

Finally, and most importantly, the Town cannot obtain approval to locate the resource recovery plant at the landfill without meeting a host of legal, technical, and environmental permit and policy criteria. The mere availability of water at the site is an insignificant, if not irrelevant, fact in meeting those exacting criteria.

Comment No. 3

The Board expresses its continued concern that the recharge water from Alternative No. 7 is too close to the public drinking wells in the District's Well Field No. 5, and therefore may impact those wells.

Response to Comment No. 3

Plainview Well Field No. 5 is 2500 feet upgradient of the recharge location proposed in Alternative No. 7. The Town's groundwater consultant, Geraghty & Miller (G&M), has prepared mounding calculations, presented to you, which have demonstrated that the Alternative No. 7 recharge water will have no impact on the groundwater beyond a point which is, at a maximum, 1300 feet upgradient of the recharge. This point, i.e., the "stagnation point", is at least 1200 feet downgradient from the nearest Plainview water supply well. The State has accepted these calculations. You have not provided us with any information which would indicate to us that these calculations are in error.

You state in your letter that the G&M analysis did not take into account the "down stream influence" of Well Field No. 5's pumpage. That statement is literally accurate but not technically accurate. The information you have provided to the State and the Town indicates that the nearest public well pumps at a depth of over 550 feet in the aquifer. In contrast, the Alternative No. 7 recharge will be occurring in the upper portion of the aquifer at depths of only 40-50 feet. There is no technical reason to take "down stream" impact of Well Field No. 5 into account in the mounding calculation because, not only are the wells in Field No. 5 located at a substantial distance upgradient from the stagnation point calculated for the recharge, they are also influencing a deeper portion of the aquifer than the mound of the recharge. Therefore, there is no basis for our technical staff to assume a greater vertical impact from this recharge mound on the Plainview wells. This issue has been raised on numerous occasions in the course of our discussions with you over the last two months. You have provided us with no information or calculation which would cause the State to alter its assessment. If you have any information or calculation which demonstrates a greater vertical impact, we would of course expeditiously consider it.

Additionally, as stated in your letter, groundwater monitoring will be conducted to verify the G&M calculations and the true impact of any recharge mounding. The final consent decree will provide that, if there is any demonstration of threat to the public drinking wells, the Town will immediately cease operation of the remedial program at the State's demand until the threat is eliminated. As we stated at the public meeting and in our previous discussions, you are welcome to participate in the development of a monitoring program to define the mounding effects of the Alternative No. 7 recharge.

Comment No. 4

The Board believes that Alternative No. 5 should be selected as the appropriate remedial plan. The Board points out that the feasibility study raises no technical argument against that option and since the recharge water will be relatively free of contamination, it will not impact groundwater quality. The Board points out that Alternative No. 5 will cost approximately one million dollars less than Alternative No. 7.

Response to Comment No. 4

The State strongly disagrees with the Board's preference for Alternative No. 5 and will attempt below to point out all the reasons why Alternative No. 5 is less desirable from an environmental, technical, and public health standpoint than Alternative No. 7. In pointing out these reasons, we must admit that all of them were not specifically articulated in the remedial feasibility study itself. The feasibility study is a document which resulted from a long and detailed negotiation and technical dialogue between the Town and the State. All the preliminary discussions which transpired are not set forth in that document. The document for the most part presented the "conclusions" of that process. Many of these reasons were, however, presented by the State at the public meeting (September 10) in the discussion of the rejection of Alternative No. 5. A reconsideration of the appropriateness of Alternative No. 5 after the September 10 meeting has reconfirmed the reasons for its rejection.

Alternative No. 5, in general terms, searched for a recharge location close to the recovery wells so that the cost of piping the water back to the landfill could be avoided. In our initial discussions of this alternative, the technical staffs of the State and the Town agreed that any potential Alternative No. 5 recharge location must meet two preconditions: 1) the location could not interfere with the efficiency of the recovery wells themselves; and 2) the recharge could not be located in an area potentially impacted by two other suspected (since confirmed) sources of

contamination to the east and west of the landfill, the Nassau County Fireman's Training Facility (west) and Claremont Polychemical (east).

The first criterion eliminated any location within approximately 2500-3000 feet of the pumping wells, the estimated combined impact of the recharge and the cone of influence of the pumping wells. (Unlike the Plainview Well Field No. 5, these recovery wells would be pumping at a depth closer to that impacted by the recharge mounding, see Response to Comment No. 3). Basic elements of the calculations demonstrating the need for approximately 2500-3000 feet of separation were verified in the recent field pump test. Since it is required that these recovery wells create a hydraulic barrier for the plume of contamination, the addition of a mounding effect to this cone of influence would, in the opinion of the State and Town, diminish the effectiveness of the required hydraulic barrier. Due to the proximity to the landfill plume of the Fireman's Training Center and Claremont sources of contamination, locations east and west of the landfill plume and downgradient of those sources were similarly rejected.

Therefore, the only area left for potential recharge under Alternative No. 5 was the southernmost portion of the Bethpage State Park, an area currently used as a public golf course. Since approximately five acres of contiguous land would be needed to construct such a treatment and recharge system, the feasibility study focused on the "institutional problem" inherent in attempting to locate a five acre recharge system in the middle of a public golf course. This reason alone provided a sufficient basis for the State to reject Alternative No. 5, particularly when an acceptable and preferable recharge location existed on the landfill itself, upgradient of the recovery wells (Alternative No. 7).

There are certainly other reasons why Alternative No. 5 should be rejected. In fact, one of the reasons in support of Alternative No. 7 is a reason for the rejection of Alternative No. 5.

Alternative No. 7 is preferable because it keeps all the discharge water, even if only "slightly contaminated," within the groundwater containment system thereby creating a closed system. This allows for the continuous recapture and retreatment of the contaminated water. Furthermore, the reinjection of water in the system will speed the cleanup of the plume by "pushing" it more quickly toward the recovery wells. In contrast, Alternative No. 5 would place the slightly contaminated discharge water outside the containment system, at a point only 1000 feet upgradient of the nearest District of Farmingdale public drinking wells. Since this discharge point is upgradient of those wells, it

would have the potential to reach those wells. This situation differs from that in Alternative No. 7 in which the discharge point is "downgradient" of the Plainview wells and contamination will not move upgradient past the stagnation point. The additional treatment of the Alternative No. 7 discharge water at no increased cost (your suggestion of further treatment of the Alternative No. 5 discharge water would require significantly increased treatment costs) is certainly cost-effective and a desirable environmental result.

The discharge location in Alternative No. 5 is also of concern if the treatment facility should malfunction thus temporarily placing contaminated groundwater only 1000 feet upgradient of public wells. This is not a concern with respect to Alternative No. 7 because this contaminated water would not move past the upgradient stagnation point. Additionally, even if monitoring did indicate movement of contamination past the stagnation point, the pumping and recharge system could be temporarily shut off allowing the contaminated recharge water to flow back into the downgradient regional flow. Any contaminated water released at the discharge location in Alternative No. 5 could not be recaptured without installing a new remedial system at great expense.

In sum, we disagree with your conclusion that Alternative No. 7 presents no demonstrable benefit over Alternative No. 5. We believe that Alternative No. 7 represents no risk that can be demonstrated at this time and can be monitored and easily remedied if any risk appears. It provides a contained environmental cleanup which is of significant environmental benefit both in the speed and degree of cleanup. The only possible discharge location for Alternative No. 5 (the other locations are technically and environmentally unacceptable) is institutionally unreasonable since the land is currently a public golf course. Furthermore, problems which may occur at the Alternative No. 5 discharge location and which might present environmental or health risks may not be so easily remedied. Such risks are not acceptable in view of a demonstrated alternative. The decision to select Alternative No. 7 is soundly based and is not connected in any way with the potential location of the resource recovery facility.

We again wish to thank you for your comments and your participation in this public process on behalf of the Plainview Water District. We have provided with this letter the entire package of written responses to all comments made at the public meetings and as submitted in writing.

After considering all the public comments received to date, the State has formally selected Alternative No. 7 as the appropriate remedial alternative for this site. This

John J. Molloy, P.E.
October 27, 1987
Page -7-

selection will now be submitted to the United States Environmental Protection Agency for review and concurrence consistent with current regulation and policy. If that concurrence is obtained, the remedial alternative will be set forth in more detail in a Remedial Action Plan which will be attached to a Consent Decree resolving the pending litigation. The Remedial Action Plan and the Consent Decree will be subject to a public comment period prior to final Court approval. We will contact you directly, however, as soon as a proposal exists for the upgradient monitoring of Alternative No. 7.

Sincerely,



ROBERT L. OSAR
E. GAIL SUCHMAN
Assistant Attorneys General

Enclosures

RLO/EGS:bjs

EXHIBIT C

STATE RESPONSES TO ORAL COMMENTS
REMEDIAL ACTION FEASIBILITY STUDY
OLD BETHPAGE LANDFILL, BETHPAGE, NY

The State of New York held two public meetings to discuss the Remedial Action Feasibility Study and the recommended remedial alternative for the Old Bethpage Landfill. The purpose of the first meeting, held at Plainview-Old Bethpage High School on July 23, 1987, was to 1) explain in detail the groundwater investigation conducted at the landfill, 2) define the environmental problem identified, 3) present the remedial feasibility study prepared by consultants for the Town of Oyster Bay, and 4) describe in detail the recommended cleanup proposal. Approximately seventy-five (75) people attended the meeting. Comments and questions were taken and a transcript made. This meeting lasted for approximately four hours. A second public meeting was held on September 10, 1987, at the Kennedy High School in Plainview, to receive formal comments on the feasibility study and recommended cleanup. Approximately fifty (50) people attended this second meeting which lasted approximately two and a half hours. Transcripts of both meetings and all documents referenced in these responses will be made available at the Plainview Public Library.

At the first public meeting, the bulk of the comments focused on the short period of time (one week) provided for review of the feasibility study prior to the meeting. It was also requested that the comment period be extended

beyond the summer vacation period. In response to those comments, the public comment period was extended to September 15, 1987, and the second meeting was scheduled for September 10, 1987.

Since the purpose of the first meeting was to provide information to the public, a consultant for the Town provided a detailed presentation, through slides, maps, and technical information, which described the investigation conducted, its results, and the various cleanup proposals. Many of the public comments and questions at the meeting were directed to the technical issues presented. These questions were answered by the Town's consultants and the State's legal and technical representatives, as reflected in the transcript. Several comments presented at the first meeting were reiterated at the second meeting or in the written comments received.

A brief description of significant comments and questions presented at both meetings is set forth below. This listing does not include the initial comments solely concerning scheduling matters which are no longer relevant in view of the State's agreement to extensions. In order to avoid repetition, if a comment listed below has been addressed elsewhere in this document or in response to written comments, only a reference to that response will be indicated.

July 23, 1987 Public Meeting

Comment: Anna Goidell, President, Plainview-Old Bethpage
School Board

What guarantee is there that the hydraulic containment system in the proposed cleanup plan will be effective?

State Response

Modeling studies and calculations were performed by the Town's groundwater consultants which indicate that the "pump and treat" system described in the feasibility study will be effective in maintaining hydraulic control of the contaminated groundwater plume. Actual pump tests conducted in the field this summer have verified the input data of the model and those calculations. More importantly, the Town will be legally required, under a consent decree resolving the pending litigation, to achieve and maintain effective hydraulic control. The proposed consent decree provides that the Town will be required to modify, enhance, and repair the system to achieve and maintain this control. Failure to do so will constitute a violation of the consent decree which can be enforced expeditiously by the Federal Judge who will maintain jurisdiction over the consent decree.

Comment: Julius Wallach

Where do the contaminants end up after the air stripping process?

State Response

The recommended remediation initially utilizes an air stripping process to treat the contaminated groundwater. The treatment process volatilizes the contaminants in the groundwater and disperses them into the air. Calculations and modeling have demonstrated that the treatment facility (air stripper) will meet all applicable air standards. The consent decree will require the Town to meet and maintain compliance with those standards. Continued compliance will be monitored. For further, more detailed discussion, see the State's October 27, 1987 letter to Ms. Ellen Levine, Response to Comment No. 1, enclosed herewith as attachment 1.

Comment: Carol Spielberger

Why is a "Proposed Resource Recovery Facility" depicted on the maps included in the feasibility study? Has the

State looked at discharge locations for the treated water other than that set forth for the recommended remediation, Alternative No. 7.

State Response

See extensive responses provided in the State's October 27, 1987 letter to Mr. John Molloy, Response to Comment Nos. 2 and 4, and the October 27, 1987 letter to Ms. Anna Goidell, Response to Comment Nos. 1 and 2, both letters enclosed herewith as attachments 2 and 3, respectively.

Comment: Ellen Levine, PTA President

What will be the impact of air emissions from the cleanup on the community?

State Response

See responses provided in the State's letter of October 27, 1987 to Ms. Ellen Levine, Response to Comment Nos. 1 and 2 (attachment 1).

Comment: Assemblyman Lewis T. Yevoli

Assemblyman Yevoli requested information concerning the credentials of one of the Town's consultants, Lockwood

Kessler and Bartlett (LKB), and its experience in hazardous waste site cleanups. He also asked whether the State took split samples during the groundwater investigation program and whether sampling results indicated any contamination to the north of the landfill resulting from "mounding".

State Response

The Town of Oyster Bay has provided the State with a packet prepared by LKB in response to Assemblyman Yevoli's request for LKB's professional credentials and experience. It is enclosed herewith as attachment 4. In response to the other comments, the State undertook extensive split sampling and independent laboratory analysis during the landfill investigation. This effort confirmed the sampling results obtained by the Town. The results of all sampling to date have not shown any significant contamination north of landfill resulting from mounding. Monitoring will be conducted during the remediation to continue to confirm this assessment.

Comment: Marlene Mendelsohn, Residents Against Garbage Expansion (RAGE)

Is there a possibility that the groundwater plume of contamination from the landfill is moving in a direction other than the direction identified in the investigation?

State Response

Principles governing movement of groundwater, in conjunction with the voluminous data, particularly water level measurements, obtained in the remedial investigation, show that groundwater under the landfill is moving toward the south-southeast. This conclusion is consistent with what has been shown in other studies to be the regional groundwater flow in this area. There is no evidence of any significant component of groundwater flow in a direction inconsistent with this regional flow.

Comment: Ugo Perzan

Mr. Perzan asked a number of specific technical questions. The major questions are as follows:

1) Based upon the estimate that the groundwater in the Long Island aquifer moves approximately one foot per day, why hasn't the plume of contamination extended over a mile horizontally from the landfill by this time?

2) Recognizing possible contribution to the plume from industrial sources in the Claremont road area [to the east], why is there contamination at well N-189 [to the west]? Since well N-189 is a shallow well, is there a

possibility that shallow constituents are moving in a different direction than deeper constituents?

3) Was the use of leachate indicators a proper way to define the plume of contamination at this landfill?

5) Was the Random Walk model used to demonstrate the distribution of the plume? Was the model calibrated to consider the low levels of contamination found in the plume?

State Response

Mr. David Miller of Geraghty and Miller (G & M), the Town's groundwater consultant, answered all of Mr. Perzan's questions at the public hearing. The State generally concurs with the answers he provided. Mr. Perzan did not provide any followup comments at the September 10, 1987 public meeting or in writing to the State. The answers to his questions are available for review in depth in the transcript of the July 23rd meeting at pages 67-77 and 86-90. Briefly, the State's responses to the above questions are as follows:

1) The groundwater investigation downgradient of the landfill showed the rate of groundwater flow in that area to be less than one foot per day. Furthermore, contaminants do not move at the same rate as groundwater.

Contaminants cling to particles of sand and other soil materials as they move through the groundwater thereby slowing their migration. This slowing of contaminants is called retardation and the rate of retardation is one factor in measuring the rate of contaminant movement per day as opposed to groundwater flow per day.

2) Well N-189 is located in and controlled by the Bethpage State Park. That well was closed to further use in 1984. It is directly downgradient of the Nassau County Fireman's Training Center ("FTC"). Based on current data, it is more likely that the low levels of contamination found in this well resulted from the FTC or an unknown local source than from the landfill plume.

3) It was agreed by the State and Town that sampling for known landfill leachate indicators was an appropriate investigating tool to define the leachate plume emanating from this municipal landfill. Once the leachate plume from the landfill was defined, the wells in that plume were sampled for a full range of organic and inorganic chemicals. This approach was effective in defining a distinct plume of organic and inorganic contamination emanating from the landfill as opposed to contamination from other potential sources in the area such as Claremont Polychemical to the east and the Fireman's Training Center

to the west. Although the landfill leachate plume is larger than the organic and inorganic plume being remediated, the leachate indicators found outside the area to be remediated do not exceed State groundwater standards.

4) There are several acceptable computer models capable of demonstrating the distribution of the contaminant plume. Random Walk is one. The Town's consultant, G & M, utilized the Prickett-Lonnquist model. A field pump test was conducted this summer which verified certain input used in that model. This field data has provided both State and Town technical personnel with a certain degree of confidence in the anticipated effectiveness of the remedial program. It is important to note, however, that modeling is only a predictive tool. Extensive monitoring has yielded data on the actual contaminant levels in the groundwater. Future monitoring will continue to define those levels of contamination and the effectiveness of the cleanup.

Comment: Mary DeKanner

Is there a connection between the remedial plan and the proposed resource recovery facility?

State Response

See extensive responses provided in the State's October 27, 1987 letter to Mr. John Molloy (attachment 2), Response to Comment No. 2, and the October 27, 1987 letter to Ms. Anna Goidell (attachment 3), Response to Comment No. 1.

Comment: Brian Culhane, State Legislative Commission On Water Resources

Will the recharge of the recovery water upgradient of the landfill cause a mounding problem under the landfill and cause more leachate?

State Response

Calculations performed by the Town's consultant have indicated that water levels due to recharge will not rise sufficiently to result in groundwater contacting refuse in the landfill. Furthermore, the recommended remedial alternative, which will recharge treated groundwater upgradient of the landfill and the recovery wells, provides for a hydraulic system to contain and treat all groundwater contaminated by the landfill until cleanliness standards are met. Therefore, if the recharge should produce new leachate, the Town will need to adjust its recharge to prevent new leachate

formation or continue pumping its system as long as leachate production continues.

Comment: Russ Haven, New York Public Interest Research Group

Referring to the number of wells used to investigate groundwater contamination on industrial sites in western New York and to Department of Environmental Conservation estimates of the costs of cleaning up municipal landfills, not enough wells were used to define the contamination problem at the landfill and the estimated cost of the cleanup, \$7 million, is too low.

State Response

As described by Mr. Miller, 46 wells were used to evaluate the groundwater contamination emanating from the landfill. State technical staff were involved in the formulation and implementation of the remedial investigation which yielded reliable results. The \$7 million figure represents solely the estimated cost of the cleanup of the groundwater plume. The entire cost of remediating the landfill, estimated to be about \$20 million, is comparable to DEC estimates.

Comment: Ron Dimonda

How long will the cleanup take?

State Response

The Town's consultant has estimated approximately ten years for cleanup. The consent decree will require the Town conduct the cleanup until the termination criteria of the decree are met.

September 10, 1987 Public Meeting

Comment: John Molloy, on behalf of the Plainview Water District

The Board of Commissioners supports the concept of fully remediating the contamination affecting groundwater southeast of the landfill by utilizing a pump, treat and recharge system. The Board is concerned about the impact of the recharge of the treated recovery water on the Plainview public drinking wells, one-half mile upgradient of the recharge. The Board requests a commitment to monitoring upgradient of the recharge and wishes to have input into the development of the monitoring plan, assuming the recommended

remedial alternative calling for recharge upgradient of the landfill is chosen (Alternative No. 7). The Board considers recharge in the State Park downgradient of the landfill to be a better alternative (Alternative No. 5). The Board requests that all data and reports developed during the remediation program be provided to the Board. The Board requests a commitment for full reimbursement by the State of all expenses incurred in correcting any drinking water problem in the Plainview wells caused by the remediation.

State Response

With the exception of the last two comments, all of Mr. Molloy's comments have been addressed in the State's October 27, 1987 letter to Mr. Molloy (attachment 2). In response to Mr. Molloy's last two comments, all data and reports generated as a result of the remediation will be made available to the Board. Upgradient monitoring wells will provide an effective warning system, so that contamination, if any, will be prevented from migrating toward the Plainview wells. (See State's letter to Mr. Molloy). Since there is no technical basis to assume that contamination will reach these wells, there is no basis to request the State to commit to provide compensation for "hypothetical damage".

Comment: Assemblyman Lewis J. Yevoli

Assemblyman Yevoli expressed concern about the Town's future attempt to connect the recommended remedial alternative and the proposed resource recovery facility for the landfill. [Messrs. Robert Goldstein Julius Wallach, Bernard Chetkoff, Bernard Abrams, Donald Rosen, and Ms. Ellen Levine expressed a similar concern.]

State Response

See extensive responses provided in the State's October 27, 1987 letter to Mr. John Molloy (attachment 2), Response to Comment No. 2, and the October 27, 1987 letter to Mrs. Anna Goidell (attachment 3), Response to Comment Nos. 1 and 4.

Comment: Robert Goldstein of RAGE

The cleanup plan must protect air and water and must be independently monitored. All data must be open to public inspection.

State Response

The State agrees with the above comments and will insure that these goals and requests are met.

Comment: Bernard Chetkof, Chairman of the Plainview Water District

Remedial Aiternative No. 5 from the feasibility study should be chosen by the State instead of Alternative No. 7. [Mr. Jacques Wolfner expressed a similar concern].

State Response

See extensive responses provided in the State's October 27, 1987 letter to Mr. John Molloy (attachment 2), Response to Comment No. 4, and the October 27, 1987 letter to Ms. Anna Goidell (attachment 3), Response to Comment No. 2.

Comment: Ellen Levine, PTA President

Will the State consider Mr. Molloy's comments regarding Alternative No. 5? Has any new information been developed concerning possible air contamination from the air stripper?

State Response

The State has considered Mr. Molloy's comments regarding Alternative No. 5 and has responded in the October 27, 1987 letter to Mr. Molloy (attachment 2), Response to Comment No. 4. In response to the second question, the State provided Ms. Levine with a copy of a modeling study conducted by the Town's air consultant. This study is

further discussed in the State's October 27, 1987 letter to Ms. Levine's (attachment 1), Response to Comment Nos. 1 and 2.

Comment: Jules Bernstein

Will capping of the landfill be included as part of the remediation. How long will the cleanup take? Does the \$7 million cost included monitoring? Will the State check the results of the Town?

State Response

The landfill will be capped as part of the proposed remedial program. The remediation will continue until the State required termination criteria are met. The Town's consultant estimates that time to be approximately 10 years. The cost of the groundwater remediation includes a complete monitoring program the results of which will be checked and verified by the State.

Dated: October 27, 1987



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October 27, 1987

Ellen Levine
President
Old Bethpage Grade School PTA
Round Swamp Road
Old Bethpage, NY 11804

Re: Comments on Old Bethpage
Landfill Remedial Action
Feasibility Study

Dear Mrs. Levine:

Thank you for your participation in the public meeting on September 10, 1987, and for your letter of September 20, 1987, providing specific comments on the Old Bethpage Landfill Remedial Action Feasibility Study and the proposed cleanup plan, Alternative No. 7. We have set forth below the comments from your letter and the responses of the State.

Comment No. 1: With respect to the study conducted by consultants to the Town of Oyster Bay to evaluate the air impacts of the groundwater treatment system (the air stripper), the modeling approach assumes that certain input parameters (i.e., the contaminant levels in the groundwater to be treated) will be met. If these contaminant levels are higher than assumed, won't the impacts of the air emissions from the stripper be changed drastically?

Response No. 1

As stated at the public meeting and in the other written comments attached herewith, extensive chemical analyses were performed on the plume of contamination emanating from the landfill. These analyses demonstrate that the plume, although large in size, does not contain a high concentration of contaminants. As this plume is pumped through the recovery wells, the contaminated groundwater will be mixed with significant amounts of clean water.

Attachment 1

Therefore, the recovery water obtained from this plume initially will contain a relatively low concentration of chemicals. These low concentrations will be reduced further by treatment of the groundwater prior to discharge. Calculations were performed to estimate the anticipated levels of contaminants in the air and water discharge after treatment.

Every calculation performed in the feasibility study and subsequent studies, including the latest modeling effort, assumed a worst case scenario, i.e., the worst contamination in the plume (plus a 30 percent safety factor) would have to be treated continuously and the worst treatment conditions would prevail continuously. Even under these worst case conditions, these calculations demonstrated that the air discharge in this remediation will fall well below acceptable standards. As further assurance, the Town will be required by the Consent Decree to meet those standards. Therefore, even if the projected calculations are in error, the Town will be required, regardless of cost and effort, to modify and adjust its treatment system until it meets the required air discharge standards. The State will not allow the system to continue operation unless it meets all appropriate standards.

In short, the studies have shown, based upon the known chemical concentration of the plume, that the air and water discharge standards will be met. More importantly, regardless of what the studies indicate, the Town will be required, as a matter of legal obligation in the Consent Decree, subject to enforcement by a United States District Court Judge, to meet those air and water discharge requirements. There is neither a factual nor a legal reason to believe that the air emission levels associated with this remediation will cause adverse impact on the community.

Comment No. 2: The odor from these air emissions will be horrendous.

Response No. 2

As stated above, the air emissions emanating from the air stripper will be substantially below relevant standards. Furthermore, the modeling study demonstrates that the maximum impact of these air emissions will occur within the boundaries of the landfill property. There will be no significant impact on the surrounding communities. The presence of odors is directly related to the concentrations of contaminants in the air emissions. Since the maximum impact of these low level air emissions will be well within the landfill boundary, the air stripper emissions will not create an odor problem beyond the landfill.

Subsequent to receipt of your written comments, we asked the Town's air modeling consultant to conduct an odor

threshold analysis for the air stripper emissions to reconfirm that there is no potential odor problem offsite. The consultant compared peak short term emissions at the landfill boundary to recognized odor thresholds for a number of chemical compounds existing in the landfill plume. The study demonstrated that no odor thresholds were exceeded beyond the landfill boundary. In other words, at the concentrations to be emitted by the air stripper, no odors will be detectable offsite.

If through actual operation of the air treatment system, air emissions do not meet appropriate air standards, the Town will be required to modify the system until such standards are met. Furthermore, it is important to note that because the landfill will be capped with a clay cover and the methane gas collection system continued as part of this remediation, its overwhelming impact will be to reduce odors from the landfill, not increase them.

Comment No. 3: The plan placing sludge back into the same landfill seems shortsighted. This sludge is going to be loaded with toxic contaminants.

Response No. 3

We assume that the sludge referred to in your comment is the sludge from the leachate collection system, discussed on page 1-4 of the Remedial Action Feasibility Study. This collection system, operating since 1983, removes metals and solids from collected landfill leachate.- The sludge generated consists primarily of the treatment agent, hydrated lime, and small amounts of metals and solids. The system produces about six cubic yards of sludge per year, the equivalent of approximately four 55-gallon drums.

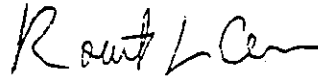
The practice of the landfill operators has been to place the sludge back in the landfill. If this sludge generates new leachate, it will be recaptured and retreated through the leachate collection system. For the future, however, the State will require, in the Consent Decree, that the sludge no longer be deposited back in the landfill. Instead, the sludge will be transported to an approved waste disposal facility as long as the leachate collection system continues to operate. Once the landfill is capped, the Town's consultant has estimated that generation of leachate will cease in approximately five years after capping.

We again wish to thank you for your comments and your participation in the public process. We have provided with this letter the entire package of written responses to all comments made at the public meeting as well as those submitted in writing.

After considering all the public comments received to date, the State has formally selected Alternative No. 7 as

the appropriate remedial alternative for this site. This selection will now be submitted to the United States Environmental Protection Agency for review and concurrence consistent with current regulation and policy. If that concurrence is obtained, the remedial alternative will be set forth in more detail in a Remedial Action Plan which will be attached to a Consent Decree resolving the pending litigation. The Consent Decree will provide for remediation of the landfill and set forth the obligations of all the parties to that litigation with respect to that remediation. The Remedial Action Plan and Consent Decree will be subject to a public comment period prior to final approval by the United States District Court. Copies of these documents will be provided to the public on a timely basis.

Sincerely,



ROBERT L. OSAR
E. GAIL SUCHMAN
Assistant Attorneys General

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October 27, 1987

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Holzmacher, McLendon
& Murrell, P.C.
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Melville, N.Y. 11787-5076

Re: Old Bethpage Landfill
Remedial Action
Feasibility Study

Dear Mr. Molloy:

Thank you for the comments set forth in your letter dated September 24, 1987, and received by our office on September 30, 1987, concerning the above referenced feasibility study. We understand these comments to supplement the oral remarks you made at the public hearing on September 10, 1987, and that both sets of comments were made on behalf of the Board of Commissioners of the Plainview Water District. Our responses in this letter will be directed specifically to the comments in your September 24 letter. To the extent that your oral comments at the meeting raised other issues not addressed by this letter, those comments have been responded to in the enclosed document entitled "Responses to Oral Comments."

Comment No. 1

You state at page 1: "The Board of Commissioners entirely supports the concept of actively remediating the contamination affecting groundwater southeast of the landfill. It is their view that remediation must include at a minimum the removal of contaminated groundwater, its treatment and recharge. The remediation plan must prevent the further spread of contamination into the Magothy aquifer."

John J. Molloy, P.E.

October 27, 1987

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Response to Comment 1

We thank the Board of Commissioners for its support of the method of active remediation chosen. The pump and treat remediation, providing for recharge of the treated groundwater, will achieve the goals the Board has emphasized, i.e., the removal and treatment of contaminated groundwater and the prevention of its spread, both horizontally and vertically.

Comment No. 2

The Board holds that the issues raised in the Remedial Action Feasibility Study must be held separate from the Town's proposal to build a resource recovery plant at the Landfill. The Board believes that the proposed remedial Alternative No. 7 will be used by the Town to provide a source of water for the proposed plant and therefore create a "bias" in favor of using the landfill site as the preferred location for the plant.

Response to No. 2

As stated in your letter, the State has reiterated on all occasions, in public and in writing, the firm position that the proposed remediation, Alternative No. 7, has been and will continue to be evaluated solely on its own merits. Similarly, the decision as to whether the proposed resource recovery plant will be located at the landfill is subject to an entirely separate Department of Environmental Conservation permitting process. The State has told the Town, throughout this remedial selection process, that it would not accept a remedial alternative which relied on the existence of the resource recovery facility for its operation. One of the reasons that Alternative No. 7 survived the selection process is that it did not rely on the existence of the resource recovery facility for its operation.

We fail to see a favorable "bias" for locating this plant at the landfill created by the selection of Alternative No. 7. You have indicated the Board's support for a pump and treat/recharge system. Any of the pump and treat alternatives, no matter where the recharge is located, will provide a potential source of water for the resource recovery facility. The projected cost of the resource recovery facility is over 150 million dollars. The cost of piping from the recovery wells to the proposed location of the plant is approximately one million dollars. Obviously, in a project of this size, the one million dollar cost of piping is inconsequential. Additionally, there already exists a well (originally used for the now closed incinerator) on the landfill property which could be used as a water source for the proposed plant.

Finally, and most importantly, the Town cannot obtain approval to locate the resource recovery plant at the landfill without meeting a host of legal, technical, and environmental permit and policy criteria. The mere availability of water at the site is an insignificant, if not irrelevant, fact in meeting those exacting criteria.

Comment No. 3

The Board expresses its continued concern that the recharge water from Alternative No. 7 is too close to the public drinking wells in the District's Well Field No. 5, and therefore may impact those wells.

Response to Comment No. 3

Plainview Well Field No. 5 is 2500 feet upgradient of the recharge location proposed in Alternative No. 7. The Town's groundwater consultant, Geraghty & Miller (G&M), has prepared mounding calculations, presented to you, which have demonstrated that the Alternative No. 7 recharge water will have no impact on the groundwater beyond a point which is, at a maximum, 1300 feet upgradient of the recharge. This point, i.e, the "stagnation point", is at least 1200 feet downgradient from the nearest Plainview water supply well. The State has accepted these calculations. You have not provided us with any information which would indicate to us that these calculations are in error.

You state in your letter that the G&M analysis did not take into account the "down stream influence" of Well Field No. 5's pumpage. That statement is literally accurate but not technically accurate. The information you have provided to the State and the Town indicates that the nearest public well pumps at a depth of over 550 feet in the aquifer. In contrast, the Alternative No. 7 recharge will be occurring in the upper portion of the aquifer at depths of only 40-50 feet. There is no technical reason to take "down stream" impact of Well Field No. 5 into account in the mounding calculation because, not only are the wells in Field No. 5 located at a substantial distance upgradient from the stagnation point calculated for the recharge, they are also influencing a deeper portion of the aquifer than the mound of the recharge. Therefore, there is no basis for our technical staff to assume a greater vertical impact from this recharge mound on the Plainview wells. This issue has been raised on numerous occasions in the course of our discussions with you over the last two months. You have provided us with no information or calculation which would cause the State to alter its assessment. If you have any information or calculation which demonstrates a greater vertical impact, we would of course expeditiously consider it.

Additionally, as stated in your letter, groundwater monitoring will be conducted to verify the G&M calculations and the true impact of any recharge mounding. The final consent decree will provide that, if there is any demonstration of threat to the public drinking wells, the Town will immediately cease operation of the remedial program at the State's demand until the threat is eliminated. As we stated at the public meeting and in our previous discussions, you are welcome to participate in the development of a monitoring program to define the mounding effects of the Alternative No. 7 recharge.

Comment No. 4

The Board believes that Alternative No. 5 should be selected as the appropriate remedial plan. The Board points out that the feasibility study raises no technical argument against that option and since the recharge water will be relatively free of contamination, it will not impact groundwater quality. The Board points out that Alternative No. 5 will cost approximately one million dollars less than Alternative No. 7.

Response to Comment No. 4

The State strongly disagrees with the Board's preference for Alternative No. 5 and will attempt below to point out all the reasons why Alternative No. 5 is less desirable from an environmental, technical, and public health standpoint than Alternative No. 7. In pointing out these reasons, we must admit that all of them were not specifically articulated in the remedial feasibility study itself. The feasibility study is a document which resulted from a long and detailed negotiation and technical dialogue between the Town and the State. All the preliminary discussions which transpired are not set forth in that document. The document for the most part presented the "conclusions" of that process. Many of these reasons were, however, presented by the State at the public meeting (September 10) in the discussion of the rejection of Alternative No. 5. A reconsideration of the appropriateness of Alternative No. 5 after the September 10 meeting has reconfirmed the reasons for its rejection.

Alternative No. 5, in general terms, searched for a recharge location close to the recovery wells so that the cost of piping the water back to the landfill could be avoided. In our initial discussions of this alternative, the technical staffs of the State and the Town agreed that any potential Alternative No. 5 recharge location must meet two preconditions: 1) the location could not interfere with the efficiency of the recovery wells themselves; and 2) the recharge could not be located in an area potentially impacted by two other suspected (since confirmed) sources of

contamination to the east and west of the landfill, the Nassau County Fireman's Training Facility (west) and Claremont Polychemical (east).

The first criterion eliminated any location within approximately 2500-3000 feet of the pumping wells, the estimated combined impact of the recharge and the cone of influence of the pumping wells. (Unlike the Plainview Well Field No. 5, these recovery wells would be pumping at a depth closer to that impacted by the recharge mounding, see Response to Comment No. 3). Basic elements of the calculations demonstrating the need for approximately 2500-3000 feet of separation were verified in the recent field pump test. Since it is required that these recovery wells create a hydraulic barrier for the plume of contamination, the addition of a mounding effect to this cone of influence would, in the opinion of the State and Town, diminish the effectiveness of the required hydraulic barrier. Due to the proximity to the landfill plume of the Fireman's Training Center and Claremont sources of contamination, locations east and west of the landfill plume and downgradient of those sources were similarly rejected.

Therefore, the only area left for potential recharge under Alternative No. 5 was the southernmost portion of the Bethpage State Park, an area currently used as a public golf course. Since approximately five acres of contiguous land would be needed to construct such a treatment and recharge system, the feasibility study focused on the "institutional problem" inherent in attempting to locate a five acre recharge system in the middle of a public golf course. This reason alone provided a sufficient basis for the State to reject Alternative No. 5, particularly when an acceptable and preferable recharge location existed on the landfill itself, upgradient of the recovery wells (Alternative No. 7).

There are certainly other reasons why Alternative No. 5 should be rejected. In fact, one of the reasons in support of Alternative No. 7 is a reason for the rejection of Alternative No. 5.

Alternative No. 7 is preferable because it keeps all the discharge water, even if only "slightly contaminated," within the groundwater containment system thereby creating a closed system. This allows for the continuous recapture and retreatment of the contaminated water. Furthermore, the reinjection of water in the system will speed the cleanup of the plume by "pushing" it more quickly toward the recovery wells. In contrast, Alternative No. 5 would place the slightly contaminated discharge water outside the containment system, at a point only 1000 feet upgradient of the nearest District of Farmingdale public drinking wells. Since this discharge point is upgradient of those wells, it

would have the potential to reach those wells. This situation differs from that in Alternative No. 7 in which the discharge point is "downgradient" of the Plainview wells and contamination will not move upgradient past the stagnation point. The additional treatment of the Alternative No. 7 discharge water at no increased cost (your suggestion of further treatment of the Alternative No. 5 discharge water would require significantly increased treatment costs) is certainly cost-effective and a desirable environmental result.

The discharge location in Alternative No. 5 is also of concern if the treatment facility should malfunction thus temporarily placing contaminated groundwater only 1000 feet upgradient of public wells. This is not a concern with respect to Alternative No. 7 because this contaminated water would not move past the upgradient stagnation point. Additionally, even if monitoring did indicate movement of contamination past the stagnation point, the pumping and recharge system could be temporarily shut off allowing the contaminated recharge water to flow back into the downgradient regional flow. Any contaminated water released at the discharge location in Alternative No. 5 could not be recaptured without installing a new remedial system at great expense.

In sum, we disagree with your conclusion that Alternative No. 7 presents no demonstrable benefit over Alternative No. 5. We believe that Alternative No. 7 represents no risk that can be demonstrated at this time and can be monitored and easily remedied if any risk appears. It provides a contained environmental cleanup which is of significant environmental benefit both in the speed and degree of cleanup. The only possible discharge location for Alternative No. 5 (the other locations are technically and environmentally unacceptable) is institutionally unreasonable since the land is currently a public golf course. Furthermore, problems which may occur at the Alternative No. 5 discharge location and which might present environmental or health risks may not be so easily remedied. Such risks are not acceptable in view of a demonstrated alternative. The decision to select Alternative No. 7 is soundly based and is not connected in any way with the potential location of the resource recovery facility.

We again wish to thank you for your comments and your participation in this public process on behalf of the Plainview Water District. We have provided with this letter the entire package of written responses to all comments made at the public meetings and as submitted in writing.

After considering all the public comments received to date, the State has formally selected Alternative No. 7 as the appropriate remedial alternative for this site. This

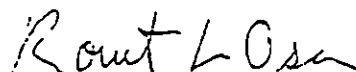
John J. Molloy, P.E.

October 27, 1987

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selection will now be submitted to the United States Environmental Protection Agency for review and concurrence consistent with current regulation and policy. If that concurrence is obtained, the remedial alternative will be set forth in more detail in a Remedial Action Plan which will be attached to a Consent Decree resolving the pending litigation. The Remedial Action Plan and the Consent Decree will be subject to a public comment period prior to final Court approval. We will contact you directly, however, as soon as a proposal exists for the upgradient monitoring of Alternative No. 7.

Sincerely,



ROBERT L. OSAR

E. GAIL SUCHMAN

Assistant Attorneys General

Enclosures

RLO/EGS:bjs



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October 27, 1987

Anna Goidell
President
Board of Education Plainview-Old Bethpage
School District
Plainview, New York 11803

Re: Letter of September 14, 1987
Commenting on Old Bethpage
Landfill Remedial Action
Feasibility Study

Dear Mrs. Goidell and
Members of the Board of Education:

Thank you for your attendance at the public meeting on September 10, 1987, and your letter of September 14, 1987, providing specific comments on the Old Bethpage Landfill Remedial Action Feasibility Study and the proposed cleanup plan, Alternative No. 7. We have set forth below the comments from your letter and the response of the State to each one.

Comment 1: Page 1, paragraph 3.

Your letter expresses your concern and the concern of the community that proposed Alternative No. 7 will be used as supporting evidence by the Town of Oyster Bay in its attempt to locate a Resource Recovery Facility ("RRF") at the Old Bethpage Landfill.

State Response to Comment 1

Alternative No. 7 has been proposed by the State because it is the best environmental solution to the groundwater problem present at the Old Bethpage Landfill. Alternative No. 7 differs from the other alternatives mainly in the point of discharge chosen, which is hydraulically upgradient of the proposed recovery wells. The discharge water, although meeting all allowable federal and state discharge requirements, may contain low levels of

contaminants. Only Alternative No. 7 provides a discharge location which will result in the recycling of this potentially contaminated discharge water back through the recovery system. This water will be recaptured and retreated and, therefore, will not escape into a non-contained environment. Furthermore, reinjection of the water into the system will speed the cleanup of the plume by "pushing" it more quickly toward the recovery wells.

In addition to the recognition of the environmental benefit resulting from implementation of Alternative No. 7, Alternative Nos. 3, 4 and 6 were deemed unacceptable because those alternatives would take approximately one and one-half million gallons of water per day from this portion of the aquifer, without replacement, contrary to the Long Island groundwater conservation policies set forth in 6 NYCRR Part 602. Alternative Nos. 2 and 4 were also rejected because, as stated in the public meetings and the Remedial Action Feasibility Study (see pages 3-1, 3-7 and 4-1), the State rejected any remediation which relied on the existence of a resource recovery facility for its operation. Alternative No. 7 does not rely on a resource recovery facility for its operation nor does it result in a contravention of the water conservation regulations.

Since the reasoning described above resulted in the rejection of Alternatives Nos. 2, 3, 4 and 6, the only other active remedial alternative was Alternative No. 5. That alternative was rejected for the reasons set forth in the State's response to Comment 2, herein. Therefore, the best remedial alternative, chosen on its own merit, is Alternative No. 7.

While it is true that the implementation of Alternative No. 7 will allow the Town to argue in its RRF permit application that a source of water will be available at the landfill, that argument is hardly dispositive of the multitude of legal, environmental and technical issues that will need to be decided before the Department of Environmental Conservation (DEC) can grant a permit for construction of the RRF. In point of fact, all the "pump and treat" remedial alternatives would provide a source of water for the RRF. The small expense of running a pipe from any discharge site to the RRF would allow the Town to argue that a source of water was available from any one of the proposed remedial alternatives.

The granting of a permit for the RRF is a totally separate and distinct legal process from the process which resulted in the selection of Alternative No. 7. The consideration of the RRF requires a complicated DEC administrative procedure, subject to public hearing and

comment, which will decide whether the RRF can be permitted. That decision, just as the decision to select Alternative No. 7, will be made on the merits of the RRF itself, not on the fact that there happens to be process water available at the site. The RRF will need to pass strict technical and legal requirements for discharge, monitoring, performance, etc. Even if the RRF passes all those permit requirements, in order to be connected with Alternative No. 7, there would have to be technical confirmation that it would meet all the very stringent treatment and discharge requirements of the remedial action consent decree.

In sum, there is absolutely no significant legal or technical advantage which accrues to the Town in its application for the RRF by the selection of Alternative No. 7 over the other remedial alternatives.

Comment 2: Page 1, paragraph 3.

The officials of the Plainview Water District expressed their preference for Alternative #5.

State Response to Comment 2

As explained in detail in the response to the comments submitted by the Plainview Water District's consultant (copy attached hereto), the State strongly disagrees with the Commissioners' preference for Alternative No. 5 over Alternative No. 7. Alternative No. 5 studied the feasibility of locating a discharge basin closer to the recovery wells so that the cost of piping the groundwater to the landfill could be avoided. Areas within approximately 2500-3000 feet of the recovery wells were eliminated because it was determined that the recharge of one and one-half million gallons of water a day within that distance would interfere with the effectiveness of the hydraulic barrier to be created by these pumping wells. Areas immediately to the east and west of the landfill plume were also eliminated as possible discharge locations because those areas are potentially impacted by other sources of contamination.

The only potential area left for recharge under Alternative No. 5 was the southernmost portion of Bethpage State Park, i.e., the middle of a public golf course. Construction of a five acre treatment and recharge system in the middle of a public golf course would create a host of institutional problems. In addition, the recharge of treated groundwater in that area would be outside and downgradient of the hydraulic containment system, and approximately 1000 feet upgradient of the nearest Village of Farmingdale public drinking well. This is of concern because the treated groundwater may contain low levels of

contamination. In addition, there is always a possibility that the treatment system could temporarily malfunction.

In contrast, the Alternative No.7 discharge location ensures that the treated groundwater is recycled through the system for additional treatment, at no risk to the upgradient Plainview wells (see Response to Comment 5). The environmental benefits of Alternative No. 7 weighed against the problems associated with Alternative No. 5 justify its selection as the appropriate remedy for the site.

Comment 3: Page 1, paragraph 3.

The Plainview Water District Commissioners expressed concern that even though strict discharge criteria would be applied to the cleanup, the State has experienced a great deal of difficulty in the past in obtaining compliance by the Town with orders to close the landfill and the incinerator, both of which were operating "illegally."

State Response to Comment 3

This is an enforcement action to implement a cleanup of contaminated groundwater, not one to enforce permit conditions at an operating facility. The consent decree resolving this enforcement action will be monitored by the State and the Court. The decree will provide that the State will have the right to shut down the cleanup operation, if it is not meeting the requirements of the consent decree. The consent decree will require the Town to implement all necessary modifications required to bring the remedial program into compliance with all treatment and discharge criteria prior to re-start. Since there is no incentive for the Town to operate the remedial program unless it is in compliance with State requirements and any non-compliance will be immediately stopped by the State, there is no reason to believe that consistent or repeated non-compliance will occur.

Comment 4: Page 2, paragraphs 1 and 2.

Once the Resource Recovery Facility becomes part of the remedial program, the possibility of non-compliance becomes a concern because the Town will have incentive to keep the Resource Recovery Facility (like the old incinerator) operating, even if it is not in compliance.

State Response to Comment 4

If the RRF is permitted and if it is allowed to use water from the remedial program, it will then be required to meet both its permit conditions and the requirements of the

remedial action consent decree. One of the conditions that the State will insist upon, if the recovery water is used in the RRF, is that the RRF will be shut down immediately if it fails to meet the air and water discharge requirements of the consent decree. Therefore, the concern over consistent or repeated non-compliance is unfounded because the existence of the consent decree, providing immediate resort to a U.S. District Court Judge, ensures compliance with all federal and state discharge requirements.

Comment 5: Page 2, paragraph 3.

We believe that this non-compliance will result in the disposal of polluted groundwater near Plainview Water District wells.

State Response to Comment 5

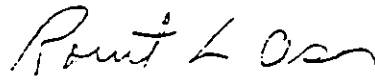
"Polluted" groundwater will not be deposited near Plainview wells. As stated above, the water, whether discharged from the treatment facility of Alternative No. 7 or the RRF (if permitted and allowed to accept recovery water), will be required to meet all applicable discharge criteria. If the discharge water does not meet those criteria, the consent decree will provide that the State can shut down the cleanup operation (the recovery wells) until the Town makes sufficient modifications and adjustments to meet consent decree standards.

Furthermore, regardless of the contaminant levels in the discharge water, it will not reach the Plainview public drinking wells which are 2500 feet hydraulically upgradient of the point of discharge. As explained in greater detail in the response to the groundwater consultant to the Water District, calculations have been made to demonstrate that this recharged water will not reach the Plainview wells. In addition, monitoring well(s) will be placed between the point of discharge and the Plainview wells to insure that these calculations are accurate and that no impact will occur on the Plainview wells. If either discharge violations occur or the monitoring wells indicate a potential impact on Plainview wells, the cleanup program will be shut down immediately until appropriate modifications are made or, if necessary, a new discharge location is found.

We again wish to thank you for your comments and your participation in this public process. We have provided with this letter the entire package of written responses to all comments made at the public meetings and as submitted in writing.

After considering all the public comments received to date, the State has formally selected Alternative No. 7 as the appropriate remedial alternative for this site. This selection will now be submitted to the United States Environmental Protection Agency for review and concurrence consistent with current regulation and policy. If that concurrence is obtained, the remedial alternative will be set forth in more detail in a Remedial Action Plan which will be attached to a Consent Decree resolving the pending litigation. This Consent Decree will provide for remediation of the landfill and set forth the obligations of all the parties with respect to that remediation. The Remedial Action Plan and the Consent Decree will be subject to a public comment period prior to final approval by the United States District Court. Copies of these documents will be provided to the public on a timely basis.

Sincerely,



ROBERT L. OSAR
E. GAIL SUCHMAN
Assistant Attorneys General

RLO:rl
Enclosures

GENERAL QUALIFICATIONS

Established in 1889, Lockwood, Kessler & Bartlett (LKB) is a multi-disciplinary consulting engineering firm headquartered in Syosset, New York, with branch offices in Manhattan, New York, and Norwalk, Connecticut. LKB maintains four departments: Engineering, Construction Administration, Field Survey, and Aerial Mapping. These four departments provide services in civil, environmental and transportation engineering design, site development, environmental consulting, waste management, construction management and inspection, facilities and systems planning, field survey, and aerial photography and photogrammetry. All four departments receive technical support from LKB's in-house Computer Center.

ENGINEERING

The Engineering Department offers integrated engineering and consulting services for feasibility studies, preliminary design, final design, project cost estimates and environmental consulting. The Department's staff consists of civil, environmental, geotechnical, sanitary, structural, transportation, and chemical engineers, in addition to environmental scientists, landscape architects, planners and support staff.

The Engineering Department is responsible for the following types of projects:

- Investigation and design of remedial actions at hazardous waste sites
- Solid waste management studies and facilities design
- Preparation of environmental impact statements and permit applications
- Bridge design and rehabilitation
- Traffic and transportation engineering
- Highway planning and design
- Structural design of buildings, highways, bridges and waterfront structures
- Site planning and development for residential, recreational, commercial and industrial projects
- Development/upgrading of wastewater collection and treatment facilities
- Flood control projects
- Water supply engineering
- Landscape architecture for parks and recreation areas

The Environmental Group within Engineering is responsible for environmental consulting services. LKB's environmental services have included preparation of environmental impact statements and assessments, regulatory reviews, preparation and submittal of permits, siting studies, and assistance to clients in negotiations with regulatory agencies.

CONSTRUCTION ADMINISTRATION

LKB's Construction Administration Department specializes in design review, project scheduling, construction plan analysis and quality control. Services provided by the Department also include claims analysis, CPM scheduling and soils investigations. LKB's highly experienced staff has provided resident engineering and inspection services to a wide range of projects including bridge and street rehabilitation, building construction, landfill reclamation, water and sewer line installation, road and drainage improvements, construction of parks and recreational facilities, and demolition and removal of existing structures. The Department also conducts building inspection to assess the condition of existing structures and to monitor the quality of new construction. The Construction Department staff consists of approximately 45 professional engineers, certified inspectors and support personnel.

FIELD SURVEY

LKB's Field Survey Department can provide up to ten fully equipped field survey crews to perform cadastral and geodetic surveys, photogrammetric control surveys and topographic surveys. Field Survey also provides the specialized services required for hydrographic surveys, route surveys (pipeline, utilities and roadways), and high order measurement precision surveys. The Department has over 30 years of experience in performing survey services for a wide range of construction projects including highways, transmission lines, pipelines, railroads, harbors, waste disposal facilities, and site developments for residential, commercial and industrial complexes.

AERIAL MAPPING

LKB's Aerial Mapping Department offers a total service of advanced photogrammetric techniques to meet the requirement of engineers, planners and private concerns. The following mapping services are available:

- Aerial photography
- Analytical triangulation
- Photogrammetry
- Planimetric mapping
- Topographic mapping
- Reproduction/graphic arts

COMPUTER FACILITIES

The Engineering, Construction Administration, Field Survey and Aerial Mapping Departments utilize LKB's in-house Computer Center for data processing and modeling services. The Computer Center is also used for CPM and project scheduling activities, and for fiscal monitoring and cost control. The Center is equipped with a PRIME 250 computer, plotter and other peripheral equipment, and employs the services of experienced systems analysts, programmers and operators. Digitized mapping has recently been added to the Center's capabilities.

HAZARDOUS WASTE PROJECT EXPERIENCE

Hazardous Waste Remedial Investigation, Former Site of Liberty Industrial Finishing Corporation, Farmingdale, NY - Four J's Company, Syosset, NY

Preparation of a plan for investigating soil and groundwater contamination at an industrial site in Nassau County, New York. Occupants of the site were involved in the metal plating industry and had been discharging plating waste effluent to the groundwater through disposal basins. The plan developed by LKB includes the drilling of borings, collection and analyses of subsurface samples and the installation of a groundwater monitoring network. Data are being analyzed to determine the location and extent of contamination and to identify remedial actions for removal or containment of contaminated areas. Subsequent stages of this work will involve assessment of appropriate remediation measures and the development of plans and specifications for this implementation.

Heavy Metal Treatment Facility Design, Comtech Laboratories, Smithtown, NY

LKB was responsible for the design and start-up of a heavy metal waste treatment facility and related hazardous waste sludge containment area for Comtech Laboratories, a manufacturer of aerospace guidance and communication equipment. The systems were designed in compliance with all federal, state and local regulations. The project also included waste sampling and characterization, data analysis, development of treatment methodology and the preparation of preliminary plans and specifications, and operation and maintenance manuals.

Hazardous Waste Treatment Facility Design, Town of Oyster Bay, NY

LKB was responsible for the planning and complete design of a 200,000 gpd leachate collection and treatment facility located at a municipal landfill designated as a CERCLA hazardous waste site. The site received both industrial and municipal wastes whose characteristics are evident in the leachate discharging from the landfill. LKB's work included process design as well as all piping, structural, mechanical and electrical aspects of the plant design. LKB prepared all construction plans and specifications, and all operations and maintenance manuals for the facility. LKB supervised construction of this facility and is conducting ongoing monitoring and performance evaluations. This facility has been operating successfully since 1984.

Hazardous Waste Investigation, Space Machines, Inc. Site, Syosset, NY

LKB has developed an approved plan and has implemented a program of investigation at a site where spills of solvents may have occurred. The site contains machine shop operations where volatile organic compounds used in facility operations apparently contaminated soils. LKB has supervised installation of borings and collection of soil systems. The program is being performed in response to Nassau County Department of Health requirements.

Groundwater Monitoring at the Old Bethpage Landfill, Town of Oyster Bay, NY

LKB has been responsible for engineering and related services required to establish a groundwater monitoring program in conformance with state requirements at the Old Bethpage landfill. The landfill overlies a major aquifer which is utilized by numerous public supply wells. The services provided by LKB included the development of a monitoring network, selection of drilling and laboratory subcontractors, coordination with regulatory agencies, and analysis of monitoring results. LKB was assisted on specific hydrogeological issues by consulting groundwater geologists and hydrologists. Two phases of the monitoring program have been completed and a third phase is presently underway.

Hazardous Waste Remedial Investigation, Anchor/Lith Kem-Ko Industrial Site, Hicksville, NY

LKB conducted a site and groundwater investigation for an industrial client suspected of groundwater contamination by toxic chemicals from leaking storage tanks. Work involved the establishment of a monitoring program and implementation of remedial measures.

Design of Groundwater Monitoring Facilities, Site Investigation, and Design for Capping/Closure, Syosset Landfill, Town of Oyster Bay, NY

Design of a groundwater monitoring program and detailed site investigation at a 44-acre municipal landfill designated under Federal Superfund as a hazardous waste site. Work includes historical data collection and analyses, geophysical studies, and landfill dimension study. This scope of work involves preparation of plans and specifications and supervision of construction activities, and the development of remedial actions. LKB is also preparing plans for capping, closure and gas control for the site.

Groundwater Investigation and Site Assessment, Proposed Office Complex, Middlebury, CT

As part of a detailed site assessment being conducted at a 340-acre site proposed for corporate development, LKB is conducting a soils and groundwater investigation in areas containing underground fuel storage tanks. The work involves installation of borings and monitoring wells, and collection of soil and water samples to determine the extent to which fuel may have leaked from the underground tanks. LKB also evaluated other physical, biological and socio-economic aspects of the site as part of its development feasibility studies.

Capping and Closure of Operating Landfill, Town of Oyster Bay, NY

LKB was responsible for planning, design and construction supervision for the capping and closure of a municipal landfill which had received industrial wastes and is included on the EPA Superfund List. Closure plans and specifications which addressed all civil, structural, mechanical and electrical aspects of the work included provisions for gas control, storm-water drainage, leachate collection, and establishment of vegetative cover/landscaping. Capping of 40 acres has been completed, and an effective, State-approved cap has been established.

**Industrial Waste Survey, Suffolk County Department of Public Works,
Suffolk County, NY**

LKB conducted an extensive industrial waste inventory to identify industrial facilities which use, store or otherwise handle "priority pollutants" or "hazardous substances". The survey was specifically aimed at identifying those industries which discharge such wastes to the sewers. The inventory, which covered six wastewater treatment districts, is a key element of the County's industrial pretreatment program.

Toxic Waste Treatment/Containment Area, Smithtown, NY

LKB provided the design and supervised start-up of a toxic metal waste treatment system and sludge containment area for a major manufacturer of aerospace guidance and communication equipment. The projects included extensive sampling, data analyses, and development of a treatment methodology. From these results, and in accordance with NYCRR Part 360 requirements and local regulations, plans and specifications were prepared as well as an operations and maintenance manual.

Comprehensive Land Use and Operations Plan, Town of Oyster Bay, NY

To comply with state permit requirements, LKB prepared a comprehensive plan for long-term management of the Old Bethpage Solid Waste Disposal Complex. The plan, completed in 1983, includes the development or continuation of programs for landfill expansion, incinerator wastewater treatment, control of leachate, stormwater and landfill gas, groundwater monitoring, control of industrial waste disposal, air quality monitoring, and site closure and reclamation. These programs are carefully coordinated with ongoing operations and with the eventual development of resource recovery operations at the complex. The plan provides a long-term course of action for the Town in managing its solid wastes in a manner consistent with state and county regulatory requirements.

**Report/Design and Environmental Impact Statement for Phase II Landfill
Extension, Town of Oyster Bay, NY**

In this major landfill project, LKB is providing all engineering and environmental work necessary to design, develop and commence operations in an extension of the Old Bethpage landfill. The landfill is listed on the Superfund National Priority List. Design of the \$2.5 million extension includes provisions for a double liner, leachate collection system, and other features required by the regulatory agencies. LKB was also responsible for preparing the 6 NYCRR Part 360 permit application as well as other work needed to obtain state and county approval for the landfill expansion. The draft EIS was recently prepared by LKB for the landfill extension. Major issues addressed in the study included: analysis of alternatives to the proposed action, potential groundwater impacts, air quality (VOC emissions) and odors, visual and aesthetic impacts, development of mitigative measures, and implications of the recently enacted New York State Long Island Landfill and Resource Recovery Law. LKB, in cooperation with the Town's counsel, provided expert testimony during lengthy adjudicatory proceedings.

**Part 360 Permit Application and DEIS for the Port Washington Landfill,
Town of North Hempstead, NY**

LKB prepared plans and a comprehensive report to obtain a permit for the Town of North Hempstead's 90-acre sanitary landfill under the New York State's Environmental Conservation Laws, Part 360. The Town, which is located in Nassau County in the metropolitan New York area, has a population approaching 250,000. Engineering planning addressed excavation, lining with an impervious material, and design of a leachate collection underdrain system. When filling is complete, the site will be capped and vented for methane gas release. Site development planning included provisions for staged utilization, stormwater drainage system, access road network, new scale house facilities, homeowner disposal area, and final use and landscape plans. LKB's Survey and Mapping Divisions undertook the field and aerial surveys for mapping for the entire project area and its vicinity. A boring and subsoil investigation program was also conducted by LKB. LKB personnel provided numerous hours of expert testimony in support of the application and DEIS. The facility is currently under construction.

Groundwater Pollution Investigation, Hicksville, NY

This study involved a detailed investigation for an industrial client suspected of polluting the aquifer with toxic chemicals from leaking on-site underground storage tanks. Work involved the assessment of groundwater flow patterns, design of a soil and groundwater pollutant investigation, construction supervision of monitoring well installation, implementation of a monitoring program, determination of groundwater quality, identification of contaminant sources, and implementation of remedial measures.

**Brookfield Avenue Landfill, Final Cover and Planting, Construction
Inspection, Staten Island, NY**

LKB's Construction Administration Department provided construction inspection services for the capping of the Brookfield Avenue landfill for the New York City Department of Sanitation. The work included construction management and consultation, field inspection, geotechnical testing and required revision of plans and specifications.

**Hazardous Waste Investigation, Commercial/Residential Development Site,
Middletown, NY**

LKB recently conducted a soil and groundwater sampling program at the proposed site of a mixed use commercial/residential development on 30 acres in Orange County, NY. Site reconnaissance determined evidence of potential hazardous waste disposal on portions of the site which was formerly a construction company storage facility. LKB developed an extensive sampling program and conducted chemical testing to fully assess the extent of contamination, and possible need for remediation, on the development site.

PERSONNEL QUALIFICATIONS

Lockwood, Kessler & Bartlett, Inc. has a staff of over 150 engineers, environmental scientists, planners, surveyors, construction inspectors, field technicians, and other support personnel. They are trained and experienced in all the disciplines necessary to provide full support to LKB's civil engineering and design projects. The distribution of personnel by discipline is summarized below:

<u>Engineers</u>		<u>Scientists</u>	
Chemical	2	Ecologists	2
Civil	11	Geologists	2
Electrical	1	Hydrologists	1
Mechanical	3	Hydrogeologists	2
Sanitary/Environmental	9	Planners	4
Soils	1		
Structural	5		
Transportation	7	<u>Support</u>	
Landscape Architects	3	Cartographers/ Photogrammetrists	4
<u>Surveyors</u>	25	Computer Programmers	4
<u>Architects</u>	1	Photo Lab Technicians	2
<u>Construction Inspectors/ Field Technicians</u>	38	Draftsmen	12
		<u>Administrative</u>	20

JOHN P. LEKSTUTIS, P.E.
Vice President - Senior Environmental Project Advisor



**CONSULTING
ENGINEERS**
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EDUCATION/REGISTRATION

B.E., Civil Engineering, Manhattan College, 1965
M.E., Sanitary Engineering, Manhattan College, 1966

Registered Professional Engineer in NY, NJ, CT, MA, RI, ME, WA

EXPERIENCE

Mr. Lekstutis has more than 21 years of experience in the fields of civil and sanitary engineering, environmental science, and hazardous waste management. During this time he has addressed and managed technical, economic, environmental and engineering programs from inception through implementation for major industrial and municipal projects. Mr. Lekstutis serves as senior advisor on all environmental projects. He is currently directing environmental projects for: groundwater contamination at municipal solid waste landfills at Syosset and Old Bethpage; preparation of a generic EIS for the Melville-Route 110 corporate office corridor in Huntington; and engineering and environmental services for a 1500-acre corporate office park development in Connecticut for IBM Corporation.

Before joining LKB, Mr. Lekstutis was Director of Environmental Engineering and Sciences for EnviroSphere Company, a Division of Ebasco Services Incorporated. He was responsible for managing EnviroSphere's eastern environmental operations on projects represented by a capital investment in excess of \$10 billion. He also planned and directed that firm's entry into the hazardous waste field. His responsibilities included the development, design and implementation of remedial engineering measures such as: groundwater monitoring and management; excavation, removal and safe disposal of wastes; in-place encapsulation; lagoon and tank farm closure; and in situ chemical treatment. Mr. Lekstutis' other experience includes site investigations, engineering feasibility evaluations, EIS reports, and economic studies for major project undertakings throughout the U.S. Specific projects included: coal storage and shipment terminals; coal gasification and other alternate fuel production facilities; high voltage transmission lines; coal fired electric generating plants; and industrial chemical manufacture.

Mr. Lekstutis recently directed a remedial investigation, feasibility and engineering design program for a former coal gasification/disposal site in central New Jersey. The work scope for this program included: detailed site investigations of the air, soils and groundwater to establish the extent and character of buried coal tar residues; a risk assessment to establish the critical health and environmental pathways of contamination; an engineering feasibility study to select a remedial program; engineering design and construction oversight of the remedial measures; and interface and negotiation on behalf of the former owners with local communities, local governments and the New Jersey Department of Environmental Protection.

IVAN POUSCHINE, JR.
Director of Environmental Engineering



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EDUCATION/REGISTRATION

B.A., Engineering, Harvard College, 1952

Graduate Studies, Political Science, Georgetown University, 1956

EXPERIENCE

Mr. Pouschine has over 35 years of consulting engineering experience, and he has served as Project Manager or Director on numerous water supply and wastewater treatment projects world-wide, including hazardous waste remediation. Presently, Mr. Pouschine is LKB's Director of Environmental Engineering, directing a wide range of environmental projects for both private and municipal clients.

Among the projects he has directed or managed are:

- Hazardous waste management studies at several industrial sites including development of plans for investigation and remediation and performing the required investigations.
- Investigations and designs of waste pickle liquor collection and disposal systems at Bethlehem Steel's Sparrows Point Plant and US Steel's Gary Plant, including supervision of construction and start-up.
- Comprehensive investigations of industrial wastewater, and preparation of reports and recommended treatment facilities for US Steel Corporation's Gary Steel, Gary Tube, National and Elwood Works; Bethlehem Steel Corporation's Sparrows Point Plant including the shipyard, and Lebanon and Bethlehem plants; and Cities Service Lake Charles Refinery.
- Pilot plant testing and report on removal of organic contaminants in Glen Cove, NY, drinking water, funded by the USEPA, and arranging for continued testing to remove pesticides in Suffolk County, NY. The Glen Cove pilot plant operations included testing of several different aeration systems, carbon adsorption, proprietary resin absorption, regeneration by steam of both carbon and resin over a three year period.
- Evaluation of USEPA wastewater effluent guidelines for the coal and ore mining, synfuels, and ferrous metals industries. Technical assistance to EPA Region III concerning achieving of limitation guidelines at six steel plants. Treatability studies of filtering combined sewer overflows and polishing secondary treatment plant effluent.
- Comprehensive master plan, design and start-up of a regional combined industrial-municipal wastewater treatment plant for Como, Italy, handling 127 wet process industries including voluminous textile wastes.

RAYMOND W. WEGENER
Chemical Engineer



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EDUCATION/REGISTRATION

B.E., 1973, Chemical Engineering, Manhattan College, 1973

EXPERIENCE

Mr. Wegener has over 14 years experience in environmental engineering, and is currently involved in the design phase of a groundwater remediation treatment system for a municipal client.

Since joining LKB in 1980, he has been responsible for one or more facets of the off-site methane gas control work at the Old Bethpage Landfill, Port Washington Landfill and Syosset Landfill in Nassau County, NY. His responsibilities included preliminary and final design, equipment specification, start-up and operation, data collection, gas sampling and follow-up inspections.

Mr. Wegener has prepared extensive theoretical landfill gas estimates for the Old Bethpage landfill, which were used as a guidance document in developing a RFP to exploit landfill gas as an energy resource. He has also designed a leachate treatment facility for the Town of Oyster Bay, now built and operational at the Old Bethpage landfill. The 200,000 gpd plant treats leachate collected from portions of landfill, which has been designated as an EPA Superfund site because of a history of industrial waste dumping. Mr. Wegener was responsible for initial feasibility and treatability studies, preliminary and final design, equipment specification, start up and operation, and preparation of a comprehensive operation and maintenance manual for the plant. He has performed similar duties for a municipal incinerator wastewater treatment plant.

Prior to joining LKB, Mr. Wegener was Laboratory Director of Ecolotrol, Inc., Bethpage, New York. His responsibilities there included wastewater sampling, data collection and interpretation, treatment plant design, report preparation, specification coordination and start up procedures related to the New York State Discharge Elimination System Program (SPDES) and NPDES outside New York. In this capacity, Mr. Wegener also directed treatability studies for a number of industrial clients such as; Engelhard Industries, Lipton Foods, American Cyanamid, Kind and Knox, and Pfizer, Inc. Mr. Wegener had conducted pilot and bench scale treatability studies on leachates and wastewater contaminated with metal refining wastes, high strength ammonia wastes, animal wastes, and electroplating and coating wastes.

Mr. Wegener has published articles for the proceedings of the New York State Association for Solid Waste Management and Pollution Engineering relating to off-site methane gas control and leachate management.

PAUL LAPPANO, P.E.
Project Manager



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EDUCATION/REGISTRATION

B.S. Civil Engineering, State University of New York at Buffalo, 1975

Registered Professional Engineer in State of New York

EXPERIENCE

Mr. Lappano has 12 years of experience in environmental and civil engineering. As Project Manager for several environmental projects, he is responsible for site investigations at landfills and hazardous waste sites, and for the design of solid waste management and remedial facilities. Mr. Lappano has been responsible for the design of landfill expansions, methane collection systems, leachate collection systems, liners and caps, and final land use plans. He has also been responsible for completing necessary regulatory permits and applications. Mr. Lappano is currently involved with the development of detailed plans and specifications for landfill, gas control and capping of a 35 acre inactive hazardous waste disposal site.

Mr. Lappano has conducted site investigations at several inactive and active hazardous waste sites on Long Island. As part of these studies, he used historic aerial photos to determine prior landfill boundaries and expansions, and to check for the presence of drum stockpiles, waste lagoons, and other evidence of individual waste disposal. As part of LKB's site development projects, Mr. Lappano has also used aerial photography to check for possible waste dumping on several large parcels of land proposed for corporate development.

Mr. Lappano's consulting experience prior to joining LKB includes the preparation of engineering designs and reports for the construction of solid waste management facilities in the Towns of Southold, Riverhead, and Huntington, New York. He designed an HVAC system, structural roofing, and the odor control system for a \$1.5 million underground advanced industrial waste treatment plant. He also contributed to a waste volume report and participated in an operations study, for the 10,000 TPD New York City Freshkills Landfill.

As a solid waste engineer for the New York State Department of Environmental Conservation, Mr. Lappano gained additional experience including engineering review of 15 landfills, 12 transfer stations, three incinerators, and four resource recovery facilities. These studies were conducted to ensure compliance with state standards under 6 NYCRR Part 360 - Solid Waste Management Facilities, for groundwater monitoring wells, methane monitoring and venting, leachate collection and treatment, incinerator residue disposal, and transfer station capacities.

Done & affix seal
not true, apparently
Mr Dale & Contents
Moses & Allen's house
at RR facility!