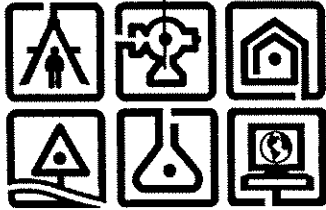


## **AQUIFER VARIANCE REPORT**

In December of 1999, as part of the Rapp Road Landfill P-4 expansion project, the City of Albany investigated the presence of an aquifer below the landfill site. This report evaluated the potential use of the aquifer as a public water supply and the potential impact such use would have on the Pine Bush Formation.

The report concluded that the aquifer is not used, and would mostly likely never be used, as a public water supply. Potential development of the aquifer could cause irreparable harm to the Pine Bush habitat. The report went on to further conclude that the P-4 expansion, while continuing to provide critical waste disposal capacity to residents of the City and surrounding communities, would not cause environmental impact to the aquifer that is part of the Pine Bush Formation.

December 10, 1999  
Revised December 21, 1999  
Revised January 11, 2000



# AQUIFER VARIANCE REPORT

## Part 360 Application to Construct and Operate a Solid Waste Management Facility

### P-4 Project Landfill Expansion

City of Albany  
Albany County, New York

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**AQUIFER VARIANCE REPORT**  
**Part 360 Application to Construct and Operate a Solid Waste Management Facility**  
**P-4 Project Landfill Expansion**

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**AQUIFER VARIANCE REPORT**  
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**6 NYCRR Part 360 Permit Application**

**1.0 INTRODUCTION**

The City of Albany has applied to expand its existing landfill located on Rapp Road in the City of Albany. In conjunction with that request, the City has requested a variance from the provisions of 6 NYCRR 360-2.12(c)(1), which prohibits siting a landfill over a primary water supply aquifer or principal aquifer. The purpose of this report is to provide the basis for the City's request for the variance, based upon the unique circumstances associated with the characteristics of the Albany Pine Bush Formation, and unique circumstances facing the City and the members of the ANSWERS Solid Waste Management Planning Unit.

## 2.0 HISTORICAL SOLID WASTE MANAGEMENT BACKGROUND

### 2.1 Albany Interim Landfill

Since 1981, the City has operated a regional solid waste system serving a number of municipalities in the Albany area. Through most of its period of operation, the system served fourteen municipalities: the Cities of Albany, Schenectady, Cohoes, Rensselaer, and Watervliet, the Towns of Berne, Bethlehem, Guilderland, Knox, New Scotland, Rensselaerville, and Westerlo, and the Villages of Green Island and Altamont. This region comprised a population of approximately 280,000 people.

Currently, the regional system continues to serve all of the municipalities listed above with the exception of the City of Schenectady. All of the participating municipalities deliver waste to the system, pay specified fees, and comply with the system's recycling programs. Thus, the ANSWERS system serves a regional population of approximately 220,000 people. In 1994, over 200,000 tons of solid waste were managed within the system by the City for the Wasteshed.

Prior to development of the ANSWERS system, the region was served by approximately 12 separate solid waste landfills. Beginning in the mid-1970's, however, state environmental requirements applicable to such landfills began to be strengthened significantly, a trend which intensified in the 1980's and continues to date. As a result, by the early 1990s the only solid waste disposal facilities remaining within the municipalities forming the ANSWERS Wasteshed were the facilities located within the City of Albany.

From 1981 to 1994, these facilities consisted of the City's landfill, the ANSWERS Refuse Derived Fuel processing facility (owned by the City), which processed solid waste into a "refuse-derived fuel," and boiler facilities owned by the New York State Office of General Services, ("OGS"), in which the refuse-derived fuel was burned to produce steam utilized to meet the thermal energy needs of the Empire State Plaza.

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The OGS boiler facilities closed in early 1994. Despite the closure of that component of the system, the City continues to serve the Wasteshed through its landfill. Currently, all of the solid waste requiring municipal management within the municipalities which comprise the Wasteshed is accepted by the City at the landfill. As noted above, in 1994, over 200,000 tons of solid waste were accepted. In 1998, nearly 175,000 tons of solid waste were accepted.

In March, 1990, the City received, after approximately 13 months of hearings, a permit to construct expansion of its Rapp Road facility ("Albany Interim Landfill" or "AIL"), from the New York State Department of Environmental Conservation ("DEC"). The Commissioner's Decision underlying the permit, dated February 13, 1990, was predicated upon the City's commitment to ensuring a long term solid waste solution for the members of the ANSWERS Wasteshed. In that decision, he stated:

In light of the fact that the interim landfill will only provide capacity for an estimated three years of solid waste management, it is critically important for the City and other municipalities that will use this interim landfill to move rapidly to complete a long term management study and implement an alternate solid waste program in that time period.

Commissioners Decision at p 6.

In response to Commissioner's concern regarding development of a long-term solution for the ANSWERS Wasteshed, the DEC permit authorizing construction of the AIL included a series of provisions which, together:

- a. Stated the City's acknowledgment that the DEC would not have approved the AIL in the absence of the City's "absolute and unequivocal commitment to identify and secure an acceptable site for a long-term facility."
- b. Required the City to undertake development of such a long term facility, or join in with other municipalities or third parties to do so,

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and established certain initially applicable milestones dates for such development.

- c. In furtherance of that requirement, required the City to submit regular progress reports on such efforts, and to "take all steps reasonably necessary to implement the system that will be constructed ... prior to the interim landfill's reaching capacity."

DEC Permit to Construct, No. 4-0101-171/1-0, Special Condition III 1-6.

### 2.2 The Long Term Planning Process

In furtherance of these requirements, the City joined with the other members of the Wasteshed to create the ANSWERS Wasteshed Planning Unit, and to develop a Generic Environmental Impact Statement/Solid Waste Management Plan ("SWMP") for the Wasteshed. In the Spring of 1989, the Cities of Albany, Schenectady, New Scotland, Rensselaerville, and Westerlo and the Village of Altamont, Green Island and Cohoes, Rensselaer and Watervliet, the Town of Berne, Bethlehem, Guilderland, Knox, and Coeymans adopted resolutions (a) authorizing creation of the Planning Unit, (b) appointing the City as agent for the Planning Unit for purposes of developing the SWMP, and (c) appointing the City as lead agency for development of the SWMP.

Pursuant to the authorization granted in the municipal resolutions, the City developed the SWMP on behalf of the ANSWERS Wasteshed Planning Unit between May 1989 and late 1991. The process included creation of, and consultation with, an Advisory Committee consisting of representatives of each participating municipality, extensive opportunities for public comment, and numerous stages of review by DEC. The SWMP was approved and adopted on behalf of the Planning Unit in 1992. Pursuant to the requirement of the DEC, conveyed in a March 9, 1992 letter to the City, that resolution committed the City, on behalf of the Wasteshed, to implement plans and projects, and programs identified in the SWMP.

On October 29, 1991, while the SWMP was being developed, DEC issued the permit to operate the AIL. Like the original permit to construct, the permit to operate included provisions requiring the City to continue the process of securing a long-term waste disposal facility to replace the AIL, and setting milestone dates for submission of the



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applications for the permits necessary to construct such facility. Subsequently, those milestones were formally extended to June 28, 1994.

The SWMP is the officially adopted plan for meeting the solid waste needs of the municipalities which comprise the Wasteshed Planning Unit, as approved by DEC. Pursuant to Environmental Conservation Law § 27-0707(2)(b), and 6 NYCRR 360-1.8(g), no solid waste project permit application proposed by or on behalf of a municipality in the Planning Unit shall be deemed complete by the DEC unless an approved SWMP is in effect for that municipality. The SWMP is a three volume document, consisting of six bound books.

After thoroughly reviewing the existing regional solid waste system, solid waste needs for the future, the available options for meeting those needs, the associated environmental impacts, and economics, the SWMP concluded that a new long-term landfill should be developed to serve the Wasteshed. The SWMP determined that an estimated 100 to 130 acres of landfill fill area would be needed to serve the planning unit for a twenty-year period, and that approximately 250 acres should be acquired to provide a site size sufficient to support administrative activities and to provide buffer area.

The SWMP considered whether the Planning Unit should rely upon exportation of waste out of the Wasteshed or upon private facilities to meet its solid waste needs. It concluded that reliance on exportation of waste out of the Wasteshed would present numerous unnecessary risks, which made that alternative "clearly less favorable" than the chosen alternatives. A similar conclusion was reached with respect to reliance on private sector facilities.

The SWMP delineated the process that the Wasteshed would use in identifying a site for its new long-term landfill. The chosen process was an extensive, multi-phased, criteria-based siting study. The criteria were selected in the SWMP, after public review, and were largely driven by requirements in the DEC's regulations, as well as by environmental and planning concerns.

The SWMP also addressed the issue of whether local zoning requirements would apply to the new landfill. In that regard, Section 16.5 of the SWMP stated that local zoning requirements would apply to the Wasteshed's new disposal facility only if a private

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developer constructed and owned the facility. Similarly, the "Local Land Use" siting criterion for the landfill stated that, although, zoning and local land use plans would be "considered" in order to assess "compatibility," "zoning is considered a planning tool, not a legal restriction." These statements all appeared in the August 1990 Draft SWMP.

The siting criteria contained in the SWMP also included "ease of acquisition". Since the City did not itself have the power of eminent domain outside of its municipal boundaries, and because a landfill is not a very popular facility, the City recognized that a site comprised of willing sellers may have an advantage over a site where it could not obtain the consent of the landowners to purchase the site.

The proposed landfill site in Coeymans was selected in August 1994 as the outcome of that siting study, based upon a thorough and reasoned application of the criteria established in the SWMP on behalf of the entire Wasteshed. The siting study was performed over a three-year period. In May 1991, the City, on behalf of the Watershed, issued the first phase siting report. That report applied the initial screening criteria and identified fifteen potential sites that satisfied those criteria. Of those sites, 3 were located in Guilderland, 9 in Bethlehem, and 3 in Coeymans. The second phase of screening was conducted in 1992. In June 1992, a report on that phase was issued, which selected three of the fifteen initial sites for further study. The selection of the proposed Coeymans site ("Site C-2") as the preferred site in 1994 was based upon a more detailed assessment of those three sites.

### 2.3 The Options Negotiations for Site C-2

While the City was undertaking this siting process, David Hansen and his wife entered into options with the landowners of two of the three (Frangella and Kinley) properties which comprised Site C-2. After extensive negotiations, the City arrived an agreement with Mr. and Mrs. Powell, the owners of the third parcel, to acquire an option for their property comprising the vast majority of Site C-2 in August, 1994. The purchase price for the property was essentially set by the prior option agreements between the Hansens and the Frangellas and Kinleys, and therefore, was virtually non-negotiable. The Common Council authorized the Mayor to execute such agreements as may be necessary to acquire the site. The Option Agreement between the City and Mrs. and Mrs. Powell provided for a payment by the City, of the sum of \$221,760, to be applied against the purchase price of \$11,000 per acre, expired, by its terms, on December 31,

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1996, but provided for a two year extension of the term, or until December 31, 1998, upon the payment of an additional \$221,760, which would also apply against the purchase price.

#### **2.4 Renewal of the Operating Permit for the AIL and Application to DEC for Site C-2**

In 1994, the City realized that it had an additional approximately 2-3 years of additional capacity at the AIL, having underestimated its original estimate of three years of capacity for the AIL. In order to ensure that there was sufficient capacity to serve the members of the ANSWERS Wasteshed while continuing the process of siting and permitting a long-term landfill, the City sought to renew its permit to operate the AIL. However, the operating permit for the AIL also required the City to submit a permit application for a long-term landfill to serve the ANSWERS Wasteshed.

The City submitted an application to renew the permit to operate the AIL during 1994. After receipt of the application to renew the operating permit, the DEC coordinated review with all potentially involved and interested agencies under the State Environmental Quality Review Act ("SEQR"). After that coordinated review, DEC required that the City prepare a supplemental draft environmental impact statement ("SDEIS") for the renewal of the operating permit, and also submit a permit application for a long term landfill to serve the ANSWERS Wasteshed, in order to demonstrate compliance with the permit condition contained in its existing operating permit.

In order for the City to continue to operate the AIL past the November 1, 1994 expiration date of the existing operating permit, the City had to demonstrate compliance with the terms and conditions of the operating permit, in order for DEC to deem the application "complete", and give the City the benefit of State Administrative Procedures Act §401.2, which would allow it to continue to operate the landfill until the DEC made a final determination on the renewal application. As a result, the City submitted a permit application pursuant to 6 NYCRR Part 360 to the DEC for Site C-2, together with a long Environmental Assessment Form ("EAF") for the construction and operation of a long term landfill to serve the ANSWERS Wasteshed.

DEC determined that the information the City had submitted for Site C-2 was sufficient to demonstrate compliance with its operating permit, and as a result, deemed the

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application for the renewal permit complete on October 27, 1994, which allowed the City to continue to utilize the existing capacity at the AIL pending the determination on its renewal application.

While the City proceeded with its application to renew the operating permit for the AIL, the City and DEC continued the review process for Site C-2. As required under SEQR, the DEC circulated the EAF and supporting documentation to all involved and interested agencies, and expressed its desire to act as Lead Agency for purposes of review of the application to construct and operate a long term landfill for the ANSWERS Wasteshed at Site C-2.

In addition, the City began the preparation of the many studies which would be required to obtain a permit to construct and operate a long term landfill to serve the ANSWERS Wasteshed at Site C-2, including a draft of an environmental impact statement, a draft Part 360 application, a draft engineering report, draft traffic study, draft wetlands delineation, draft hydrogeological investigation (to determine groundwater quality, quantity, and flow), draft visual assessment, draft archeological assessment, and draft groundwater survey. The City, on behalf of the Wasteshed, expended over \$1.25 million dollars in developing the SWMP, conducting the siting process, and developing a permit application for the proposed landfill.

The Town of Coeymans objected to the DEC Region 4 office acting as Lead Agency for purposes of review of the construction and operation of a long term landfill for the ANSWERS Wasteshed under SEQR. This objection set in motion an appeals process to the Commissioner of DEC. By decision dated March 14, 1995, the Deputy Commissioner of DEC determined that DEC Region 4 was the appropriate agency to act as Lead Agency.

As a result of the Lead Agency decision, on April 10, 1995, DEC Region 4 determined that the construction and operation of a long term landfill for the ANSWERS Wasteshed at Site C-2 may have a significant effect on the environment, issued a Positive Declaration under SEQR, and determined to hold a public hearing on a proposed scope of the DEIS. On May 31, 1995, DEC held a public hearing on the proposed scope of the DEIS for the construction and operation of a long term landfill for the ANSWERS Wasteshed at Site C-2 at the Ravena-Coeymans High School. After the public hearing, DEC required the City to revise the proposed scope of the DEIS, and on January 5, 1996,

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DEC approved a final scope for the DEIS. DEC required minor revisions to the final scope in June, 1996.

### 2.5 Town of Coeymans I Litigation

While the scoping process was proceeding, the Town of Coeymans, commenced a combined Article 78/Declaratory Judgment action against the City, DEC, and each of the member municipalities in the ANSWERS Wasteshed, seeking (a) to overturn the designation of DEC Region 4 as Lead Agency; and (b) a designation that the City was subject to the Town of Coeymans Local Laws of 1976, 1982 and 1995, which purported to ban a landfill such as the City proposed at Site C-2, and to prohibit the importation of solid waste generated within New York State to any landfill within the Town. *Town of Coeymans v. City of Albany, et al. ("Town of Coeymans I")* By decision dated January 7, 1996, Hon. Anthony Carpinello determined that the Town's claims were not ripe for review, and dismissed the action. This decision was affirmed by the Appellate Division, Third Department on March 20, 1997, and on June 27, 1997, the Court of Appeals denied the Town's request to review that decision.

### 2.6 The Renewal Permit and Decision to Pursue the "Wedge"

On October 27, 1995, well over a year after the application was originally submitted, the DEC issued the permit to renew the operating permit for the AIL. That permit required the City to continue to fund the activities of the Albany Pine Bush Preserve Commission by paying it \$1.33/ton of waste received at the landfill, required a status report on the City's efforts to obtain a permit to construct and operate the long term landfill at Site C-2, and also required that in the event the City determined to abandon its plans to pursue a long term landfill for the ANSWERS Wasteshed, that it provide an alternative arrangement acceptable to the DEC. In addition, the DEC determined that because of the existing transition rules under 6 NYCRR Part 360, that there was no need for a variance from the prohibition on siting a landfill over a principal aquifer. That permit expires, by its own terms, on October 27, 2000.

Because of the *Town of Coeymans I* litigation, the application to construct and operate a long term landfill to serve the ANSWERS Wasteshed at Site C-2 was thrown into disarray and doubt. If the City's application had proceeded without interruption, based

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upon its past experience with the AIL, a permit to construct and operate a long term landfill at Site C-2 could have been granted with sufficient time to complete the testing and permitting process, as well as allowing construction of a landfill at Site C-2, prior to the capacity at the AIL being exhausted.

However, since there is never any guarantee of a successful result in any litigation, and because the City had an obligation to ensure solid waste disposal capacity to the residents of the ANSWERS Wasteshed, the City devised an alternate strategy to prevent a "gap" in landfilling capacity for the ANSWERS Wasteshed in the event that the Court determined that the Town of Coeymans should have been designated Lead Agency, while still allowing sufficient time to complete the permitting process for Site C-2. Because of the exhaustive amount of information available regarding the City's Rapp Road facility, that strategy included a suspension of testing at Site C-2, and a determination to pursue an application to fill the "Wedge" between the Greater Albany Landfill (GAL), and the AIL, through a "piggy-back" design consisting of a new liner constructed over the closed GAL, connected to the liner for the AIL. The City estimated that this application would provide approximately 2 ½ - 3 years of capacity at its Rapp Road facility, roughly corresponding to the expiration date of its existing permit to operate the AIL.

During the summer of 1995, the City began to undertake the testing necessary to submit an application for the Wedge to DEC. The City completed the testing and analysis required to submit an application to DEC for the Wedge, and on March 15, 1996, while the *Town of Coeymans I* litigation was still pending, submitted a DEIS, together with a long EAF and 5-volume permit application to DEC.

Again, DEC Region 4 determined that it should be Lead Agency for purposes of review of the Wedge application, coordinated review of the application, issued a Positive Declaration under SEQR, and on June 20, 1996, determined the application complete for purposes of public review. A permit to construct the Wedge was finally granted on January 1, 1997, again, while the *Town of Coeymans I* litigation was still pending. The permit for the Wedge granted a variance from the prohibition on siting a landfill over a principal aquifer. DEC stated in its Findings Statement that:

The modification which is presently under review involves a lateral expansion of the landfill over and area previously

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landfilled with solid waste from the AIL and GAL. As was the case in the original approval of the AIL, based upon the location of the AIL expansion over the GAL and AIL, there will be no increase in Pine Bush aquifer area exposed to any possible leak of leachate should the collection systems not work as designed and approved. Additionally, the proposed double composite liner and tie in to existing landfill closure features will prevent any contravention of subsurface water quality and serve as better protection to underlying water sources. Therefore, the Department finds that approval of a variance under 6 NYCRR Part 360-1.7 (1993) does not conflict with the intent and purpose(s) of the principal aquifer construction restrictions of Part 360-2.12(c)(1)(ii)(1993).

Findings Statement, January 31, 1997, pages 8-9.

After construction of the Wedge, and undertaking many contingency measures, with the approval of DEC (including filling the AIL beyond its closure design of 1 on 3 slopes, to a slope reaching 1 on 1), to ensure there would be no gap in landfilling capacity for the members of the ANSWERS Wasteshed, the DEC allowed the City to begin filling the Wedge with the solid waste generated throughout the ANSWERS Wasteshed in the fall of 1997.

### **2.7 The Renewal of the Options for Site C-2 and SWMP Update**

The permit for the Wedge, like the renewal permit for the AIL, required the City to report on its progress with respect to a long-term landfill to serve the ANSWERS Wasteshed, and also required, as the renewal permit required, that in the event the City determined to abandon a long-term landfill to serve the ANSWERS Wasteshed, that it provide an alternative option to the members of the ANSWERS Wasteshed acceptable to the Department. Refer to Special Condition 7 of the permit.

While the City was pursuing the Wedge, and as noted above, the City's option for the Powell property was scheduled to expire on December 31, 1996, the *Town of Coeymans I* litigation was still pending, and it still did not have control over all of the property

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comprising Site C-2. In light of these circumstances, the City began negotiations in earnest with Mr. and Mrs. Hansen, who held the Frangella and Kinley options, to obtain control over all of Site C-2, as well as renewal of the option for the Powell property. After contentious negotiations, the City acquired, by assignment, the Hansens' interest in the Frangella and Kinley options by payment of \$144,120, and renewed the Powell option by payment of \$221,760. With the renewal and assignment, the options were extended to the fall of 1998.

In April 1997, the City submitted a report to DEC, detailing the progress of the ANSWERS Wasteshed in implementing the SWMP, as well as providing a road-map of its plans to comply with the SWMP. That report states that the City intended to maximize the capacity of the Rapp Road facility, prior to pursuing an off-site long term landfill to serve the ANSWERS Wasteshed.

### 2.8 The Decision to Exercise the Options

After the permit for the Wedge was granted, the *Town of Coeymans I* litigation had still not been finally decided. The City felt it had a chance to concentrate on other issues pending the outcome of the litigation, since it had gained options for all of Site C-2, and had sufficient capacity to serve the members of the ANSWERS Wasteshed for several years. However, the City did not stop working on solid waste issues. One of the major initiatives pursued during this time included pursuing a new recycling contract to replace the City's existing contract. In February, 1997, the City issued a Final Request for Proposals, pursuant to the provisions of General Municipal Law §120-w, seeking qualified bidders to use its existing Rapp Road RDF facility for a transfer station and recycling facility. The City received two bids in response to its Request for Proposals, but could not negotiate terms acceptable to the City. As a result, the procurement process was discontinued in March of 1998, after expending over \$100,000 in an effort to obtain a favorable contract for transfer and recycling services to serve the City and the ANSWERS Wasteshed.

While trying to maintain the ANSWERS Wasteshed's existing system, the reality of the final expiration (December 31, 1998) of the options on Site C-2 soon became apparent to the City. During the summer of 1998, with hardly any time to recover from the permitting process for the Wedge and the recycling Request for Proposals, the City realized it had to make a decision whether to purchase the land comprising Site C-2 in



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order to preserve its options for a long-term solution for the member municipalities of the ANSWERS Wasteshed.

Similar to its decision to pursue the Wedge, since there is considerable information regarding the existing Rapp Road facility, the City decided to pursue a two-prong strategy to ensure that there will be no gap in capacity for the member municipalities of the ANSWERS Wasteshed: seek further landfill capacity at its Rapp Road facility, consistent with its Solid Waste Management Plan, as updated, as well as exercise the options for the property comprising Site C-2 to allow it to undertake the testing necessary to support a landfill application.

To implement this strategy, the City submitted a Part 360 application, and long EAF, to DEC for permission to expand its Rapp Road facility in August, 1998 ("the P-4 Project"). This application involves both a vertical expansion of its existing landfill (from approximately 390' to approximately 440', as well as an application to expand, horizontally, the footprint of the landfill. DEC, in September, 1998, circulated the long EAF and draft scope to all involved and interested agencies for their review and comment, indicated DEC's interest in acting as Lead Agency for purposes of acting on the City's request, and commenced a public comment period on the draft Scope. Because the City's proposal for its Rapp Road Facility involves a horizontal expansion of the existing landfill which is in the Albany Pine Bush, the DEC received extensive comments from both the Albany Pine Bush Preserve Commission, and Save the Pine Bush, Inc.

In the meantime, however, and in order to ensure again that there would be minimal disturbance to the ANSWERS Wasteshed existing solid waste management system, the City also entered into negotiations to extend the options for property comprising Site C-2. The only avenue available to the City to extend the options for the property was to pay an exorbitant amount of money to extend the options for another year (to December 31, 1999), but not have the money paid to extend those options applicable to the purchase price for the property. This was an unacceptable alternative for the City.

### **2.9 Coeymans II**

The City adopted an Ordinance on November 16, 1998, authorizing the issuance of \$3.45M in bonds to purchase the property known as Site C-2. At the same time, the

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Common Council of the City of Albany adopted a resolution authorizing the segmentation of the purchase of the property known as "Site C-2" from the actual construction and operation of a landfill on that site, and determined that the purchase of the property would not have a significant impact on the environment. Both the Bond Ordinance and the Negative Declaration specifically prohibited any development of Site C-2 without further Common Council approval.

Shortly thereafter, the Town of Coeymans, as well as residents of the Town of Coeymans and the City of Albany, commenced combined Article 78/Declaratory Judgment Actions, seeking to overturn the decision of the City of Albany to authorize the issuance of bonds to purchase the property, on the grounds that the City improperly segmented review of the purchase of the property under SEQR from the construction and operation of a landfill on the property. The residents' action also claims that the purchase of the land constitutes a waste of public funds.

As a result of the pendency of the litigation, the City has not been able to issue bonds to fund the purchase of the acquisition of Site C-2, and therefore, has been unable to acquire the site. As of the date of this report, no decision on the merits of the case has been received.

### **2.10 Extension of the Options**

Despite the fact that the City had already exercised its rights to purchase the property, it entered into negotiations to extend the options for Site C-2 for an additional year. Those negotiations were successful, resulting in the City being required to pay \$399,850.00 to extend the three options until December 31, 1999. In late December, 1999, the City negotiated an additional one-year extension for the three options, again requiring the City to pay \$399,850. The monies paid by the City also apply to the purchase price. In total, the City has expended or will be required to expend \$1,387,340 to retain control over Site C-2.

### **2.11 1997-1998 SWMP Compliance Report and Schedule**

The City prepared and submitted to DEC a SWMP Compliance Report for 1997-98, detailing the activities of the City and ANSWERS Wasteshed with respect to the SWMP,

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and more particularly, a long-term landfill. A copy of this report, submitted to DEC in February, 1999, is attached to the Third Supplemental Draft Environmental Impact Statement ("TSDEIS") for the P-4 Project as Appendix K. This report states that while the City is pursuing the expansion at Rapp Road, consistent with the theme of the ANSWERS SWMP, it will continue to pursue long term landfill capacity off-site as diligently as possible. As noted therein (TSDEIS, Appendix K, p.9), a more definite scheduled for continued pursue of an off-site landfill to provide long term landfill capacity to the ANSWERS Wasteshed cannot be provided until the litigation regarding Site C-2 is resolved.

### 3.0 THE PINE BUSH FORMATION

The Pine Bush Formation is an unconsolidated (i.e., surficial) sand deposit located within the City of Albany, the Town of Guilderland, and the Town of Colonie. It is located within a 40 square mile urban area between Albany and Schenectady, New York that has been developed for primarily residential and commercial land uses. The name for the Pine Bush is taken from its dominant and unique pitch pine and scrub oak vegetative community. The Pine Bush is part of an extensive sand dune and swamp area that extends from South Glens Falls to Delmar. This extensive dune field developed on top of a series of interconnected glacial lake sediments that occupied the Hudson River Valley from approximately Glens Falls to Newburgh. The glacial lakes developed in front of the ablating continental ice sheet during and after the Late Wisconsinan deglaciation. The Pine Bush is covered by sand dunes of light yellow-brown to light gray very fine to medium grained sand deposits that are reported to range in thickness from 5 to 150 feet. The thickest sand deposit is located in the northwestern and central parts of the Pine Bush. In some areas, streams have eroded completely through the sand formation and into the underlying clay.

Attachment E to the Part 360 application for the P-4 Project is a Pine Bush Formation Declassification Study which is intended to support the position that the City's Rapp Road property does not overlay a principal aquifer. This declassification study maintains that the Pine Bush Formation: (1.) does not have the distinguishing characteristics of a principal aquifer, (2.) does not represent a viable public water supply source for the future, and (3.) that the development of a potential public water supply source would have an adverse impact to the Pine Bush habitat by lowering of the water table. The delisting of the Pine Bush Formation has not been accepted by DEC, and the formation continues to be classified as a principal aquifer.

The following discussions related to the potential utilization of the Pine Bush Formation as a public water supply provide expanded supplement information in support of the variance request for the "siting" of the P-4 landfill expansion over a DEC classified principal aquifer.

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### 3.1 Current and Potential Usage of the Pine Bush Formation

C.T. Male evaluated the current and potential usage of the Pine Bush Formation as a municipal groundwater supply source. This evaluation included an assessment of the areas in the vicinity of the AIL, both upgradient and downgradient of the existing landfill and proposed P-4 landfill expansion.

The direction of local groundwater flow in the vicinity of the AIL is southeast, towards Rensselaer Lake. A distance of approximately 1 mile was evaluated upgradient and cross gradient of the AIL, and a distance of approximately 3 miles was evaluated downgradient of the AIL. The area evaluated is bounded to the west by New Karner Road (Route 155), to the north by Central Avenue (Route 5), and to the south by Western Avenue (Route 20), and continues in a southeasterly direction for approximately 3 miles downgradient. The area evaluated is shown on the figure titled "Public Water Districts", which is attached to this variance request.

This municipal water supply evaluation included a determination of whether public water is available in areas contained within the area described above (i.e., between Routes 5, 20 and 155, and extending southeasterly into the Town of Colonie). C.T. Male also contacted each of the water districts and obtained information regarding their current production capacity, the amount of growth which could be managed using the existing system, the number of years the existing system is expected to serve the district's needs, and whether there are any existing plans for use of the Pine Bush formation as a water source.

#### 3.1.1 Existing Water Supply Districts and Areas Covered

There are currently no existing sources of public water within one mile of the AIL, either upgradient or downgradient. The nearest source of public water is a Town of Guilderland deep well field located approximately 3 miles west (upgradient) of the AIL, at the intersection of Route 155 and Nott Road. Areas in the vicinity of the AIL are supplied with public water through four water districts: the Town of Colonie, Village of Colonie, Town of Guilderland, and City of Albany.

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The sources of water for these districts are located as follows. None of the public water sources are within the vicinity of the AIL.

- Town of Guilderland: Deep wells located approximately 3 miles west (upgradient) of the landfill, at the intersection of Route 155 and Nott Road, according to Mr. Bill West of the Town of Guilderland.
- City of Albany: Alcove and Basic reservoirs, located in the Helderberg Mountains, approximately 20 miles southwest of the landfill, according to the "City of Albany Department of Water and Water Supply Report on Disaster and Emergency Planning for the Water Supply System", prepared by Smith & Mahoney, P.C., dated March 1990.
- Town/Village of Colonie (Latham Water District): Mohawk River, Stony Creek Reservoir and 5 wells on Onderdonk Avenue, located approximately 7 miles northeast of the landfill, according to the water district world wide web site, located at <http://www.colonie.org/lathamwater/index.html>.

C.T. Male contacted each of the four water districts in the vicinity of the AIL to obtain specific information regarding the extent of their municipal water supply coverage in the vicinity of the AIL, and whether any areas in the vicinity of the AIL did not have the option to connect to public water. With one exception, all of the properties within the area evaluated are provided access to public water or are classified as Pine Bush Preserve and not developable. The attached drawing shows the areas covered by each water district.

The Latham Water District owns land on Morris Road that formerly was used for pumping groundwater from two wells. These two wells are reported to have been installed within the Pine Bush Formation and were abandoned in the 1960's due to their low well yields in comparison with new groundwater wells installed proximal to the Mohawk River, thus rendering the Pine Bush Formation wells unnecessary. Additional factors for the abandonment of the two wells included poor water quality and the need to treat groundwater to remove fines (Personal Communication with Gary Mostert, Superintendent of the Latham Water District, December 1999).

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### 3.1.2 *Capacity of Existing Systems to Manage Future Growth*

C.T. Male contacted each of the water districts to obtain information regarding existing capacities and the capability to manage future growth.

The average daily municipal water production by the Latham Water District is currently 10.46 million gallons per day, with a maximum production capacity of 21.5 million gallons per day. The Latham Water District, which serves both the Town and the Village of Colonie, reported that they have the capability to increase production by approximately 15% using their existing system, and that this will meet the district's needs for a minimum of 5 years. Future expansions of the water district are pending, both in the areas covered and the sources of water. Current plans for future water development involve use of surface water from the Mohawk River and groundwater wells in the vicinity of the Mohawk River. There are no plans for use of the Pine Bush Formation by the Latham Water District as a source of municipal water (Personal Communication with Gary Mostert, Superintendent of the Latham Water District, October 1999).

The minimum daily municipal water production capacity of the Town of Guilderland is currently 4.57 million gallons per day, and the maximum production capacity is 9.27 million gallons per day (these amounts include interconnections with the City of Albany and the Town of Bethlehem). The Town of Guilderland reported that their current system is able to accommodate approximately 15-20% growth in usage, and is projected to satisfy the district's needs for approximately 15-20 years. Future expansions of the water district are pending, both in the areas covered and the sources of water. Current plans for future water development involve use of surface water from the Watervliet Reservoir, purchasing municipal water from the City of Albany, or additional groundwater well sources. There are no plans for use of the Pine Bush Formation by the Town of Guilderland as a source of municipal water (Personal Communication with Bill West of the Town of Guilderland Water & Wastewater Management, October 1999).

The average daily municipal water production by the City of Albany is currently 20 million gallons per day, with a maximum production capacity of 32 million gallons per day. The City of Albany reported that their current system is capable of increasing average daily production by approximately 60%. The City currently supplies municipal

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water to the Towns of Guilderland and Bethlehem, and is capable of satisfying the City's requirements for an indefinite period. The City has no plans for developing any additional water sources (Personal Communication with Bill Simcoe of the City of Albany Department of Water and Water Supply, October 1999).

### 3.2 Private Water Supplies

A single area was identified which is not currently connected to public water. This area is located approximately 1 mile northwest (upgradient) of the AIL, and is bounded by Karner Road, New Karner Road (Route 155), and Rifle Range Road. The area is currently occupied by commercial establishments, and there are no residences in this area which is not presently connected to a public water distribution system. The Latham Water District stated that this area could be supplied with public water if the property owners desired public water and petitioned the district for a water district extension (Personal Communication with Gary Mostert, Superintendent of the Latham Water District, October 1999).

No other areas with private water supplies were identified in the vicinity of the AIL, and there are no residential wells in the area that are reported to be used for consumptive purposes.

### 3.3 Existing Water Quality

The existing water quality of the Pine Bush Formation is known based on previous studies and the historical water quality results from the groundwater monitoring wells which surround the City's landfills at the Rapp Road facility.

The regional groundwater quality of the Pine Bush Formation is commonly characterized as poor with elevated levels of chloride associated with road salting, and relatively high concentrations of nitrogen which is attributed to septic tank effluent. Since the formation is a fine sand water table formation it is susceptible to contamination by various anthropogenic sources.

On a site-specific basis, environmental monitoring data from the Rapp Road property shows that the GAL, an unlined landfill that is closed, has had an impact on



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groundwater quality, and confirms that the AIL is not adversely impacting groundwater. Parameters which have been elevated in groundwater attributed to the GAL are typical leachate constituents (i.e., iron, magnesium, manganese, sodium, turbidity, TDS, lead, total phenols, nitrate, ammonia, chloride, etc.). Volatile organic concentrations for benzene, toluene, methylene chloride, and chlorobenzene are reported to be elevated slightly above their respective maximum contaminant levels (MCLs) in several wells around the GAL. Both upgradient and downgradient wells (relative to the GAL) are reported to be impacted, probably as a result of leachate mounding within the elevated landfill mass.

The GAL's impact on site groundwater quality will be mitigated or improved by the proposed P-4 Project as discussed in Section 6.0, Environmental Benefit.

#### 4.0 EFFECTS OF DEVELOPMENT OF A PUBLIC WATER SUPPLY ON THE PINE BUSH HABITAT

A unique ecosystem has recently (in geologic time) developed on top of the Pine Bush Formation which originally formed in an arid environment following the last deglaciation. The plants and animals of the Pine Bush are dependent upon a suite of environmental factors including the depth of the water table below the sand dunes. It is a common belief that the theoretical development of a viable municipal groundwater supply in the Pine Bush Formation has the potential to adversely impact the Albany Pine Bush habitat<sup>1</sup>. The direct impact of pumping groundwater on a continuous basis within this unconfined, fine grained sand water table formation may result in a permanent lowering of groundwater elevations. Secondary impacts may affect the distribution of flora and associated fauna within a protected ecological area. In general, the impact of a lowered water table within a wetland area would be more profound over a relatively shorter time frame than for an uplands area. However, due to the deep root zone development of various upland trees, shrubs, and other plants in the Pine Bush, including the food-source of the Karner blue butterfly, the blue lupine plant, and the sensitivity of these flora to water table lowering, it is a plausible theory that continuous groundwater withdrawal, given enough time, could even effect the distribution of uplands plant species in the Pine Bush. This is particularly true for tree and shrub species with lateral root growth at depth that "tap" the water table.

The following hydrogeologic analysis has been done to quantitatively assess the magnitude and aerial extent of drawdown impacts associated with the theoretical development of a municipal groundwater supply source within the Pine Bush Formation.

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<sup>1</sup> The technical feasibility of potential groundwater withdrawal for the purposes of a municipal water supply is unproven and addressed in more detail within the Pine Bush Declassification Study, Attachment E, Volume 5 of 5 of the Part 360 Application for the P-4 Project. This discussion in no way assumes that it is viable to develop a municipal groundwater supply in the Pine Bush Formation; it is intended to assess the theoretical hydrogeologic impacts from hypothetical groundwater withdrawal.

#### 4.1 Drawdown, Transmissivity, Storativity, and Specific Capacity

Drawdown is the extent of lowering of the water level in a well during pumping; it is the difference between that static water level prior to pumping and the dynamic water level during active pumping. The cone of depression is the three dimensional lowering of the water table or piezometric surface at varying distances from a pumping well. For a uniform and homogeneous formation, the cone of depression for a single pumping well has radial symmetry. Multiple pumping wells produce additive drawdown effects for a given location (i.e., the drawdown at any given point is a summation of the drawdown produced by each individual pumping well). Drawdown is directly proportional to the pumping rate (Q); for example, a doubling of the pumping rate would cause a doubling of the drawdown.

The geometry of the cone of depression and the amount of drawdown for a particular formation is generally dependent upon the transmissivity and storativity of the geologic formation being pumped. A general definition for transmissivity, T, is the rate of water flow through the formation. Values of T range from less than 1,000 to over 1,000,000 gallons per day per foot of drawdown (gpd per ft). Highly transmissive formations have shallow cones of depression with a wide radius of influence. Low transmissive formations have a deep cone of depression with steep sides and a much shorter, but deeper radius of influence. Storativity, S, is defined as the volume of water released from storage per unit of surface area of the aquifer per unit change in head. In a water table, or unconfined formation, S is the same as the specific yield of the material unwatered during pumping. The specific yield is defined as the quantity of water that a unit volume of material will give up, and is commonly expressed as a rate per unit of drawdown (i.e., gpm per foot). S values generally range from 0.01 to 0.35 for water table formations.

The specific capacity of a well is its yield per unit of drawdown, after a given time has elapsed. It is most commonly determined at the end of a constant rate pump test. Specific capacity is measured in units of gpm/foot of drawdown.

#### 4.2 Drawdown in the Pine Bush Formation

The magnitude of predicted water table lowering is herein estimated by using the results of limited available constant rate pump tests previously conducted within the

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Pine Bush Formation by the USGS<sup>2</sup> in 1979. The use of USGS pump test data assumes that these results are characteristic of the entire formation. The USGS installed two test wells (Well 4 and Well 6) in the thickest known locations of the Pine Bush Formation near the intersection of Karner Road and the Thruway. To monitor drawdown during pumping, five observation wells were similarly installed at three pre-determined distances with well pairs at the two most distal locations. Refer to pump test data and calculations in the Attachment.

Well 4 was pumped for 24 hours at a rate of 45 gpm. It had a diameter of 6-inches and a total depth of 60 feet. A 010-slot screen was installed from 55 to 60 feet in fine to medium sands. The static water level at the start of the 24 hour pump test was 20.15 feet. The specific capacity of Well 4 is 1.6 gpm/ft. The following drawdowns were recorded at the termination of the 24 hour test and show that pumping of the Pine Bush formation produces a deep cone of depression, correlating to a low transmissive formation:

WELL IDENTIFICATION	DRAWDOWN (FEET)	DISTANCE FROM PUMPING WELL (FEET)	SCREENED INTERVAL (FEET)
4	27.32	--	55-60
4A	2.15	10	56-60
4B	0.58	160	63.5-67.5
4C	0.54	160	40-44
4D	0.84	87	65-69
4E	0.86	82	28-32

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<sup>2</sup> Snavely, D.S., 1983; Ground-Water Appraisal of the Pine Bush Area, Albany County, New York: U.S. Geological Survey, Water-Resources Investigations Report 82-4000, in cooperation with City of Albany, 47 PP.

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Well 6 was pumped for 24 hours at a rate of 58.5 gpm. It had a diameter of 6-inches and a total depth of 49 feet. A 008-slot screen was installed from 44 to 49 feet in fine sands with a trace of silt. The static water level at the start of the 24 hour pump test was 12.91 feet. The specific capacity of Well 6 is 2.4 gpm/ft. The following drawdowns were recorded at the termination of the 24 hour test and show that pumping of the Pine Bush formation produces a deep cone of depression, correlating to a low transmissive formation:

WELL IDENTIFICATION	DRAWDOWN (FEET)	DISTANCE FROM PUMPING WELL (FEET)	SCREENED INTERVAL (FEET)
6	24.50	--	44-49
6A	3.22	10	45-49
6B	1.03	60	44-48
6C	1.06	60	18-22
6D	1.78	30	45-49
6E	1.51	30	18-22

### 4.3 Long-Term Pumping Rates

Assuming a proper pump setting above the screened interval<sup>3</sup>, the maximum available drawdown in Well 4 is 29.85 feet (55 ft.-5 ft.-20.15 ft. = 29.85 ft.), and 26.09 feet for Well 6 (44 ft. - 5 ft. - 12.91 ft. = 26.09 ft.). Both 24 hour pump tests were conducted at pumping rates that resulted in a generally stabilized drawdown just above the pump setting, accordingly these settings correspond to maximum short-term well production rates<sup>4</sup>. For Well 4, at the end of the 24 hour pump test at 45 gpm, the measured drawdown (27.32 ft.) approached the maximum available drawdown (29.85 ft.). Similarly, in Well 6

<sup>3</sup> Actual pump setting not specified in report or original data obtained from USGS.

<sup>4</sup> Assuming that discharge water was not allowed to recharge into the formation in proximity of the wells.

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at the end of the 24 hour pump test at 58.5 gpm, the measured drawdown (24.50 feet) approached the maximum available drawdown (26.09 ft.). Thus, the 24 hour pumping rates of 45 gpm in Well 4, and 58.5 gpm in Well 6, are for practical purposes the maximum short-term yields. Short-term pumping rates greater than these two respective rates are not feasible.

Long-term pumping rates are commonly estimated as a percentage of the maximum short-term yields. Ten States Standards recommend that constant rate pump tests be performed "...until stabilized drawdown has continued for at least six hours when test pumped at 1.5 times the design pumping rate."<sup>5</sup> This general standard is adopted by DEC for water supply permits.

Based on the available 24 hour pump test data, it is estimated that the design pumping rate, or long-term pumping rate, for Well 4 is 30 gpm, and 39 gpm for Well 6<sup>6</sup>. These are the highest pumping rates that DEC would theoretically permit for each of the two individual wells under existing regulations to provide a minimum margin of safety during continuous pumping operations. It is important to note that groundwater wells with long-term pumping rates ranging from 30 to 39 gpm are not considered to be high-yielding wells.

The theoretical development of a municipal groundwater source in the Pine Bush Formation would most likely involve multiple pumping wells within a geometric array or well field. An assumed average pumping rate for each well is 35 gpm. Groundwater withdrawal would be spread over an aerial extent corresponding to the municipality's water requirements. Assuming a modest municipal groundwater requirement of 200 to 400 gpm, this would correlate to the need for approximately 6 to 14 individual pumping

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<sup>5</sup> Recommended Standards for Water Works, 1997; Great Lakes Upper Mississippi River Board of State Public Health & Environmental Managers; p.18.

<sup>6</sup> These theoretical long-term pumping rates may not be viable discharge rates due to a variety of factors, most notably including the fine-grained nature of the formation which could produce silting of the well and foul the pump.

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wells<sup>7</sup> appropriately spaced to prevent excessive interference from overlapping cones of depression.

Assuming a minimum spacing of approximately 100 feet between the individual wells as well as a 100 feet zone of primary protection around the perimeter wells, the theoretical well field area would range from 2.8 to 5.2 acres (120,000 to 230,000 sq. ft.). Based on an average pumping rate of 35 gpm and specific capacities ranging from 1.6 to 2.4 gpm/ft., drawdown within the individual pumping wells would range from 14.6 to 21.9 feet. Water levels within the interior portions of the well fields (i.e., between the wells) would likely approach these levels after one year of continuous operation<sup>8</sup>.

At the margins of the well field area (i.e., 100 feet from outside wells) water levels would be lowered, but not as severely as the interior sections. It is theoretically estimated that water levels would be lowered or drawn down by as much as 16 feet at the margin of the well field area, by as much as 13 feet at a distance of 500 feet from the margin of the well field area, and by as much as 11 feet at a distance of 1,000 feet. Thus, the theoretical development of a municipal water supply source within the Pine Bush Formation is estimated to result in the lowering of static water levels by more than 10 feet across an area in excess of 77 acres.

### 4.4 Impact to Pine Bush Habitat

The depth to the water table is generally 10 to 15 feet in most of the Pine Bush Formation and rarely exceeds 20 feet<sup>9</sup>. An exception to this generalization is in wetland

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<sup>7</sup> Obviously this assumes that the formation is homogeneous and isotropic with respect to the water-bearing characteristics of Wells 4 and 6. The likelihood of this assumption being valid over a wide area is considered to be remote, since Wells 4 and 6 were selected as the most productive locations in the Pine Bush Formation by USGS based on test boring investigation results.

<sup>8</sup> Based on drawdown calculations for a 14 well array using the Cooper and Jacob modified nonequilibrium Theis equation. This equation allows the calculation of drawdown for given pumping rates. An average Transmissivity value of 30,682 gpd/ft, average Storativity value of 0.0034, and one year time frame (365 days) were used for all calculations.

<sup>9</sup> Snively, D.S., 1983; Ground-Water Appraisal of the Pine Bush Area, Albany County, New York: U.S. Geological Survey, Water-Resources Investigations Report 82-4000, in cooperation with City of Albany, p. 1.

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areas where the water table is at or close to the surface for much of the year. Normal seasonal variations in static water levels are moderate and range from several feet in uplands areas, and are more constant near wetlands and open water. The theoretical development of a municipal water supply source in the Pine Bush Formation predicts significant depressions of the water table over a large area. Within the well field area (2.8 to 5.2 acres), the static water levels could be lowered by an estimated 20 feet. At the margin of the well field, the static water levels could be lowered by an estimated 16 feet, and 1,000 feet from the well field drawdown impacts could be greater than 10 feet corresponding to an impact area of greater than 77 acres.

Aquatic resources are known to be at a premium in the Pine Bush habitat. Open water resources are scarce in xeric communities such as the Pine Bush, therefore the existing open water and wetland areas are a critical habitat for a number of wildlife species. A variety of amphibians and reptiles are known to inhabit the Pine Bush, and rely on open water and wetland areas for their life cycle. Species include several uncommon species, including the eastern spadefoot toad (*Scaphiopus holbrookii*), Fowler's toad (*Bufo woodhousei fowleri*), spotted turtle (*Clemmys guttata*), eastern box turtle (*Terrapene carolina*), wood turtle (*C. Insculpta*), Jefferson and spotted salamanders (*Ambystoma jeffersonianum* and *A. maculatum*) (Stewart and Rossi, 1981). Amphibians rely on open water pools free of fish, such as vernal pools, for breeding. Reptiles such as turtles rely on open water bodies for all segments of their life cycle. A decrease in the elevation of the groundwater table would decrease the duration and extent of open water within the Pine Bush, consequently reducing their critical habitat and adversely impacting their population.

Wetlands in the Pine Bush ecosystem are dependent on groundwater. A number of unique wetland communities are located within the Pine Bush, including State wetlands mapped by the DEC for their particular habitat value. A reduction in the water table would alter the hydrology of these habitats, likely reducing their overall extent. In addition, the drier environment would facilitate the colonization of the wetland by drought tolerant non-wetland species or less desirable invasive species, therefore shifting the community composition and reducing overall habitat value.

Upland Pine Bush plants are known to have various adaptations to xeric conditions including deep root systems to tap into the water table. Plants are adapted to the current water table and are able to thrive despite relatively dry conditions. A drastic



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permanent reduction in the water table would increase stress to vegetation, and lead to increased plant mortality. The gaps created by the loss of vegetation, particularly trees, would increase the colonization of these areas by undesirable pioneer species, such as black locust (*Robinia pseudoacacia*) and quaking aspen (*Populus tremula*), altering the unique biology of the Pine Bush ecosystem. In addition, losses of critical plants such as the blue lupine, which serves as the sole food source for the endangered Karner blue butterfly, would further impact the diversity of the Pine Bush ecosystem.

Based on the large magnitude of predicted water table lowering and the vast aerial extent of more than 10 feet of drawdown, the theoretical development of a groundwater supply source in the Pine Bush Formation would possibly have significant adverse impacts to the Pine Bush habitat. Wetlands could be dewatered, streams could seasonally run dry, the duration and frequency of vernal pools could be diminished, certain species of trees and plants could progressively die off, and rare and protected species unique to the Pine Bush could be lost.

## 5.0 ECONOMIC BACKGROUND

This section describes the economic impacts which solid waste management activities have on the City of Albany. The costs of these activities have been estimated and are presented as annual expenses which would be incurred if the P-4 Project were not approved.

### 5.1 General

The avoided costs of landfilling versus shipping and off-site disposal are substantial. The avoided costs include the direct costs of collection, management, debt service, and shipping and disposal, as well as indirect costs associated with a loss of revenue from the tipping fees. The revenue from the landfill tipping fees is utilized to pay for a variety of solid waste related services within the City of Albany, including: recycling programs, curbside collections, long term debt service costs for the existing AIL, and personnel costs for solid waste management activities which would be required even for off-site disposal. Funding for these services would be required regardless of whether the P-4 Project is approved, and would therefore require an alternative revenue source to subsidize these essential public services. The avoided costs of landfilling versus shipping and off-site disposal are further detailed within this section.

Other costs associated with the actual operation of the AIL are not included within this analysis, and include: closure and post closure costs, potential future liability costs, management personnel, maintenance, and equipment required to run a modern state-of-the-art landfill facility.

### 5.2 Shipping and Off-Site Disposal

#### 5.2.1 *Alternative Disposal Locations*

As set forth in Section 6.1 of the TSDEIS, the costs of shipping and off-site disposal were evaluated during a March 1999 survey of potential off-site disposal facilities, which included the following:

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Town of Colonie Landfill, Albany County  
Adirondack Resource Recovery Facility, Washington County  
Seneca Meadows Landfill, Seneca County  
Chenango County Landfill  
Chautauqua Landfill  
Delaware County Landfill  
Fulton County Landfill  
Broome County Nanticoke Solid Waste Landfill  
Chemung County SWMD Solid Waste Landfill  
Schuyler Falls Landfill  
Dutchess County RRA  
Bristol Hill Solid Waste Landfill, Oswego County  
Onondaga County Resource Recovery Facility

The potential facilities listed above were contacted. Four facilities (Town of Colonie Landfill, Seneca Meadows Landfill, Adirondack Resource Recovery Facility, and Chautauqua Landfill) reported that they had the capacity to accept at least some of the waste from the ANSWERS watershed for a tipping fee. The remaining facilities stated that they did not have the capacity or were unable to accept waste from outside regional areas without modifications to local laws. In addition, in June 1999 Saratoga County reaffirmed its commitment to keep out-of-county waste from their proposed landfill in Northumberland.

### *5.2.2 Unit Costs for Shipping and Off-Site Disposal*

As set forth in Section 6.1 of the TSDEIS, the rates quoted for spot disposal landfilling, not including transportation or consolidation costs, ranged from a high of \$55.00/ton at the Town of Colonie Landfill to a low of \$20.00/ton at the Chautauqua Landfill. The rate quoted at the Seneca Meadows Landfill was \$30.00 to \$35.00/ton. Adirondack Resource Recovery Facility declined to provide a rate for disposal. These rates would vary depending upon quantity, time commitment, and other contract conditions.

With the exception of the Town of Colonie Landfill, all of the facilities contacted are outside of Albany County and over an hour travel time from the City of Albany. In addition, hauling of waste long distances brings additional environmental impacts, costs, and fuel consumption. Hauling costs to any of these locations would be primarily dependent on round trip travel time. In order to own and operate a fleet of trucks that

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could haul the Planning Unit's current quantities of solid waste several hundred miles per round trip, the City would have to charge an additional per tonnage fee to ANSWERS localities.

Several waste management units around New York State were contacted about the current costs for hauling waste. Hauling costs ranged from \$7 to \$12 per ton (average of \$9.50 per ton) for a 100 mile round trip. This would raise the total tipping fee for exporting to the facilities contacted to the range of approximately \$60 to \$90 per ton for spot disposal (inclusive of transportation cost plus tipping fee).

### 5.2.3 *Solid Waste Generation Rates*

The AIL derives its solid waste stream from a variety of sources, which include:

- curbside and non-curbside municipal solid waste (MSW) collected within the City;
- MSW from ANSWERS municipalities & SUNY Albany;
- MSW from private haulers and non-ANSWERS municipalities; and
- petroleum containing soil (PCS) brokered by the City of Albany Department of General Services.

The average monthly disposal for each entity during the period of January 1999 through July 1999 was:

- City of Albany: 2,820 tons/month
- ANSWERS/SUNY: 3,470 tons/month
- Private/Non-ANSWERS: 4,820 tons/month
- PCS: 2,120 tons/month

### 5.2.4 *Total Estimated Shipping and Off-Site Disposal Costs*

Currently, the City waste disposal is subsidized by the tipping fees paid by other users. Based upon the typical monthly tonnage rate for the City of Albany (2,820 tons per month; 33,840 tons per year) and the estimated per ton costs, the estimated annual costs for shipping and off-site disposal incurred by the City of Albany to manage its own solid waste would be:

- At \$60/ton: \$2,030,400
- At \$90/ton: \$3,045,600

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If the P-4 Project were not approved, the ANSWERS municipalities and SUNY Albany would also need to utilize an alternative disposal location. Based upon the typical monthly tonnage rate for the ANSWERS municipalities and SUNY Albany (3,470 tons per month; 41,640 tons per year; based on January through July 1999 usage), an assumed current tipping fee of \$55/ton at the AIL for these entities, and the estimated per ton costs for off-site shipping and disposal, the estimated additional annual costs for shipping and off-site disposal incurred by these entities would be:

- At \$60/ton (\$5/ton increase): \$ 208,200
- At \$90/ton (\$35/ton increase): \$1,457,400

### 5.3 Solid Waste Related Services

The City of Albany provides its residents with a number of solid waste related services, including separate curbside collection of MSW and recyclables, resident transfer station, compost facility, special materials collection (scrap metal/appliances, yard waste), and household hazardous waste collection days. These services are currently funded through revenues derived from the operation of the AIL, and would continue to be funded through revenues derived from operation of the proposed P-4 Project. Costs associated with these programs include the capital costs, labor, tipping fees, and equipment required to run the programs. Based on an estimate prepared by the City in October 1999, the projected annual cost for fiscal year 2000 to run the recycling programs, excluding management costs is:

Curbside Recycling Collection:	\$1,591,000
Recyclables Transfer:	\$ 855,000
Compost Facility:	\$ 119,000
Special Collection:	\$ 185,000
<u>Household Hazardous Waste:</u>	<u>\$ 88,000</u>
• Total Recycling Services Cost:	\$2,875,000

Based on an estimate prepared by the City in December 1999, the projected annual cost to run the program for curbside collection of MSW, excluding management costs is:

- Curbside Collection of MSW: \$1,750,000

Additionally, the City of Albany would need to construct and operate a transfer station to process waste for off-site shipping and disposal. Based on an estimate prepared by the City in October 1999, the projected annual cost of constructing and operating a 1,050 tons per day transfer station facility would be:

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- Initial Construction Cost: \$1,750,000
- Annual Operating Cost: \$1,150,000

The estimated annual operating cost for the transfer station is exclusive of management costs, equipment maintenance, and future equipment replacement costs.

### 5.4 Long Term Debt Service

Long term debt service for the existing AIL and other solid waste related projects is funded through revenues derived from the operation of the AIL, and would continue to be funded through revenues derived from operation of the P-4 Project. If the P-4 Project is not permitted, it would be necessary to pay these debt service using an alternative revenue source or the City of Albany's General Fund. Currently, the City has six bonds associated with solid waste related activities, at a total value of \$11,888,500. The approximate cost of the debt service for these bonds in fiscal year 2000 is:

- Annual Debt Service: \$981,000

### 5.5 Total Estimated Annual Costs

The total estimated annual cost which would be incurred by the City of Albany for solid waste management activities (including shipping and off-site disposal, recycling, composting, curbside collection, transfer station operation, and long term debt services) are summarized below. It would be necessary to pay this cost using a new revenue source or the City of Albany's General Fund.

Off-Site Shipping and Disposal:	\$2,030,400	to	\$3,045,600
Recycling Related Services:	\$2,875,000	to	\$2,875,000
Curbside Collection of MSW:	\$1,750,000	to	\$1,750,000
Transfer Station:	\$1,150,000	to	\$2,900,000
<u>Long Term Debt Service:</u>	<u>\$ 981,000</u>	<u>to</u>	<u>\$ 981,000</u>
Total Estimated Annual Cost:	\$8,786,400	to	\$11,551,600

A portion of this cost could be funded by tipping fees generated from a transfer station operated by the City of Albany. However, without the City's landfill the revenue generated from tipping fees would be dependent upon the costs at other disposal facilities and the costs of transportation. Therefore, a fixed revenue stream would not be guaranteed to the City of Albany. Furthermore, in the event other revenue streams

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are not available to the City to offset these substantial increased costs, the City could be forced to curtail or eliminate recycling services in order to save money. This has or will occur in the City of Amsterdam, and is currently occurring in the private sector.

Put a slightly different way, the operation of the landfill provides revenues sufficient to pay for the City's solid waste and recyclables collection services (\$4,625,000) and annual debt service for bonds issued for solid waste related projects (\$981,000), for a total of \$5,606,000. To the extent revenues from the operation of the landfill exceed this amount, those revenues are paid into the general fund, to reduce the total tax burden on the residents of the City of Albany. In the event the P-4 Project were not approved, the City would not only have to find an alternative source of revenues for these costs, it would incur an additional \$3,180,400 to \$5,945,600 per year in transfer and hauling costs and the operation of a transfer station.

Additional costs and losses which would be incurred by other entities beside the City include:

- ANSWERS/SUNY Albany: \$208,200 to \$1,457,400
- Approximately \$100,000 per year to Albany Pine Bush Preserve Commission
- Loss of jobs at landfill
- Additional cost to private haulers (non-ANSWERS waste)
- Additional cost to dispose of PCS

## 6.0 ENVIRONMENTAL BENEFIT

In association with the proposed P-4 Project, the City of Albany will assess the feasibility of an environmental benefit project aimed at improving groundwater quality within the shallow, water table portion (i.e., the first water-bearing formation) of the Pine Bush Formation directly downgradient of the closed GAL. By incorporating this environmental benefit, the implementation of P-4 could have a net positive impact on the New York State Department of Environmental Conservation (DEC) classified principle aquifer, a sand water table formation that underlies the Rapp Road property and surrounding area.

The proposed P-4 landfill cell construction, provided that it properly constructed and operated, will not have any significant adverse impact on shallow groundwater quality. Undertaking this environmental benefit project component can only result in shallow groundwater quality improvement. Thus, there will be a net groundwater quality improvement for the proposed P-4 Project.

The GAL is an unlined solid waste landfill that operated from circa 1977 to the late 1980's. This solid waste landfill was closed pursuant to a NYSDEC approved closure plan, and post-closure groundwater monitoring has been conducted on a quarterly basis for over 10 years. Monitoring reports are submitted quarterly to NYSDEC. Based on the existing database of post-closure groundwater data, future groundwater actions for the GAL are limited to continued environmental monitoring, and there are no current plans to remediate any impacted groundwater from GAL leachate.

The proposed environmental benefit project will proceed in three phases, each of which will require review and approval by DEC. The first phase is the Groundwater Investigation, phase two is the Feasibility Study, and Design and Implementation is the third. Each of these three phases represent discrete work tasks that are described in the following sections together with a schedule for completion that is premised on obtaining a Part 360 permit for the P-4 Project.



## 6.1 Groundwater Investigation

A groundwater investigation for the downgradient edge of the GAL will be conducted in two phases. In the first phase, existing hydrogeologic data in the vicinity will be compiled, summarized and presented in a Phase I groundwater investigation report. The Phase I report will make recommendations for future action, that may likely include the collection of additional hydrogeologic data to quantitatively assess the feasibility of groundwater remediation. The Phase II groundwater investigation will involve the collection of new hydrogeologic data, as necessary, to primarily assess groundwater withdrawal rates and resulting cones of depression geometries', and secondarily pumping concentrations of several key chemical indicator parameters. Data from the Phase II investigation will be summarized and presented in a report that will provide the hydrogeologic framework for the feasibility study.

## 6.2 Feasibility Study

The feasibility study will present options for groundwater withdrawal, including the no action alternative, and at least two active pumping scenarios. At the present time it is anticipated that these two withdrawal options will be a shallow groundwater interceptor trench and a multiple well-common header system, either of which could be controlled by a single pump. Discharge is anticipated to be into existing wastewater piping on the Rapp Road property with treatment at the Albany County Sewer District's north plant. No pre-treatment is likely to be required. Each of the options will be assessed in terms of the following criteria: identification of groundwater exceedances, water quality improvement, human health and environmental benefit, cost, reliability, location of potential receptors, and future land use. Emphasis will be placed on the costs of the several alternatives, achieving compliance or significant progress towards compliance with groundwater standards, and the amount of environmental benefit derived from their theoretical implementation. For comparison purposes, the estimated costs will be compared to the total project costs for the landfill expansion.

The feasibility study will make a technical recommendation for a selected option, and will be submitted to DEC for review and approval. If the no action alternative is selected and approved by DEC, no further work associated with this environmental benefit project will be performed.

### 6.3 Design and Implementation

Implementation may be done on either a pilot-scale or full-scale level with DEC's approval. Engineering design documents will be prepared using input from the groundwater investigation and feasibility study and submitted to DEC for review and approval. With DEC's concurrence, the engineered system will be installed and operations will commence subject to the approval of the Albany County Sewer District. If no timely approval is received from Albany County Sewer District, then the feasibility study will be revisited and alternatives re-evaluated, and resubmitted to DEC for review and approval.

If design and implementation proceeds on a pilot-scale basis, then the results of a representative duration of system operation will be compiled and presented in an engineering report that contains recommendations for future actions. Should the pilot-scale results demonstrate to DEC's satisfaction that it is not technically feasible to operate a full-scale system, no further work associated with this environmental benefit project will be performed.

### 6.4 Schedule

The following schedule is proposed for this environmental benefit project assuming that DEC issues a Part 360 permit for the P-4 Project on or around January 31, 2000:

- Groundwater Investigation                      Spring 2000
- Feasibility Study                                      Fall 2000
- Design and Implementation                      Spring/Summer 2001

## 7.0 DISCUSSION

Part 360, and specifically 6 NYCRR 360-1.7(c), provides that an applicant may request that DEC grant a variance from a specific provision of Part 360. An application for a variance must:

- (i) identify the specific provisions of this Part from which a variance is sought;
- (ii) demonstrate that compliance with the identified provisions would, on the basis of conditions unique to the person's particular situation, tend to impose an unreasonable economic, technological or safety burden on the person or the public; and
- (iii) demonstrate that the proposed activity will have no significant adverse impact on the public health, safety or welfare, the environment or natural resources and will be consistent with the provisions of the ECL and the performance expected from application of this Part.

This section is intended to demonstrate that the City is entitled to the requested variance, as more fully set forth below.

### 7.1 Part 360 Provisions from which a Variance is Sought

The City requests, *inter alia*, a variance from the provisions of 6 NYCRR 360-2.12(c)(1)(i) and (ii), which prohibits, as relevant herein, siting a landfill over a primary water supply aquifer or principal aquifer.

### 7.2 Conditions Justifying the Variance

This report, together with the Third Draft and Final Supplemental Environmental Impact Statements and the Part 360 application as a whole, thoroughly demonstrates

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that there are circumstances unique to the City of Albany and the ANSWERS Wasteshed which justify granting a variance from the provisions of 6 NYCRR 360-2.12(c)(1)(i) and (ii). These circumstances, as more fully summarized below, include (a) the City's diligent pursuit of Site C-2 in the face of persistent litigation; (b) the devastating economic consequences which the City and the members of the ANSWERS Wasteshed will face in the absence of the requested variance; (c) the lack of any significant adverse impact associated with the grant of the requested variance; (d) the potential impacts on Pine Bush habitat which would result should a public water supply be developed utilizing the Pine Bush Formation; and (e) the City's proposed environmental benefit project to analyze the cost and feasibility of intercepting the contaminant plume from the unlined and closed GAL.

The City has been diligent in its pursuit of an alternative site for disposal of solid waste for the ANSWERS Wasteshed (refer to Section 2.0). When the City submitted a Part 360 application for Site C-2 in 1994, the Town of Coeymans challenged the designation of DEC Region 4 as lead agency for purposes of SEQR review. Although the City was ultimately successful in this litigation, the litigation was not finally resolved until June, 1997. The City renewed its options for the site, but in the meantime, needed to pursue the Wedge and P-4 in order to provide solid waste disposal capacity to the ANSWERS municipalities. Nonetheless, the City has continued to pursue Site C-2, renewing the options for Site C-2, and finally deciding to exercise the options for Site C-2 in 1998. However, once again the Town of Coeymans (and others) challenged the City's decision to issue bonds in the amount of \$3.45 million to purchase the property, claiming that the City improperly segmented review of the acquisition from the construction of a landfill at the site. That litigation is still pending, and as a result, the City once again had to seek to extend the options for Site C-2. The City has expended approximately \$990,000 to retain control over Site C-2 to date. However, because of the repeated litigation surrounding Site C-2, with the resultant possibility that the City may never be able to acquire the property, the City has been reluctant to expend further funds to undertake the extensive testing required to support a Part 360 application. If ultimately successful in the litigation, the City will acquire the property and revise and update the studies started in 1993-94 to support the application.

Notably, as demonstrated in Section 5.0, failure to grant the requested variance will result in severe economic consequences, not only for the City of Albany, but for the ANSWERS Wasteshed as a whole. As noted therein, revenues from the operation of the

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landfill currently pay for the City's solid waste and recyclables related services (\$4,625,000) and annual debt services on bonds issued for solid waste related projects (\$981,000), for a total of \$5,606,000. To the extent that revenues from the operation of the landfill exceed this amount, those revenues are paid into the general fund, to reduce the total tax burden on the residents of the City of Albany. In addition, if the P-4 Project were not approved with the requested variance or delisting of the Pine Bush Formation, the City would not only have to find an alternative source of revenues for these costs, it would incur an additional \$3,180,400 to \$5,945,600 per year in transfer/haul costs, including the operation of a transfer station. The members of the ANSWERS Wasteshed would incur an additional \$208,200 to \$1,457,400 per year to dispose of its waste should the P-4 Project not be approved. Therefore, the failure to grant the requested variance would impose an unreasonable economic burden on the City of Albany and the members of the ANSWERS Wasteshed as a whole.

Moreover, the grant of the requested variance will not have a significant adverse impact. As demonstrated in Section 3.0, the Pine Bush Formation has limited utility as a potential source of groundwater, and the municipalities in the Pine Bush area have focused their efforts to develop public water supplies in more highly productive aquifers or surface waters outside the Pine Bush Formation. The City of Albany utilizes the Alcove and Basic reservoirs, located in the Helderberg Mountains; the Town of Guilderland utilizes a deep well array located approximately 3 miles west (and upgradient) of the landfill, and the Town and Village of Colonie (Latham Water District) utilize the Mohawk River, Stony Creek Reservoir, and 5 wells on Onderdonk Avenue, located approximately 7 miles northeast of the landfill. Although the Latham Water District owns land on Morris Road which had been developed for wells to be used as a groundwater supply, these wells were abandoned in the 1960's due to their low yield, poor water quality, and need for treatment to remove fines. These existing public water supply systems currently have adequate capacity to handle expected growth in the area, and none of the municipalities involved have plans to develop any additional groundwater capacity within the Pine Bush Formation. Finally, the existing water quality of the Pine Bush Formation, both region-wide, and at the Rapp Road facility, is of poor quality, and therefore, not susceptible to use as a public water supply.

Furthermore, as demonstrated in Section 4.0, any development of a public water supply within the Pine Bush Formation could have devastating effects on the Pine Bush ecosystem. As demonstrated therein, development of a public water supply of

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sufficient quantity to provide approximately 200 to 400 gpm would require 6 to 14 individual pumping wells, resulting in the lowering of static water levels by more than 10 feet across an area in excess of 77 acres. Such a lowering of the water table could have significant adverse impacts such as dewatering of wetlands, streams running seasonally dry, and diminishing the duration and frequency of vernal pools. Since there are many rare and endangered species which rely on these characteristics of the Pine Bush habitat, any development of a public water supply within the Pine Bush Formation could result in the loss of these species.

Finally, the City has proposed, as part of this request for a variance, to evaluate the feasibility of improving groundwater quality within the shallow, water table portion of the Pine Bush Formation directly downgradient of the closed, unlined, GAL. This environmental benefit project will involve an analysis of the cost and feasibility for the interception of the contaminant plume, and thus, together with the double-composite liner underlying the AIL, the Wedge and the proposed P-4 Project, will provide a net positive impact on the Pine Bush Formation.

In sum, the City has amply demonstrated that the granting of a variance from the provisions of 6 NYCRR 360-2.12(c)(1)(i) and (ii) meets the requirements of 6 NYCRR 360-1.7(c), due to the unique economic burdens it would impose on the City of Albany and the members of the ANSWERS Wasteshed, and the lack of any significant impact from the proposed variance request.

## 8.0 CONCLUSION

Under the unique circumstances presented here, a variance from the provisions of 6 NYCRR 360-2.12(c)(1) is warranted. The Pine Bush Formation is not presently, and most likely will never be, used as a public water supply. In addition, any potential development of the aquifer potentially could cause irreparable harm to the Pine Bush habitat. Furthermore, the delays which the City has encountered in siting a long term landfill have been totally unforeseeable, and the City has an obligation to provide disposal capacity to the member municipalities in the ANSWERS Wasteshed. Providing this variance will ensure that the City continues to provide that critical disposal capacity to the members of the ANSWERS Wasteshed, while not causing any environmental impact to the Pine Bush Formation.

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