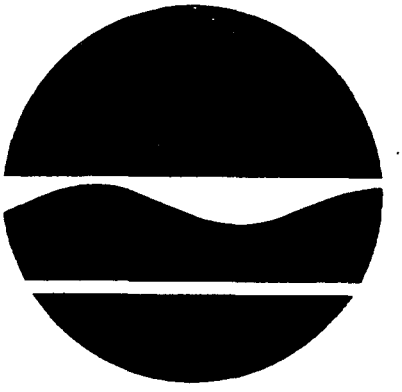
OLD BATH LANDFILL
Inactive Hazardous Waste Site

Town of Bath, Steuben County, New York
Site No. 8-51-014

RECORD OF DECISION

MARCH 8, 1995



Prepared by:
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation

DECLARATION STATEMENT - RECORD OF DECISION

"Old Bath Landfill" Inactive Hazardous Waste Site
Town of Bath, Steuben County, New York
Site No. 8-51-014

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Old Bath Landfill inactive hazardous waste disposal site which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Old Bath Landfill Inactive Hazardous Waste Site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site will be addressed by remedial construction activities to be completed as part of the Record of Decision for Interim Remedial Measures, March 1994. Prior to completion of the IRM, actual or threatened releases of hazardous waste present a potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation/Feasibility Study (RI/FS) for the Old Bath Landfill and the criteria identified for evaluation of alternatives, the NYSDEC has selected continuous maintenance of the landfill cap and periodic sampling of surface water and groundwater. The components of the remedy are as follows:

- Completion of the Interim Remedial Measures (enhanced cover system, leachate collection system, sedimentation basin excavation, leachate pre-treatment facility, and treated effluent pipeline). At the present time, sedimentation basin excavation and construction of the leachate pre-treatment facility are scheduled for 1995, with construction of the cover system, leachate collection system, and treated effluent pipeline scheduled for 1996.

- Development and implementation of long term land use restrictions at the site to protect the cover system and eliminate disturbance to the cover, the collection system, etc.

- Provide for periodic maintenance and repairs to the cover system as necessary.
- Provide for continued operation and maintenance of the leachate pre-treatment plant and treated effluent pipeline.
- Provide for the comprehensive long term monitoring of site related conditions including nearby potable water wells, as well as groundwater and surface water to evaluate the continued effectiveness of the IRM.
- Provide for future actions to ensure continued protection of nearby residential drinking water wells.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element.

3/24/95
Date

Michael J. O'Toole, Jr.
Director, Div. of Hazardous Waste Remediation

RECORD OF DECISION

"Old Bath Landfill"

Town of Bath, Steuben County, New York State
Site No. 8-51-014
March 1995

SECTION 1: SITE DESCRIPTION

The Old Bath Landfill is located three miles southwest of the Village of Bath, on the South side of Turnpike Road and is adjacent to the currently operating Steuben County sanitary landfill (the "New Bath Landfill"). The site sits on a 145 acre parcel of land owned by Steuben County, is approximately 28 acres in size and is bounded to the east, west, and north sides by open farmland. The New Bath landfill is immediately south of the site. Figures 1 and 2 show the site location.

SECTION 2: SITE HISTORY

2.1: Operational/Disposal History

The Old Bath Landfill began operation in 1978. Municipal and industrial wastes from Steuben County were disposed of at the site during its operating history. These wastes include paint sludges and various solvents such as methyl ethyl ketone. The County, under a legal agreement signed with the NYSDEC in September 1988, agreed to stop accepting waste by November 1, 1988. The County also agreed to construct an "Interim Cover" system over the landfill, and submit certification reports on the construction of this cover. Acceptable testing of the cover material could not be performed, so the certification submitted by the County was not approved by the NYSDEC, and thus the cover placed on the landfill was not considered to be an acceptable closure of the landfill.

2.2: Remedial History

Previous investigations and quarterly monitoring results have determined that the overburden and bedrock water-bearing zones were contaminated with volatile organic compounds as well as some metals at concentrations exceeding New York State Class "GA" Ground Water Quality Standards. In February 1991, the County entered into a Consent Order (Index #B8-293-89-08) with the Department that required the completion of a Remedial Investigation and Feasibility Study, as well as an IRM consisting of capping and leachate collection (see Section 5 for a complete discussion of the IRM). The Consent Order also obligated the County to implement any additional remedial actions found to be necessary upon completion of the RI/FS.

The selected alternative presented in this Record of Decision addresses the obligation for any additional remedial actions.

The County has signed a State Assistance Contract (SAC) and a SAC amendment with New York State which provides State funding of 75% of all eligible costs of the remedial program under the 1986 Environmental Quality Bond Act (EQBA) Title 3 program.

Hydrogeologic investigations performed in 1994 under the operating permit for the adjacent sanitary landfill (the New Bath landfill) revealed the presence of trichloroethene (TCE) in the groundwater between the old landfill and the new sanitary landfill. It is believed that this contamination originated from the same area of soil contamination which was investigated and partially excavated by the County in 1988. The County, in cooperation with, and under the oversight of the NYSDEC Division of Solid Waste (through the New Bath Landfill operating permit), has performed additional investigations of the area and will be presenting a plan to the Division of Solid Waste to remedy this TCE source area. One preliminary alternative which has been raised by the County to address this material is to excavate the contaminated soils and place them on the Old Bath landfill under the "new cover system" which will be constructed over the wastes excavated from the leachate collection system trenches. This proposal will be evaluated by the NYSDEC, and will only be considered if such an action would be consistent within existing regulatory requirements and could be incorporated into the design of the landfill cover system. A possible benefit to the IRM from this soil placement on the landfill would be in the reduction in the amount of additional soils needed to achieve adequate slopes (for drainage) on the top of the landfill (which is relatively flat in its current state).

SECTION 3: CURRENT STATUS

Steuben County, in cooperation with the NYSDEC under the Title 3 program, initiated a Remedial Investigation/Feasibility Study (RI/FS) in October 1991 to address the contamination at the site. The final Remedial Investigation Report was approved on February 28, 1994. A Supplemental RI was begun in December 1993 to further characterize bedrock groundwater quality. The Supplemental RI report was approved on September 21, 1994. A Feasibility Study was prepared and was approved on January 20, 1995 which discusses remedial alternatives beyond the IRM. These reports can be found in the public document repositories.

3.1: Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site.

A report entitled "Remedial Investigation Report for the Old Bath Landfill", dated January 1994 has been prepared describing the field activities and the findings of the RI in detail.

The RI activities consisted of the following:

- o Geological Reconnaissance survey and Seismic Refraction survey
- o Soil Gas survey
- o Residential Well survey
- o Electromagnetic Terrain Conductivity survey
- o Natural Resources assessment
- o Monitoring well installations
- o Piezometer installations
- o Surface water, soil, and sediment sampling
- o Groundwater sampling

The analytical data obtained from the RI was compared to applicable Standards, Criteria, and Guidance (SCGs) in determining remedial alternatives. Groundwater, drinking water and surface water SCGs identified for the Old Bath landfill site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of NYS Sanitary Code. For the evaluation and interpretation of soil and sediment analytical results, NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used to develop remediation goals for soil.

Based upon the results of the remedial investigation in comparison with the SCGs and potential public health and environmental exposure routes, no areas or media of the site are in need of further remediation beyond the IRM.

Groundwater sampling was performed using 26 groundwater monitoring wells around the landfill perimeter. Table 1 indicates compounds detected in groundwater samples and their detected concentration range. Results from the two rounds of sampling indicate several wells with sporadic detections of volatile organics. However, in general these detections are very low. With the exception of one overburden well (which had detections of 440 parts per billion (ppb) and 27 ppb of Acetone during two sampling events), the maximum concentration of any volatile organic is 16 ppb.

Several sporadic detections of semi-volatile organic compounds were detected in groundwater samples. With the exception of one overburden well (the well mentioned in the above paragraph, which showed several semi-volatiles, at concentrations up to 53 ppb), the maximum concentration detected was 21 ppb. No pesticides/PCBs were detected in groundwater samples.

Several groundwater samples indicated the presence of various metals in both the overburden and bedrock wells. The concentrations of metals detected are generally within the range of concentrations detected in wells upgradient from the landfill. In general, metals concentrations are highest in overburden wells, with substantially lower concentrations in samples from the bedrock wells. These higher metals concentrations in overburden groundwater may be a result of naturally occurring metals present within the surrounding clay-rich till in the overburden.

The RI indicated a downward hydraulic gradient present in the bedrock aquifer. To confirm these results, and to further characterize the bedrock groundwater quality directly beneath the landfill, a Supplemental RI was performed. The Supplemental RI consisted of the installation and sampling of two additional bedrock monitoring wells directly beneath the landfill mound. Results from the sampling of these wells indicates minor landfill related contaminants within the shallow bedrock groundwater, and only one organic compound above detection limits (phenol at 21 ppb) in the deep bedrock groundwater.

Sediment samples were collected from the on-site storm water/sediment control basin, Knight Creek, and the roadside drainage ditch along Turnpike Road. Sediment samples taken from four locations in Knight Creek did not show the presence of volatile organics, pesticides or PCBs. One sample showed detections of semi-volatile organics in low concentrations.

Sediment samples taken from the storm water basin also indicated several semi-volatile compounds in low concentrations. However, these compounds are petroleum fuel related and were found in concentrations normally associated with operation of landfill machinery and trucks. There were no detections of volatiles, pesticides or PCBs in the storm water basin sediment.

Metals concentrations in Knight Creek are within the naturally occurring range. Metals concentrations of the sediment in the storm water detention pond were slightly elevated.

Sediment samples in the roadside drainage ditches contained very low levels of volatile organics (less than 5 ppb) and numerous petroleum related semi-volatiles (up to 1900 ppb). While numerous semi-volatiles were detected, levels are not significantly high and are indicative of road runoff which is commonly found in areas of vehicular traffic.

3.2: Interim Remedial Measures

An IRM consisting of additional capping efforts and leachate collection was required by the 1991 Consent Order. An IRM field sampling plan was prepared and implemented during 1991 to characterize the concentrations and quantity of landfill leachate within the waste mound. Results of the IRM field sampling and early RI investigations were presented in the "Preliminary Site Characterization Report". The findings of these investigations revealed that a large quantity of leachate was stored in the waste mound with high concentrations of contaminants which would require treatment following its collection. A leachate treatability study was performed in the summer/fall of 1992 to evaluate treatment technologies for the effective treatment of the collected

leachate. Results of the treatability study were used to perform an economic analysis of long term leachate treatment and disposal for both on-site and off-site options. Results of this analysis were presented in a revised version of the "IRM Concept Design Report". This report presents the elements of the current IRM. These elements include design and construction of the original cap and leachate collection system, as well as design and construction of an on-site leachate pretreatment plant and treated effluent pipeline to convey the treated leachate to the Village of Bath Public Owned Treatment Works (POTW) for final treatment. An additional element of the IRM is the removal of silt and sediment containing metals contamination from the on-site sediment basin, with placement of this soil in the New Bath Landfill.

Design of the pretreatment plant and pipeline is nearing completion, and construction is expected to begin in the spring of 1995.

A Proposed Accelerated Remedial Action Plan was prepared and presented for public comment in February 1994, and resulted in a Record of Decision for Interim Remedial Measures which was prepared and issued in March 1994.

3.3: Summary of Human Exposure Pathways

A Baseline Health Risk Assessment was performed as a part of the Remedial Investigation. This risk assessment includes an exposure pathway analysis to identify media of concern and assess the potential for human exposure based on these pathways. Various exposure scenarios were evaluated for residents, landfill workers, site trespassers, for both children and adults. The risk assessment calculations were performed assuming the landfill would remain in its present state, without implementation of any IRM activities (i.e., additional capping effort, leachate collection and treatment). The risk from groundwater assumed long term consumption of the groundwater containing the highest contaminant concentrations detected (at the site perimeter). While the risk assessment indicated potential concern associated with future long term consumption of the most contaminated groundwater at the site, given the conservative nature of the calculations, the distance of residences from the site, and the fact that remedial measures will be undertaken according to the Record of Decision for the IRM, the site was not found to pose any unacceptable risks to the public.

3.4: Summary of Environmental Exposure Pathways

A NYSDEC Division of Fish and Wildlife "Impact analysis" was performed at the site, with the following conclusions:

- The primary concern for fish and wildlife impacts is the on-site storm water/sediment control basin, which contains sediment with metals concentrations in excess of background concentrations.

- o Since wildlife utilization at the basin is minimal (as the basin is currently filled with sediment), the risk to indigenous or transient wildlife is low.

- o Since the storm water/sediment control basin ultimately discharges to Knight Creek, removal of contaminated sediment from the basin should result in a reduction in potential future contaminant migration to Knight Creek.

Since the primary route of wildlife exposure to landfill contaminant migration is through the storm water/sediment basin, the excavation of sediment from the basin undertaken as part of the IRM activities will minimize fish and wildlife impacts.

The overall conclusion of the fish and wildlife impact analysis is that landfill related contaminants have minimal effect on surrounding resources.

SECTION 4: ENFORCEMENT STATUS

A previous Consent Order was signed on September 19, 1988 which required the County to stop accepting waste at the landfill by November 1, 1988. This Consent Order also required the County to complete an "Interim Closure" of the landfill which included (among other things) the construction of a cover system consisting of 2 feet of barrier soil with 1 x 10^{-7} cm/sec or less permeability, overlaid with 6 inches of topsoil, along with certification for construction of the cover system. However, certification of the cover system was not approved by the NYSDEC, because the County was unable to perform the appropriate tests to confirm that the material placed on the landfill met permeability requirements. The NYSDEC and Steuben County entered into another Consent Order on February 19, 1991. The Order obligates the Town to implement a full remedial program at the landfill and allows reimbursement to the Town of up to 75 percent of the eligible cost of the remediation.

Orders on Consent

Date	Index	Subject
9/19/88	#R8-0574-86-07	Landfill Closure
2/19/91	#B8-293-89-08	Remedial Prog.

The current Consent Order (March 1991) requires the completion of an RI/FS as well as an IRM (cap and leachate collection) and any Remedial Design and Construction activities which were identified as necessary from the RI/FS findings.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS

Goals for the remedial program have been established through the remedy selection process stated in 6NYCRR 375-1.10. These goals are established under the guideline of meeting all standards, criteria, and guidance (SCGs) and protecting human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to public health and to the environment presented by the hazardous waste at the site, through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Reduce, control, or eliminate the contamination present within the soils/waste on site (generation of leachate within the fill mass).
- Eliminate the threat to surface waters by eliminating any future surface leachate outbreaks from the site.
- Eliminate the potential for direct human or animal contact with the contaminated soils on site.
- Prevent, to the extent practicable, migration of contaminants in the landfill to groundwater.
- Provide for attainment of SCGs for groundwater quality at the limits of the area of concern (AOC).

SECTION 6: SUMMARY OF THE EVALUATION OF ALTERNATIVES

Potential remedial alternatives for the Old Bath landfill site were identified, screened and evaluated in a three-phase Feasibility Study, dated January 1995. A summary of the detailed analysis follows.

6.1: Description of Alternatives

This ROD evaluated the need for any remedial actions above and beyond the IRM capping and leachate collection activities. Because the IRM will address many of the remedial goals, alternatives discussed in the ROD were limited to those which deal with groundwater impacts.

I. No Further Action Beyond IRM

Present Worth:	$519,500
Capital Costs:	$ 0
Annual O&M (30 years):	$ 44,895
Time to Implement:	0 months

The No Further Action alternative recognizes the remediation of the site to be accomplished under the IRM. It requires continued monitoring to evaluate the effectiveness of the remediation to be completed under the IRM. Several minor (low-flow) leachate seeps which now exist (prior to the cap construction) are expected to be eliminated. These seeps, which periodically occur on several side slopes of the landfill, are the primary mechanism for transport of low level contaminants to surface water and sediment. The active leachate collection system and enhanced cap to be constructed under the IRM will prevent these seeps from persisting. Operation and maintenance (O&M) activities for Alternative I include those O&M activities required as part of the Record of Decision for the IRM, but with the addition of monitoring for off-site impacts. Costs presented for this alternative include only the additional efforts beyond the O&M required for the IRM. An O&M workplan would be developed by the County which would detail long term monitoring requirements. The added monitoring would include groundwater sampling off-site, as well as nearby residential wells. An annual survey would also be performed by the County to identify any new groundwater users in the vicinity of the site. Alternative I would also require a modification to the property deed for the site to clearly indicate the limits of the landfilled area within the property boundary. The deed would also be revised to indicate that use of the site is restricted to those uses which would not disturb the integrity of the final cover system or any other components of the remedial system.

II. Additional Bedrock Monitoring

Present Worth:	$ 874,300
Capital Cost:	$ 304,500
Annual O&M (30 years):	$ 49,365
Time to Implement:	3 months

Alternative II includes all the components described for Alternative I, as well as the construction of additional bedrock groundwater monitoring wells. These wells (installed either through the landfill mass or from the perimeter using angled boring) would supplement the two existing wells which monitor bedrock groundwater quality directly beneath the landfill. These wells would be included in a long term O&M program similar to Alternative I.

III. Groundwater Collection and Treatment

Present Worth:	$4,255,300
Capital Cost:	$2,542,800
Annual O&M (30 years):	$ 150,865
Time to Implement:	6 months

Alternative III includes all the components described for Alternative I, as well as construction and operation of horizontal groundwater collection wells underneath the landfill which would collect contaminated bedrock groundwater. Groundwater collection directly underneath the landfill would be the only feasible collection location since bedrock groundwater flow at the landfill is downward. Collected groundwater would be combined with leachate and would be treated in the leachate pretreatment plant. Operation of the bedrock groundwater collection and treatment system could begin after the leachate pretreatment facility is operational. A long term O&M program similar to Alternative I would also be implemented, but would include additional O&M activities for the collection system.

6.2 Evaluation of Remedial Alternatives

The criteria used to evaluate the potential remedial alternatives are defined in the regulation that directs the remediation of inactive hazardous waste sites in New York State (6NYCRR Part 375). For each of the criteria, a brief description is provided followed by an evaluation of the alternative against that criterion. A detailed discussion of the evaluation criteria and comparative analysis is contained in the Feasibility Study.

The first two evaluation criteria are termed threshold criteria and must be satisfied in order for an alternative to be considered for selection.

1. Compliance with New York State Standards, Criteria, and Guidance (SCGs). Compliance with SCGs addresses whether or not a remedy will meet applicable environmental laws, regulations, standards, and guidance.

Alternative I:

No Further Action may not result in full compliance with chemical specific SCGs at all locations. The cap and leachate collection portion of the IRM will result in a substantial decrease in leachate generation, which in turn will reduce or eliminate future chemical impacts on surface water, sediment, and groundwater. Although the concentrations of landfill constituents in the groundwater are limited, it is likely that some groundwater within the vicinity of the site would continue to exceed groundwater standards after completion of the IRM. However, groundwater which has been impacted by leachate constituents should biodegrade/attenuate over time and may

ultimately achieve groundwater standards. This alternative would be in compliance with location specific SCGs for storm water discharge. It would also be in compliance with NYCRR Part 360 Solid Waste Management Facilities criteria for the construction of the cap. Long term monitoring of existing groundwater monitoring wells would be performed to gauge the effectiveness of the IRM.

Alternative II:

The Additional Bedrock Monitoring alternative would only provide additional bedrock wells for long term groundwater monitoring purposes. These wells would be used as an addition to the existing wells to evaluate the effectiveness of the IRM. As with the No Further Action alternative, this alternative may not result in full compliance with chemical specific SCGs. It is likely that some groundwater within the vicinity of the site would continue to exceed groundwater standards after completion of the IRM. However, groundwater which has been impacted by leachate constituents should biodegrade/attenuate over time and may ultimately achieve groundwater standards. This alternative would be in compliance with location specific SCGs for storm water discharge. It would also be in compliance with NYCRR Part 360 Solid Waste Management Facilities criteria for the construction of the cap.

Alternative III:

Groundwater collection and treatment also may not result in full compliance with SCGs. While a collection system within the bedrock would capture and treat some contaminated groundwater, it is not likely it would capture all bedrock groundwater. This is due to varying fractures within the bedrock which are the primary means for bedrock groundwater flow. As with the other alternatives, it is likely that implementation of this alternative would still result in some groundwater within the vicinity of the site exceeding groundwater standards after completion of the IRM. However, some biodegradation and attenuation would be expected to occur for the groundwater which would not be collected and this groundwater may achieve groundwater standards. This alternative would be in compliance with location specific SCGs for storm water discharge. It would also be in compliance with NYCRR Part 360 Solid Waste Management Facilities criteria for the construction of the cap. Long term monitoring of existing groundwater monitoring wells would be performed to gauge the effectiveness of this alternative in conjunction with the IRM.

2. Protection of Human Health and the Environment. This criterion is an overall evaluation of the health and environmental impacts to assess whether each alternative is protective.

Alternative I:

The No Further Action alternative relies on implementation of the IRM to eliminate potential for casual human contact with the waste and the potential for future migration of landfill constituents to the surface water, sediments, and groundwater. Deed restrictions would also minimize

potential for future human exposure to landfill constituents by restricting uses of the site to only those future uses which would not disturb the integrity of the final cover system or any other component of the remedial system. If periodic monitoring indicates the remedial measures undertaken as part of the IRM are not functioning effectively, the need for further remedial alternatives would be evaluated. If monitoring of residential wells show the presence of contaminants, the County would be required to equip those impacted residences with individual drinking water treatment systems or provide an adequate supply of potable water. The County would also be required to perform an annual survey to identify any new groundwater users in the vicinity of the site.

Alternative II:

As with Alternative I, human health and the environment would be protected through implementation of the IRM, deed restrictions and long term monitoring. The installation of additional bedrock monitoring wells below the landfill would provide additional groundwater monitoring to gauge the effectiveness of the IRM. If monitoring indicates the remedial measures undertaken as part of the IRM are not functioning effectively, the need for further remedial alternatives would be evaluated.

Alternative III:

The collection and treatment of bedrock groundwater would offer the same protection as the other alternatives (through implementation of the IRM), but would add bedrock groundwater collection and treatment as an additional remedial measure. Collection and treatment of bedrock groundwater would help to further reduce potential leachate impacts to bedrock groundwater.

The next five "primary balancing criteria" are used to compare the positive and negative aspects of each of the remedial strategies.

3. Short-term Effectiveness. The potential short-term adverse impacts of the remedial action upon the community, the workers, and the environment during the construction and implementation are evaluated. The length of time needed to achieve the remedial objectives is also estimated and compared with the other alternatives.

Alternative I:

The No Further Action alternative produces no additional concerns for the protection of workers or the community beyond the IRM. This alternative would not require any additional time to implement.

Alternative II:

The construction of additional bedrock monitoring wells installed either through the landfill mass or from outside the landfill with angled drilling would require health and safety measures for the protection of workers. Installing wells through the waste would pose greater risks from exposure to wastes for the workers than angled drilling from the landfill perimeter. Protection of workers during well installation would be readily accomplished through appropriate monitoring activities and through the use of appropriate protective equipment. Although risks to residents would be small, protection of the nearest residences from dusts or other airborne emissions during the well installation would be provided through monitoring and suppression methods. Construction of additional monitoring wells would take approximately three months.

Alternative III:

The construction of a bedrock groundwater collection system would require health and safety measures for the protection of workers very similar to that described for Alternative II. Because of the more intrusive activities, Alternative III would pose somewhat greater risks to nearby residents. However, airborne contaminant monitoring would be performed to protect the residences in the vicinity of the site from possible airborne emissions. Construction of a bedrock groundwater collection system would take approximately 6 months.

4. Long-term Effectiveness and Permanence. This criterion evaluates the long-term effectiveness of alternatives after implementation of the response actions. If wastes or treated residuals remain on site after the selected remedy has been implemented, the following items are evaluated: 1) the magnitude of the remaining risks, 2) the adequacy of the controls intended to limit the risk, and 3) the reliability of these controls.

Alternative I:

The No Further Action alternative would provide for long term effectiveness and permanence through implementation of the IRM. While the waste would remain, capping the landfill and collection and treatment of the leachate eliminates potential for casual human contact and specifically reduces potential for migration of landfill leachate to the surface water, sediment, and groundwater. Deed restrictions would prohibit future uses of the site which would disturb the cap. Groundwater monitoring would provide an adequate and reliable means to evaluate the long term effectiveness and permanence of this alternative. There are currently over 40 wells surrounding the landfill on-site and off-site which could be used for long-term monitoring as part of O&M. In addition, nearby residential wells will be monitored over the long term and if well water contamination is identified, residents will be provided with a safe source of water. The O&M workplan will provide a mechanism for evaluation of long term cap effectiveness.

Alternative II:

Installation of additional bedrock monitoring wells would offer the same long-term effectiveness and permanence as the No Further Action alternative (through the implementation of the IRM), but would include the addition of several monitoring wells to provide additional long term bedrock groundwater quality information directly beneath the landfill mass. Because of the large number of wells already around the landfill, the addition of wells directly beneath the landfill would provide only marginal additional monitoring information.

Alternative III:

Construction and operation of a bedrock groundwater collection system would offer the same long-term effectiveness and permanence as the No Further Action alternative (through implementation of the IRM), but would add an active bedrock groundwater collection system to intercept some of the impacted groundwater. Implementation of a horizontal collection system in the bedrock would be a permanent means of collecting groundwater. However, it is likely that such as system would not be completely effective in capturing contaminants in the bedrock, due to the complex nature of groundwater flow through bedrock fractures. Some of the bedrock beneath the landfill is not saturated, and thus sections of a horizontal collection system may not intercept bedrock groundwater, further reducing the effectiveness of a bedrock groundwater collection system.

5. Reduction of Toxicity, Mobility or Volume. Preference is given to alternatives that permanently and significantly reduce the toxicity, mobility or volume of the wastes at the site.

Alternative I:

The No Further Action alternative takes into account the reduction in volume and mobility of leachate associated with the completion of the IRM. Leachate is the primary mechanism for landfill contaminants to impact surrounding surface water, sediment, and groundwater. Natural degradation processes in the bedrock aquifer are expected to continue to reduce the already low concentrations, and hence the potential toxicity, of landfill constituents.

Alternative II:

Additional bedrock monitoring wells would not offer any improvements in reduction in volume, mobility, and toxicity over the No Further Action alternative.

Alternative III:

Installation of a bedrock groundwater collection system would offer similar reductions in toxicity, mobility, and volume of the leachate as the other alternatives, but would also serve to reduce the concentrations, mobility, and volume of contaminated bedrock groundwater. It is likely that such

a system would reduce contaminated groundwater concentrations and volumes, but would not eliminate all groundwater impacts.

6. Implementability. The technical and administrative feasibility of implementing each alternative is evaluated. Technically, this includes the difficulties associated with the construction, and the ability to monitor the effectiveness of the remedy. Administratively, the availability of the necessary personal and material is evaluated along with potential difficulties in obtaining specific operating approvals, access for construction, etc.

Alternative I:

The No Further Action alternative requires no additional construction activities beyond implementation of the IRM as detailed in the Record of Decision for the IRM. The surface water and groundwater monitoring programs and deed restrictions limiting future site uses in this alternative are readily implementable.

Alternative II:

The construction of additional bedrock groundwater monitoring wells can be readily implemented. Wells installed through the landfill waste require more health and safety protection than angled drilling from the site perimeter. Installation of wells either through the waste or from the landfill perimeter may pose some construction difficulties, but are implementable. Groundwater and surface water monitoring programs and deed restrictions limiting future site uses are also readily implementable.

Alternative III:

The construction and operation of a bedrock groundwater collection system would be significantly more difficult to implement than Alternative I or II. There are potential difficulties which may be encountered in utilizing horizontal drilling techniques. The technology is not widely used but has been demonstrated to be effective elsewhere. Various piping and pumps would be required, but would not present construction difficulties.

7. Cost. Capital and operation and maintenance costs are estimated for the three alternatives and presented on a present worth basis. The costs are presented in Section 6.1. Present worth costs for Alternative II are roughly twice those of Alternative I. Present worth costs for Alternative III are approximately eight times those of Alternative I and approximately five times those of Alternative II.

This final criterion is considered a modifying criterion and is taken into account after evaluating those above. It is focused upon after public comments on the Proposed Remedial Action Plan have been received.

8. Community Acceptance - Concerns of the community regarding the RI/FS reports and the Proposed Remedial Action Plan were evaluated. A " Responsiveness Summary" that describes public comments received and the Department responses is included as Appendix A.

SECTION 7: SUMMARY OF THE PREFERRED REMEDY

Based upon the results of the RI/FS, and the evaluation presented in Section 6, the NYSDEC has selected Alternative I - No Further Action Beyond The IRM as the remedy for this site.

This selection is based upon the review of the site data and evaluation of the alternatives and their ability to meet the above discussed criteria.

This selection is based on the following:

All three alternatives would not fully comply with SCGs for groundwater. However, groundwater may ultimately meet SCGs through natural degradation in all three alternatives, with no major difference in the time that this may take.

The IRM provides for protection of human health and the environment. While Alternative III would provide for some additional protection of the bedrock groundwater through collection and treatment, groundwater impacts from the landfill have been shown to be minimal, even in the landfill's unremediated state.

Alternative I poses fewer short term impacts than either Alternative II or III.

Since numerous monitoring wells are presently available under Alternative I, the added monitoring wells under Alternative II would provide marginal added effectiveness. All three alternatives provide for monitoring of nearby residential wells and a survey to identify any new groundwater users in the vicinity of the site on a periodic basis.

Alternative III provides for slightly greater long-term effectiveness and reduction of toxicity, mobility and volume through active collection of bedrock groundwater under the landfill. However, since a bedrock groundwater collection system would not likely capture all bedrock groundwater impacted, and since groundwater impacts are currently minor, the added benefits are not considered significant.

Alternative I is the most implementable of the alternatives, since Alternatives II and III present possible construction difficulties, and require more health and safety protection.

The No Further Action Beyond IRM alternative provides sufficient long term groundwater monitoring with which to gauge the effectiveness of the IRM, with roughly one half the present

worth costs of additional bedrock monitoring and less than one eighth the present worth costs of bedrock groundwater collection and treatment.

The elements of the selected remedy are as follows:

1. Completion of the IRM per the "Record of Decision for Interim Remedial Measures" dated March 1994. This includes all necessary operation and maintenance activities for the IRM elements (i.e. cover system, leachate collection system, sedimentation basin, leachate pre-treatment plant, and treated effluent pipeline).

2. Long-term monitoring of groundwater both on-site and off-site. Long-term surface water sampling on-site.

3. Long-term residential well sampling. If monitoring shows the presence of contaminants, the County will either equip those impacted residences with individual drinking water treatment systems or provide an adequate supply of potable water.

4. Periodic surveys to identify any new groundwater users in the vicinity of the site.

5. Modification of the property deed to clearly indicate the limits of the cover system and to restrict future uses of the site to only those uses which will not disturb the integrity of the final cover system or any other component of the remedial system.

SECTION 8 - HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the citizen participation process, a citizen participation plan was developed for the Old Bath Landfill site. The principal objectives of the Citizen Participation Plan were to: inform the public about conditions at the site; educate the public about the PRAP and ROD process; obtain comment on the proposed remedy presented in the PRAP; obtain community acceptance of the remedial actions; and to ensure that all comments provided by the public were evaluated and addressed in the Responsiveness Summary.

Document repositories were established at the following locations for public review of project related material:

Davenport Public Library
Cameron Circle
Bath, N.Y. 14810

Steuben County Department of Public Works
3 East Pulteney Square
Bath, N.Y. 14180
(607) 776-9631

NYSDEC Region 8 Headquarters
Ms. Linda Vera
Region 8 Citizen Participation Specialist
6274 East Avon-Lima Road
Avon, New York 14414
(716) 226-2466

NYSDEC - Central Office
Mr. Jeffrey A. Konsella
Old Bath Landfill Project Manager
Div. of Hazardous Waste Remediation
50 Wolf Road
Albany, N.Y. 12233-7010
(518) 457-5636

The following citizen participation activities were conducted:

- Public Meeting - January 22, 1992: Described field activities for remedial investigations and IRM field sampling.

- Fact sheet - February 1994: Announced availability of PARAP (for IRM remedial actions), and public comment period.

- Public meeting - February 15, 1994: Presented the PARAP for public comment.

- March 1994: Completed Responsiveness summary for comments received during PARAP presentation and during public comment. Incorporated Responsiveness Summary into ROD and executed ROD March 28, 1994.

- Fact sheet - January 1995: Announced availability of PRAP (further remedial actions based on RI/FS results), and public comment period.

- Public meeting - February 2, 1995: Presented PRAP for public comment.

- January 27 - February 27, 1995: Public comment period on PRAP.

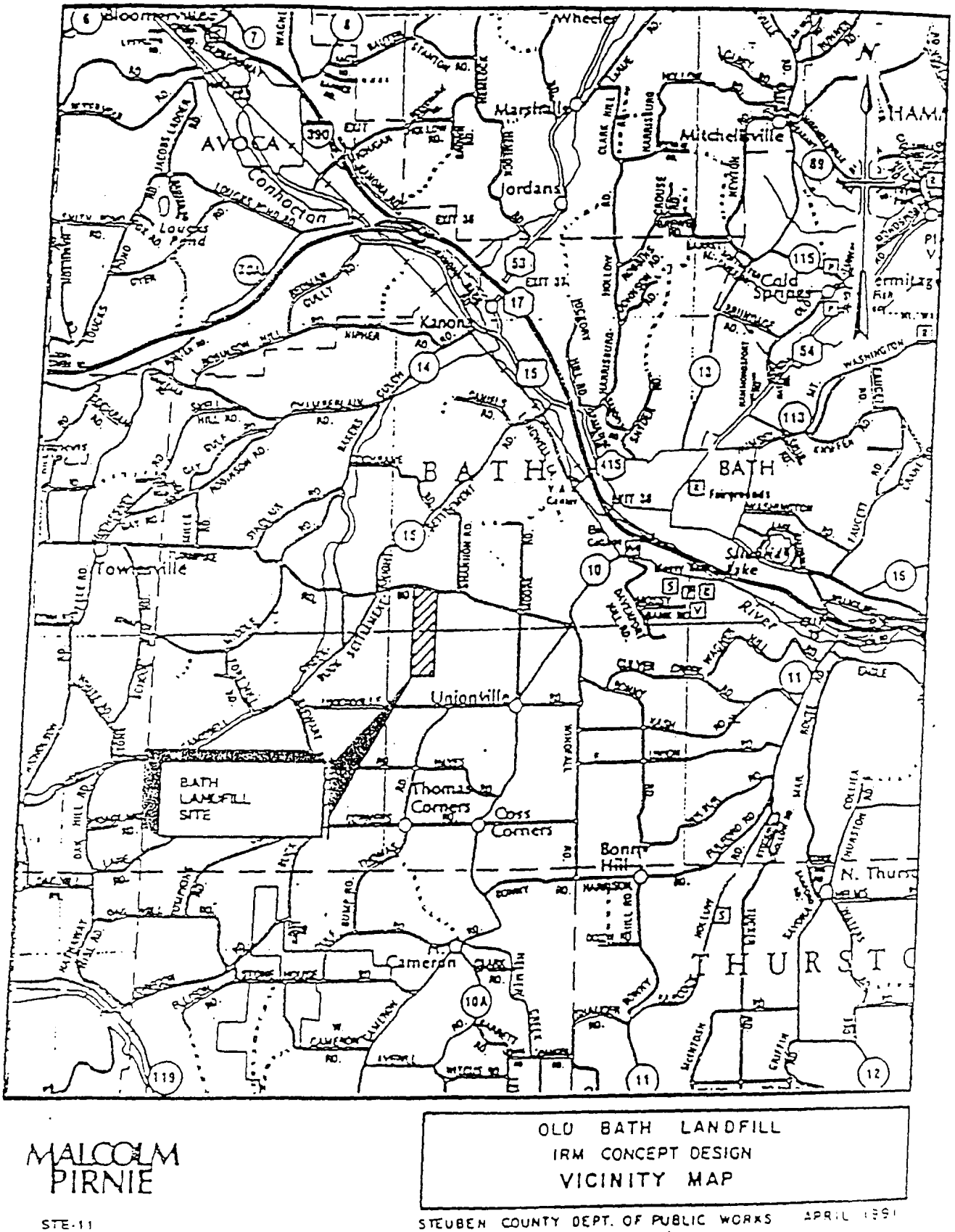
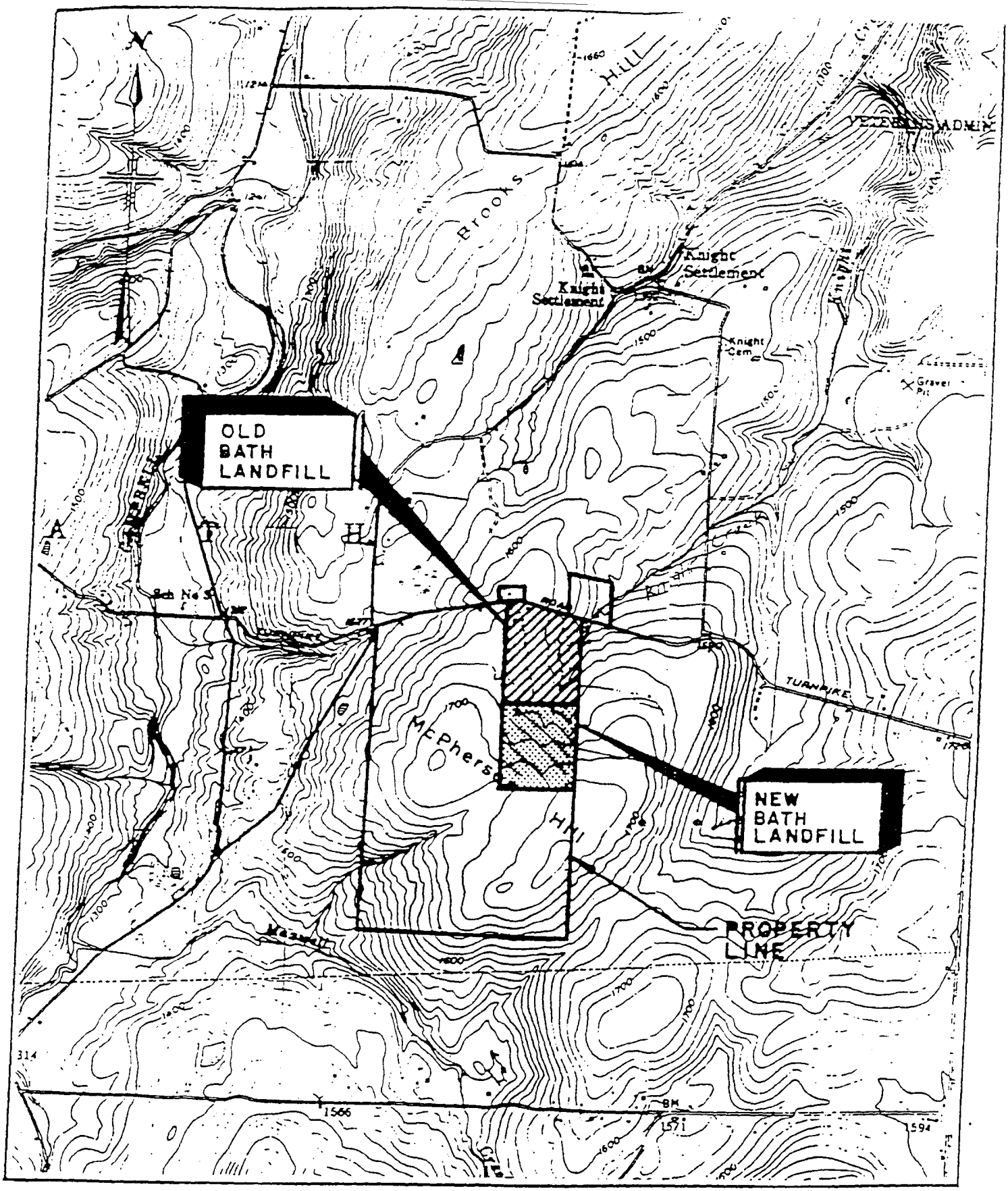


Figure 1. Site location.



MALCOLM PIRNIE

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NEW BATH SANITARY LANDFILL
PART 360 PERMIT RENEWAL
SITE LOCATION MAP

STEUBEN COUNTY DEPT. OF PUBLIC WORKS AUGUST 1993

FIGURE 2 Site Detail

Table 1

Frequency of Analyte Detection in Groundwater

ANALYTE	Overburden			Upper Bedrock			Deep Bedrock		
	No. of Detect	Max. Conc.	Loc. of Max.	No. of Detect.	Max. Conc.	Loc. of Max.	No. of Detect.	Max. Conc.	Loc. of Max.
Volatiles (ug/L)									
Acetone	2	410	408S	0	—	—	0	—	—
2-Butanone	0	—	—	0	—	—	0	—	—
1,1 - Dichloroethane	2	14	403S	0	—	—	0	—	—
1,2, - Dichloroethane	1	3	403S	0	—	—	0	—	—
Methylene Chloride	4	13	403SD	4	10	407R	0	—	—
Tetrachloroethene	0	—	—	2	10	*	0	—	—
Trichloroethene	0	—	—	2	4	413R	1	1	411DR
Toluene	1	16	408S	0	—	—	0	—	—
Semi-Volatiles (ug/L)									
Bis(2-ethylhexyl) phthalate	5	2	*	5	2	*	3	21	301DR
Butylbenzylphthalate	0	—	—	2	3	413R	0	—	—
Diethylphthalate	1	1	403S	1	1	301R	1	1	301DR
Di-n-octylphthalate	4	2	402S	5	4	403R	2	18	301DR
Fluoranthene	1	34	408S	0	—	—	0	—	—
4-Methylphenol	2	53	408S	0	—	—	0	—	—
Phenol	2	34	408S	0	—	—	0	—	—
2,4 - Dimethyl phenol	1	43	408S	0	—	—	0	—	—
Di-n-butylphthalate	0	—	—	1	1	1	0	—	—
Inorganic Element (ug/L)									
Aluminum	14	40600	403SD	28	7070	411R	10	2010	411DR
Arsenic	0	—	—	2	17.6	402R	1	38.8	402DR
Barium	14	332	403SD	28	1460	403R	10	1140	301DR
Beryllium	1	1.4	403SD	0	—	—	0	—	—
Calcium	7	223000	403S	14	121000	411R	5	131000	402DR
Chromium	7	74.1	403SD	11	390	411R	4	15.2	301DR
Cobalt	4	39.9	403SD	4	9.7	411R	0	—	—
Copper	7	28.8	403SD	13	23	411R	6	19.1	301DR
Iron	14	83300	403SD	28	134000	*	10	4930	402DR
Lead	7	24.2	403SD	15	48.4	407R	4	17.2	301DR
Magnesium	14	73900	403S	28	40300	402R	10	42000	402DR
Manganese	14	7160	408S	28	4730	414R	10	3680	402DR
Mercury	0	—	—	1	0.87	402R	0	—	—
Nickel	4	80.1	403SD	7	79.4	411R	1	18.5	411DR
Potassium	7	7500	403SD	11	4930	410R	4	3130	409DR
Sodium	7	12000	413S	14	42700	410R	5	18100	301DR
Vanadium	4	60.6	403SD	4	17.2	411R	2	7.8	411DR
Zinc	12	205	403SD	19	157	403R	8	25	301DR

Notes:

— Not Applicable

* More than one well location had maximum concentration.

APPENDIX A

OLD BATH LANDFILL
RESPONSIVENESS SUMMARY

Questions raised during the public meeting of February 2, 1995:

The public meeting was recorded and transcripted by Steuben County. A copy of the transcript has been placed in the document repositories.

Several questions were raised on the leachate pre-treatment plant and the treated effluent pipeline, which are elements of remediation to be performed according to the Record of Decision for the IRM, executed in March 1994. These questions are paraphrased below.

Q: Please provide details of the pipeline construction and alignment. Will it be underground? Is it going through the VA grounds?

A: The treated effluent pipeline will be underground and will convey treated leachate from the pretreatment plant to the Village of Bath sewer system for secondary treatment by the Village waste water treatment plant. The pipeline alignment is from the Old Bath landfill to the west under Turnpike Road (right-of-way) to the corner of Turnpike Road and County Route 10, then under County route 10 (right-of-way) proceeding north to the Cohocton River (hung from bridge where Route 10 crosses the river), and terminating in a manhole near Cameron Circle.

Q: Will there be more meetings to inform residents about construction activities?

A: The County will be holding an availability session in the spring of 1995 . Representatives from Public Works and Malcolm Pirnie will be on hand to discuss what construction activities are scheduled, their expected duration, and possible impacts to residences in the vicinity of the site. The meeting will be scheduled after final pipeline designs are completed. The pipeline designs will be available for public review at the meeting. Residents will be notified by mail of the availability session(s).

Q: Could operations in the stone quarry have any effect on the effluent pipeline?

A: The effluent pipeline will be installed under the right-of-way of Turnpike Road in front of the quarry and should not be effected by any activities within the quarry.

Q: Will the effluent pipeline have warning signs showing it's location?

A: The effluent pipeline will be marked with warning signs. The County plans to have a natural gas pipeline installed along the same route to supply gas to the treatment plant. There will be signs and buried tape above the pipes to provide warnings.

Q: Is there any chance of residents connecting to the natural gas pipeline that is installed?

A: Bath Electric, Gas, & Water should be contacted concerning the possibility of residential connections to the natural gas pipeline.

Q: What will be included in repairs to Turnpike Road as part of the effluent pipeline construction.

A: The road will be restored to its original pre-construction condition or better. However, the County has no plans to pave Turnpike Road. Any further questions on suggested enhancements should be directed to the County.

Q: Will property owners along effluent pipeline alignment be paid for allowing the construction?

A: As the effluent pipeline will be installed in the County owned right-of-way, the pipeline will not be constructed on any private property. Further questions regarding this should be directed to the County.

Several questions were raised on another element of the ROD for the IRM. These questions concerned the landfill cover system.

Q: Please discuss the cover system. Did the DEC approve a request from the County for a variance to regulations concerning the cover system?

A: The County submitted a request to the DEC for a variance to Part 360 regulations (solid waste regulations which require specific elements for a landfill cover system) in accordance with the Local Government Regulatory Relief Initiative of February 26, 1993. Specifically, the County requested a variance from specific gas venting layer requirements and barrier protection layer requirements.

Gas venting layer

The variance requested from the gas venting layer requirements proposed the installation of gas venting trenches instead of a continuous venting layer over the landfill. This request was based on the fact that the existing material on the landfill is between 2 - 6+ feet thick and is very compact (it does not allow gas to penetrate readily), and trenching through the existing cover material would provide for more effective landfill gas venting than placing a continuous layer over the existing cover. It would also save considerable money vs. removing a portion of the existing cover in order to place an effective gas venting layer over the site.

Barrier layer

The variance requested from the low permeability barrier layer requirements proposed the utilization of portions of the existing cover system, with the reworking of portions of the existing cover where: there is insufficient cover thickness; there are disturbances to the cover from the installation of gas vent trenches and risers; there are disturbances to the cover from installation of the leachate collection system; or where waste from necessary excavations is placed back on the top of the landfill.

After careful evaluation of the County's request, the DEC approved both variances as waivers of ARARs (Applicable or Relevant and Appropriate Requirements). This is based upon the fact that, when properly constructed, the cover system will be an effective and cost saving alternative to installation of a new, Part 360 cover system over the entire landfill.

Q: How can the State be sure that the existing cover will be adequate?

A: The County had performed field investigations on the existing cover and has located the areas of insufficient cover thickness. Tests performed on the existing cover have shown the cover to have a permeability of between 2.2×10^{-7} cm/s and 4.7×10^{-7} cm/s. In areas where the cover thickness is not sufficient, or the existing material is heavily disturbed, the cover will be reworked to comply with standard Part 360 requirements.

Q: Without testing the existing cover every few feet, how can you be certain as to the thickness?

A: The County performed test pits using a grid pattern every 200 feet on center, or approximately 40 excavations over the landfill. This information, used in conjunction with previous surveys of the landfill surface, provided an accurate cross section of current cover thicknesses over the landfill.

Q: If the present cover system is sufficient, why is there a leachate problem?

A: There is a significant amount of leachate which is present in the landfill now. A great deal of that leachate was generated when the landfill was in operation, before cover was placed and compacted on the landfill. About half of the landfill has a fairly tight glacial till layer underneath that impedes the flow of leachate out. Most likely some portions of the landfill (some original cells) have accumulated leachate in a bath-tub type effect. This is supported by the relatively high strength of leachate that was discovered during the field sampling phase of the IRM. If leachate was being continuously flushed from the waste, you would expect to find more diluted concentrations in the landfill.

Q: Isn't the cover only as strong as it's weakest link?

A: A properly built cover acts to shed water and promote runoff. If the cover system is properly graded to promote runoff, a "weak spot" (an area with greater permeability) will not necessarily allow a great deal of infiltration. However if the area was a low spot or depression which ponded, this would cause the cover system to be significantly impaired. This is the primary reason why proper grading is a critical requirement of landfill closure regulations. The Old Bath landfill design will be required to comply with grading requirements for landfill closures.

Q: If leachate is hauled from Lindley to the plant, will there be an increase in truck traffic on Turnpike Road?

A: There will be an increase in truck traffic in the short term during construction activities. However, when the plant and pipeline are operating, there is not expected to be any increase in truck traffic due to leachate hauling. This is due to the fact that the County will no longer have to haul leachate from the New Bath landfill down to the existing County pre-treatment plant. The net effect is expected to be no increase in trucks hauling leachate in the vicinity of the site.

Questions related to the Remedial Investigation and Feasibility :

Q: How did the State and County decide on which homes to sample as part of the groundwater analysis?

A: The County conducted a well user survey of 29 homes in the vicinity of the landfill in the Spring of 1992. Based on the information provided by the residents and the hydrogeologic data on groundwater flow direction obtained from the remedial investigation, the State Health Department selected wells to be sampled by the County's consultant in 1992.

Q: I live a half mile or so from the landfill and my well has not been tested. The old well was tested for bacteria several times and came back positive. Our new well was installed last summer and we're still having problems. Can my well be sampled?

A: Normally the presence of bacteria is related to septic system problems and/or poor well design /installation. Monitoring wells located between your wells and the landfill have been tested for site related chemicals and no contamination from the site was identified. Therefore, it is unlikely that your wells are impacted by the site. It is suggested that you contact the NYSDOH's Hornell District Office (607-324-8371) and discuss your well's bacteriological problems with Department staff. DOH staff will be able to advise you on how you can disinfect your well.

Appendix B
Administrative Record

RI/FS

- Remedial Investigation/Feasibility Study Scoping Document, prepared by Malcolm Pirnie, October 1991
- Remedial Investigation/Feasibility Study Workplan, prepared by Malcolm Pirnie, October 1991
- Preliminary Site Characterization Report - Remedial Investigation/Feasibility Study, Vols. I&II, prepared by Malcolm Pirnie, March 1992
- Remedial Investigation Report, Vols. I&II, prepared by Malcolm Pirnie, September 1993
- Supplemental Remedial Investigation Report, prepared by Malcolm Pirnie, July 1994

IRM

- Field Sampling Plan, prepared by Malcolm Pirnie, June 1991
- Interim Remedial Measures Concept Design, prepared by Malcolm Pirnie, October 1991
- Health and Safety Plan for the IRM Design and Construction Activities, prepared by Malcolm Pirnie, December 1991
- Leachate Treatability Study Workplan, prepared by Malcolm Pirnie, May 1992
- Alternative Cover System Evaluation, prepared by Malcolm Pirnie, December 1992
- Treatability Study and Design Report, Vols I-III, prepared by Malcolm Pirnie, February 1993
- Responses to NYSDEC comments on the Treatability Study and Design Report, prepared by Malcolm Pirnie, May 1993
- Treatability Study and Design Report Supplement, prepared by Malcolm Pirnie, December 1993
- Interim Remedial Measures Concept Design (Revised), prepared by Malcolm Pirnie,

February 1994

- Record of Decision For Interim Remedial Measures, Prepared by NYSDEC, March 1994

Earlier Reports

- Hydrogeologic Investigation, prepared by H & A of New York, May 1988
- Geotechnical Engineering Report, prepared by H & A of New York, December 1988
- Groundwater Remedial Measures Investigation, prepared by H & A, October 1988
- Contaminated Soil Excavation, prepared by H & A of New York, August 1988
- Closure - Post Closure Plan, prepared by Larsen, September 1988

Legal Documents

- Order on Consent, Case # R8-0574-86-07
- Order on Consent, Index # B8-293-89-08
- State Assistance Contract - 1986 Environmental Quality Bond Act Title 3 Inactive Hazardous Waste Disposal Site Remediation Program, October 28, 1991
- State Assistance Contract Amendment - July 22, 1994

Other

- Steuben County Project Management Plan, December 1991
- Citizen Participation Plan, Appendix E of RI/FS Workplan, prepared by Malcolm Pirnie, October 1991