally occurring arsenic at levels above the federal MCL of 10 ppb. The City's own sampling data from 2002 confirms that the well contained 18 ppb of arsenic. (Exhibit 3). This fact has not previously surfaced as an independent reason for the City to take its well out of service and keep it that way. The City's sampling arsenic result is consistent with preliminary sampling PLS conducted in other wells in the Unit E aquifer, which showed elevated arsenic levels well above the federal MCL at multiple wells. (Exhibit 4). DEQ's own water quality database reflects the elevated levels of arsenic found in this area.

If the City was willing to abandon its well based on the presence of a compound at levels 40 times lower than the cleanup standard, it necessarily follows that the presence of a "known carcinogen" at levels well above the cleanup standard should independently cause the City to abandon its well. Certainly, it would not be prudent for DEQ to implement an incredibly disruptive, potentially unsafe, and infeasible remedial alternative based on the existence of a well that is already, and independently, contaminated.

Similarly, PLS disputes DEQ's position that a new institutional control in the form of a new City or County ordinance is a prerequisite for approval of PLS' plan. The current county ordinance accomplishes what is required under Part 201 with limited exceptions. A combination of existing ordinances and other institutional controls, such as a court order, can, however, be implemented to accomplish the statutorily mandated objective for institutional controls that prevent unacceptable exposure. The following ordinances are already in place that control drinking water exposure in the zone that needs to be protected:

Washtenaw County Rules and Regulations for the Protection of Groundwater, adopted February 4, 2004, Res. No. 04-0029 (Appendix F to FS), reliably restrict the installation of new water supply wells in the zone of protection. Under those rules and regulations: (1) no one can construct or drill any well (including a drinking water well) without first obtaining a permit from the County Health Office (Sec. 2:1); (2) no municipality within the county may issue a building permit where a well is necessary or allow construction to commence on any land where an approved public or private water supply is not available

until issuance of a permit by the Health Officer (Sec. 2:4); (3) no permit can be issued by the Health Officer if it is not in compliance with the Rules or if it would create a dangerous or unsafe condition (Sec. 2:5); (4) it is unlawful for any person to occupy or permit to be occupied any premise in Washtenaw County not equipped with an adequate supply of potable water as determined by the Health Officer (Sec. 6:1); (5) the rules apply to all non-community and private groundwater supplies within Washtenaw County (Sec. 6:2); (6) water supplies intended for human consumption that are not “potable” must either be abandoned, identified at the outlet as unfit for human consumption, or treated by methods approved by DEQ or the County Health Officer so as to make the water potable; (7) newly drilled wells cannot be used for human consumption until approved by the Health Officer and after they have been tested for bacteriological or chemical contaminants (Sec. 6:6); and (8) no well can be located within at least 100 feet of a source of contamination, or within such increased distance as determined necessary by the Health Officer (Sec. 6:7). “Potable” water is defined as water that is free of contaminants in concentrations that may cause disease or harmful physiological effects, is safe for human consumption and meets the State drinking water standards set forth in the Michigan Safe Drinking Water Act.

The only inadequacy in the current county ordinance identified by DEQ is that it allegedly does not prohibit the installation of a new industrial well that could exacerbate the contamination by changing its flow path. PLS disagrees with that conclusion. The existing county ordinance would indeed prohibit installation of such a well (see Section 2.1: permit required for installation of any new well; and Section 2:5(b): Health Officer “shall” deny permit for any well that would “create a dangerous condition, public nuisance, or potentially contaminate the groundwater.”). Thus the existing institutional controls are more than adequate to provide the required protection.

Moreover, an institutional control is not required at all in connection with a waiver granted under subsection MCL 324.20118(6)(c) (“The adverse environmental impact of implementing a remedial action to satisfy R 299.5705(5) or R 299.5705(6), or both, of the Michigan administrative code would exceed the environmental benefit of the remedial action.”). Any attempt to prevent the leading edge from migrating (let alone capture the plume at multiple locations) would cause far more environmental harm than benefit. As explained in the FS, this would be true even if the response action were limited to capturing the leading edge. The DEQ’s proposal would essentially triple the environmental harm described in the FS.

Moreover, recent testing of the Unit E aquifer demonstrates that it is already contaminated by naturally occurring arsenic, well above the federal MCL of 10 ppb (which Michigan is in the process of adopting, as required by federal law). PLS’ testing in the Maple Shopping Center area revealed high levels of arsenic, ranging as high as 138 ppb. Arsenic is a known carcinogen, and based on drinking water standards, is considerably more dangerous than 1,4-dioxane. Given the already contaminated status of the aquifer, the benefit of capturing the leading edge of 1,4-dioxane, which would still allow 84 ppb to be present in the aquifer, is non-existent. How then can DEQ justify the extraordinary environmental damage, community disruption and overall expenditure of resources that would be required to implement DEQ’s

plan?

## V. Weston Cost Analysis

Weston repeatedly acknowledged during a recent conference call that it did not have sufficient time to properly analyze the cost estimates. As explained below, it is obvious that Weston did not have sufficient time to learn the first thing about this site or the treatment technologies being contemplated. The result of Weston's cost analysis is so inaccurate and misleading that it cannot be used as a basis for any remedial decisions and should be withdrawn. The inadequacy of the cost estimate is revealing, not just because of its inaccuracy, but also because it confirms that Weston did not have sufficient time to familiarize itself with the site to properly evaluate the competing remedial proposals. For example, it is difficult to see how Weston could provide a meaningful evaluation of the costs and benefits of DEQ's proposed Wagner Road interim response when they admit that they didn't know that the plume would be intercepted off the PLS property under that approach. Their evaluation of both the PLS plan and DEQ's proposal should be disregarded for the same reasons that their cost estimate is woefully inaccurate and misleading.

The following is a summary of some of the most significant shortcomings in the Weston cost analysis. PLS reserves the right to identify additional errors as it continues to review Weston's analysis:<sup>1</sup>

1. No capital or O & M costs were included by Weston for Wagner Road portion of DEQ's proposal. According to Weston, this was excluded intentionally. ("Operation and Maintenance (O & M) costs for extraction, treatment, and discharge are not included in the cost estimate because they will be absorbed by existing system costs." (p. 23))

This position is not supportable. PLS currently uses its capacity at Building 5 to support remediation of other aquifers. Displacing that capacity will upset court ordered deadlines for completion of response actions in those other aquifers. Also, use of existing capacity still has an O&M cost and should still be evaluated because are still incurred under DEQ's proposed response. The O & M for Wagner Road is not free. Moreover, neither the cost nor the alleged benefit of this interim response can be determined until the capture volume has been determined and the effect of adding this volume to the existing system can be evaluated. Any such benefit must be compared to the detrimental effect reducing the D2/C3 purging will have. PLS incorporates by reference its dispute resolution letter regarding this issue and all subsequently filed materials.

2. No costs for pipelines were proposed by Weston for Wagner Road. No explanation was provided for why this cost was omitted. During a recent conference call, Weston admitted that they assumed that the plume would be intercepted at a point on Wagner

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<sup>1</sup> PLS also does not agree with Weston on some routine numbers, such as those for installation of monitoring wells or purge wells and various unit costs. PLS can provide more detail on the rationale for its costs, which is typically based on PLS' experience with installations at this site over the last ten years, if such detail will provide a basis for a different remedy.

Road that would be on PLS' property. As DEQ's representative acknowledged, DEQ's remedy would require installation of three off-site wells and pipelines along Wagner Road back to PLS' facility and that these costs should have been included.

3. Overall unit costs for treatment were grossly underestimated. In an email from DEQ, PLS learned that Weston's numbers (\$0.26 / 1000 gallons for "Leading Edge" and \$0.27 / 1000 gallons for Maple Village) were derived from two sources. One was a vendor quote (\$0.15 per 1000 gallons based on a scenario where the influent would only have 85 ppb), and the other was unidentified "general unit costs for advanced oxidation processes" (\$0.35 per 1000 gallons).<sup>1</sup>

PLS contacted the same vendor (same contact person). That person stated: (1) that the APT system was not intended to be used for low concentrations (85 ppb or less) of 1,4-dioxane; and (2) \$0.15 per 1000 gallons seemed "very low." As of the time of this writing, that vendor had no recollection of, nor could he find, any record of any communications with Weston where such a quote was provided. PLS also notes that influent for the system proposed for DEQ's remedy will include a combination of water in the 80 ppb range with water containing 1,4-dioxane in the 1000s of ppb range. This will increase operating costs significantly above the quote. Weston's costs obtained from the vendor also include nothing for system **maintenance** – they cover only operation. PLS' experience in Building 5 shows that these systems will require routine millions of dollars of maintenance. DEQ in fact requires that PLS implement an operation *and* maintenance plan for its treatment facilities.

It should also be noted that PLS assumed a modest treatment unit with an on-site ozone generator. The ozone generator raises operation costs, but eliminates the need for large-scale storage of liquid oxygen. A treatment system large enough to treat the volume of water envisioned by DEQ's proposal would involve large-scale on-site storage (and frequent shipments) of liquid oxygen. As discussed above, this is a very significant health and safety issue, especially given the location of the proposed system. It is not possible to accurately calculate a reasonable O&M unit cost for a system sized to meet the demands of DEQ's proposal that could safely be operated in the Maple Road area, but it would be far higher than the absurdly misleading numbers Weston has used.

4. Weston inadvertently dropped 10 years of treatment costs at Maple Village. This is because treatment costs were estimated in total for volumes for both Maple and "leading edge" locations under the latter category, and a 10-year horizon was then used for computing treatment costs for both of those locations together. In reality, DEQ's proposal is for approximately 10 years "leading edge" and 20 years at Maple Village.<sup>2</sup>

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<sup>1</sup> PLS also notes that Weston used the \$0.15 unit cost, only, when it evaluated the cost estimates provided in the FS. Apparently, this was done intentionally to give the incorrect impression that PLS overstated the costs. In fact, since the FS was submitted, PLS has revisited its liquid oxygen based unit costs and they have risen from \$0.91 to \$1.43/1000 gallons.

<sup>2</sup> See DEQ Fact Sheet, Table 1, footnote 5.

5. No staff costs were included by WESTON. Running and maintaining Building 5 currently requires a full-time staff of 8 people. Because DEQ's remedy involves surface water discharge, the staff will have to be certified operators, and someone will have to be present or on call 24 hours a day. A new treatment building at Maple Road cannot be "absorbed" by the current staff as it will require the commitment of a similar level of staff hours to run.
6. The estimate for Maple Village includes nothing for property access for the treatment system. The cost estimates assume that access for the 25,500 feet of pipeline would be free (no cost provided).

## **Conclusion**

It is impossible to accurately calculate the cost of DEQ's proposal because it's simply not feasible. For instance, the treatment costs cannot be calculated since it is not feasible to continuously operate an oxygen generator-based system of the required size. Even if one were to use the less expensive liquid oxygen based treatment costs, and ignore the impossibility of calculating the necessary access fees, the total costs would be many times the estimated cost Weston has conjured up.

Weston's estimate is so misleadingly low that it appears that their overriding goal was to make the cost of DEQ's proposal appear "less scary." An example of this is their so-called present value calculation. All Weston did was to apply a discount factor of 7% to their already low cost estimate. Weston's calculation is not based on any DEQ or EPA guidance, applies an inordinately high discount factor, and, incredibly, fails to account for inflation at all. As noted above, PLS liquid oxygen unit treatment cost has already gone from \$0.91 to \$1.43/1000 gallons, in large part because of an increase of chemical costs.

Weston's cost estimate, which was admittedly rushed and incomplete, should not be considered in DEQ's decision-making process.