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4.6.16

Heather Ken

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September 10, 1984

Mr. Gerald Levy (By Hand)
Program Coordinator
Enforcement Division
U.S. Environmental Protection Agency
J.F. Kennedy Federal Building, Rm. 2103
Boston, Massachusetts 02203

Mr. Gilbert T. Joly, P.E. (Express Mail)
Regional Environmental Engineer
Massachusetts Department of Environmental
Quality Engineering
Central Regional Office
75 Grove Street
Worcester, Massachusetts 01605

Re: W. R. Grace & Co. "Final Report on Aquifer Restoration Program"
(June 1984)

Dear Messrs. Levy and Joly:

Enclosed are the Town of Acton's comments on the above W.R. Grace & Co.
report submitted pursuant to the EPA Final Decree and the DEQE Order.

Sincerely,



Stephen D. Anderson

SDA/lv

Enclosure

cc: Willard R. Pope, Esq. (By Hand)
Mr. Allen E. Rothermel
William J. Cheeseman, Esq. (By Hand)
Mr. John E. Ayres
Erik Lund, Esq. (By Hand)
Mr. Nigel Palmer (By Hand)
Andrew Lauderback, Esq. (By Hand)
Mr. Joseph DeCola (By Hand)
Mr. Edmond Benoit (Express Mail)
Mr. Kenneth Wenger (By Hand)

COMMENTS OF THE TOWN OF ACTON
(SEPTEMBER 10, 1984) REGARDING
W. R. GRACE & CO. "FINAL REPORT ON
AQUIFER RESTORATION PROGRAM" (JUNE 1984)

The present comments of the Town relate to Grace's remedial plans which may become final remedial options for aquifer restoration at the W.R. Grace facility. Accordingly, the Town takes this important opportunity to summarize the applicable provisions of the EPA Decree and DEQE Order, to reemphasize certain substantive comments that the Town has made to date, to set forth the Town's understanding of the ultimate goal of aquifer restoration at the W.R. Grace facility, and to make specific technical comments on the W.R. Grace proposal.

I. OPERATIONAL PROVISIONS OF THE EPA DECREE AND DEQE ORDER

Under the EPA Decree and DEQE Order, aquifer restoration has four phases:

Phase (1): Submit a plan of study for an engineering report for aquifer cleanup and restoration "to a fully usable condition" including a determination of the "extent and direction of all hazardous waste contaminant plumes from the W.R. Grace Acton facility" and an analysis and evaluation of "alternatives for accelerated cleanup" (emphasis added).

Phase (2): Proceed with the analysis, evaluation, recommendations and findings. Submit a report including, among other things, an "aquifer restoration plan of action ... implementing one or a combination of the restoration alternatives which will insure restoration of the aquifer to a fully usable condition" (Emphasis added).

Phase (3): Implement the plan approved by EPA and DEQE.

Phase (4): Monitor the aquifer "to verify that contamination by hazardous waste has ceased."

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II. SUMMARY OF TOWN COMMENTS

Throughout the history of the consent decree implementation process, the Town has recommended that complete and optimum waste site cleanup and aquifer restoration be carried out. I will summarize some of the comments that the Town has submitted to EPA and DEQE concerning the major goals of the program and the Town's suggestions on how to implement them.

A. The Objective Of Aquifer Restoration

In comments submitted to EPA and DEQE on January 19, 1981, the Town summarized its understanding of the goal of aquifer restoration embodied in the EPA Final Decree and the DEQE Order as follows:

Both the EPA Final Decree (¶XII) and the DEQE Order (¶7) establish the goal of "aquifer cleanup and restoration." The EPA Final Decree further specifies that aquifer cleanup and restoration must be "to a fully usable condition." In addition, both the EPA Final Decree and the DEQE Order specify that the aquifer restoration plan must address "all hazardous waste contaminant plumes from the W.R. Grace Acton facility." The necessary conclusion from these requirements is the following: The proper frame of reference for the aquifer restoration plan is not simply the restoration of Assabet Wells Numbers 1 and 2 to potable use but the restoration of any part of the aquifer affected by contamination from the W.R. Grace Acton Facility. Neither the GZA study nor any subsequent work by CDM has defined precisely the extent of the aquifer or the extent of the contaminant plumes from all sources on the Grace property. For this reason the EPA Final Decree and the DEQE Order call for a thorough program of sampling and analysis of all hazardous waste contaminant plumes. While the present CDM proposal has focused on a known area contamination, it fails adequately to address other possible areas of contamination which must be cleaned-up as part of the overall aquifer restoration.

The Town reiterated these comments on July 13, 1983, and went on to state:

It is implicit throughout the present report that Grace views "aquifer restoration" as synonymous with "restoration of the Assabet Wells" to the point where they are free of, or contain only low levels of, contaminants. Despite the unequivocal governmental mandate that aquifer restoration is broader than well restoration, Grace's present program does not address restoration of all other contaminated portions of the aquifer in addition to the Assabet Wells, nor does it consider restoration of areas in adjacent aquifers which have been degraded by Grace activities. The Town does not agree with the assumption implicit in Grace's approach that if chemical contaminants do not enter the

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Assabet Wells, they do not pose a problem and need not be addressed. Not only does the presence of these contaminants inhibit the possible future development of the aquifer for potable water, but also the flow of these chemicals toward the Assabet River is itself an environmental health problem that must be addressed. In addition, since Grace has now admitted that certain sources of contamination such as the north lagoon and the blowdown pit impact the Fort Pond Brook watershed (Report at 5-7), these contaminant plumes must be addressed.¹

In short, the Town strongly recommends that EPA and DEQE enforce the requirements of the Final Decree and Order and the conditions of approval of the aquifer restoration plan of study by requiring that Grace restore the complete aquifer to a fully usable condition and address the contaminant plumes affecting the Fort Pond Brook watershed.

B. The Impact Of The Landfill On The Mass. Broken Stone Aquifer

Commenting on the need for continued investigation at the landfill, the Town submitted on May 11, 1983, the following comments:

The Acton Water District (AWD) may consider other locales in the vicinity of the Massachusetts Broken Stone Pit to be potential additional supply well sites. If one or more such sites were to be developed, questions concerning pumping related changes in flow direction will arise (i.e. would pumping from a well located between the landfill and boring B-9 alter the flow field to such an extent as to induce contaminants to move toward that location?) Assessments of this type should be considered at this time, using the CDM computer model (as described in the recent aquifer restoration plan), prior to completion of the final landfill investigation.

C. Drinking Water Standards And Aquifer Restoration

In the context of commenting on the aquifer restoration program and the proposed "pumping test," the Town stated on January 19, 1981:

The question of what is an "acceptable" or "safe" level of any contaminant material in drinking water is a topic of much present investigation and debate. The Town understands from its meeting on January 5, 1981, with CDM and federal and state officials that new federal water quality standards for the "129 priority pollutants" are in the process of issuance. The Town further understands that DEQE can set more stringent standards than any that may be established at the federal level.

¹This was not the first or the last time the Town pointed out the need to address contamination migrating in the direction of Fort Pond Brook. See Exhibit A, attached.

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The Town requests that any studies or combination of studies performed under the aquifer restoration plan and/or the proposed pumping test should be followed through to evaluate the optimal achievable results, not some hypothetical "breakthrough" point. Only at the completion of such studies will it be possible to assess the relationship between benefit and cost and whether there is an absolute solution that goes far enough in restoring the aquifer to a fully usable condition.

D. Proposed Use Of The National Contingency Plan Standards

In its comments dated June 17, 1983 on the phase three lagoon plan of study, the Town stated:

The Town agrees with DEQE's letter to Grace dated April 4, 1983 regarding the proposed use of the National Contingency Plan standards adopted under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as a guide for the activities under the EPA Final Decree and the DEQE Order. Both the Decree and the Order are designed to address the specific problems at the Grace site and are stricter in certain respects than the CERCLA regulations. For example, the "cost-effectiveness" criteria of CERCLA and the NCP [National Contingency Plan] should not be interposed to prevent the adoption of technically superior remedial alternatives arrived at through the consent decree process.

With this by way of background, the Town will now address the ultimate goal of aquifer restoration and the specifics of the Grace proposal.

III. THE ULTIMATE GOAL OF AQUIFER RESTORATION

In its letter dated August 31, 1984, to Messrs. Moebes and Benoit (copy attached), the Water Supply District of Acton has amply demonstrated the critical present and future water needs of the Town, its citizens and its residents. The Water District has further shown that these needs can only be met if all adversely aquifers affected by the W.R. Grace Facility, including specifically the Massachusetts Broken Stone Area, are restored to a fully usable condition. These observations by the Water District

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conclusively establish that the aquifers affected by the Grace facility are entitled to the maximum level of protection as important supplies of potable water and must be completely restored to fully usable conditions.

The ultimate test for a "fully usable" aquifer is whether its water is safe for human consumption (under the most stringent public health standards, using the the conservative medical principles) and whether this level of safety can be assured and maintained both now and in the future. Both the clean-up of the individual waste sites and the restoration of any affected aquifer must proceed with this as the foremost goal, with particular regard for the present and future needs of the Town of Acton, for a continuous, self-sufficient supply of potable water which meets this test of safety at an affordable price. The burden is on Grace, as a demonstrated source of organic chemical contamination of the Assabet wells and related Massachusetts Broken Stone aquifer and an admitted source of contamination in the Fort Pond Brook aquifer, to restore those affected wells and aquifers to the point where, untreated, the water pumped from those wells and aquifers will now and in the future satisfy this strict test of safety.

To the extent drinking water standards may be used as the performance test for safety and aquifer restoration, the strictest promulgated standards should be employed. In this context, the Town notes the following. As EPA and DEQE are aware, the Acton Water District adopted in 1980 a water quality standard that limits to 1 ppb any single volatile organic contaminant and to 5 ppb the total of such contaminants. On June 12, 1984, EPA proposed Recommended Maximum Contaminant Levels (under the Safe Drinking Water Act, 42 U.S.C. § 300f et seq.) of zero for Benzene, Carbon Tetrachloride, 1,2 Dichloroethane, 1-1 Dicloethylene, Tetrachloroethylene, Trichlorethylene and Vinyl Chloride. Studies conducted at the Grace site indicate that many

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of these substances can be found in the groundwater and surface water of Grace's property as well as in the affected aquifers. Further, the EPA has issued Ambient Water Quality Criteria Documents for sixty-five toxic pollutants or pollutant categories including the Dichloroethylenes. 45 Fed. Reg. 79318 (11/28/80). These documents, issued pursuant to Section 304(a)(1), of the Clean Water Act, 33 U.S.C. 1314(a)(1), aim to reflect the latest scientific knowledge on the pollutant's effect on the health and welfare of aquatic life, wild life, plant life, shorelines, beaches, esthetics, recreation and groundwater, the concentration and disposal of the pollutant and its effect on biological community diversity, productivity and stability. For maximum protection of humans from potential carcinogenic effects on 1,1-dichloroethylene due to exposure through ingestion of contaminated water and contaminated aquatic organisms, the EPA states that the ambient water concentration should be zero.

In its draft Aquifer Restoration Approval Criteria for the Grace site dated August 30, 1984, DEQE has stated that it will accept a concentration standard achievable in 3-5 years of "1 ppb or less of total VOC" for restoration of Assabet Wells 1 and 2 and for any areas undergoing natural cleansing, and a maximum concentration "not to exceed 1 ppb total VOC ... and no adverse impact on downgradient aquifer usage" at recovery wells. The Town understands DEQE to mean that all portions of any affected aquifer must be restored to meet a criterion of 1 ppb total VOC as soon as possible. DEQE's draft goal is therefore intermediate between the criterion of zero (EPA's proposed RMCL's and actual ambient water standard for certain chemicals at issue) and the Water District's drinking water standard of 1 ppb of any and 5 ppb total VOC. The Town believes that the criterion of one ppb or less of total VOC is a reasonable restoration performance

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requirement and must, at a minimum, be achieved and enforced.² In particular, this criterion must be achieved and enforced for all aquifers which are to supply water to existing and future well sites identified by the Acton Water District, including groundwater resources for well sites at Assabet 1, Assabet 2, and the proposed Massachusetts Broken Stone Pit. Groundwaters and surface waters leaving W. R. Grace properties and/or impacted by Grace activities and subsequently used by the Lawsbrook, Christofferson (formerly School Street), and/or Scribner wells are at risk and must also be considered in the same context.

IV. SPECIFIC COMMENTS ON THE GRACE PROGRAM

With the foregoing statement of background and goals in mind, the Town has the following specific comments on the Grace program:

1. Plume Configurations

Specific definition of plume configurations, at 1 ppb total VOC, should be presented at any and all locations from which groundwaters and/or surface waters could be pumped by the wells and sites listed above. Such delineations should reflect Grace's predictions of when this will occur and identify measurement points which will uniquely reflect the water quality captured by the individual pumping wells. Procedures for verifying attainment of the criterion of 1 ppb maximum total VOC should be described in detail, including the sites and types of observation or pumping wells used for monitoring, methods used for integrating and interpreting the chemical data obtained from these wells, and procedures for government party intervention in the event that the results are either unsuccessful or inconclusive. Only in this way will it be possible to answer fundamental

²The Town would of course also support more stringent criteria that would result in further cleansing and restoration of the aquifer.

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questions about, for example, the Massachusetts Broken Stone Pit, such as:

(a) when will groundwater, with less than 1 ppb total VOC, be available from this source? (b) Are there monitoring wells in place which will be used to specifically evaluate the quality of groundwater contributions at this source? (c) If so, where are they, what are they sampled for, at what depths and when; and how will the data be used to verify the effect of the restoration program on the groundwaters in question? (d) What will be the case after completion of restoration and/or alteration of recovery operations? (e) What controls will be maintained and used if the Grace plan does not succeed?

2. Plume Analysis and Monitoring

It is not yet apparent that all plume concentrations, as they may impact existing and potential receptors, have been defined and verified under worst case scenarios which may be the present day conditions or conditions at some time in the future after the aquifer restoration plan is implemented, during source removal, or at some point thereafter. For instance:

(a) The potential impact on Fort Pond Brook from Grace contaminants requires further investigation at downstream locales during low flow conditions. The Acton Water District has downgradient water supply resources which use surface waters in the brook. This use requires unequivocal direct measurement verification of "no adverse impact." As a minimum, several additional downstream monitoring stations are needed.

(b) With respect to Grace's contention that flow to the northeast of the secondary lagoon has been adequately characterized and significant movement of contaminants in that direction has not or could not have occurred, the Town notes the following:

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- No measurement points, capable of determining either piezometric levels or water quality exist at depth between wells AR 9 and AR 10.³ Consequently, direct measurements of water levels and water quality have not been made and cannot be made. No direct measurement of the flow field is possible under the proposed recovery operations, nor is compliance monitoring in this area proposed or verifiable.

- Certain methods used by W. R. Grace and its consultants to characterize flow and water quality conditions northeast of the secondary lagoon appear indirect or questionable. (1) Decreasing the infiltration rate at the secondary lagoon from 0.08 ft/day (4/83 CDM report) to 0.05 ft/day (present CDM report) in order to calibrate the model, in lieu of measurements and test results in the area in question, is an example of an indirect approach. (2) Based on data supplied by CDM, the particle entry locations of the secondary lagoon appear to be located south of the groundwater divide which passes through this lagoon when simulating the 1961 to 1971 or 1971 to 1978 conditions. This selection of particle placement may artificially force the plume to migrate predominantly in a southerly direction, leaving only dispersive forces to induce movement in any other direction. A more representative simulation of the secondary lagoon plume would be to increase the number of source particle entry locations in an effort to assure that all of the water which is filtrating and causing mounding in the flow model (CDM's DYNFLO) is represented as contaminated water in the solute transport model (CDM's DYNTRACK).

³Well G-3, located in the general area of interest, is a shallow well point, does not fully penetrate the aquifer, and cannot be used for such purposes.

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For these and other reasons, the Town urges the government parties to require a minimum of two additional multilevel monitoring wells northeast of the secondary lagoon. These wells should penetrate bedrock and be used for both piezometric level monitoring and water quality sampling. They should be sited (1) within, and (2) outside of the radius of influence of the proposed recovery wells. The latter well should be at a sufficient distance to verify that contaminants introduced into the lagoon prior to 1978 and potentially migrating to the northeast will be intercepted and sampled.

3. Monitoring Well Locations

Comparison of the proposed W. R. Grace monitoring program with DEQE's reinterpretation of this program reveals the following questions and/or deficiencies (per DEQE draft Approval Criteria 8/30/84):

(a) Field Verification Wells

With the exception of the surface waters of Fort Pond Brook and additional wells northeast of the secondary lagoon, the plan calling for water level monitoring at virtually all available data points appears generally adequate at this time. However, the plan approval must be contingent upon field verification. Until predicted drawdown data are verified, the Town reserves the right to comment on the need for and location of additional water level monitoring wells.

(b) Compliance Monitoring Wells

As stated by DEQE, the compliance monitoring wells are intended to serve as monitoring points ". . . at locations of expected known worst case contaminant plumes or potential breakthrough of recovery systems." If this is the case, the sites proposed by Grace are insufficient in number and/or at locations too far removed from ". . . areas just immediately outside downgradient cones of influence . . ." (DEQE, page 1, C). The Town

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understands that Grace and CDM have verbally (during technical meetings) stated that additional sites are to be tested and used. This should be done. Further, additional compliance monitoring at existing and new wells should be established during the recovery program. The proposed monthly/biannual monitoring (Vol. 1, p 99 and 104) is insufficient. The locations of such sites would be based upon field verified data which establishes the actual radius of influence of Grace's proposed recovery wells. The Town reserves the right to provide input into this process.

(c) Natural Cleansing Wells and Final Compliance Wells

As in the previous examples, the Town reserves comment on the proposed Grace program until the recovery system is in place, operating, and adequately monitored. The Town takes exception to Grace's proposal to ignore potential flow components northeast of the secondary lagoon and discharges downstream along Fort Pond Brook. The computer model should be expanded to deal with this.

4. Verification of Assumptions

Grace makes a number of assumptions which are of questionable validity or which lack an adequately demonstrated basis. These assumptions require scrutiny. For instance, Grace assumes that Assabet 1, Assabet 2 and the gravel washing well will be pumped in accordance with certain schedules. However, these wells are not subject to Grace's control and may have alternate requirements such as the need to rest municipal pumping wells. Similarly, Grace makes certain predictions about the removal of contaminants by biodegradation (See, e.g. Vol. 2, Table 2; Vol. 3, p. I, figure E-1; Vol. 3, pp. 2-36, 2-38, 2-42, 4-12). The basis and field data which supports this hypothesis should be produced and analyzed.

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V. SOURCE REMOVAL CONCERNS

At this juncture, the Town reemphasizes that recovery operations must be in effect and fully established prior to source removal. The Town understands that Grace has accepted this. Source removal may release contaminants into the underlying aquifer and subsequently put downgradient water supplies and/or the Water District's treatment facilities at risk. Monitoring of the effects of source removal, however, have not been addressed by either Grace or CDM. It is not prudent to assume that there will be no release; therefore, questions of the effect of variable releases on the proposed aquifer restoration plan require answers. However, these questions cannot be answered at this time because no definitive closure means have been proposed. Consequently, the Town reserves the right to address these issues in the future.

VI. CONCLUSIONS

Subject to the foregoing comments and requirements, the Town recommends that contingent approval of the aquifer restoration plan should be given. The Town insists that the additional work outlined above should be completed during the restoration program. Additionally, the Town reserves the right to comment on the plan's effectiveness and have further input into the verification and conditional approval processes.

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April 5, 1984

By Hand

Mr. John R. Moebes, Chief
Waste Response and Compliance
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U. S. Environmental Protection
Agency
J.F. Kennedy Federal Building
Boston, Massachusetts 02203

Mr. Edmond Benoit
The Commonwealth of Massachusetts
Department of Environmental Quality
Engineering
Central Region
75 Grove Street
Worcester, Massachusetts 01605

Re: W.R. Grace & Co.

Dear Messrs. Moebes and Benoit:

Recently, the Town of Acton received a copy of Nigel Palmer's letter to you commenting on the Acton Water District's letter dated March 1, 1984, addressed to EPA and DEQE regarding the chemical contamination of the Lawsbrook and Scribner wells and the related Fort Pond Brook aquifer. The Town feels compelled to respond to Mr. Palmer's letter and to reemphasize to you the importance of the emergency concerns raised by the Water District.

EX. A.

Mr. John R. Moebes, Chief
Mr. Edmond Benoit

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April 5, 1984

The Town has the following comments:

1. The Town has Consistently Pressed for Investigation and Eradication of the Problem of Contamination of the Fort Pond Brook Watershed

Throughout the process of implementing the EPA Final Decree and the DEQE Order, the Town has consistently and emphatically called for the investigation, prevention and eradication of contaminant plumes from the Grace facility affecting on the Fort Pond Brook aquifer and wells. Examples of these comments are as follows (emphasis added):

- a. Comments Dated October 17, 1980 Re Sampling & Analysis Plan

[W]ith respect to the CDM well proposed for an area downgradient of the "North Lagoon," recent GZA analysis of stormwater runoff in this area indicates that some residual contamination by volatile organics continues to infiltrate here. We suggest that CDM propose specific well locations (or a methodology for selecting well locations) in this area which can be carefully analyzed to insure a selection that will provide the best possible evaluation of the potential impact from this source. Should contamination be found to exist in the Fort Pond Brook watershed or any other adjacent watershed, we strongly recommend that CDM expand or modify its program to assess these areas.

- b. Comments Dated June 23, 1981, Re Sampling and Analysis Program

The Town stresses here, as it did in these [previous] comments, that the goal of aquifer restoration must address all contaminant plumes emanating from the Grace Acton site, not simply plumes that may directly impact the Assabet Wells. For example, monitoring wells should be placed to investigate plumes that may impact Fort Pond Brook, the Assabet River, etc.

- c. Comments Dated July 13, 1983, Re Progress Report on Aquifer Restoration

It is implicit throughout the present report that Grace views "aquifer restoration" as synonymous "restoration of the Assabet Wells" to the point where they are free of, or contain only low levels of, contaminants. Despite the unequivocal governmental mandate that aquifer restoration is broader than well restoration, Grace's present program does not address restoration of all other contaminated portions of the aquifer in addition to the Assabet Wells, nor does it consider restoration of area in adjacent aquifers which have been degraded by Grace activities. The Town does not agree with the assumption implicit in Grace's approach that if chemical contaminants do not enter the Assabet Wells, they do not pose a problem and need not be addressed. Not only does the presence of these contaminants inhibit the possible future development of the aquifer for potable water, but also the flow

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Mr. John R. Moeber, Chief
Mr. Edmond Benoit

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April 5, 1984

of these chemicals toward the Assabet River is itself an environmental health problem that must be addressed. In addition, since Grace has now admitted that certain sources of contamination such as the north lagoon and the blowdown pit impact the Fort Pond Brook watershed (Report at 5-7). These contaminant plumes must be addressed.

In short, the Town strongly recommends that EPA and DEQE enforce the requirements of the Final Decree and Order and the conditions of approval of the aquifer restoration plan of study by requiring that Grace restore the complete aquifer to a fully usable condition and address the contaminant plumes affecting the Fort Pond Brook watershed.

2. Grace's Has Admitted that Contaminant Plumes from its Facility Impact Fort Pond Brook Watershed

Commenting on the "Simulated Composite VDC Plume" shown in Figure 5.1 of the "Progress Report on Aquifer Restoration Program" dated April 1983, Grace and CDM admitted that the "Blowdown Pit appears to be located above the groundwater divide; thus, contamination from this source moves both to the south, discharging into the Assabet River, Muskrat and Turtle Ponds, and WRG-3; and to the north, discharging into Fort Pond Brook" (Report at 5-7; emphasis added). It also concluded that "[c]ontaminants from the North Lagoon move northward, discharging into Fort Pond Brook" (Report at 5-7; emphasis added). Furthermore, while the report maintained that volatiles entering Fort Pond Brook "rapidly evaporate out of the water" (Report 5-7), the report was singularly unhelpful with respect to subsurface migration of contaminants. Subsequently, as the Water District has pointed out in its letters dated February 13 and March 1, 1984, to EPA and DEQE, not only has Grace further admitted that contaminant plumes from its facility impact the Fort Pond Brook watershed, but tests of the Lawsbrook and Scribner Wells by the Water District have forced the disconnection of these wells from the public water supply owing to the presence of 1,1 Dichloroethylene (VDC) and 1,1,1 Trichloroethane.

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Mr. John R. Moebes, Chief
Mr. Edmond Benoit

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April 5, 1984

3. Emergency Action is Required to Mitigate and Eradicate this Problem

The problem which the Town has warned about for the last several years has now become a reality. Two more existing public drinking water wells have been shut down due to chemical contamination. This problem can only worsen if left unattended with the passage of time. Emergency action is necessary to mitigate and eradicate the problem.

Mr. Palmer has referred in his letter to so-called "[f]irm hydrological data" which allegedly "shows unequivocally that no transfer to the Lawsbrook and Scribner wells of any contaminant found on Grace property is occurring now or could have occurred in the past" and which has allegedly "been reviewed with technical representatives of EPA, DEQE and the Town of Acton" (Palmer letter, p. 1). The Town is unaware of any such data and requests that Grace immediately supply in writing any such data and explanatory material to the Town,

In any case the Town is primarily interested in expediting by whatever means necessary the prevention, mitigation and eradication of further contamination of the Fort Pond Brook aquifer, watershed and wells. Accordingly, the Town urges that EPA and DEQE expedite under the Final

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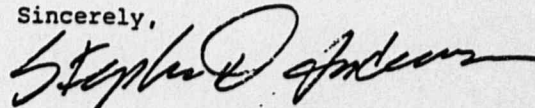
Mr. John R. Moebes, Chief
Mr. Edmond Benoit

- 5 -

April 5, 1984

Decree and Order approval of all appropriate measures to restore the aquifer
and thus to prevent any further contamination from these plumes.

Sincerely,



Stephen D. Anderson

SDA/lv

cc: Willard R. Pope, Esq. (By Hand)
Ms. Nancy Banks
William J. Cheeseman, Esq. (By Hand)
Mr. John E. Ayres
Erik Lund, Esq. (By Hand)
Water Supply District of Acton
Mr. Nigel Palmer
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0276

TELEPHONE 263-9107

4.6.168

Water Supply District of Acton

MASSACHUSETTS AVENUE
ACTON, MASSACHUSETTS 01720

August 31, 1984

Mr. John R. Moebes
Waste Response & Compliance Branch
U.S. Environmental Protection Agency
John F. Kennedy Federal Building
Boston, MA 02203

Mr. Edmond G. Benoit
Deputy Regional Environmental Engineer
Air and Hazardous Waste Program
Mass. Dept. of Environmental Quality
Engineering
75 Grove Street
Worcester, MA 01605

RE: The Necessity of Restoration of the Massachusetts
Broken Stone Pit Aquifer and the Lawsbrook/
Scribner Aquifer by W. R. Grace & Co.

Dear Messrs. Moebes and Benoit:

It is the Acton Water District's position that the United States Environmental Protection Agency (EPA) and the Commonwealth of Massachusetts Department of Environmental Quality Engineering (DEQE) should require W.R. Grace & Co. to clean up and restore the aquifers in the Town of Acton upon which Grace's property is situated, and the aquifers through which its contamination flows, including that portion of any aquifer flowing through the property known as Massachusetts Broken Stone Pit (MBS) and/or any aquifer flowing toward the Lawsbrook and Scribner Wells. The result of this restoration should be to yield water the quality of which does not exceed the criteria established by the Acton Water District -- maximum total allowable concentration of volatile organic compounds (5ppb); maximum allowable concentration for any single compound (1ppb).

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The AWD criteria were adopted by the AWD in 1980. On June 12, 1984, EPA proposed Recommended Maximum Contaminant Levels (under the Safe Drinking Water Act, 42 U.S.C. §300f et seq.) of zero for Benzene, Carbon Tetrachloride, 1,2 Dichloroethane, 1-1 Dichloroethylene, Tetrachloroethylene, Trichloroethylene and Vinyl Chloride. Studies conducted by Grace's consultants show that many of these substances can be found in the groundwater and surface water of Grace's property as well as in the aquifers. The AWD criteria have been exceeded for samples collected at the Assabet Wellfield since the wells were closed in 1978; at the Clapp Well since 1982; and more recently at the Lawsbrook and Scribner Wellfield in February 1984. AWD treatment of Assabet 1 and 2 by means of carbon filtration began in 1982; aeration treatment was added to the filtration process in February, 1984. Treatment of the Clapp Well by the AWD is scheduled to begin shortly.

Only if these aquifers are restored can the Acton Water District meet its current and long-term demand for water. Demand can only be met if all wells are operating and all remaining potential water supplies (including the Massachusetts Broken Stone area) are developed. The restoration of the aquifer flowing through the Massachusetts Broken Stone property is critical to meeting the current as well as the future needs of the citizens of the Town of Acton.

The current total average annual pumpage/water supply of the Acton Water District is approximately 2.27 million gallons per day (mgd). The summer demand is estimated at 2.3 mgd. The necessary backup water supply is estimated at 0.7 mgd. This figure assumes that all wells are pumping at maximum capacity. Approximately .45 mgd of this water supply is generated by the Whitcomb Well which has a high color problem, and is only used when absolutely necessary. In order to provide a reasonable margin of safety, the AWD estimates that a ready supply between 2.5 and 3 mgd should be maintained at all times. The Lawsbrook, Scribner, and Clapp Wells are no longer available, having been taken off line due to contamination by volatile organic compounds. Under ordinary circumstances, the Lawsbrook Well could only be operated during emergencies because the AWD does not own a 400 foot radius of surrounding land. The AWD has its current 2.27 mgd supply only because it designed and built a treatment plant at the Assabet Wellfield.

If another supply well becomes contaminated or if a pump fails, there is no available backup supply. A minimal storage capability is available in the AWD's artificial "reservoirs" but not at higher elevations in town. Clearly a severe shortage of water would exist.

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EXISTING DRINKING WATER SUPPLIES

Currently, the AWD has eight major supply well sites. Table 1 shows the average annual capacity at each site, yielding a total of 3.3 mgd if all sites were operating at full capacity. Table 1 also shows the average pumping rates at each site for the current supply situation, pumping a total of 2.27 mgd from the Assabet, Christofferson (formerly School Street), Conant, and Whitcomb sites. The current shut down of the Lawsbrook, Scribner, and Clapp Wells represents a loss of 1.05 mgd. Pumped water from the Assabet 1 and 2 Wells is extensively treated for removal of volatile organics prior to input to the supply network.

The following is a description of the status of the water supply and demand in Acton, which description supports the Water District's position.

While the current delivered drinking water supply in Acton is 2.27 mgd and the summer demand is estimated at 2.3 mgd, computer model simulations for "drought" conditions reported in "Final Report, Municipal Aquifer Study", Goldberg- Zoino & Associates, Inc., June 1984, indicate that the currently active wells may yield only 1.8 mgd, creating a peak summer demand shortfall of 0.50 mgd under drought conditions. The quantity was computed by assuming the Whitcomb and Assabet Wells pump 100,000 gpd less than their average measured capacity, as was generally the trend at other modeled sites.

Three aquifers were modeled in the GZA's June 1984 Final Report: North Acton (Nashoba Brook), Conant and Lawsbrook. Model results were calibrated to field groundwater level measurements. The purpose of each model was to aid in determining the water supply potential of each aquifer and to provide information which would enable the Acton Water District to maximize the use and protection of these aquifers. Pumping capacities from both yearly average and drought conditions were predicted using the model. The more conservative drought condition simulations assumed streams were dry and areal recharge was zero for a duration of thirty days.

EXISTING INACTIVE SUPPLY SITES

Reactivation of the Lawsbrook, Scribner, and Clapp Wells represent drought capacities of approximately 250,000 gpd, 200,000 gpd, and 300,000 gpd, respectively. However, the extent of remedial action necessary to permanently reactivate the wells is unknown and it is conceivable that these sites may never be reactivated without expensive treatment such as that underway at Assabet 1 and 2. A study of the contaminated Clapp Well is

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currently underway, and treatment of the well, pursuant to a grant by the Commonwealth of Massachusetts, is scheduled to begin shortly. In-depth studies of the Lawsbrook and Scribner Wellfields have not been initiated.

POTENTIAL SUPPLY SITES

Based on results of GZA's groundwater modeling studies, the wellfields in North Acton would yield up to 1.4 mgd for average annual conditions and 1.0 mgd under drought conditions. However, the cost to develop this site has been estimated by the AWD and their consultants (Dufresne-Henry Engineers) to be \$2,200,000 for wells, pumping stations and a piping network.

The Sinking Pond Aquifer, which includes the water supply flowing through the Massachusetts Broken Stone property, is currently the best known available water yielding aquifer in Acton. This aquifer's hydraulic properties of transmissivity and storage coefficient are excellent for well development. See, "Groundwater Investigation Assabet Well Field, Acton, Massachusetts", Goldberg, Zoino, Dunncliff & Associates, Inc., January 1980; "Final Report on Aquifer Restoration Program", W. R. Grace & Company, CDM, June 1984; "Development and Calibration of Groundwater Flow and Contaminant Transport Models of the Sinking Pond Aquifer System", CDM, 1983. Based on pumping test analyses and computer modeling studies contained in the above-referenced studies, significant sections of the aquifer have transmissivities in excess of 20,000 gallons/days/foot and storage coefficient values are estimated to be about 0.2. The close proximity of the Assabet River provides an additional source of water by way of induced infiltration.

At present the Sinking Pond Aquifer yields approximately 1 mgd from the Assabet 1 and 2 supply wells. The aquifer probably has the capacity to yield between 1 and 2 million gallons per day in addition to this current yield. One area which is best suited for development is located at the southern end of the Massachusetts Broken Stone property. This area was the subject of investigation, testing, and evaluation by the AWD in 1973, 1977, and 1978. See, "Groundwater Investigation Assabet Well Field, Acton, Massachusetts", Goldberg, Zoino, Dunncliff & Associates, Inc., January 1980. An aquifer pump test in this area was conducted by the Acton Water District in 1978. Interpretations of the test shown in this GZA report indicate transmissivity values similar to those obtained during pump tests at the high capacity W. R. Grace wells and Assabet wells. It was the intention of the AWD in 1978 to develop the Sinking Pond Aquifer,

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including the land of the Massachusetts Broken Stone Company, to its fullest extent by installing additional municipal wells. The contamination present in this area precluded the AWD from proceeding with its plans. In April of 1984, the AWD submitted to DEQE its application seeking a \$155,000 Aquifer Land Acquisition Grant for the Massachusetts Broken Stone property. A copy of this application is enclosed.

ADDITIONAL LOW POTENTIAL SUPPLY SITES

A review of surficial geology, stream flow data, and current supply well withdrawals was conducted to estimate the probability of locating additional supply sites. Results showed that the length of Fort Pond Brook from the confluence of Guggins Brook to the intersection of Lawsbrook Road receives a significant amount of water and could provide induced infiltration to a supply well if pervious soils are present. However, explorations conducted by GZA and others in this area indicate that the soils are not suitable for a conventional large supply well.

Other areas which are believed to be unsuitable for supply wells due to high density development (i.e. Acton is not sewered and individual septic systems are used) and low permeability soils include the Heath Hen Meadow Brook Aquifer near Stow and the West Acton Aquifer between West Acton Center and Grassy Pond.

Additional water supply may be available at the former O'Toole property in West Acton which the AWD has accepted as a gift. However, the AWD does not yet own a 400 foot radius around the proposed well site, and the groundwater may require treatment. The potential yield of water from this site has not yet been determined.

The Conant and proposed North Acton Wellfields are believed to be capable of capturing the upgradient available water from the Nashoba Brook Aquifer during low flow conditions. Water entering Nashoba Brook between the Conant Well and Fort Pond Brook could provide induced infiltration to a well in this area; however, little information is available regarding suitability of soils there. In any event, development of these areas would be subject to limitations described previously for North Acton, requiring wells, pumping stations, and a waterline network.

ADDITIONAL DRINKING WATER SUPPLIES

Additional possible drinking water supplies in Acton include the reactivation of closed supply wells and/or the installation of new supply wells.

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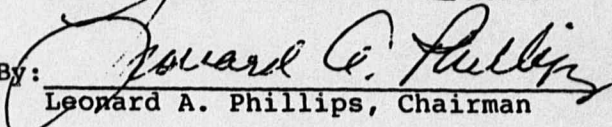
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SUMMARY AND CONCLUSIONS

In summary, there are no existing supply sites to immediately supplement the current near shortfall of drinking water supplied to the Town of Acton. Should another well be closed, a severe shortage would exist. This current situation will worsen as the Town's population and the number of water-users increase. The best water supply in Acton, in terms of the quantity of water available and costs for development, is the Sinking Pond Aquifer, which includes the Massachusetts Broken Stone area, where a large yield can be developed, pumped, and piped through the existing network at a minimal cost. Since W.R. Grace & Co. is required by the terms of its Consent Decree with EPA to restore the aquifers to a fully usable condition, the AWD takes the position that EPA and DEQE should require Grace to clean up and restore the aquifers, including the Massachusetts Broken Stone area to meet the water quality criteria established by the AWD.

Sincerely,
WATER SUPPLY DISTRICT OF ACTON

By:


Leonard A. Phillips, Chairman

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TABLE 1

Acton Water District

A. Water Demand (million gallons per day [mgd])

- | | |
|---|------------|
| 1. 1984 - summer peak necessary backup (20,000 population) | 2.3
0.7 |
| 2. 2000 - summer peak and necessary backup (30,000 population - est.) | 4.5 to 5.0 |

B. Water Supply

	<u>Normal Conditions (gpd)</u>	<u>Drought Conditions (gpd)</u>	<u>Operational Constraint:</u>
1. currently operating			
a. Conant	325,000	325,000	treatment is desirable for ph, carbon dioxide
b. Christoffersen (formerly School St)	500,000	350,000	
c. Whitcomb (high color)	450,000	350,000 ^{1/}	color treatment desirable
d. Assabet 1 & 2	1,000,000	800,000 ^{1/}	aeration and carbon treatment
2. near term operating			
Clapp (may be intermittent)	400,000	300,000 ^{1/}	treatment required
3. potential operating			
a. Lawsbrook	350,000	250,000	state approval required
b. Scribner	300,000	200,000	treatment required
4. future			
a. Kennedy, Marshall	1,000,000- 1,400,000	1,000,000	
b. Mass Broken Stone	1,500,000	1,200,000 ^{1/}	needs cleanup treatment by aeration and carbon
c. O'Toole (gift to AWD)	To be determined	To be determined	may need cleanup treatment by aeration and carbon

^{1/}Estimated drought capacities based on trends from other modeled sites.

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