

NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION

IN RE PHILADELPHIA ELECTRIC CO. : DOCKET NOS. 50-352 CP
LIMERICK GENERATING STATION : 50-353 CP
Units 1 and 2 :

REQUEST FOR SUSPENSION OR REVOCATION
OF CONSTRUCTION PERMITS PURSUANT TO
10 C.F.R. §§2.202 and 2.206(a):
SUPPLEMENT TO PETITION

I. INTRODUCTION

Del-AWARE Unlimited, Inc., by a Petition entitled "Request for Suspension or Revocation of Construction Permits Pursuant to C.F.R. §2.202 and 2.206(a)", dated July 2, 1981, requested that the NRC, under 10 C.F.R., Sections 2.202 and 2.206, take action to prevent the Point Pleasant Diversion and related construction meant to provide supplemental cooling water for the Limerick Generating Station; the purpose of that requested action is to allow proper comprehensive environmental evaluation of the PPD and construction connected with the PPD, and consideration of alternative means for supplying supplemental cooling water to Limerick in ways which would be environmentally superior to PPD. Del-AWARE now submits this Supplement to Petition for these purposes:

1. Answer arguments raised by the Comments of Philadelphia Electric Co., the Licensee, (PECO) in response to Del-AWARE's Petition (Comments received September 7, 1982);

2. Supply additional information to substantiate the need for action as requested in the Petition.

Del-AWARE hereby requests that the NRC Staff consider this Supplement to Petition in conjunction with its earlier Petition and treat it as if incorporated into the earlier Petition. Del-AWARE submits that to do so (1) is in keeping with the flexibility inherent in the informal procedures associated with 10 C.F.R. §2.206 petitions, and (2) will help to promote the policy inherent in 10 C.F.R. 2.206 of giving fullest possible consideration to legitimate concerns raised by members of the public in relation to the construction and operation of nuclear power plants.

II. RESPONSE TO PECO'S ARGUMENT

The following is a response to "Comments of Philadelphia Company on Del-AWARE Unlimited's Request for Suspension or Revocation of Construction Permits Pursuant to 10 C.F.R. §2.202 and §2.206(a)" (Comments):

Said Comments were received in this office on September 7, 1982.

1. In the Comments, it is stated that "each of these project components underwent a full environmental review as required by NEPA and related environmental statutes." Comments, 6. However, the PPD components reviewed in connection with Limerick, even allowing the most generous possible weight to previous environmental evaluations, were

only those which directly feed water into Limerick. None of the components which will be used by the Neshaminy Water Resources Authority (NWRA) solely for water supply purposes were reviewed in conjunction with the components used for PECO or jointly by PECO and NWRA. This creates a very high probability, arising virtually to a certainty, that cumulative and synergistic effects have not been and will not be considered in the decision to permit or not permit the Point Pleasant Diversion and related work.

More directly, in the DRBC EIS, the intake was located only generally. No note was made of shaft spawning, blasting, the status of the Pennsylvania Canal as a National Historic Landmark, the nature and extent of construction and establishment of a 60-80 foot high pumphouse (including fill), and the blasting and clearing on the hill, the archaeological sites, and the historic district. Consideration of these matters as in the 1980 EA was cursory or nonexistent, and did not comply with NEPA procedural requirements. Historical and aquatic matters were deferred to the Corps of Engineers, and depletive use considerations were deferred to this Commission. Documents showing the substantiality of these concerns are attached as Exhibit A.

Nor was consideration given to the present demonstrable inadequacy of water resources in the Delaware River, since shown by DRBC's proposed new Management Plan and storage requirements; which constitute changes in circumstances as contemplated in the NRC Regulations.

2. Reliance on the Corps of Engineers permit is similarly misplaced. The "Environmental Assessment and Section 404 Analysis of Point Pleasant Diversion Project for U.S. Army Corps of Engineers" (January, 1981), submitted by Betz- Converse-Murdoch, Inc., states that, "The Corps of Engineers have review and permitting responsibilities for the intake on the Delaware River at Point Pleasant and the rechanneling of Pine Run at the North Branch Water Treatment Plant... The overall functioning of the Point Pleasant Diversion Project and the construction of other system components are beyond the jurisdiction of the Corps of Engineers." (Page 1) This indicates that the Corps of Engineers has, like NWRA and NRC, only considered a portion of the overall complex of construction associated with PPD. This report further calls for the studies of wetlands at the site of the water intake for PPD, which have not been studies as of the date of the report. Study was also seen to be required of the impact of rechanneling Pine Run. (Page 30). This further demonstrates the fragmentation of the environmental analyses which have been conducted to date, and which are seen by PECO, erroneously in the view of Del-AWARE, to be adequate for purposes of compliance with NEPA.

3. Del-AWARE respectfully but vigorously disagrees with the determination of the Atomic Safety and Licensing Board in its Special Pre-hearing Conference Order, June 1, 1982, that the water supply components of the overall PPD

plan, which are dependent upon the diversion and related works serving Limerick, need not be evaluated as part of the overall project. The water supply components cannot be built without the components serving Limerick. Therefore, the water supply components of the overall scheme must be seen as a direct result and impact of the components meant to supply water to Limerick. A bifurcated environmental analysis could be justified only if the Limerick-serving components were already in place. This manifestly is not the case.

4. PECO attached to its comments the Affidavit of Robert A. Flowers, Executive Director of NWRA, to the effect that the PPD and sufficient facilities to allow the water supply projects of NWRA would be built regardless of the Limerick generating station. This Affidavit must be given small evidentiary weight, since it is obviously self-serving and/or subjective wishful thinking. Moreover, it is directly contradicted by the memo attached hereto as Exhibit A in which Mr. Ackerson of PECO records that NWRA needs to know whether PECO will proceed.

5. It is asserted by PECO that the Delaware River Basin Commission has responsibility for licensing PPD, with the implication that such responsibility establishes exclusive authority. PECO cites no authority for this implication. On the contrary, it is clear that NRC must also evaluate PPD and related construction under NEPA, since the PPD and related construction are, in effect, parts of the

overall plant of the Limerick Generating Station. While the Staff, has been allowed to use primary technical and scientific data from DRBC and other agencies, the opinion made it clear that NRC has the responsibility of integrating such information into a comprehensive picture of the environmental impacts and of applying its own significance ratings or weights and judgment to these data to arrive at a balanced environmental decision. Philadelphia Electric Company (Limerick Generating Station, Units 1 and 2), ALAB-262, 1 NRC 163 (1975).

6. The Comments assert that the material in Delaware's Petition of July 2, 1982, concerning the relationship between PECO and NWRA was irrelevant. On the contrary, this relationship, as shown in the contract between the two entities, is strong evidence of the dependence of NWRA's components of the overall project and scheme upon the components serving Limerick. Although this evidence is circumstantial, circumstantial evidence has long been accepted at law, and this evidence is extremely convincing.

7. The Comments cite the "Final Environmental Impact Assessment for the Neshaminy Water Supply System", Delaware River Basin Commission, August, 1980, as a complete environmental analysis of the PPD and related works. On the contrary, this document cites the diversion of water to supply the Limerick Generating Station as a peripheral matter which is outside the scope of that environmental analysis. See pages IV-5.

8. In their Comments, PECO cites the "Memorandum and Order", July 14, 1982, of the Atomic Safety and Licensing Board, as the "law of the case" which excludes analysis of the environmental impacts of the PPD and related construction from 2.206 review. (Comments, 24-25.) This is an incorrect interpretation of the Order of July 14, 1982. The passage from that Order which PECO quotes clearly affirms only the determination not to admit certain contentions to the Operating License Hearing. It in no way negatives the suggestion in the Special Pre-hearing Conference Order of June 1, 1982, that these matters be referred to the Staff under 10 C.F.R. §2.206. In the June 1 Order, the Board stated,

"Presumably, consistent with NEPA, under the condition in the Limerick CP, the Director of NRR can exercise his authority to stay a construction activity which may cause significant adverse effects not previously evaluated, until the NRC staff can complete its evaluation of the changes. ...Accordingly, Del-AWARE's allegations that changes in construction impacts due to either changes in proposed construction or the changes in the recognition of historical values of areas which may be impacted by construction should be directed as a request for action to the Director of Nuclear Reactor Regulations pursuant to 10 C.F.R. §2.206(a)." Order, 85-86.

The Board further stated that,

"Accordingly, in order to avoid the risk of rendering the above portions of contentions substantially moot and/or requiring the applicant to undue costly (in time and money) construction work, we determine that

every effort should be made to resolve the above summarized issues prior to the construction of the Point Pleasant intake and associated pump station and the Bradshaw Reservoir. In conjunction with our examination of these operational impacts we will compare the alternatives, e.g., designs and locations, under NEPA. For that purpose, we will look at the Staff's findings under condition 3.E(3) of the construction permit of request pursuant to 10 C.F.R. §2.206 concerning construction impacts." Order, 88.

The Board could not have stated more clearly that 10 C.F.R. §2.206 provides an appropriate avenue for exploring those environmental issues which it rules to be beyond the scope of the hearings. Del-AWARE now avails itself of the opportunity and procedure urged upon it by the Board. ^{1/}

III. STAFF COMMITMENT TO THOROUGH ENVIRONMENTAL EVALUATION

1. Del-AWARE draws to the Staff's attention the letter of January 5, 1982, from Robert L. Tedesco, Assistant Director for Licensing, Division of Licensing, to Mr. Vincent Boyer, Senior Vice President, Nuclear Operations, PECO, in which it was stated that

"Cooling water supply in the diversion of Delaware River water was discussed by several participants at the meeting. We recognize that the final design of the diversion project was not completed when the Final Environmental Statement was issued for your

1. Del-AWARE does not hereby relinquish any right to appeal the holdings of the board concerning the narrowing or exclusion of any of its contentions from the OL Hearing.

Construction Permit. Therefore, the staff will thoroughly review the environmental impact associated with the diversion of the Delaware River water. This area should also be thoroughly discussed in your tendered application."

2. Del-AWARE further draws the attention of the staff to a letter from Stephen H. Lewis, Counsel for NRC staff, to Robert J. Sugarman, Esq., in which it was stated:

"The environmental site visit and public meeting have since been deferred until the late summer or or early fall of 1982. Since the Draft Environmental Statement (DES) is not scheduled for issuance until May, 1982, a late summer or early fall meeting will afford the staff ample opportunity to take into account the comments of members of the public offered at the meeting in preparing the DES." (amy 6, 1982)

It is clear from the context of this letter that the referenced DES is for the operation of the Limerick Generating Station.

3. The thorough environmental review promised in the letter of January 5, 1981, quoted above, and the DES referred to in the letter of May 6, 1982, quoted above, are not available at this time to assist the Staff in determining whether the PPD and related construction should go forward. However, the scheduled date for initiating construction of the PPD is December 15, 1982. Since this last date is practically upon us, unless the complete environmental evaluation promised in January, 1981 is to be released practically instantly, the date for initiating construction

of PPD must be delayed. Otherwise, there will be a commitment of economic resources which will seriously prejudice consideration of the environmental issues; moreover, withdrawal of permission to construct PPD after construction has started would cause economic waste which would needlessly burden PECO and its customers. It is preferable to avoid start of construction until environmental issues, and alternatives for supplying supplemental cooling water to Limerick Generating Station, can be considered in light of existing conditions and of the revised design of PPD.

4. The construction period for PPD has been established as 540 days in the bid documents. PECO's documents establish that the water supply system is not needed until April, 1985, and, in any event, the Perkiomen portion of the supplemental cooling water system will not be available until the end of 1984 or the beginning of 1985. Simple arithmetic establishes that, in these circumstances, there is no need to commence construction of PPD until the middle of 1983.

5. The PECO claim that two winters in the river are needed is not sustainable. Indeed, PECO's original construction phasing called for the construction in the river to be in Phase III, thus clearly implying no need for two winters' access to the river. Moreover, before any serious work can be done in the river, an access road is required. By the time the access road is constructed, the winter could be substantially over in any event. This is

true not only because of the time required for construction itself, but also because of the need for detailed procedures and plans in connection with constructing the access road across the National Historical Landmark, i.e., the Pennsylvania Canal. Thus, there is no need for an immediate start to construction, even if PECO can demonstrate the PPD is the most desirable means of supplying supplemental water for Limerick.

6. An immediate start of construction by PECO would only prevent the staff from exercising its responsibilities and prerogatives to perform a thorough environmental evaluation of the supplemental cooling water system. An early start to construction would have the effect of a preemptive move, preventing the staff from carrying out its responsibilities under NEPA.

IV. SECONDARY IMPACTS OF PPD

1. NEPA and the CEQ guidelines promulgated thereunder require consideration of secondary impacts of any major Federal action affecting the human environment. Suburban development is clearly such a secondary impact.

2. Secondary impacts were considered in the "Environmental Report on the Neshaminy Water Supply System", Neshaminy Water Resources Authority, Bucks County, February, 1979. However, the consideration of secondary impacts was cursory at best, occupying only two double-spaced pages.

The analysis characterized the water supply aspect of PPD as responding "to needs created by the inevitable population increase rather than vice versa. ...The construction is in direct response to pleas by municipalities and water agencies in these areas for water to supplement their ground water supplies which have proven to be inadequate during low rainfall years..." Page V-31 of foregoing report. The report further states that zoning, subdivision regulations and floodplain ordinances are sufficient to control growth and protect the environment of the affected municipalities. However, there is no evidence that this assertion is true. There is no analysis of ordinances or of local administrative machinery for forming or carrying out of growth-management policy.

3. Secondary impacts are similarly reviewed in the "Final Environmental Assessment for the Neshaminy Water Supply System", Delaware River Basin Commission, August, 1980. This report states that "The forecast water demands to be met by the proposed project are based upon revised population projections. ... Bucks and Montgomery counties will likely continue to experience growth and development with or without the Neshaminy Water System." Aforementioned report, pages 2-47 and 2-48. This report further asserts that the local communities would, through zoning, be able to control growth and influence development patterns in a way which would be beneficial. The assertion is made without proof.

4. The "Environmental Assessment Report and Findings, Point Pleasant Water Supply Project", of the Pennsylvania Department of Environmental Resources, August, 1982, similarly asserts that the PPD Water Supply elements are simply responding to demand, and also asserts without proof that the project would encourage a more desirable pattern of growth and development. In itself, in any event, this acknowledges an impact.

5. Therefore, it can be seen that the so-called analysis of secondary effects consists of (1) A Fatalistic acceptance of demands for water based upon suburban growth as compelling an increase in the probably water supply by means of a diversion from the Delaware River, and (2), an optimistic but unproved assertion that local zoning and related ordinances can insure that growth will occur in an environmentally desirable fashion.

6. These analyses completely fail to recognize, let alone analyze, alternative means of coping with asserted shortages in existing sources of probable water (predominantly ground water extraction). Such alternatives could include water conservation, growth management to guide suburban development in the greater Philadelphia area into part of the metropolitan area where water supply is not a problem, and building and construction requirements, by means of ordinance or other regulations, which would allow better recharge by rainwater absorption of the aquifer serving the affected market area. (Construction methods for

insuring better efficiency in recharge of an aquifer, even with suburban land development, are well developed and recognized by the civil engineering profession.)

7. The so-called analyses of secondary impacts are extremely optimistic concerning the ability of local communities to formulate and implement a growth management policy. Absent proof that the communities in the region served by Neshaminy Water Resources Authority are exceptions to the general rule and experience, the common experience of urban and suburban communities with the free granting of variances and exception from zoning ordinances throughout the United States undermines the basis for any such optimism.

V. WATER QUALITY IMPACTS

1. Del-AWARE's Petition of July 2, 1982, pointed out many water quality problems which will be exacerbated by PPD.

2. The water quality problems of the Delaware River, which are directly attributable to diversion and the depletive use of Delaware River Water, have recently been recognized by the four states which are members of the Delaware River Basin Commission (New York, New Jersey, Pennsylvania, Delaware) and New York City. These entities have recently entered into "good faith" negotiations to revise the 1954 U.S. Supreme Court allocation of Delaware River Water and/or

management practices and augment reservoirs to maintain water quality in the Delaware River.

3. The new discovery of the difficult Delaware River water quality problems is evidenced by the DRAFT "Recommendations and Background Report Concerning Interstate Water Management, Recommendation of the Parties to the U.S. Supreme Court Decree of 1954 to the Delaware River Basin Commission Pursuant to Commission Resolution 78-20", July, 1982, prepared by the staff of the parties and the Delaware River Basin Commission. A copy of this report, which speaks clearly to the point, is attached hereto and incorporated herein.

4. The diversion of 95 million gallons per day at PPD, approximately half of which would be lost through consumption at Limerick and evaporation and leakage losses in transmission from the Delaware River Watershed, can only make salinity and other water quality problems more serious.

5. Therefore, in light of the information reflected in the attached report, the permit by DRBC to divert water at the PPD is contestable. Del-AWARE, accordingly, has submitted a Petition to DRBC to reopen permit proceedings for the PPD diversion.

6. The worsened anticipated conditions documented in the attached "Background Report" constitute new circumstances which would require a new environmental evaluation of PPD, regardless of any other facts advanced by Del-AWARE.

VI. CONCLUSION

Section 2.206 of 10 C.F.R. provides an informal procedure by which the public may alert the staff of NRC to adverse impacts of nuclear plant construction or operation. Section 2.206 permits the Staff, in response to a Petition, to issue a "Show Cause" Order under Section 2.202 of the Regulations if this is seem to be necessary. Such Show Cause Order may be immediately effective when circumstances require.

Del-AWARE is requesting that such an immediately effective Show Case Order be issued. This Order obviously would not cause the shut-down of an operating nuclear plant. It is even doubtful whether it would delay the start-up date of the Limerick plant. Hearings under the Show Cause Order could be held and concluded with ample time for PECO to construct whatever supplemental cooling water system is ultimately approved. Thus, prompt and timely action by the Staff to halt construction of PPD would not significantly burden the applicant, PECO. The only burden would be the legal costs associated with hearings, and the cost of litigation is not an unreasonable burden where interests protected by NEPA are at issue.

On the other hand, failure to delay construction could cause either the commitment of economic resources by PECO to a construction project which ultimately would have to be dismantled, or, more likely, a commitment of environmental

resources in a way which would be, for practical purposes, irreversible even if the environmental cost was later shown to be too high and unnecessary.

Although many studies of the environmental impacts of PPD and related construction have been made, these studies individually and taken together present numerous shortcomings. As shown in Del-AWARE's Petition, and this Supplement, they fail to consider the entire complex focused on PPD in a comprehensive fashion, so as to draw into consideration any cumulative and synergistic effects. In addition, there appears to be no adequate consideration of the secondary effects, i.e. suburban growth impacts, of alternative means of meeting the probable water requirements of the service area dependent on NWRA, of the wetland impact of the intake structure for PPD and of the problems presented by the ever-increasing burdens placed upon the Delaware River and water quality in the river. Also slighted are the impacts of this construction upon historic resources.

Moreover, the NRC staff has committed itself in the past to a thorough environmental review of PPD. This review has not yet been performed. The hour is late, and Staff review completed after the beginning of construction would be, for practical purposes, irrelevant to a decision concerning construction of PPD. Once economic resources are committed, it is very hard to turn back the clock and pursue environmentally superior alternatives.

The Petition of Del-AWARE and this Supplement show, at

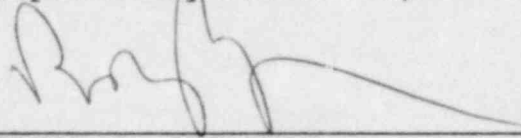
a minimum, that serious issues of environmental concern have not be adequately evaluated. Granting the relief requested in this Petition, i.e. an immediately effective Show Cause Order, will not materially burden PECO. Failure to grant this relief will lead to commitment of environmental and economic resources in a way which can be deleterious and unnecessary. The Petition, the Supplement, and correspondence which has occurred in the interim between submission of the Petition and this Supplement, clearly demonstrate that serious issues of fact remain to be resolved. The Atomic Safety and Licensing Board, in the Special Pre-hearing Conference Order of June 1, 1982, has indicated that a Petition to the Staff under 10 C.F.R. 2.206 is an appropriate procedure for resolving these issues.

For issuance of a Show Cause Order, it is not necessary for Del-AWARE to prove "its case". It is sufficient that we have demonstrated that there are issues which require resolution. The appropriate place for contesting these issues, should PECO wish to do so, is an adjudication pursuant to Section 2.202 of the Regulations.

In the circumstances, where issuance of the requested Show Cause Order cannot materially burden any party, and failure to do so could have irreversible and serious negative consequences, Del-AWARE submits that the only reason-

able course of action for the Staff is to issue the requested Order.

Respectfully submitted,



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Dated: November 8, 1982

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)	
Philadelphia Electric Company)	Docket Nos. 50-352
(Limerick Generating Station,)	50-353
Units 1 and 2))	

Brief clarifying testimony by the Intervenor's witness, Mr. Jonathan Phillippe, concerning hydraulic, hydrologic and related issues based on cross-examination testimony, further study and information only newly available to the witness.

Five topics are addressed, as follow:

1. Flow patterns in the proposed Point Pleasant Pumping Station Intake Area, e.g. below the mouth of Tohickon Creek and the Lumberville Wing dam.
2. Time of travel, Point Pleasant to Trenton
3. Accuracy of Applicant's Rating Curve
4. Utility of velocity measurements
5. Horizontal positioning considerations.

10/23/82

1. Flow patterns in the proposed Pt. Pleasant Pumping Station Intake Area.

Figure 1 and Figure 2 can be used to summarize observations concerning flow patterns in the Pt. Pleasant area. The following discussion represents the educated observations and opinions of Mr. J. Phillippe based on information presently available. General low flow hydraulic control of the river is provided by the Lumberville wing dam at approximately river mile 155.90. A shallow area of the river having a more pronounced channel gradient exists upstream of the mouth of the Tohickon Creek in the vicinity of the cross-section 22.56, at approximately river mile 157.08, surveyed for the "Corps of Engineers Tocks Island Reservoir Study" in 1964. This Section 22.56 corresponds to a general "riffle area" immediately above the mouth of Tohickon Creek. Stream velocities are accelerated in the riffle area. Combined flows from the Delaware and the Tohickon Creek merge just upstream from the bar at the mouth of Tohickon Creek. The bar acts as a constriction in the river under low flow conditions which concentrates the river flows to a channel more narrow than upstream or downstream channels. In fact, the river channel does not return to its general cross-sectional shape for several hundred feet below the proposed PPPS Intake.

Under low flow conditions, flows up to approximately 6000 \pm cfs, the bar tends to produce a cross-current component from the Pennsylvania to the New Jersey sides. The bar itself, as indicated in Figure 2, continues on toward the base of the

proposed intake structure. However, since the bar becomes lower as one moves from Tohickon Creek toward the proposed base of the intake structure, the flow in the river can expand and substantial velocity components angling diagonally across the proposed intake structure can be anticipated particularly in the flow range of 4000-5500 cfs. These velocity components can be expected to be most pronounced in the uppermost flow layers and to be less pronounced lower in the water column because of the continuing constraints of the residual bar. One can contemplate velocity components from the deep channel, upstream of the intake structures, up and over the bar as well.

The eddy, as observed, exists because of the lee formed by the Tohickon Creek bar. This volume of water below the bar expands and contracts only a small amount because the bar itself continues, slightly submerged, for almost another one hundred feet channelward from the depiction on Figure 2. Consequently a large, relatively quiescent, volume of water below the bar constitutes the eddy ^{for} _A flows up to approximately 6000 cfs. As shown in Figure 2, at flows above 6000 cfs the bar is overtopped and the eddy becomes washed out. At lower flows the eddy becomes accelerated by the transfer of momentum from the main current to the eddy. This energy transfer apparently continues from the point the flow passes the bar to several hundred feet below the proposed intake. Under steady-state conditions the eddy accelerates up to the velocity equal to that at the edge of the "main channel." As the flow rises, vortices are noted

in the transition between the eddy and the "main channel." It should be noted, that the "main channel" velocity is achieved as the Delaware River flow passes through the "riffle area" upstream of the Tohickon, is merged with the Tohickon flow, and is constrained by the bar at the mouth of the Tohickon. This accelerated flow becomes damped out somewhat within the "pool" created by the Lumberville dam as the flow is allowed to "spread out" across the river. It should also be noted that rising river stages probably are the assisting mechanism for adding aquatic biota to the eddy, that falling levels of flow encourage out-migration, and that at "steady-state" the integrity of the eddy is essentially maintained.

Within the eddy, one can observe both upstream flow near the shore ~~and~~ and, of course, a downstream flow toward the channel. Because of shallow water and attendant higher energy losses the nearshore upstream velocities are lower, of course than the downstream flow adjacent to the "main channel." Somewhere near the bar the upstream flows are turned toward the main channel. It can be postulated that the returning flows are constrained by the submerged bar and tend to follow the submerged Hickory Creek "channel". It is anticipated that at lower levels in the water column definite currents can be anticipated and these will be directed as discussed above. Swimmers in the area report such currents, however the magnitude of these currents has never been measured in terms of direction.

Finally, it should be noted that the river channel returns to its "normal" shape some 300-500 feet downstream of the proposed intake. From the latter area to above the Lumberville wingdam the channel remains relatively uniform. At the C of E surveyed Section 22.0, the river is somewhat constricted but the constriction is gradual. It can be anticipated that flow directions will be uniform in this area and that a relatively high river velocity can be maintained. Also, the "main channel" is closer to the Pennsylvania than the New Jersey side of the river at Section 22.0, as well.

1. Travel Time to Trenton.

At issue is the time it takes for flow observed at the PPS area to appear at Trenton. The following discussion is based on review of time-of-travel studies (three) performed by the New Jersey office of the U.S. Geological Survey. These studies were done to characterize a low flow regime in the river. The three studies were performed over the flow range of approximately 3500-3900 cfs, 4000-4500 cfs, and 6000-7000 cfs as measured at Trenton.

For the 3500-3900 cfs range, time-of-travel between PPS and Trenton was observed to be approximately 22 hours, with average instream velocities in the PPS area of 1.63 fps. For the 4000-4500 cfs range, time-of-travel was likewise observed to be approximately 20 hours, with average instream flow velocities of 1.82 fps in the PPS area. For the 6000-7000 cfs range, the corresponding time of travel was observed to be 16.5 hours, and the corresponding average velocities in the PPS area were 2.25 fps.

For higher streamflow, the USGS reports an expected time-of-travel of approximately 12 hours between Nockamixon and Trenton as a guide used in its monthly reports of provisional flow data.

3. Accuracy of the Rating Curve Submitted by E.H. Bourguard and Associates to Roy Denmark by letter dated January 22, 1982.

At issue is the accuracy of the rating curve, since this curve is the basis of stream^{velocities}~~flows~~ reported elsewhere.

The rating curve is extremely hard to evaluate. It purports to have good measurements in the flow range from 2850 cfs through 376,000 cfs. However, flows under 5000 cfs are variably affected by the hydraulic control provided by the Lumberville wing dam. At flows below roughly 3000 cfs the weir section of the dam controls, between 3000 cfs and 5000 cfs control is provided by both the weir and the broad crested wing dam. The dam controls elevations at PPPS. Probably somewhere between 5000 cfs and 8000 cfs the effects of the dam are dissipated. Consequently, the upper flow portions of the rating curve probably are realistic. However, even though the weir at Lumberville controls elevations at PPPS up to the 3000-3500 cfs level, establishment of a rating curve is difficult because the weir acts as a partially submerged weir rather than a free-overflow weir. I have developed a reasonable relationship but it is limited because of the very limited number of comparison points. It is clear, however, that one cannot simply extend the preferred rating curve down to 65 feet msl, as has been suggested.

The channel-storage methodology may be useful for adjusting rapidly varying flows observed in the upper ranges of the rating curve. However, the channel-storage is based, apparently, on

scaling cross-sections from topographic maps and/or charts depicting "normal" river levels. Unfortunately, "normal" river levels and flows do not reflect the conditions of interest under low flow conditions. Basically, linearity is assumed under low-flows as well as high flow conditions in the calculations preferred. It is suspected that other non-linearities, such as the Lumberville Dam, exist under low-flows. The USGS time-of-travel studies may be useful in constructing a rating curve because between PPPS and Trenton various channel aberrations have been integrated so that one may be able to progress from PPPS to Trenton while ignoring conditions in between.

A further problem exists in the flow range between 3000 and 3000 cfs in that the few observed "good" sets of flow values and elevations are closely clustered and, in several instances, are contradictory.

One elevation at PPPS has been coordinated with a PPPS flow value. Certain deficiencies have been noted in the handling of the Delaware and Raritan Canal diversion. One can also note that although the USGS staff characterized the Lumberville measurement as good, that characterization indicates a variation of up to plus or minus five percent.

4. Velocity Measurements.

At issue is the worth of velocity measurements used to support the Applicant's submissions.

It is accepted that the flow-meter device used is essentially a state-of-the-art device and is probably sensitive to the range of velocities anticipated.

What is lacking, however, is the direction of maximum flow referenced to the centerline of the proposed intake. Also important ~~for~~ understand^{ing} the flow dynamics about the intake are flow measurements, with direction, at transects upstream and downstream from the intake under various flow conditions. These conditions range from 2000-2500 cfs up to 6000 cfs. Beyond 6000 cfs the river is expected to begin to behave like other cross-sections downstream; e.g., after the bar has been substantially overtopped.

5. Horizontal Positioning.

At issue here is the actual location of the various velocity measurements proffered by the Applicants.

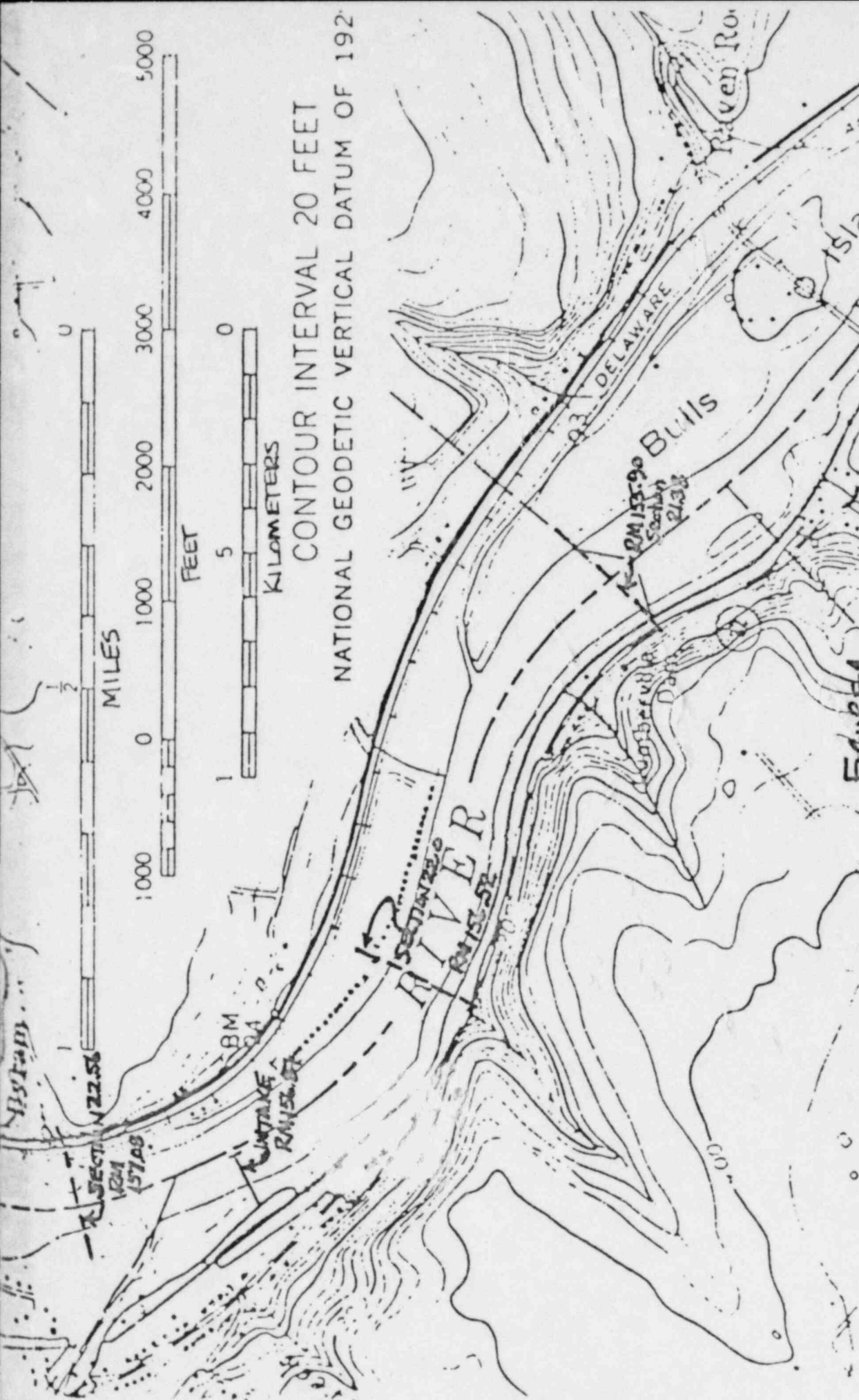
Two methods of horizontal positioning were reported for two velocity surveys.

A rangefinder was used for horizontal distance measurement and a visual range object(s) was used. Rangefinders using split-image are based on optical-parallax and are quite sensitive to mechanical alignment of the optics. Distances as graduated on rangefinder scales are notoriously mismarked. Errors in calibration of a reliable surveying instrument are expected to be systematic and of an uniformly increasing or decreasing nature. When non-systematic deviations are found, they are often indicative of mechanical problems. Such non-systematic deviations were observed in the rangefinder used.

Stadia methods were used to provide horizontal positioning for the second velocity survey along with a transit line to maintain proper horizontal alignment. The stadia approach is inherently rather reliable when performed with the transit and the level rod, both on firm surfaces and over short distances, and is useful in topographic surveying and landscaping layout, etc. It is well known that although a transit may be used effectively for accurate horizontal alignment, or angular measurement up to 600 feet, visual resolution of instrument cross-hairs and small-targets deteriorate over greater distances, particularly where heat waves may interfere. On stationary surfaces one can

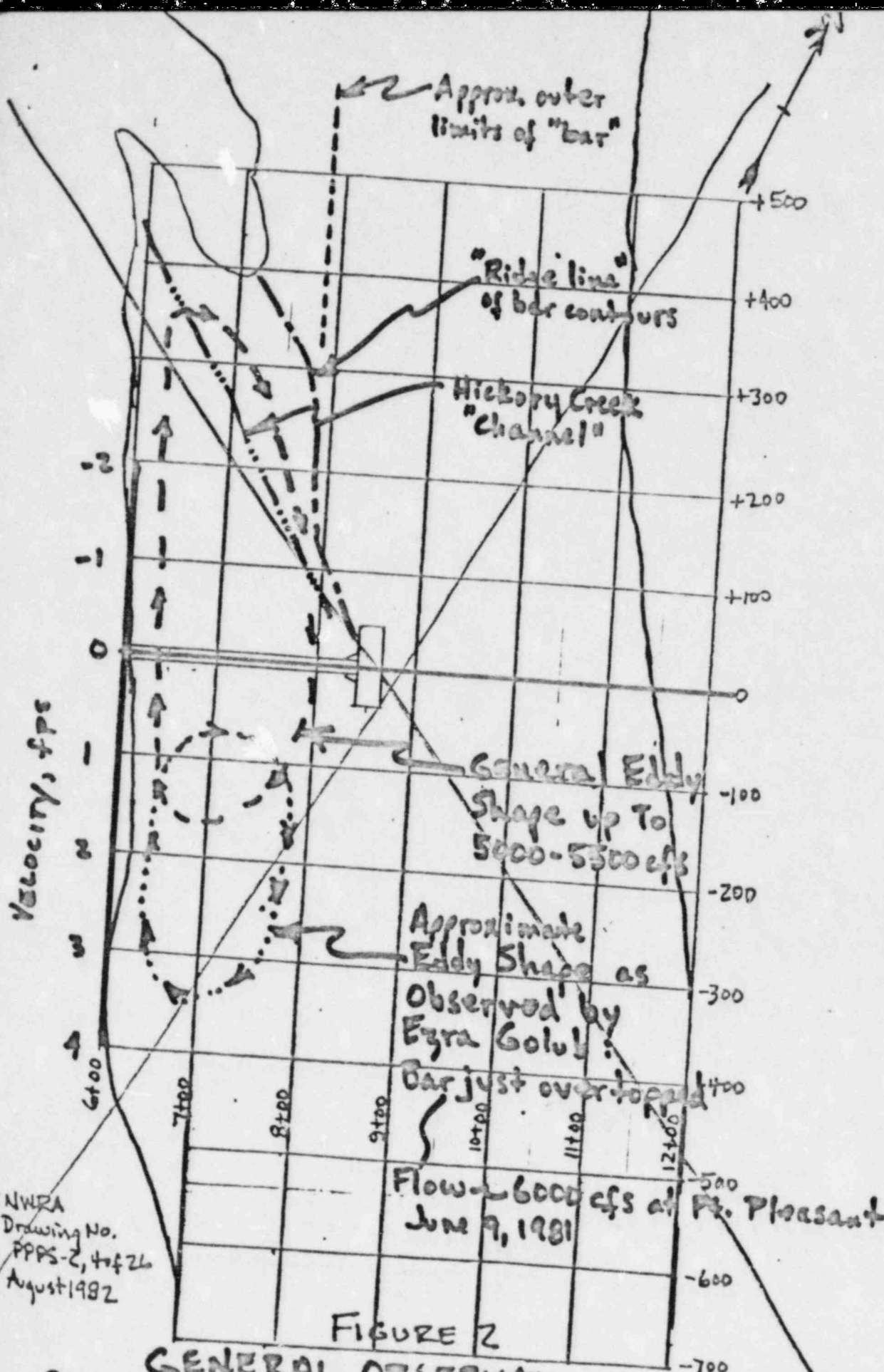
5. (continued)

anticipate horizontal accuracy to at least the nearest foot over short, less than 300 feet, distances. When the level rod is used on a moving, or non-stationary surface, accuracy is affected because the gradations on the rod represent a moving target across a fixed set of stadia hairs, both of which need to be read simultaneously. Thus, if the location is only needed to plus or minus a few feet, then the stadia approach, while not optimal, is adequate. Also, with greater distances cross-hairs tend to block out rod gradations tending to elicit from the observer inaccurate readings of a random nature. For this reason, other methods of horizontal positioning are recommended, such as: a floating tag-line with transit for alignment; two transits (and an accurately measured baseline between them) observing simultaneously a target on a boat; a combined theodolite with distance-meter; or other, presently common, state-of-the-art methods.



CONTOUR INTERVAL 20 FEET
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

Figure 1
 APPROXIMATE LOCATION OF CROSS-SECTIONS WITH AVAILABLE DATA
 IN THE POINT PLEASANT, PENNSYLVANIA AREA



SCS: NWRA
 Drawing No.
 PPS-2, 4426
 August 1982

FIGURE 2

GENERAL OBSERVATIONS
 CONCERNING EDDY DYNAMICS AT
 POINT PLEASANT ON THE DELAWARE R.

R. Danman

NAFEN-E

27 JAN 1981

Mr. Gerald Hansler
Executive Director
Delaware River Basin Commission
P.O. Box 7360
West Trenton, N.J. 08620

Dear Mr. Hansler:

This will acknowledge your 28 August 1980 letter to us concerning Point Pleasant water diversion project.

Your letter indicated that the Delaware River Basin Commission was in a position to comply with the provisions of the National Water Policy Act of 1966 as it may pertain to this docket.

We now have permit applications from the project sponsors for portions of the work within Corps' jurisdiction. In processing these applications the Corps will comply with the cited Act in accord with 33 CFR 325, Appendix C; a copy of this regulation is included.

Sincerely,

1 Incl
As stated

JAMES G. TON
Colonel, Corps of Engineers
District Engineer

Received 2/27/81 during meeting with COE.

Meeting 5-14-82 VSB Conf. Room
Flowers, Carlin

VSB, EJB, WHD

1. Meeting 2³⁰ on Monday 5/17/82 Prepare testimony
for PVC hearings.

1. Bucks needs assurance by letter, agreement or memo
a) that PE can not break agreement and leave
Bucks financially responsible.
b) that PE will not reduce its capacity requirements.

2. Final design - date of issuing specs. Flowers is aiming to
accelerate to May 30, not June 15.

PE does not find that the action by the PVC in
anyway provides for termination of the existing Agreement,
it does not call for a reduction in the planned capacity,
and does not make any alternative acceptable as a
replacement for the Kent District pumping facilities.

PVC hearing on Finding of Necessity -

Room 1306 10AM State Office Broad & Spring Garden Sts

Bucks Co - 5/20/81

Montco Co - 5/21/81.

Meet VSB in garage at 9²⁰ AM.

Very sorry - flowers

BOROUGH OF MORRISVILLE

INCORPORATED A. D. 1804

MORRISVILLE, BUCKS COUNTY, PA. 19067

RECEIVED

OCT 11 1982

SECRET

Statement of
BOROUGH OF MORRISVILLE
and
POLLUTION CONTROL GROUP OF LOWER BUCKS COUNTY

Before the
DELAWARE RIVER BASIN COMMISSION

Concerning
INTERSTATE WATER MANAGEMENT RECOMMENDATIONS

September 29, 1982

Mr. Chairman,
Members of the Delaware River Basin Commission and Staff,
and Ladies and Gentlemen:

My name is Gretchen Leahy. I have been Environmental Coordinator of the Borough of Morrisville and Secretary of the Pollution Control Group of Lower Bucks County since 1973, and I have been actively involved in Delaware Basin water resources planning activities at local, county, state and regional levels for the past eleven years as indicated on the attached page (Attachment 1).

My comments today are on behalf of both the Borough and the Pollution Control Group. We appreciate the opportunity to address the Commission concerning the Draft Report Interstate Water Management Recommendations and its accompanying Background Report. The reports deal with a number of critical issues and policies that we have been concerned about since the Pollution Control Group's formation fourteen years ago.

For those of you who are new to the Commission and its Staff, we offer both a cordial welcome and an attached brief explanation of the Pollution Control Group of Lower Bucks County. (Attachment 2)

Over the years we have made a number of recommendations concerning policies and procedures regarding conservation and re-use of our resources, flexibility in meeting future needs, and reduction of costs and bureaucratic structure. Although we are one of few if not the only such technical committee in the Basin, our technical findings and our recommendations remain to date largely ignored by the DRBC Staff and by the Commission itself. It should be noted, however, that the technical basis of most of our past findings and testimonies of long standing has been recognized only in recent years through various government reports and technical studies.

We appreciate the opportunity to comment on the two documents, Interstate Water Management, Recommendations of the Parties to the U. S. Supreme Court Decree of 1954 to the Delaware River Basin Commission Pursuant to Commission Resolution 78-20, and the accompanying Background Report. The first part of our comments is concerned primarily with Section II, "Diversions, Releases and Reservoir Management During Drought" and germane matters. The latter part of our comments cites examples of other areas of concern of long standing. In some instances we have noted the numbers of specific recommendations to which our comments pertain. Where no numbers appear, our comments pertain to all the recommendations since they refer to fundamental policies which are basic to all Commission activities and decisions whether such policies or programs have been formally or otherwise acted upon by DRBC. This is in keeping with the Parties' statement in Section VII,

"Enforcement", that all the Recommendations be considered as a whole, with each Recommendation being considered material to the whole.

We must be assured of an adequate supply of good quality water at a reasonable price as population and water demand in the Delaware Basin increase. To that end, physical structures such as dams will be needed to some extent, and drought conditions must be planned for. It is appropriate to discuss potential solutions to the problems created by drought conditions.

Fundamental to the finding of sound solutions is clear and accurate problem identification. As long as causes and effects of the problems we face are not clearly and fully identified and differentiated between, recommended and proposed solutions will continue to be inequitable and unsound.

What is before us today is really two problems: one is how to meet out-of-basin water supply demands; the other is how to meet in-basin needs. Unfortunately, the documents before us neither differentiate between the problems of out-of-basin demand and in-basin needs nor discuss how the problem of meeting out-of-basin demands adds to and compounds the problem of meeting in-basin needs. In addition, the Interstate Water Management Recommendations documents focus only on the water resources of the Delaware Basin and do not include water resources available to those areas that demand waters from the Delaware.

Without these distinctions and absent any alternatives, it is obvious that the solutions recommended here are solutions to solve out-of-basin problems at the expense of in-basin needs, both in terms of quantity and quality of waters as well as economically. Furthermore,

.....
the documents confirm precisely what the Commission has been doing in the past, for example, during the drought of the sixties.

The major demand on the Delaware Basin is that of the New York City water supply system. While New York City has built dams to meet its own demand and also to provide for flow augmentation to the Middle and Lower Delaware Basin, it is clear that the design of the City's Delaware system has been grossly inadequate.

It is clear from the documents themselves that New York City's problem is its inability to take its maximum allowable Delaware water diversion of 800 mgd as an annual average with the condition that it provide sufficient water to maintain a downstream flow of at least 1750 cfs at Montague as decreed in 1954 by the Supreme Court.

It is clear, too, that the documents pose to the people of the Delaware Basin not only the problem of managing the remaining waters wisely, but also the problem of compromising our own needs and resources in order to help New York City meet its demands.

Our point is that New York City's problem of meeting the mandated 1750 cfs flow at Montague is precisely that: it is New York's problem, not ours. New York is a water-rich state. For us even to enter into negotiations for lesser flows at any time under any circumstances is for us to assume responsibility for New York's problem.

New York City has many alternatives which would permit maintenance of the required 1750 cfs flow at Montague, for example: further development of the vast resources of the Hudson River including turning on the pumps at Chelsea, New York, as was safely done during the 1960's

drought, aggressively metering the City and repairing system leakage, and enlargement of Cannonsville Reservoir. It should be remembered that drought is not a recent problem but is one of long standing, and that New York City has done little if anything of significance to solve its own water supply problems.

If New York were not a water-rich state, or if the City had made a genuine effort to conserve and develop other water supply sources, we would be sympathetic to its needs and willing to share available resources. As it is, we are not.

Under no circumstances should we permit the mandated 1750 cfs flow at Montague to be violated. We know of nothing in the intent of the 1954 Supreme Court Decree that requires downstream water users to share the cost of compensating for the New York diversion either directly or indirectly, then or in the future.

It is obvious, then, that adoption of the recommended reservoir release program and drought operation formulas should be opposed by all. The proposed action would formally involve the Basin Commission in New York City's problem of providing the necessary water to meet the Supreme Court-mandated flow of 1750 cfs at Montague, and would do this at the expense of the Basin's resources including its people. We point out that DRBC has no regulatory or administrative authority and consequently no control over the use and management of waters beyond the Delaware Basin's borders: it can only make recommendations to the receivers of exported waters.

If we adopt the proposed reservoir management program and drought operation formulas now, can other changes which would adversely affect

the Basin's water quantity, quality and costs be far behind?

We cannot seriously talk of drought programs, storage needs, conservation or a depletive water use budget when, after twenty years of existence, this Commission still has not established any policies on interbasin transfer of water for the protection of the Basin's resources and its people.

It is hard to fathom why the Commonwealth of Pennsylvania would be party to recommending interstate policies on interbasin transfers of water in the Delaware Basin that are contradictory to its own adopted policies on transfers of water between basins in the rest of the state. Pennsylvania's self-contradiction is even harder to understand since the recommended Delaware Basin interstate policies are largely at the expense of the Commonwealth. The essence of Pennsylvania's 1975-adopted policies regarding interbasin transfers in the rest of the Commonwealth is as follows:

- "a. Water within the [requesting] basin shall be developed to the fullest economic, environmental and hydrologic extent before transfers will be considered.
- b. Future needs of the basin of origin shall be protected.
- c. No transfers will be allowed without proper compensation to the basin of origin. *

Nothing less than that which is fully consistent with the above should be adopted by any agency including DRBC. We note that had such policies been in effect in the basin, the form of the recommendations under consideration and of a goodly number of related federally and otherwise funded studies would be radically different from their ex-

* Dept. of Environmental Resources, Commonwealth of Pennsylvania, State Water Plan Planning Principles (SWP-1), Harrisburg, March, 1975, p. 4.

isting form.

Additional relevant concerns that we have raised over the years are repeated again upon reviewing the two documents before us today. Unfortunately, we find that more of our concerns are omitted than are included. For example:

(A) We are concerned about the continuing absence of any control over New York City's present and future water use during normal, non-drought conditions.

...Failure to address this concern increases the frequency of imposing drought warning and drought conditions on the Middle and Lower Delaware Basin.

(B) We are concerned over the continuing absence of a specific schedule for development of New York City's Hudson River resources and for implementation of aggressive conservation measures such as control of system leakage and metering including retroactively.

...Water used by the Delaware Basin's 7,000,000 people is already over 90% metered, but the 18,000,000 people outside the Basin who use our water are only about 25% metered. Furthermore, according to Commissioner McArdle, in 1979 there were only three wet industries in New York City, and the City's water use was 160-190 gallons per capita per day (160-190 gpcd) as compared to 100-130 gpcd nationally. The latter figure includes industrial as well as municipal water use: actual domestic water use is about 50 gpcd.

...Given these inequities and the absence of any control over

the City's normal use and over parallel development of the City's own available resources, we find:

- a. Use of storage conditions in New York City's Upper Delaware reservoirs as a trigger for declaring a basin-wide drought emergency under the Compact and for initiation of emergency in-basin conservation measures is inequitable and unreasonable. (Rec. 10)
- b. Any drought-imposed "conservation objective" of reduced in-basin depletive use and contingency plans applied only to in-basin water use are inequitable and unreasonable. (Rec. 11 and 12)
- c. We emphasize that New York City's stringent, drought-imposed conservation measures are inefficient as long as the City's normal, non-drought, wasteful use remains unchecked and its own available resources remain undeveloped. Similarly, like percentage reductions of out-of-basin and in-basin non-consumptive and consumptive water use are inequitable and unreasonable.

(C) We are concerned that DRBC still has no legally established minimum flow to the head of the Estuary at Trenton, nor has the Commission set any upper limit on the amount of water that can be removed from the Basin either by exportation or by evaporation.

...Sympathy for New York City's water supply problems should be rooted out in any form, particularly in view of the following finding of the Level B Study:

(T)he controlling factor in sea salt intrusion may prove to be the total annual flow, rather than the manipulation of the waters remaining after export and consumptive use in order to sustain minimum flows during the summer months.

If this is the case, a major concern should be the reduction of total annual depletive uses, (consumptive and export use) not just emergency measures applied to the "dry" summer months. (Sic) *

(D) We have long recommended development of a Basin-wide depletive water use budget including all exportations, but we are concerned about inconsistencies in the structure of the depletive water use budget as presently recommended. We are concerned for a number of reasons, for example:

...Exemption of areas from control is inconsistent with conservation.

...Exemption of the New York City reservoir drainage area or the area above Montague from control is inequitable and inconsistent with the "pooled waters" concept.

...Under the Basin's "pooled waters" concept, adopted policy is that all the Basin's waters form a single pool. It should be understood by all, however, that DRBC's existing and proposed regulations contradict Commission policy by separating the freshwater supply into three distinct pools: 1) New York City's pool; 2) the remaining Upper Basin pool, which includes the large Lackawaxen drainage basin and other tributaries as well as the waters between New York City's reservoirs and Montague; and 3) the watershed below Montague.

...Inequities already exist because of the three pools created

by DRBC's present administrative structure (for example, water

* p. 4, Delaware River Basin Comprehensive (Level B) Study Draft Final Report, October, 1979.

charges regulations). The proposed changes protect and enlarge New York City's pool at the expense of the Lower Basin.

...For all the Basin's waters to work as one pool, the Basin's waters should be allocated both in proportion to contributing watershed area within the respective states and in proportion to in-basin population served within respective states. With respect to New York City, that portion of the pool controlled by New York City shall be in accordance with the mandates of the 1954 Supreme Court Decree, and none of the costs of the City's meeting its mandate shall be assessed against downstream water users.

(E) We are concerned that the documents make no effort to relate flows to water quality despite known interdependencies, and that flows are related only to salinity. (Rec. 1)

...We note that although it is recommended that New York City's flow requirements at Montague be relaxed only part of the time, chloride standards would be relaxed all of the time. Water quality is not improved by lowering existing salinity standards.

...Relaxation of existing chloride standards is inappropriate in the absence of full public evaluation of water quality ramifications including those referenced in the Level B Report as unknown and in need of further study and evaluation.

...The documents fail to recognize:

- a. need for flushing;
- b. seasonal water quality impacts of an altered flow regime;

- c. the value of water to the stream itself; and
- d. that the Delaware is a resource and a commodity of incalculable value.

(F) We are also concerned that it is not generally known either what the costs will be or who will bear the costs of off-setting adverse water quality impacts in the River system caused by the proposed actions. We are concerned, too, that the documents fail to provide this basic information to the Basin's people.

...It is unconscionable that this Commission, charged with the responsibility of protecting the resources and people of the Delaware Basin, would justify removing water from the River and Estuary by these documents, then turn around and tell the Basin's people they must buy back presently existing flows of water. Yet this is precisely the assumption made by DRBC in its May, 1981, Final Level B Report regarding the cost of enlarging New York City's Cannonsville Reservoir for flow augmentation. DRBC would have the people of the Delaware Basin bear costs of this project, as per footnote 4, Table 23. (Attmt. 3)

...This type of information should be in the body of that report rather than in its footnotes. Also, DRBC is being less than forthright in omitting this information from the body of the documents under comment today as well.

...Again, it is New York's problem to supply the 1750 cfs flow at Montague and to bear all costs of doing so, not our problem. No action whatsoever should be taken to reduce flows below the presently mandated level at Montague, to lower existing salin-

ity standards or to reduce the present 3000 cfs flow objective at Trenton without full public knowledge of who will bear the consequences and costs of recommended courses of action.

(G) We are concerned about the inconsistency of DRBC's application of the Montana Method in setting minimum stream flows.

...The Montana Method which correlates stream flow with water quality is not used on the main stem of the Delaware, but is recommended by DRBC Staff for use elsewhere in the Basin, for example, on Little Merrill Creek.

...We note that improving water quality in the Delaware River and Estuary for fish, wildlife and recreation is a priority item in the Level B and other studies.

(H) We are concerned that the documents fail to reveal what method or methods will be used to calculate flows at various control points in the Basin, and that it is therefor unclear whether measured flows will be actual flows of real water usable by people, fish and other aquatic life, or will be "equivalent flows" as set forth in DRBC's Level B Study.

...An "equivalent flow" is an amount of water measured elsewhere and then calculated as if the water actually flowed by a control point when in fact it has not.

...Public attention was first called to the "equivalent flow" concept following DRBC's publication in October, 1979, of its Draft Final Level B Report.

...On March 30, 1981, DRBC's Executive Director testified before the U. S. House Subcommittee on Water Resources that the "equivalent flow" concept had been dropped from the Level B Study.

...In May, 1981, DRBC published its Final Level B Report which included as well as the concept itself: 1) a number of sections justifying its use; 2) a table showing how amounts of water diverted above Trenton are subtracted from the Trenton flow objective, how amounts of water projected as being conserved below Trenton are subtracted from the Trenton flow objective, and how the Trenton flow objective has thus been reduced from 2690 cfs to 2340 cfs (i.e., to 20% of the average annual flow at Trenton); 3) a number of other tables using "equivalent flows" as the basis for determining New York City diversions, flows at Montague, and projected impoundment costs and yields; and 4) in its Final Environmental Impact Statement Section the statement, "This concept is eliminated in the Final Report."

...Use of the "equivalent flow" concept is inconsistent with DRBC dockets which cite specific control point figures as triggers for compensating reservoir releases.

(I) Last but not least, we are deeply concerned that wording regarding sustainable flow has been changed from "minimum sustainable flow" to "maximum sustainable flow".

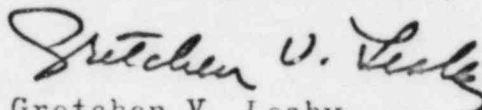
...This as per the May, 1981, Final Level B Report notwithstanding the Executive Director's additional denial of this concept at the aforementioned Congressional Hearing on March 30, 1981.

...For example, where we once had 2700 cfs as minimum sustainable flow at Trenton, this change would permit DRBC to operate the Basin's water resources with 2340 cfs or less as the maximum sustainable flow at Trenton.

In short, we find that the Interstate Water Management Recommendations of the Parties to the U. S. Supreme Court Decree of 1954 to the Delaware River Basin Commission are inconsistent with the charge of the Commission, that they adversely affect the Basin's Comprehensive Plan and that they should be rejected virtually in toto by all.

If the Commission and its Staff persist in deceiving and misleading the Basin's people by withholding critical information and misrepresenting that which is presented for public review, we cannot survive as a viable River Basin.

Respectfully submitted,


Gretchen V. Leahy

Environmental Coordinator,
Borough of Morrisville

Secretary,
Pollution Control Group of Lower Bucks County

Gretchen V. LeahyWater Resources Credentials - May 15, 1979

B. A., Smith College, 1949

(All water resources activities have been on a voluntary, unremunerated basis.)
.....

Independent study in Water Resources field		1971-
Borough of Morrisville/Morrisville Municipal Authority Environmental Coordinator		1973-
Pollution Control Group of Lower Bucks County Co-representative Executive Secretary		1973- 1974-
Neshaminy Water Resources Authority Assistant Secretary/Treasurer; Secretary		1976-78
 <u>Bucks County Master Plan for Water Supply</u>		
Advisory Committee	regularly attending voting member	1973-75
 <u>Pennsylvania State Water Plan</u>		
Subcommittee on Water Resources	regularly attending voting member	1973-78
 <u>Pennsylvania Comprehensive Water Quality Management Plan (COWAMP/208)</u>		
Municipal Dischargers Subcommittee	regularly attending voting member	
Industrial Dischargers Subcommittee	regularly attending voting member	
Mun./Ind'l. Dischgrs. Joint Subcom. (succeeded previous committees)	regularly attending voting member	
Study Advisory Committee (SAC)	non-voting participating member	
Technical Advisory Committee (TAC)	participating observer	
Policy Advisory Committee (PAC)	non-participating observer; participant where permitted by structure (e.g., joint committee meetings)	
County Forums and related meetings	e.g., Year 2000 Forums	
Special meetings with Staff and Consultants		
 <u>Delaware Estuary Model Study</u>		
Technical Advisory Committee	non-participating observer	1976-
Policy Advisory Committee	participating observer at certain joint meetings with Estuary Model TAC	
 <u>Coastal Zone Management Plan</u>		
County Forums	regular attendee	1975-
Study Steering Committee	regular attendee	1975-76
(Lower Bucks County Municipal Governments Representative)	regularly attending member	1976-
 <u>Level B Comprehensive Study, Delaware River Basin</u>		
Invited Observer	non-voting participant	1977-
Study Advisory Committee	participating member	

The Pollution Control Group of Lower Bucks County is a voluntary, non-funded, non-partisan, technical advisory committee comprised of water quality control professionals who represent the major municipal and industrial water suppliers, users and dischargers located in the highly developed, heavily industrialized lower part of Bucks County, Pennsylvania. The area begins immediately north of Philadelphia and extends along the upper reach of the Delaware Estuary to the Estuary's headwaters at Morrisville, Pennsylvania, directly across the River from Trenton, New Jersey.

Together the municipalities and industries we represent employ about 8,000 people and provide more than 200,000 people in the Basin's economic heartland with water supply, pollution abatement and waste treatment services.

The Pollution Control Group was formed in 1968 in response to DRBC's request that these municipalities and industries perform a technical evaluation of a then-proposed Upper Estuary facility. Since that time we have continued to offer joint technical testimonies consisting of our findings based on publicly available government data and studies, and our recommendations.

Our testimonies document our continuing concern over the ways in which various aspects of water resources planning and management may affect water quantity, quality and costs in the Delaware River Basin and in the Upper Estuary in particular since it is the most sensitive and thus the critical part of the system, and how such programs, projects and policies or lack of same may affect the health, safety and welfare of the people of the Delaware Basin.

TABLE 23

COST AND AUGMENTED YIELD OF PROPOSED IMPOUNDMENTS FOR FLOW AUGMENTATION

Project	(A) Allocated Capital Cost for Flow Augmentation ¹	(B) Augmented Yield, cfs Delaware River at Trenton ²	A ÷ B Capital Cost per cfs Augmented Yield
<u>Comprehensive Plan Impoundments</u>			
Aquashicola	\$ 70 million	100	\$700,000
Maiden Creek	\$101 million	310 ³	\$330,000
Prompton (Mod.)	\$ 19 million	130	\$150,000
Tocks Island	\$152 million	1790	\$ 85,000
Trexler	\$ 28 million	165	\$170,000
Walter (Mod.)	\$ 46 million	290	\$160,000
<u>Impoundments Identified by URS/Madigan-Praeger</u>			
Girard	\$ 46 million	80	\$570,000
Hawley	\$ 73 million	120	\$610,000
Hackettstown	\$ 45 million ⁵	130	\$350,000
Lackawaxen	\$261 million	740	\$350,000
McMichael	\$ 44 million	80	\$550,000
Shohola Falls	\$ 27 million	80	\$340,000
Tobyhanna	\$ 77 million	350	\$220,000
<u>Other (Cannonsville Mod.)</u>			
Cannonsville (Mod.)	\$ 1 million ⁴	85 ⁴	\$ 12,000
<u>Off-Stream Impoundments</u>			
Cherry Creek	\$210 million	1800	\$117,000
Equinunk	\$133 million	560	\$240,000
Flat Brook	\$125 million	1050	\$120,000
Little Martins Creek	\$ 96 million	370	\$260,000
Merrill Creek	\$ 88 million	220	\$400,000
Milanville	\$115 million	550	\$210,000
Pidcock Creek	\$122 million	620	\$200,000
Mill Creek	\$ 79 million	270 ³	\$290,000
Red Creek	\$ 81 million	340 ³	\$240,000

Source: Delaware River Basin Comprehensive (Level B) Study, Final Report and Environmental Impact Statement, DRBC, May, 1981.

FOOTNOTES TO TABLE 23

¹Costs for the on-stream impoundments (Comprehensive Plan impoundments, those identified by URS/Madigan-Praeger, and the Cannonsville modification) are based on October 1977 costs. Costs for off-stream impoundments based on the 3 percent higher June 1978 costs. There is no need for further refinement - costs and yields are approximate.

²Augmented yield estimated by dividing flow augmentation storage by 120 days; assumes full to empty storage uniform withdrawal for this period of time.

³Augmented yield at confluence of Schuylkill River with Delaware River. Same method as Note 2 used for determining equivalent flows for salinity repulsion purposes.

⁴Assumes half of project cost and storage dedicated for flow augmentation of Delaware River at Trenton.

⁵Cost discounted to 1977 dollars. No allocation for future Water supply or recreation benefits.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

FEB 17 1981

Mr. Robert L. Tedesco
Assistant Director for Licensing
Department of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

D. H. Pence

Dear Mr. Tedesco:

Philadelphia Electric Company's Limerick nuclear facility is a complex project that has been controversial for many years. We have recently been involved in numerous meetings with the Delaware River Basin Commission (DRBC) concerning plans to permit diversion of water from the Delaware River in part for supplemental cooling water supply for the facility. We are particularly concerned with the consumptive use of scarce water resources, the mechanisms for provision of the necessary storage, and the physical and biological impacts on the natural streams which will convey the flows to Limerick.

Therefore, we were pleased to hear from the DRBC, from Dr. Samworth at NRC in Washington, and from the article quoting you in the Philadelphia Inquirer (February 10, 1981) that NRC is planning to prepare Draft and Final Environmental Impact Statement supplements prior to issuance of an operating license for Limerick. We were also encouraged to note that you will be including review of the impacts of the supplemental cooling water diversion. DRBC has indicated that they would like to consult and coordinate with you on those portions of the EIS.

Since, as required by the National Environmental Policy Act, EPA will be reviewing the EISs, we would like to participate in the project scoping meetings so as to address the concerns we have raised in the past and provide for their resolution in a timely fashion during EIS preparation.

We are looking forward to working with you.

Sincerely,

George D. Pence, Jr.
George D. Pence, Jr., Chief
Environmental Impact Branch



BUCKS COUNTY CONSERVANCY

11 North Main Street, Doylestown, Pennsylvania 18901
(215) 345-7020

November 27, 1981

Mr. Ron Eller
U. S. Army Corps of Engineers
Philadelphia District
U. S. Customs House
2nd & Chestnut Streets
Philadelphia, PA 19106

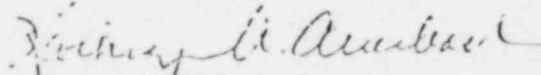
Dear Mr. Eller:

Pursuant to our telephone conversation of November 12, 1981 and previous correspondence to the Corps I am submitting comments to the Eligibility Determination Report prepared by Ms. Elizabeth Mintz August 1981. This report is in reference to the historic resources located in the area of Point Pleasant, Bucks County, Pennsylvania which are being reviewed at this time with regard to the effects of the proposed pumping station.

Please accept these comments and forward them to all agencies and individuals responsible for the review of this project.

Thank you for the time extended to the Conservancy to prepare these comments.

Sincerely,


Kathryn Ann Auerbach
Director, Historical Sites Survey

Enclosure

Ech 374

DIRECTORS: William Arney • Mrs. Robert Biddle III • Robert C. Bodine • T. Sidney Cadwallader, Esq. • Norman J. Drustup
Mrs. Paul Flack • Kenneth W. Gemmill, Esq. • William F. Heufner, Esq. • Lewis Hull • Virgil Kauffman
Lloyd H. Klazkin • Lloyd Lawrence • Mrs. Fred W. Little • Mrs. Renton McIninger, Jr. • William C. Ridge • Harley L. Stowell
Martin Sutton • Peter A. Glascoff, Esq., Solicitor • Robert W. Pierson, Executive Director

D-41

November 28, 1981

I do hereby affirm that I am an authorized representative of the U. S. Army Corps of Engineers, Philadelphia Branch and have been instructed by Mr. Ron Eller to receive a packet of information from the Bucks County Conservancy of the above address containing comments on the Eligibility Determination Report prepared by Ms. Elizabeth Mintz regarding the area of Point Pleasant, Bucks County, PA.

I have received such package and will deliver accordingly.

John A Burnes 11-28-81
Signed,

John A BURNES
Printed

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

Comments and Criticisms regarding the
Request for Determination of Eligibility
prepared by Elizabeth Mintz
for the
Army Corps of Engineers

August 1981

Prepared by Kathryn Auerbach
Director, Historical Sites Survey
Bucks County Conservancy

November 1981

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

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POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

General Comments

Specific Comments

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

Comments and criticisms regarding the Request for Determination of Eligibility prepared by Elizabeth Mintz for the Army Corps of Engineers August 1981

General Comments

In March 1980 the Bucks County Conservancy was apprised of the Point Pleasant Pumping Station proposal and its location within a potential historic and archaeological district. Although scheduled to conduct other survey and register work at the time, the Conservancy recognized the threat this project could pose to the historic village and worked quickly with local residents to gather enough information so that state and federal officials would recognize the historic and prehistoric resources and provide the area with a proper review.

Within one week the information was prepared and delivered on March 10, 1980 to Mrs. Brenda Barrett of the then Office of Historic Preservation of the Pennsylvania Historical and Museum Commission. While brief, and in some sections not fully developed, the information submitted clearly defined the extent of the district and the major development trends throughout its history. The Conservancy encouraged volunteers to continue the research and the cataloguing of buildings which proceeded at a slow but steady rate.

For purposes of environmental review, the Conservancy provided the National Register of Historic Places with a copy of the above prepared information. On November 7, 1980 the Conservancy submitted additional information to the Pennsylvania Historical and Museum Commission and on November 10, 1980 Point Pleasant was listed as an historic district on the Pennsylvania Inventory. On December 18, 1980 the village was accepted to the Bucks County Register of Historic Places.

In April 1981 the Conservancy met with representatives of the Pennsylvania Historical and Museum Commission, the Army Corps of Engineers, the Neshaminy Water Resources Authority (proposing the project) and the Philadelphia office of the Heritage, Conservation and Recreation Service to discuss the effects of the proposed pumping station on the pre-historic and historic resources and what documentation was necessary for further and complete review of the project.

The Conservancy commented that a Cultural Resource Study prepared in 1978 by Edward Shortman and Patricia Urban did not mention the existence of the Point Pleasant district and did not

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General Comments (continued)

adequately locate or analyze the Indian village site studied by Dr. Henry Mercer in the immediate vicinity of the proposed pumping station. The HCRS commented that more in-depth information than had been officially presented by the Conservancy was needed on the historic and archaeological district and the boundaries justified. The Conservancy and the PHMC concurred and recommended further study by contract with the Army Corps. It was the Conservancy's intention in recommending this study to have the opportunity to clarify the facts that were vague, expand upon the information that was previously submitted and secure the proposed boundaries with sound geographical, archaeological and historical justification.

The Conservancy was initially dismayed to hear the contract was awarded to someone who had not had contact with the Conservancy nor had done much (if any) research in Bucks County. We were further alarmed when we noted that the contractor, Ms. Elizabeth Mintz, did not contact our office for the information we had on file (some of which was in addition to that which had been previously submitted) nor for precise items requiring in-depth research to clarify certain historical beliefs and facts. When the Conservancy received a copy of the Mintz report from the Army Corps on September 10, 1981, it became obvious that she re-researched what the Conservancy had already done and drew conclusions without the benefit of a basic knowledge and understanding of architectural and developmental trends of the central portion of Bucks County.

Furthermore, and totally inexcusable, is the deletion of the Tinicum Township section of Point Pleasant in the definition of the district boundaries. The district with boundaries including the Tinicum section was approved by both the Bucks County Register of Historic Places and the Pennsylvania Inventory. While Ms. Mintz does comment on the existence of historical resources in Tinicum, she does not give any justification as to why they are not included in the district. The result is an unbalanced presentation of the Historical and Archaeological District of Point Pleasant and a report that supplied no new information. It is unfortunate that the existing information in the Conservancy office was not used in the preparation of the Mintz report so that new and more accurate comments could be presented.

The Conservancy's primary concern is to have Point Pleasant Historical and Archaeological District represented at all levels of review as thoroughly and correctly as possible. We requested of the Army Corps the opportunity to submit comments and criti-

POINT PLEASANT HISTORICAL AND ARCHAEOLOGICAL DISTRICT

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General Comments (continued)

cisms on the Mintz report in order that all records are a consistent and proper documentation of Point Pleasant.

On November 12, 1981 in a telephone conversation with Ms. Kathryn Auerbach of the Conservancy Mr. Ron Eller requested that comments on the inaccuracies of the Mintz report be as detailed and specific as possible. To this end the report has been reviewed section by section, paragraph by paragraph. In some cases the comments may not affect the review of the pumping station project or may appear petty, but they are made to be historically accurate and consistent with other documentation of Point Pleasant. Some of Ms. Mintz' mistakes are sloppy and not expected from a professional researcher.

The deletion of the Tinicum Township section of the district alone would require the rewriting of the report. In addition, it is the opinion of the Conservancy historical staff that the village developed in response to natural features and transportation routes and not particularly to English community planning concepts. What can be said for the latter theory is that English (and other national and ethnic) community planning in rural Bucks County essentially took the form of responding to the given natural resources and practical use and development of transportation routes. In that sense Point Pleasant does represent community development although not conscious planning of a town system that interrelates.

Point Pleasant is very important in the study of Delaware River towns and villages. It is also very valuable from the point of view of archaeology, having such a complex variety of sites within one area.

Despite her lack of contact with the Conservancy and limited knowledge of Bucks County, Ms. Mintz did stress the value of the archaeological sites and historic district that she defined and expressed most of the development trends important to the evolution of Point Pleasant.

Point Pleasant is a valid and valuable historical and archaeological district and we hope the Army Corps will accept our comments with the sincerest intentions.

Kathryn Ann Auerbach
Director, Historical Sites Survey
Bucks County Conservancy

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

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Specific Comments

Cover Page:

PROPERTY NAME:

The first recorded name for the Plumstead side of the area later to be named Point Pleasant was apparently "Pearson's Ferry." However, a more common, and longer lived, historic name would be "Black's Eddy" or "Lower Black's Eddy" for the Swartz (Black) family who owned considerable property, including the ferry and tavern during the developmental years of the village.

Although the name "Black's Eddy" was supplanted in 1828 by "Point Pleasant" by the Post Office Department, the name has been maintained, in part, due to the naming of "Upper Black Eddy" village in Bridgeton Township in the nineteenth century, the name by which this Bridgeton village is known today.

LOCATION:

The researcher's assertion that the Point Pleasant District is located in Plumstead Township reveals a basic flaw in the documentation. Although the Army Corps of Engineers is specifically interested in the portion of the proposed district which is situate in Plumstead (re the Point Pleasant Pumping Station), the proposed historic and archaeological district is not wholly contained in Plumstead, but encompasses much in Tinicum Township as well, with substantial buildings and sites of significance in each. Any historically and archaeologically adequate representation of Point Pleasant must include the areas in both townships. The supposition that the Point Pleasant district lies totally in Plumstead Township leads to repeated defects in the presentation, omitting important aspects of the village's physical description and historic significance.

The brief Verbal Boundary Description given here if mapped according to present day land forms and tax parcels does not connect in several places.

CLASSIFICATION:

Historic and Archaeological District. Due to the diverse and extensive prehistorical sites known to exist in this

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

Comments and criticisms regarding the Request for Determination of Eligibility prepared by Elizabeth Mintz for the Army Corps of Engineers August 1981

Specific Comments

CLASSIFICATION: Cover page (continued)

area (more extensive than in most areas of Bucks County) the Conservancy feels it is appropriate to classify the area it has defined as the village of Point Pleasant to also be an archaeological district.

PREPRESENTATION IN EXISTING SURVEYS:

1. Point Pleasant Historic District was listed on the Bucks County Register of Historic Places December 18, 1980.
2. Point Pleasant Historic District was listed on the Pennsylvania Inventory of Historic Places Nov. 10, 1980.

Map:

POINT PLEASANT, PENNSYLVANIA, HISTORIC DISTRICT BOUNDARIES 8/81:

As mentioned before, the entire section of Point Pleasant in Tincum Township has been deleted from the district with no justification. In addition, the Conservancy feels that the properties on either side of Tohickon Hill Road up to and including #34-18-94 be included in the district as it is felt the approximate 300' elevation line forms a natural and effective boundary distinction. (See enclosed map of boundaries proposed by the Bucks County Conservancy).

PHYSICAL DESCRIPTION: Page 1

1st Paragraph:

The historic district should include Tincum Township. This above cited limited understanding of the proposed district makes the researcher's physical description statement incomplete. The district is located in the central part of Bucks County--"Central" Bucks County is not an official term; the "C" should not be capitalized. (See also pages 9 and 16 of the Mintz report.)

2nd Paragraph:

"...developmental history of the 18th Century English..." should read, "18th and 19th Century, English and German..."

3rd Paragraph:

The unity among the developmental trends representing different periods of growth is the control imposed by the surrounding natural features of the area and how

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Specific Comments

PHYSICAL DESCRIPTION: Page 1

3rd Paragraph: (continued)

the various transportation links enter into and cross this area. Early 18th century English settlement was not extensive enough to create a structure by which later development was inserted. The early settlement was controlled by the natural terrain and access to resources. The village today does have a very rural, rambling character lacking sidewalks, straight roads, etc., which may be what Ms. Mintz is referring to as 18th century English.

4th Paragraph:

Ms. Mintz does not clearly define what she feels is the "village core". Since as early as 1800, and definitely by 1828 when the post office was moved, reinforced by the Point Pleasant Pike and Delaware bridge c. 1850, through to today, the village core is the bridge over the Tohickon Creek leading to the Point Pleasant Hotel (Trading Post). The village core of the mid-18th century was probably the area at the foot of River Hill (Old Ferry) Road. The Ferry Road was laid out c. 1738 from Chalfont (Butler's Mill, 11 miles southwest of Point Pleasant) and was a point of access as important as River Road. Ms. Mintz' statement, "Sense of place and cohesiveness created by the English..." is inadequate. Substantial settlement by Germans and other groups took place after 1760.

5th Paragraph:

As mentioned before the Verbal Boundary Description needs to be rewritten and the boundaries more justifiably defined (particularly to include the Tincum Township portion of the village). The Pennsylvania-New Jersey border does not connect to the rear property line of the Stover Mill (44-32-2).

PHYSICAL DESCRIPTION: Page 2

1st paragraph: (continued from page 1)

Refer to previous comments regarding including Tincum Township section of Point Pleasant. See enclosed map

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Specific Comments

PHYSICAL DESCRIPTION: Page 2

1st Paragraph (continued)

for the Conservancy's proposed boundaries which are defined by the elevation lines (approximately 300'), the prehistoric and historic sites. Ms. Mintz mentions again the "core of the early village" being in Plumstead. The "Cave Bank" for which the Cave Bank Fishery (c.1748) was named was in Tinicum Township; the first mill (c.1740) in Point Pleasant was along the creek in Tinicum Township (44-32-2); and John VanFossen petitioned in 1792 for a house of public entertainment near a ferry "to be erected" near or at the present site of the Point Pleasant Hotel in Tinicum. (Two of the signers of the petition were George and John Geddes.) In addition, as part of the archaeological district, the Walter's Nursery property (44-33-11 & 11-1) is the site of a substantial Indian settlement site and has produced unique and important artifacts.

There is no sound justification for ignoring the later and very important growth events and their physical manifestations. The 1868 Map by Thomas S. McNair of the Delaware Division Canal (PA State Archives: RG#6-#27-Point Pleasant) shows a substantial village core around the hotel, store and church in Tinicum Township, with just a scattering of structures in the Lower Black's Eddy area. While this map does not represent all the structures in the village it is interesting that McNair seems to emphasize the Tinicum section of Point Pleasant as the primary area of the town. Ms. Mintz, while validly recognizing the control nature had over growth patterns in Point Pleasant, seems to misrepresent the amount of growth occurring before 1760 and overemphasizes its effect on later growth. Throughout the history of this village the natural features and transportation routes have defined the arrangement of structures more so than any one ethnic group's efforts at town planning.

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Specific Comments

PHYSICAL DESCRIPTION: Page 2

2nd Paragraph:

Ms. Mintz has oversimplified the early development pattern. There were structures scattered throughout the Plumstead and Tinicum areas of this valley in the 18th century. At the ferry site (Plumstead) there was possibly a much more extensive collection of buildings than at present. (Some remain along River Road at the junction of Old Ferry Road.) While we can comment on the location of the 18th century buildings which remain today, it is dangerous to make definite conclusions as to the original settlement patterns as some of the original buildings are gone. Much more detailed research is required before a clear picture of what was there can be made.

Page 3:

2nd Paragraph:

Ms. Mintz has presented a totally misrepresentative generalization of Bucks County architecture. Information from the Conservancy's comprehensive historic sites survey indicates that approximately 70% of Bucks County's houses before the Civil War are 2 1/2 story, three bay, one pile (room) deep with a gable roof and only one door. While not uncommon, buildings with two front doors and/or two rooms in depth are not the forms by which Bucks County architecture is characterized. These are features which appear in domestic architecture after 1800 and in many cases after 1820.

3rd Paragraph:

Mr. Glassie draws his base for generalizations on English Pennsylvania architecture from a much wider region than the central portion of Bucks County. Within the latter region fieldstone construction and one front entrance door is predominant. The two examples given by Ms. Mintz appear to have been built in the early 19th century and are not exclusively English in design--they could have also been built by Scotch-Irish or Germans.

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Specific Comments

PHYSICAL DESCRIPTION: Page 3

4th Paragraph:

The statement that "I" houses were built before 1760 is inaccurate; the house type described by Glassie took its form during the mid-18th century and was used extensively throughout Bucks County until 1850 and in some cases later. Two room deep houses were built by Germans and other national and ethnic groups as well as English and, as stated above, were an exception to the norm and usually built after 1800.

Comments on this section:

Ms. Mintz' selective quotes from Glassie (p. 49 Pattern in the Material Folk Culture of the Eastern U.S.) give a different interpretation to his theory. The Conservancy's historical staff has read Glassie's statements and find they concur with our comprehensive survey findings and our above comments.

It is interesting to note that Bucks County architecture along the Delaware River presents a wide diversity of building styles, materials, etc. and cannot be categorized or generalized as easily as inland rural architecture. It is important to Bucks County by illustrating how exposure to a variety of cultural groups and trends and ideas in addition to a variety of building uses can affect style in architecture.

Page 4:

1st Paragraph:

No footnote #3 to document the quote.

2nd Paragraph:

Double pile houses, while not always purely 2/3 Georgian, are more popular in Bucks County villages than in the countryside--a pattern most likely defined by building lots with limited road frontage.

3rd Paragraph:

Ms. Mintz does not give a tax parcel number for the Indian village site, does not mention the two locks

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Specific Comments

PHYSICAL DESCRIPTION: Page 4

3rd Paragraph (continued)

on the canal in this section, gives the wrong tax parcel number for the Lock Tender's house (which is 34-20-63, not 69) and has the ferry landing coming after the Lock Tender's house instead of before. Moving up the River Road toward the center of the District she does not mention the intersections with River Hill (Old Ferry) Road or Ferry Road, both very important in the development of Point Pleasant. The firestation dates to c.1925, not 1950. The village "core" as described by Ms. Mintz in this paragraph is different from the one seemingly described in Paragraph 1, Page 2. This second village "core" of converging waterways and roads concurs with that described by the Bucks County Conservancy, March 1980. The "Y" and "T" shapes described here are unclear and cumbersome. Even recognizing the Corps of Engineers interest in the Plumstead portion of Point Pleasant, Ms. Mintz gives a very cursory accounting of the Tincum section of Point Pleasant, ignoring several important structures and sites such as the Solliday House (44-30-3), Stover Mill (44-32-2), Stover House (44-30-8-1), the Baptist Church (44-30-7), the 19th century Victorian houses and store, the intersection of Cafferty Road, and the Walter's nursery with its substantial Indian village site. The iron bridge carries Point Pleasant Pike over the canal; the bridge across the river (built c.1853) was destroyed by the 1955 flood. The cited "Park Road" is shown on maps as "Tohickon Hill Road".

4th Paragraph:

Including the Tincum Township section, there are approximately 190 buildings within the District, with examples of 18th and primarily early 19th century vernacular styling.

Page 5:

1st Paragraph:

Ms. Mintz' summary statement is essentially well-presented although we feel it is dangerous to state that Point Pleasant is a "proto-typical 18th century rural village" based on the information presented. Individual

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

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Specific Comments

PHYSICAL DESCRIPTION: Page 5

1st Paragraph: (continued)

title searches and research would need to be conducted in order to date structures which have characteristics we have found to be indicative of the early 19th century which Ms. Mintz dates as 18th century.

The question still remains of what was the extent of the 18th century development, and was it sufficient to define and influence later development, or does development in Point Pleasant contain common threads due to the influence of nature and transportation routes?

34-18-166 Mountainside Inn (photographs #1 & #2)

Seven bays best described as 3 bays plus 4 bays representing two sections built at different times. Very doubtful that the Inn dates earlier than 1738. Significant patronage from rafters from earliest times through 1880's.

34-20-50 (photograph #3)

Simple boxed wood cornice with modillions, not dentils. This building has an appearance of 1850 or later, not 1830, although specific dating would need historical information to justify. It was used as a lodge or meeting hall with the double doors leading to a wide set of stairs. First floor built into stone cliff and possibly just used for storage.

34-20-45 (photograph #4)

Ms. Mintz has confused her labeling. Photograph #4 is of structure 34-20-46 which was built of block c.1950. Structure 34-20-45 is pictured in photograph #7 and dates c.1800 or earlier with a second story door possibly for an earlier two story porch. Possibly used as a hotel.

Page 6:

34-20-43 (photograph #8)

"Georgian Vernacular"--does this mean two rooms deep? Or does it refer to detailing?

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PHYSICAL DESCRIPTION: Page 6

34-20-39 (photograph #9)

This house is better described as 2 1/2 story with an exposed basement. While probably dating to 1820, the porch, probably added, creates a later look influenced by the Greek Revival.

34-20-37 (photograph #10)

The dormers are probably recent. This structure exhibits traits of a house of 1820-30, not 1760.

34-20-34 (photograph #12)

"L" houses are not defined by Ms. Mintz. Again, certain features are more characteristic of 1820, not 1760.

Page 7:

Photograph #15 was not commented upon. It also falls into the category Ms. Mintz terms "Georgian Vernacular".

Photograph #19 is the Tohickon Creek Aqueduct for the canal, the longest in the Delaware Canal System.

44-30-1 (photograph #20)

This property is in Tincicum Township, not in the boundaries of the district proposed by Ms. Mintz. Also, a former resident of this house states that it was always used as a house.

44-30-13 (photograph #21)

Also in Tincicum Township. Possibly the VanFossen hotel. A hotel on or near this site burned and was rebuilt in 1812.

34-20-64.1 (photographs #28 & 29)

Rumored to have been a speakeasy and to have been rebuilt c.1912.

34-20-64 (photograph #30)

More likely on tax parcel 34-20-63.

34-20-58 (photograph #32)

Possibly older than 1825.

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Specific Comments

PHYSICAL DESCRIPTION: Page 8

34-20-55 (photograph #34)

Apple Jack's Tavern. Said to have been built by the Swartz family c.1810-1812, possibly remodeled c.1850.

34-20-70 (photograph #35)

Possibly the kitchen for the house opposite which was marked as a hotel on the McNair map. Architectural description inaccurate--2 story with assymetrical fenestration; "Georgian Vernacular" does not apply in the same sense as Ms. Mintz has used it previously. No basis for dating the structure 1790.

Comment on photographs:

Ms. Mintz has described those buildings which she feels "best characterize the intent and flavor of the district". She has neglected the buildings on Ferry Road and important ones in Tincum Township including two schools, a church, an 18th century mill, fine houses, and places minimal emphasis on the canal, one of the most important development factors of the village....

HISTORICAL SIGNIFICANCE: SUMMARY: Page 9

1st Paragraph;

The periods of development for Point Pleasant may better be outlined as follows:

- Indian Settlement in the Delaware Valley (Pre-history)
- White Settlement, including English, German, Scotch-Irish in Plumstead and Tincum Townships (c.1730-1820)
- Operation of the Delaware Canal (1830-1931, prime before 1830)
- Tourism, commercial & limited industry (c.1820-present)

2nd Paragraph:

As per previous comments, it is misleading to call Point Pleasant a "product of 18th century community development planning." Contrary to English 17th and 18th century towns such as Philadelphia, Williamsburg, or even Bristol Borough or even "New Town" in Bucks County, Point Pleasant never had a mapped plan for development or an arrangement of buildings for style rather than practicality.

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Specific Comments

HISTORICAL SIGNIFICANCE: INDIAN SETTLEMENT: Page 9

1st Paragraph:

Point Pleasant has an archaeological district with boundaries corresponding to those proposed by the Bucks County Conservancy. In Tinicum there is an extensive site at Walter's Nursery (44-33-11 and 11-1) and the boundary on Tohickon Hill Road abuts an unusual and as yet unexplained grouping of stone walls, towers, pedestals or platforms on property 44-18-91-1. This archaeological district represents possibly the most extensive and diverse Indian settlement site in Bucks County, possibly serving as a central trade area with Indians of other regions.

Ms. Mintz refers to Dr. Henry Mercer as an "amateur archaeologist". This classification understates Dr. Mercer's prominence in the field of archaeology for his time. The Bucks County Parks and Recreation Department's brochure on the Moravian Pottery and Tile Works states that Dr. Mercer held the professional capacity of Curator of American and Prehistoric Archaeology at the University of Pennsylvania Museum.

4th Paragraph:

Mercer also gives a detailed accounting of his findings in Point Pleasant in the "Antiquity of Man".

Page 10:

1st Paragraph:

Ms. Mintz mentions "as a side note" the area was referred to as "Lower Black's Eddy". See our comments under PROPERTY NAME in this report.

Ms. Mintz makes no attempt to pinpoint the location of the Indian village site studied by Dr. Mercer. This information is important for the proper review of the pumping station proposed in the immediate vicinity.

Page 11:

3rd Paragraph:

There is no footnote for the Rivinus map.

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HISTORICAL SIGNIFICANCE: INDIAN SETTLEMENT: Page 11

4th Paragraph:

There is no footnote or reference for the Kollner watercolor of Point Pleasant.

5th Paragraph:

Ms. Mintz does not document who has reported archaeological findings in the area near the village site.

Page 12:

1st Paragraph:

Ms. Mintz's accounting of the Indian Walk is not entirely accurate. The Walk of 1737 was a resurvey of a 1686 purchase of land in Bucks County north of Wrightstown to extend as far back in the woods as a man could walk in a day and a half. As viewed by the Indians this area lay south of Tinicum Township (incorporated March 12, 1738). Ms. Mintz needs to document the source that states that the Indian Walk did not take place. According to Josiah B. Smith's unpublished manuscript of the history of Newtown and Upper Makefield there were eyewitness accounts of this walk (John Knowles' family history).

"Springford" is most likely Springtown on Route 412 in Bucks County. "Solesbury" (also mentioned in paragraph 3) is a derivation of Solebury which appeared in a few early records. The common and accepted form, Solebury (Township), has been used since 1720.

ENGLISH SETTLEMENTS: Page 12:

3rd Paragraph:

No documentation for the statement that members of the "Society of Friends" began settling in the Point Pleasant area.

Page 13:

1st Paragraph:

The date for the Mountainside Inn given here is 1869, possibly a typing error from the previous reference to 1689. Again, c.1738 is a safer date.

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Specific Comments

ENGLISH SETTLEMENTS: Page 13

1st Paragraph (continued)

No reference has ever been given for a grist or saw mill on property 34-20-40 at the point of River and River Hill Roads. The 1868 McNair Map shows a saw mill on parcel 34-20-62 or 63 near the canal lock. While possibly having investments in Plumstead Township, the Cave Bank Fishery from which the collective took its name was actually located in Tinicum Township.

2nd Paragraph:

The name Black appears in 1769 when Michael Swartz purchased the ferry and surrounding land. The post office was at Lower Black's Eddy from 1821-1828 when it was removed to Point Pleasant. The map reference given by Ms. Mintz, Kennedy 1817, is actually the W. E. Morris map of 1850 (figure 3 is also mislabeled).

3rd Paragraph:

In 1738 the Old Ferry Road was laid out from Butler's Mill (Chalfont) to Pearson's Ferry. The Point Pleasant Turnpike was not established until the mid-19th century, probably in anticipation of the completion of the bridge over the Delaware in 1853. According to research conducted by Mrs. Helen Sirmay (see enclosed) the section of River Road through Point Pleasant can be dated from 1736.

Comments on "English Settlements":

Ms. Mintz makes no mention of the growth of the area after the settlement of other national and ethnic groups. Scotch-Irish names appear on early maps and Germans migrating through the Perkiomen Valley reached this area by the 1760's. Both groups made valid contributions to the early development of the area. Also, no mention is made of one of the earliest industries--rafting, particularly to move logs, down the Delaware River. The Eddy near the ferry was a natural spot to "put in" for the night and accounts record that the nearby inn would need to accomodate dozens of rafters in one night. This industry remained strong, although leaving no blatant physical evidence, until the 1880's.

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Specific Comments

CANAL PERIOD: Page 13

1st Paragraph:

The statement, "Canal systems were long a popular transportation mode in other parts of the county..." is misleading. According to C. P. Yoder in Delaware Canal Journal: A Definitive History, "But it was not until the Erie Canal, across New York State from Albany to Buffalo, was completed in 1825 that the real potential of this means of transportation was demonstrated" (page 13). The Delaware Canal, begun in 1827 was not far behind the popular trend.

Page 14:

1st, 2nd, and 3rd Paragraphs:

Ms. Mintz does not stress the importance of Point Pleasant as a mid-point in the canal system with many canal-associated structures--mule barns, lock keeper's house, tool house; and structures/businesses active due to the canal--hotels, brothels (reputedly), stores, saw mills, and limekilns.

The Delaware Canal perhaps prospered longer than other canals because the railroad lines could not follow the same path or anywhere near. Also, judging from the record of toll charges for the Delaware Canal in 1849 (Yoder, p. 244) there was no charge rate for coal, although 580,934 tons were shipped in that year (Yoder, p. 241).

POST CANAL ERA: Page 14

1st Paragraph:

The present core of the village has an appearance contemporary with the creation of the Point Pleasant Turnpike and the opening of the bridge over the Delaware--c.1850-1855. It was an important stop on crossing stagecoach routes.

2nd Paragraph:

Ms. Mintz has read the quoted Atlas of 1876 incorrectly--the proposed railroad does not follow "along the path of the canal route" but enters the northern portion of Plumstead Township and follows closely along the Tohickon Creek to its mouth near the Delaware Bridge.

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

Comments and criticisms regarding the Request for Determination of Eligibility prepared by Elizabeth Mintz for the Army Corps of Engineers August 1981

Specific Comments

POST CANAL ERA: Page 15:

1st Paragraph:

Comments on tourism, commerce, quarrying and other smaller industries are totally undeveloped. Tourism was important to Point Pleasant throughout the 19th and 20th centuries, not just "in Point Pleasant's more recent history". Especially popular for its natural beauty and fishing, notable people frequented there. It is rumored the Point Pleasant Hotel accomodated U.S. presidents. George MacReynolds in his Place Names of Bucks County (p. 254) mentions that President Grover Cleveland frequented a section of the Delaware River several miles north of Point Pleasant. Speculation suggests that he might have stopped at Point Pleasant. The records for the Hotel were destroyed in a fire in recent years. In the early 19th century the famous Solliday clocks were made in or near Point Pleasant as members of the family lived throughout the area. The stone quarried from Point Pleasant was exported to New York and Philadelphia.

HISTORICAL SIGNIFICANCE: A STATEMENT: Page 16

1st Paragraph:

The information herein is basically well-presented although it is necessary to stress that the entire area of Point Pleasant (Plumstead and Tinicum sections) is important as an archaeological district with various interrelated sites. Ms. Mintz needs to comment on the extensive archaeological findings at Walter's Nursery site.

3rd Paragraph:

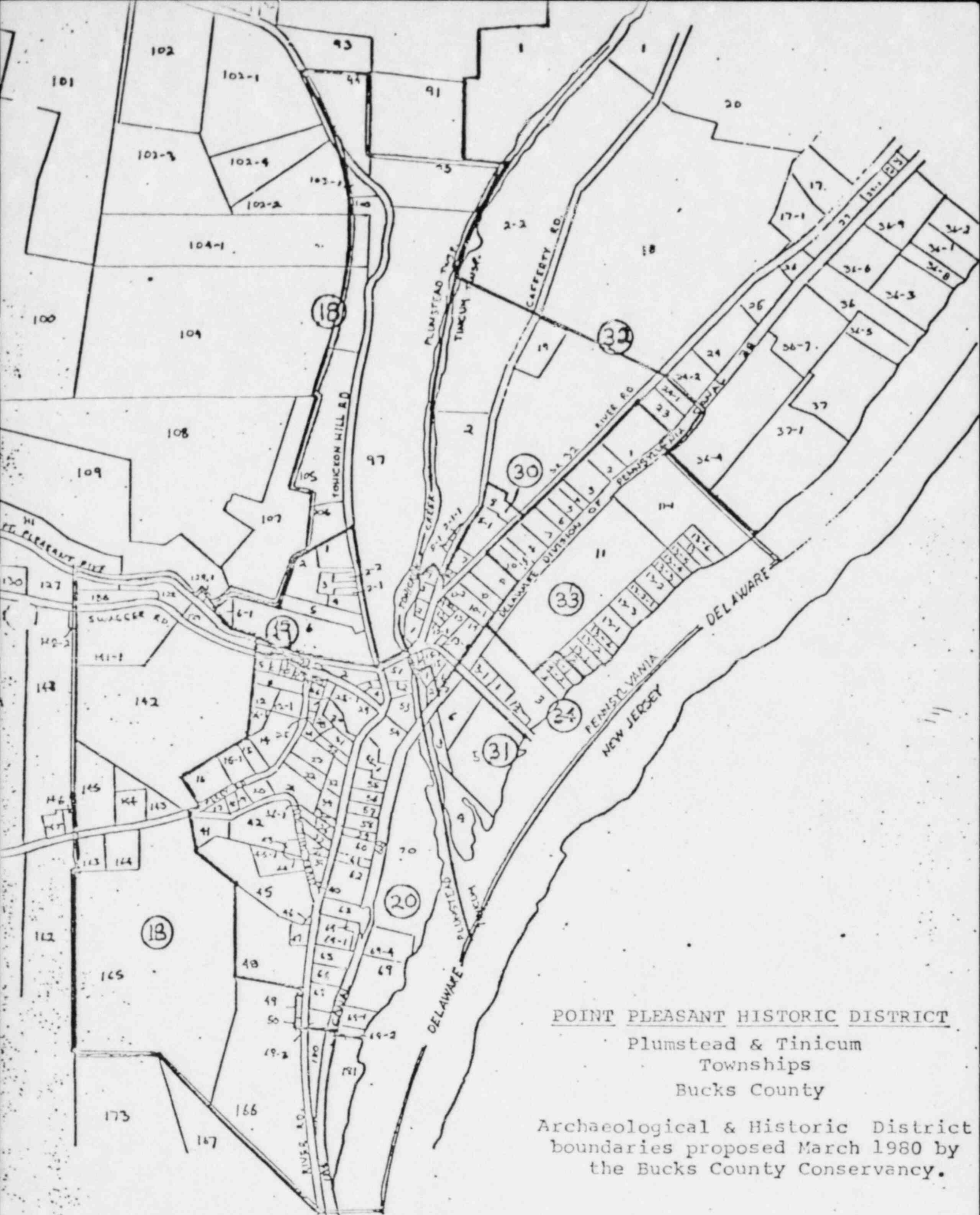
While white settlement was established in the 18th century it wasn't until the late 18th and early 19th centuries that the town took its real form.

Ms. Mintz' other general comments on pages 16 and 17 are basically sound.

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

Map Index:

- Archaeological and Historic District boundaries proposed March 1980 by the Bucks County Conservancy.
- Approximate elevation lines in the area of the Point Pleasant District, Plumstead and Tinicum Townships.
- "Plumstead Township, 1759" land ownership map.



POINT PLEASANT HISTORIC DISTRICT
 Plumstead & Tinicum
 Townships
 Bucks County

Archaeological & Historic District
 boundaries proposed March 1980 by
 the Bucks County Conservancy.

Source unknown. Filed here.
Showing land owners in 1759
Probably mid twentieth cent



John Boyle

St. Georges St

St. Louis St

St. Louis Hill

St. Louis Square

St. Louis St

101

102

103

104

St. Louis Hill

St. Louis Square

St. Louis Hill

St. Louis Square

St. Louis Hill

St. Louis Square

St. Louis Hill

St. Louis Square

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

Information prepared by the
Bucks County Conservancy
and submitted to the
Pennsylvania Historical and Museum Commission

March 1980

Later included in nominations to the
Bucks County Register of Historic Places
Pennsylvania Inventory of Historic Sites

POINT PLEASANT HISTORIC DISTRICT

Physical Description:

The village of Point Pleasant is located along the Delaware River in Bucks County at the boundary between Plumstead and Tinicum Townships. It is visually bounded by the ridges (approximately 300' elevation) of the steep beautiful valleys formed by the confluence of the Tohickon Creek, Geddes Run and Delaware River. Most of the clustered settlement is in or directly above the alluvial plain of the Tohickon or set against the steep cliffs along the creeks and river. The village center opens out from the crowded approaches to reveal a "town common" of rushing water, bridges and the buildings edging on the mouth of the Tohickon.

Moving throughout Point Pleasant one is constantly aware of the closeness of the natural setting, the steep slopes and water. Only perhaps on the plain between the canal and the river north of the Tohickon does one sense any feeling of immediate openness although the high diabase hills close off any distant vista.

Geographic features break the village up into small areas and limit the visual as well as physical access to the town. At the same time proximity to these features in addition to a general uniformity of scale tends to unify the physical elements.

Twelve roadways and waterways follow a 200° spoke-like pattern to approach the hub of Point Pleasant, the mouth of the Tohickon. All excepting River Road and the adjacent Delaware Division of the Pennsylvania Canal south of Point Pleasant drop considerably in elevation coming into town, most following the steep stream valleys.

The Geddes Run Valley paralleled by Point Pleasant Pike is the most breathtaking. Lined with mountain laurel and hemlock this valley according to George MacReynolds, supplies "some of Bucks County's most attractive scenery".¹ As one approaches from the west the road begins to drop passing operating and abandoned quarries on the right and steep slopes on the left. As the road progresses into the valley, there are steep slopes on both sides, with the stream down to the left. There are almost no structures until the center of town along this approach as the inclines are too great and the velocity of the stream during flood season destructive.

1. George MacReynolds, Place Names In Bucks County. Doylestown: The Bucks County Historical Society. 1942. p.185

POINT PLEASANT HISTORIC DISTRICT

Physical Description (continued):

Swagger Road traces the tops of the above-mentioned quarries directly southeast of Point Pleasant Pike then bends down into the Geddes Valley passing two recessed intrusions then steep natural slopes until a vista of the town unfolds with the hotel and bridges off to the far left (picture #8), summer cottages on the right, and the Point Pleasant Pike below on the left. Swagger Road then intersects with Ferry Road which passes a few older homes and sheds until meeting with the River Road just South of Geddes Run.

The third and oldest approach from the west is along top of the diabase hill filling the south corner of the intersection of Geddes Run, the Tohickon and the Delaware. This road, Ferry Road, parallels Hickory Run named for the abundant hickory trees along its banks.

Hickory Run does not flow through a valley due to the extreme hardness of the rock but cascades over the ridge above River Road. (picture #1) Ferry Road, likewise, follows along the plateau with random construction adjacent. Approaching two 19th century frame houses on the right, Ferry Road turns slightly and begins to drop. Suddenly a cluster of houses appear, Old Ferry Road (now River Hill Road) bears off to the right closer to Hickory Run and Ferry Road bends to the left passing a two story cupolaed schoolhouse (picture #3) and crowded 18th and 19th century 2 1/2 story stone and frame houses. At this point the road is dropping steeply, giving a view of Point Pleasant and bends to the right as it meets Swagger Road. It continues briefly until it dead-ends into River Road with the firehouse and an old 1 3/4 story frame house opposite. Old Ferry or River Hill Road as it bears off from Ferry Road winds down a steep wooded hill to River Road passing closely by a few 18th and 19th century houses and a contemporary house set back. River Hill Road intersects with River Road just north of Hickory Creek adjacent to a striking 18th century 2 1/2 story stone house. (picture #2)

The approach from the south on River Road although fairly level passes by very steep and dramatic cliffs. Directly preceding the historic district the road barely fits between the cliffs and the canal with only a sliver of the towpath between the canal and the river. The road bends to reveal the bridge supports in the distance (the bridge itself destroyed in the 1955 flood) and a field wedged between the road and the canal.

BUCKS COUNTY CONSERVANCY • 33 West Coun Street, Doylestown, Pennsylvania

POINT PLEASANT HISTORIC DISTRICT

Physical Description (continued):

Split rail fencing surrounds the gradually widening field graced with trees creating a very pleasing prospect. The stone Mountainside Hotel, and early 18th century river inn, is set against the cliffs on the left immediately followed by an interesting white frame Greek Revival structure. As one proceeds through the Lower Black Eddy Section of Point Pleasant there is a mixture of 18th and 19th century houses on either side of the road, tall cliffs to the left and a broadening plain to the right extending to the canal and river. A slightly overgrown field formerly the site of the ferry landing, limekilns and possibly very early Indian settlement is on the right before River Road crosses a small bridge over Hickory Run. The density of houses increases, mostly 2 1/2 story, set fairly close to the road, predominantly 18th and 19th century.

River Hill Road comes down the cliff and marks the visual widening of the district to the left to include the houses on the hill in the block bounded by River, River Hill and Ferry Roads. From River Hill Road to the town center the development is close yet casual, early 20th century resort related structures such as bungalows and a luncheonette are interspersed among small yet interesting old 2 1/2 story stone and frame houses. (pictures # 4 & 5) Approaching Ferry Road one passes on the right "AppleJacks" bar, a mid-19th century large stone building, (picture #6), the late 19th-early 20th century firehouse, an old frame house and blacksmith shop foundations. River Road bends slightly to the left and intersects with Point Pleasant Pike at the Post Office. River Road joins with the Pike to cross the 1922 concrete bridge over the Tohickon with the large Point Pleasant Hotel on a knoll directly facing.

The River Road approach from the north is somewhat similar to that from the south with more of a drop in elevation. Coming from Smithown the road is again squeezed between the cliffs and the canal. The road drops and the area widens slightly to accomodate older homes on the cliff side and newer ones on the River side. The plain between the road and the river widens considerably by the beginning of the district marked by a small red frame store on the left. No buildings occur on the right or cliff side until well into the town. On the left is the flood plain with Indian sites, a nursery and the canal. A 30-40 year old trailer and summer cottage park is located at the edge of the plain along the Delaware and is totally obscured by trees having no visual impact on

POINT PLEASANT HISTORIC DISTRICT

Physical Description (continued):

on the district. Up higher along the road are a few newer homes, then a series of Victorian frame houses. These tend to get larger and more interesting as one approaches the town center. The plain below is almost totally obscured by these houses and their respective barns and plantings.

The level ground widens on the right and set back is a large 19th century house and barn. Cafferty Road, which passes directly by these buildings, is coming down from the top of the hill on the right. Next is a newer home then a small parking lot separating it from the striking 1832 Baptist Church and school on the point formed by Cafferty and River Roads (picture #11). The series of Victorian homes on the left ends here succeeded by several small 20th century structures then a complex of low sheds behind the large Point Pleasant Hotel being approached from the rear. Facing River Road where Cafferty Road blends in on the right is a well-designed late Federal (1826) 2 1/2 story white frame home with flanking one-story wings (picture #10). Following close to the road is an old store and as the road bends down slightly to the left is a three story brick building on the right directly before the bridge (picture #9). River Road continues to the right over the 1922 Tohickon Bridge. Should the road be followed round to the left in front of the hotel one passes a bungalow on the right then goes up over the canal on an 1877 iron bridge (pictures #23,24,25) to the flood plain area with 19th century farm house and buildings on the left and an early 20th century dance pavillion, now restaurant, and barns on the right. The road essentially dead ends at the approach to the former Delaware Bridge and a dirt lane to the left goes by the wooded trailer and cottage lots.

Cafferty Road comes into Point Pleasant from the north paralleling River Road and the Tohickon on top of the ridge separating the two. The district begins with the cemetery (picture #15) at the top of the hill and follows on the Tohickon side of the ridge affording a wooded view of the valley. The road descends through the wooded hill with random stone walls on the left until passing by a large stone barn and house and on the right a frame house and shed. The 18th century stone and frame grist mill is down the hill on the right (pictures #12,13). The road continues briefly past the church and school to River Road.

POINT PLEASANT HISTORIC DISTRICT

Physical Description (continued):

The Tohickon Hill approach also affords a splendid view of the Tohickon Valley. Beginning at the top of the hill a stone wall to the left marks the property line for a striking 18th century fieldstone house set back from the road. Beginning the descent through the wooded slope the road bends to the right between two houses set close to the road, the left one a 19th century frame and the right an 18th century stone. The Valley now can be seen with the graveyard appearing on the top of the hill directly across. Tohickon Hill Road travels down the face of the slope in a gradual linear fashion passing one intrusion on the left, then a stretch of natural terrain before reaching a row of regularly spaced houses on the right. During the descent one catches glimpses of Point Pleasant through the trees, especially the Baptist Church. Two older homes, three early bungalows and three more homes bring one to the 1978 concrete Geddes Run Bridge and the intersection with Point Pleasant Pike. The last house, a 2 1/2 story grey stone is particularly handsome set against the backdrop of the Geddes Valley (picture #9).

Experiencing Point Pleasant from the Delaware Division of the Pennsylvania Canal gives one a much less crowded impression of the town. To canal goes Point Pleasant is an alluvial plain between two stretches adjacent tall cliffs. The town is set up on a higher level away from the river with only a scattering of structures near the canal. Coming from the south, one passes near the Mountainside Inn and a bridge to Lock #13, then along a short stretch of open fields to the Hickory Run overflow and Lock #14 with the locktender's house adjacent. Progressing into town the backs of lots on River Road face the canal to the left and what is called Kings Island to the right. The mule barn is on the right as well as a white frame house formerly an inn with a small stone kitchen adjacent. The canal crosses the Tohickon via a concrete aqueduct replacing the wooden one after a severe flood in the 1930's. The canal is then crossed by the 1877 iron bridge near the Point Pleasant Hotel and travels across the low plain now a nursery. After leaving the district it is crossed twice by wooden bridges and comes very close to River Road as the Delaware presses against the hills.

POINT PLEASANT HISTORIC DISTRICT

Physical Description (continued):

Point Pleasant visually has two distinct architectural sections supported historically by the existence of two separate villages now merged into one. The earlier section, Lower Black Eddy, is clustered around the two Ferry Roads down to the Mountain-side Inn. It has an 18th and early 19th century atmosphere, small to medium sized houses clustered closely against the hillside above the floodplain. There are relatively no documented service structures in this section save the inn and the school.

Point Pleasant proper is essentially adjacent to and north of Point Pleasant Pike and is a town of the mid-19th century. There is more spacing between and dramatic placement of structures in this part, particularly with the hotel, church and a fine Victorian house between Swagger Road and Point Pleasant Pike. There are more service buildings in this section: the Hotel, church, school, stores and grist and saw mill.

There are approximately 190 structures within the suggested boundaries of the historic district with close to 85 pre-1900 houses and less than 25% intrusions. 8% of total, or 12 of the intrusions are situated along the river and not visible.

The architecturally and visually dominant buildings located throughout Point Pleasant are as follows:

34-18-94	Large fieldstone house, top of Tohickon Hill
34-18-166	Mountainside Inn
34-19-6	Grey stone at mouth of Geddes Run
34-20-2	White frame Victorian house overlooking town center
34-20-3	Dobron's Store, Victorian frame
34-20-15-1	2 story schoolhouse with cupola
34-20-45	Colonial 2 1/2 story white plastered stone house
34-20-54	Late Victorian firehouse
34-20-55-1	AppleJack's Tavern
44-30-3	1826 late Federal white frame house
44-30-6, 7	1832 Greek Revival Baptist Church & school
44-30-13	Point Pleasant Hotel

POINT PLEASANT HISTORIC DISTRICT

Historical Significance:

Very little history has been written about the quiet river town of Point Pleasant. The following has been compiled from general Bucks County Histories and oral history.

Archeology - Prehistoric:

Probably the best documented segment of Point Pleasant's past is that about the extensive Indian settlement and activity in and around the site of the present town. Dr. Henry C. Mercer investigated sites throughout the Delaware Valley and made this statement on his findings in the Lower Black Eddy section of Point Pleasant:

I discovered after digging a deep trench that there was a lower village layer below the well-known surface village at Lower Black Eddy. This underplaced village-site at Lower Black Eddy is the oldest human trace that I have been able to find in the Delaware Valley, and if I give up the Trenton gravel specimens it is all I have left. Who inhabited it? Was the denizen a predecessor of the Indian, was he the Trenton gravel man himself, or was he only the first Lenape immigrant? To these questions I can say that no extinct animal bones were found to give date to the lower hearths. The lower village man made pottery which the ice men were not supposed to be able to do. He used more argillite than jasper. His arrows and spears were very narrow and long, but that does not seem evidence enough to me to prove, as has been urged, that he was an Eskimo. Until other evidence is in, the reasonable supposition seems that he was the first coming Lenape pioneer of the 15th century.

Although this site was not precisely pinpointed in the article the open field near Hickory Run (34-20-65,66) occasionally produces prehistoric artifacts on its surface, mortar and pestle arrowheads and pipes found recently.

¹ Dr. Henry C. Mercer, "Red Man's Bucks County" in a Collection of Papers Read Before the Bucks County Historical Society, Vol. II, pp. 279, 280

BUCKS COUNTY CONSERVATION & WATER CONTROL DISTRICT, DOYLESTOWN, PENNSYLVANIA

POINT PLEASANT HISTORIC DISTRICT

Historical Significance:

Another archaeologically significant site is along the Geddes Run Valley and is described by Dr. Mercer in the same article:

The Valley has distinction in scientific circles from its Indian quarry on the south side of the creek, a short distance above Point Pleasant where countless "Turtle Backs", fashioned out of local argillite by Lenape Indians could be found.²

Other Indian sites are a small village atop Hickory Run, clay digging site between Ferry and Swagger Roads (34-18-142), settlements in the plain along River Road north of the Point Pleasant Hotel (44-33-11). Adjacent to the presently proposed district boundaries is a most unusual grouping of stone walls and foundations on the hill (34-18-91) overlooking the Tohickon Creek. Included in these undocumented remains is a solid round stone tower about 8' high. Further investigation should be conducted to determine its significance and inclusion in the district.

Archaeology - Historic

Pearson's Landing or Black's Ferry, established 1739, was located in Lower Black Eddy, southeast of the intersection of River Hill Road with River Road possibly on parcels 34-20-65, 66, 69. It operated continuously until the Delaware Bridge upstream was constructed in 1853. Old pillings have been found on the site and some residents remember the location or a boathouse there.

These parcels are also the location of old limekilns, now in ruins. The areas adjacent the canal, particularly at the locks, aqueduct, Inn and mule barn could produce archaeological information as well as the blacksmith shop ruins. (34-20-52)

²George MacReynolds, Place Names In Bucks County - Doylestown, Bucks County Historical Society 1942 p. 185-186

POINT PLEASANT HISTORIC DISTRICT

Historical Significance (continued):

Ferry Road was opened in 1738 extending across Bucks County 11 miles from Chalfont to Point Pleasant then called Pearson's Landing to bring travelers to the only Delaware crossing for 5 miles either north or south. When the Delaware Bridge was opened in 1853 the Point Pleasant Pike became the important transportation route and the development emphasis switched from Lower Black's Eddy to Point Pleasant.

The Delaware River was the earliest transportation route and continued to be used by rafters and loggers until 1900. The Mountainside Inn dates back close to 1700 servicing the river travelers. River Road was an old Indian path and provides the only North-South route for 4 miles from the river. Its course was somewhat altered when the Delaware Canal was built in 1831-1832.

The Delaware Division of the Pennsylvania Canal is probably the most important route in Point Pleasant. Constructed in 1831-32, it was in operation until 1931 carrying coal, lumber, iron ore and other heavy and bulky items between Bristol and Easton. c.1876 a railroad was planned from the canal aqueduct along the west bank of the Tohickon Creek and up through Plumstead Township to be called the Delaware River and Lancaster Railroad.

Commerce

The canal, ferry and bridge traffic stimulated commerce in Point Pleasant throughout its history making it an important point of transfer for many goods. Items produced from the quarry, saw and grist mill, limekilns and local farms were shipped from Point Pleasant north and south

Industry

One of the first industries was the Cave Bank Fishery Company established in the early 1700's. Although the company's base was Prahl's Island slightly north of the district boundary, it had the fishing rights for the entire area. In 1748 the seven village residents comprising the company bought the ferry from Enoch Pearson. One of the founders of the company, John White, built the grist and saw mill around 1750.

Fishing has remained important to Point Pleasant since the mid-19th century not as an industry in itself but by contributing

POINT PLEASANT HISTORIC DISTRICT

Historical Significance (continued)

to the tourist and vacation industry. MacReynolds cites Point Pleasant as one of the best fishing resorts on the river for rockfish, white perch, several kinds of bass, catfish and sunfish, and in the spring for suckers and shad.³

The quarries along Point Pleasant Pike and Geddes Run have been in operation at least since the 19th century. George MacReynolds comments:

On the southeast bank of the creek, not far from the old Indian quarry, is a famous "bluestone" quarry, operated for many years by the late Nicholas L. Heaney, who supplied many thousands of feet of curbstone and flagstone for Doylestown's streets before stone for that purpose was supplanted by concrete.⁴

In addition to supplying Doylestown, building stone from the quarry has been used for construction in Philadelphia and New York.

The grist and saw mill date from the mid-18th century servicing the area farmers. Other local-oriented trades such as blacksmithing were located in Point Pleasant.

The vacation resort industry has left its physical mark from the mid-19th century onward with hotels, bungalows, dance hall, bars, etc. Vacationers from Philadelphia and New York came to the area for its natural beauty, hunting, fishing, boating and other water-related activities.

³ Ibid., p. 246.

⁴ Ibid., p. 186.

POINT PLEASANT HISTORIC AND ARCHAEOLOGICAL DISTRICT

Information researched by
Mrs. Helen Sirmay
and submitted to the
Bucks County Conservancy

April 1981

POINT PLEASANT HISTORIC DISTRICT

Information researched by Mrs. Helen Sirmay and submitted to the Conservancy April 26, 1981.

Point Pleasant, Pa., is located on the Delaware River in Bucks County, between the towns of Lumberville and Erwinna. The River Road (Route 32) follows the river from Bristol in the lower part of the county to the junction with Route 611 at Kintnersville, enroute to Easton. Traditionally it was an Indian trail. The section which goes through Point Pleasant is dated from 1736. In the center of the town it is the point of termination of Point Pleasant Turnpike, River Hill, Old Ferry and Tohickon Hill Roads. A short distance further along it is also the termination point of Cafferty Road.

Originally the town, which lies in Plumstead as well as in Tinicum Township was named Black's Eddy but it was changed to Point Pleasant when the post office was moved in 1828. The 300' cliff along which the River Road runs permitted the town to grow only in one direction - north and it also precludes much farming although there is a small fertile plain between it and the river at some points. So far as transportation is concerned, the river was always more important than the above-mentioned roads. In the earliest days the Durham boats came down the river, laden with flour and whiskey. At that time northeastern Pennsylvania was heavily forested and the log rafts, some of which were 100'-200' long and 16'-36' wide were floated down during the high water seasons.

Before the white man came, the upper part of the proposed historic district was a flourishing Indian village and at times there were larger groups of Indians at what is now Point Pleasant who came there because of the good fishing and to use the "Indian quarry" an undeveloped outcropping of easily worked stone used for arrow heads, tools and other implements. There is also some evidence, as determined by Dr. Henry Mercer the curator of the University of Pennsylvania Museum,¹ of prehistoric man along the Delaware River at this location.

In the 1730's the original grants of land began to be divided. The development of the town commences with the awarding of ferry rights to Matthew Hughes and Enoch Pearson, whose adjoining lands bordered the river, in 1739, the year in which Point Pleasant Turnpike, the road to Butler's Mill (now Chalfont) which was the primary route from this part of the Delaware River to Philadelphia and the western section of the State.² Hughes' ferry seems to have been the first commercial establishment in Point Pleasant.

In 1740 Enoch Pearson sold 50 acres of land, including the ferry site, to Daniel Dawson of Philadelphia who, in 1744, willed it to his son Daniel and his daughter Mary Thompson. John Thompson, Dawson's son-in-law, sold to John White, John Hart, Jane Hart, Hezekiah Rogers, Ezekiel Rogers, John Meyer, Elias Carey and Rolof Sebring, all nearby landholders, each one having a 1/8 interest. Although it does not appear on the 1759 map of Plumstead³ or the Survey map of Tinicum Township,⁴ Gen. Wm. W.H. Davis, who was president of the Bucks County Historical Society, states in his History of Bucks County, Pa. that Isaac Swartz was an early landholder on the south side of Tinicum Creek, including lower Black's Eddy, and John Von Fossen was the first settler on the north side. He also states that Von Fossen built the first tavern and established the Cavebank Fishery Company.⁵

However, the above-mentioned group of eight people organized a business, operating a fishing hotel and the ferry. Michael Swartz acquired Hezekiah Roger's share in 1769 and after the death of John White he bought out the others and operated the ferry as a sole proprietor. It descended to his children and grandchildren (the family anglicized their name to Black about this time) and accordingly the town was known as Black's Eddy.

Although there may have been a mill on the Tohickon Creek at Point Pleasant at an earlier date, the first one documented was operated by the above-mentioned John White who is described in the deed of 1748 for the ferry tract as a miller. The mill tract was patented to John White and his brother Joseph in 1765, but John White owned the adjoining land at an even earlier date as shown on the 1759 map of Plumstead Township. These two tracts totaled over 160 acres, the "upper Hughes tract" and were divided in 1784 between Joseph White, Sr. and the heirs of his brother John. The upper Hughes tract, and part of the mill tract below Gaddes Run, went to Joseph who sold to John Van Fossen. It appears that it was at this time Van Fossen established the Cave Bank Fishery with John N. Solliday, a prominent clock and watchmaker who owned a great deal of land around Point Pleasant, as well as the islands in the river.

Joseph White sold 134 acres and the mill which, after having had several owners, was acquired by Jacob Stauffer who transferred it to his son Henry. Later, it was transferred to another son Ralph Stover who was a member of the State legislature from 1783 to 1799 and served in many other official capacities in the community. Ralph Stover was a prominent business man. He is reputed to have bought up land at the mouth of every Creek in Tinicum Township and to have stipulated in his will that his lands were not to be cut over again for 100 years. His mill was at the bottom of Cafferty Hill, on the west side, while his impressive home was on the east side of Cafferty Hill Road, opposite the mill site. Originally a grist mill, he operated it as a saw mill

POINT PLEASANT

- 3 -

Conservancy/Sirmay

with his son, as the record states, "producing large amounts of hardwood lumber for shipment to distant parts".⁸ Belknap's 1832 Gazetter of Pennsylvania describes Black's Eddy as "a rapid of the Delaware River at Point Pleasant, at which a samll village of 6-8 dwellings a tavern, store and post office" are located and Point Pleasant in Tini-cum Township as "a town on the lower road to Easton, 14 miles north-east of Doylestown, having 8-10 houses, a store and a tavern". Actual-ly, there has been only one town here, from the beginning.

Beside the ferry, the hotel, the Cave Bank Fishery and the mills, Point Pleasant also supported quarries only one of which, the "Indian quarry" an undeveloped outcropping of rock along Geddes Run which as mentioned seems to have been the source of rock for arrow heads and other Indian artifacts, is within the limits of the proposed historic district.

Three streams empty into the Delaware River at Point Pleasant, Hickory Creek,⁹ into which Geddes Run empties, and the Tohickon Creek. About half a mile from the junction of Hickory Creek¹⁰ and Geddes Run there is a pool which the farmers used, in the 1800's, as a sheep dip. These swiftly running streams made this a logical place for mills, and in the mid 1800's there were three or four saw mills in the town producing finished lumber from the hemlock and pine trees which grew profusely in the Delaware Valley. By 1900, most of them had been destroyed by fire.

In addition, along the river near the site of the ferry a lime kiln was operated, burning limestone taken from the deposits further down the river.

There has always been good fishing at Point Pleasant. The first "fish-ing hotel" the Mountainside Inn which is on the River Road across from the site of the ferry and the limekiln still stands, although it is not being operated at the present time. The original building with its 16' bar room with large fireplace seems to have been erected in the mid 1700's although some authorities date it to 1689. It has been enlarged from time to time (the second floor of the second section was formerly the Point Pleasant Ice House) but the stone front has always been care-fully matched. Since it contains only about 6 bedrooms, a frame house on the opposite side of the River Road was enlarged. The first floor was used for dances and other entertainments, while the second floor had at least 12 bedrooms.

In early 1900's this hotel was owned by Chris. Schneider, a New York man, who organized parties that came to the Mountainside for vacations and week-end fishing trips. An ardent member of the I.O.O.F he donated the land for the white frame Odd Fellows lodge which was built on the rocks beside the inn. Beside the Saturday lodge meetings, here were held the local entertainments and also the sessions of the weekly de-bating society. A more recent owner of the hotel said that as recently

as 1949 a group of 70 fishermen came to the inn on a Saturday morning, and this was not an unusually large group to be accommodated there.

There was another smaller hotel in the town, the Central Hotel, which is now called Apple Jack's. This is said to have been built to accommodate the men working on the barges, as Point Pleasant was a convenient spot to tie up for the night. There was also an inn near the two mule barns on King's Island which is part of Point Pleasant.

On the high point of land which juts out over the river in the center of the town, stands the "upper hotel" the Point Pleasant Inn which was built about 1786. The original building was destroyed by fire in 1812. It was rebuilt by Michael Weisel and it is still an imposing structure with its six supporting pillars and double-deck porch, and is now an antique store. The second floor has about 35 rooms and since the present owner has found 17 small stoves, and 17 keys to the separate toilets in the yard behind the hotel, it is assumed this is the number of guests which could be comfortably accommodated over night. He states that in the guest book, which was destroyed when they had a fire in the barn in 1948, appeared the names of Grover Cleveland, William McKinley, Gov. Stokes of New Jersey, and many other prominent people including members of the Whitney, Astor and Vanerbilt families, who came to Point Pleasant to enjoy the fishing.

This structure is referred to as the "quality" hotel. Here the stage coach stopped and here were held sales of livestock. Behind the barn in the rear are small shops of rather recent date. Opposite the hotel, across the River Road, is a handsome brick structure, also with a double decker porch, which was built to accommodate the servants of the hotel guests. Further down the point, in back of the inn, stand the weigh station for the Pennsylvania Canal, and a building occupied by a coal and feed dealer. Crossing the canal, we find a large restaurant which has been converted from a roller skating rink.

Early in 1800's, after the Erie Canal became profitable, the idea of building a network of canals in Pennsylvania became popular. The Delaware Division of the Pennsylvania Canal was authorized by the state in 1827 and completed in 1832. It ran between the river and the River Road from Bristol to Easton.¹¹ It has 9 aqueducts, 110 overhead bridges, a guard lock at Easton and a tide lock at Bristol, and a total of 23 lift locks. In addition to the dam at Easton there was a wing dam in the river at New Hope. It was connected to the Morris Canal at Phillipsburg, N.J. and to the Delaware and Raritan Canal at Trenton, N.J., and consequently served a large area. With the advent of the railroad the canal fell into disuse but in 1959 the Lehigh Coal & Navigation Co., the owners, transferred it to the State and as the Roosevelt State Park it again serves the people of the community.

Point Pleasant was popular stopping spot on the canal. Dressed stone from the quarries was shipped out, destined for the streets of Philadelphia as well as buildings there and in the city of New York. Lock #12 and #14, which are only about 700' apart, are situated opposite the Mountainside Inn. The lock keeper's house was adjacent to Lock #14. The aqueduct, which is the longest one over the canal, spans the Tohickon Creek in back of the present fire house near the Point Pleasant Hotel.

The canal of course brought a lot of business to Point Pleasant which enjoyed its greatest prosperity about the time of the Civil War. For several years thereafter it was one of the busiest places in Bucks County. It is said that dozens of rafts of timber were unloaded each season when the river was high. The canal at that time employed hundreds of men between Easton and the locks at Point Pleasant and Lumberville. A great deal of coal was shipped down the canal on barges. While most of them used mules, sometimes teams of oxen were used.

In addition to the river and the canal, travelers patronized the Doylestown and Point Pleasant stagecoach, which in 1884 was operated by Jacob Isentrager. The Delaware River bridge, which was built by Hood and Steel in 1853 connected Point Pleasant with the town of Byram, N.J. which was served by the Belvidere Railroad. This rail line (plans made to extend the service to Point Pleasant and other towns in Pennsylvania never materialized) had a president Elias Morris, and secretary John Clemens, both of whom lived in Point Pleasant.

The bridge over the Delaware at Point Pleasant was destroyed in the flood of 1862. While the freshets which brought high water down the river were useful, the serious floods of 1841, 1862, 1869, 1936 and 1955 did a great deal of damage washing out bridges, uprooting trees, destroying crops and farm buildings and seriously damaging the canal which in some of the above mentioned years was out of service for several months.

The State of Pennsylvania passed a law in 1834 establishing free schools, but it was not well received as men preferred to have their children educated in their own languages and customs and consequently many schools were associated with the churches. In 1850 the little schoolhouse which stands at the intersection of the River Road and Cafferty Road was opened. It was built by subscription, and it was to belong to the contributors for a period of ten years and then sold to the highest bidder. This school was built by a group of public spirited citizens but any child could attend. Ralph Stover, who was the largest contributor, gave \$25 while there were many donations of 12-1/2¢ --this at a time when a man's wage was perhaps only \$1 a day. The building continued to be used as a school until 1918. From 1934 to 1954 it was the local library. In 1954 it was sold and later became a part of the Baptist Church which stands directly behind it on the

River Road. There were other schools in the proposed historic district-- the River Hill School was built in 1849. It is a sturdy structure having 20" stone walls with stucco finish and is graced with a wooden cupola. The inside dimensions are 33'x22'. At first it was a one room building, with wainscotted walls, later a second floor, which still has the teacher's platform, was added. There is also an old school house at the end of the proposed historic district at the intersection of Tohickon Hill and State Park Roads.

The Baptist Church, the only religious structure in the town, is located above the point on the River Road. It was started by a group of ministers headed by the Rev. Joseph Mathias of the Baptist Church of Hilltown. They came to the area and preached to the residents in groves, barns and other locations and, just before the Church was erected, held meetings at the old River Hill School building. The original membership, when it was organized in 1849, number 53 persons but revival meetings were held in the 1870's and the membership increased, 134 new members were added in one year, and 85 in another. The occupations of the townspeople changed constantly. The 1871 Directory of Bucks County lists many businessmen at Point Pleasant, such as blacksmiths, boatsmen, carpenters, a horse trader, a lime burner, locktenders, masons, millers, storekeepers, a coal dealer and a shoemaker, also hotelkeepers, and about 30 farmers. In 1898 the Directory lists a wheelwright, a physician, storekeepers, stone workers, a lumber and coal dealer, a drover, but only 4 farmers. By 1902 the Directory also lists a reporter, a barber and a telephone operator. In addition, the men of the Solli-day family were noted clock and watchmakers and Henry Troemner, who married Ralph Stover's daughter Elizabeth was a maker of fine scale and, according the tradition, he invented the Troy scale used by apothecaries.

With the advent of Prohibition in 1920, the hotels ceased to flourish although it has been said the some sold illicit beverages, and by 1928 the canal boats, many of which carried coal, discontinued service. With the introduction of clean and cheap oil heat the coal dealers could no longer make a profit.

POINT PLEASANT

- 7 -

Conservancy/Sirmay

BUCKS COUNTY CONSERVANCYFOOTNOTES

- 1 Department of American and Prehistoric Archaeology.
- 2 Statement over emphasizes the importance of the Point Pleasant Turnpike.
- 3 Source and date of compilation unknown. Map is a probably of twentieth century re-creation of township.
- 4 Source unknown.
- 5 McReynolds Place Names in Bucks County states that the Cave Bank Fishery Company was organized in 1748.
- 6 Sentence should read "upper Hughes tract" in Tinicum and the "lower Hughes tract" in Plumstead were divided.
- 7 Anglicized version of Stauffer.
- 8 Most area grist mills in the region regularly combined grist and saw milling operations.
- 9 Sentence should read "Tohickon Creek, into which Geddes Run empties, and the Hickory Creek".
- 10 Tohickon Creek.
- 11 In this part of the county. Further south it crosses under River Road in several places.



BRYN MAWR COLLEGE
BRYN MAWR, PENNSYLVANIA 19010

DEPARTMENT OF ANTHROPOLOGY
(215) 845-5030

8 April 1982

Cathy Auerbach
Bucks County Conservancy
11 North Main Street
Doylestown, PA 18901

Dear Ms. Auerbach:

Enclosed is our evaluation of the archaeological investigations conducted in 1978 by Shortman and Urban in conjunction with the pumping station, transmission corridors, and reservoirs in and around Point Pleasant. Based on our own understanding of the local prehistory, we are highly critical of their report.

Note that we have no objections to your using this in any future discussions concerning this proposed construction project.

Sincerely,

Dr. Richard H. Jordan
Associate Professor

and

Glenn W. Sheehan
Ph.D. Candidate

cc:

Dr. Larry Tice
Pennsylvania Historic and Museum Commission
William Penn Memorial Museum
Harrisburg, PA 17120

and

Kurt W. Carr
Review Archaeologist
Division of Planning and Protection
Bureau of Historic Preservation
William Penn Memorial Museum
Harrisburg, PA 17120

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The Bucks County Conservancy has asked us to present a brief evaluation of the archaeological sensitivity and potential of the area around Point Pleasant which is involved in the proposed diversion project. We have been doing independent research in the area for almost a year, including field research to locate prehistoric sites which are documented archivally, and surveys to discover new sites. The project has had the over-all goal of documenting outcrops of stone which were used as sources of raw materials for tools, and of investigating the distribution of these materials after their initial quarrying. A secondary goal has been to research the history of archaeology in the area as exemplified by the work of Henry Mercer. Our archival research has extended to the collections of Mercer's field notes and correspondence at the Mercer Museum, at Font Hill, and at the University of Pennsylvania. This project, the South Mountain Lithics Project, is under the direction of Richard H. Jordan, associate professor of Anthropology at Bryn Mawr College. G.W. Sheehan, one of Jordan's doctoral students, serves as field supervisor. About a dozen other individuals have devoted considerable time to the project. Our initial interest in Point Pleasant lay in Mercer's work there before the turn of the century, and in the distribution, nature and age of the historic Indian sites in the region. Hence we feel that we are in a somewhat special position to comment upon the archaeological work conducted in conjunction with the proposed Point Pleasant pumping station and the pipe line corridor.

Schortman and Urban (1978) conducted the work at Point Pleasant under contract with E.H. Bourquard Associates. Their work is summed in the Environmental Report on Neshaminy Water Supply System (1979:III,104) as follows:

"In the area of Point Pleasant, four archaeological sites were identified by

Henry Mercer in the late nineteenth century, from the late 1880s (sic) to the early 1890's. None of the sites lie within or proximate to the right-of-way..." And "There is no archaeological evidence that the construction of the project's components would harm or destroy any archaeologically valuable site (III-113)."

These conclusions are almost without question incorrect. We believe that an examination of the effort by Shortman and Urban reveals areas in which their program did not meet generally accepted standards for cultural resource management projects, and that these deficiencies account for their failure to note the presence of even a single "archaeologically valuable" site in the impact area. We address our remarks specifically to prehistoric remains, but it should be noted that they apply at least in part to the question of historic archaeological sites.

The program failed to involve a thorough or significant literature and archival search. This resulted in an inability to find or judge the significance of sites which have already been documented by other archaeologists and collectors. This initial failing should have resulted in a more intensive field project, since the lack of archival sources made the impact area a virtual terra incognita to the investigators.

Unfortunately, the field work was seriously flawed above and beyond the lack of archival documentation. Although the report is not explicit as to the exact width of the corridor, it was at least 10.25 miles long. In this entire area, only four test pits and twenty highly localized rapid shovel tests in four areas were made. Had the entire corridor been under the plow or otherwise exposed, perhaps a small number of tests would have been sufficient. According to the investigators, most of the ground surface was totally obscured,

which in our opinion, would require more intensive sub-surface testing. Moreover, the investigators rigidly adhered to a self-imposed course of action which restricted them totally to the land inside the designated, but not always apparent, boundaries of the corridor itself. In mitigation surveys it is necessary, especially where ground cover obscures the visibility of surface materials, to consider the setting of the corridor by investigating adjacent areas, especially when these areas are plowed or sparsely covered, or where they exhibit topographic or other features that might indicate the possibility of sites. Failure to consider and examine areas adjacent to the corridor leads to an inability to properly assess the geographic setting and site potential within the corridor itself.

At the juncture of the combined transmission line, east branch and north branch ^{lines} is the Bradshaw Reservoir - a 25 acre impact area just northeast of the north branch of the Neshaminy Creek. We feel that since these efforts here consisted of a single test pit, that they are inadequate. The only reported time that the investigators strayed from the corridor was during an investigation of a stratified village site trenched and reported upon by Mercer (1897 and elsewhere). Although they report that this mounded area, the Lower Black's Eddy site, is 350 feet from the pipeline running out of the pumping station, a more accurate assessment is that it is at most a few tens of feet from the pumping station impact area. Although they did find the general site that Mercer investigated, Schortman and Urban failed, as did Mercer, to delineate the extent of the village site. In other words, activity areas associated with the village could very well lie entirely within the impact area - no one knows. Within the direct impact area of the pumping station, an area of about 3.9 acres, only two test pits were excavated. One test pit hit a rock at

36 cm (14") so excavation was stopped. The second subsurface test by the investigators was carefully placed on the same contour interval as the known part of the village site. It extended to 25 inches below the surface. Since Mercer states and illustrates in his publications, sketches, and notes, that the second and older stratum of the site is at least 25" below the depth reached by Shortman and Urban's test (Mercer, 1897), and since they stopped in a sand subsoil which may be the same one reported by Mercer to overlay the lower stratum of cultural material, we can only conclude that there was a complete failure to test for this buried horizon.

Although the investigators were aware that Mercer had found a lithic reduction station (he called it a blade factory), they, as did Mercer, made no attempt to discover its extent. Although our field work was not directed toward ascertaining locational facts in relation to the proposed construction area, we have succeeded in determining that both the village site and the lithic reduction station immediately to the south and north of the pumping station impact area, are still valuable and viable archaeological entities. In fact, both contain undisturbed in situ prehistoric materials which make them particularly significant for archaeologists.

The steep slope corridor up Hickory Run was not investigated at all by Shortman and Urban. See, for example, the enclosed Schaddinger 1890's map of Hickory Run, indicating ten sites where Indian "relics" have been found (Mercer Museum Archives). Without question Shortman and Urban were entirely unaware of this map. Moreover, local residents have stated that there are numerous caves along Hickory Run which may have been temporary occupation sites (Charles Chaney, personal communication - Chaney lived for years on the plateau adjacent to Hickory Run) and there is a distinct possibility that

quarry work shops are also present here. We have found that the steep slopes along Gaddis Run were not a hindrance to aboriginal quarrying and are extremely visible along the Danboro-Point Pleasant Pike. We thus feel that this area of the corridor should have been closely inspected.

Our experience indicates that what, at first glance, often appears to be scree and loose rock in the Point Pleasant area is in fact the remains of pre-historic quarrying and reduction activities. Since Shortman and Urban report walking over loose rock, we suspect that some quarry or reduction sites lie within the impact area and were not recognized. Again, no archaeologist, including Mercer, has ever precisely delineated the extent of the quarrying activities. Although the Danboro-Point Pleasant Pike is almost one continuous archaeological site for a distance of about 0.4 mile west of Point Pleasant, with evidence of extraction and reduction activities everywhere, Shortman and Urban make no mention of the fact. We believe they were unaware of this, and were therefore not alerted to test for its possible extensions within the impact area.

Our review of the work by Shortman and Urban reveals it to be unsatisfactory for the reasons stated above and summarized here: there was a totally inadequate archival and literature search; there was an inadequate program of interviews with knowledgeable local people; there was a misunderstanding about the basic areal extent of concern for investigation during the course of a cultural resource management project, so that areas adjacent to the direct impact area were ignored, both unnecessarily limiting the scope of work and limiting the possibilities for understanding the area within the corridor; and finally there was a totally inadequate testing program. In short, the conclusion reached in the Environmental Report that "there is no archaeological

evidence that the construction of the project's components would harm or destroy any archaeologically valuable site"(1978, III-113) is totally without scientific justification; there is no basis for such a determination.

We have not reviewed the work done by archaeologists other than Shortman and Urban. That is, we have not seen any reports on other impacted areas, such as the transmission lines and water treatment plant in and around Chalfont. Nor have we seen any archaeological investigations at Limrick or the pipeline corridor leading from the Perkiomen to the Limrick Power Plant site.

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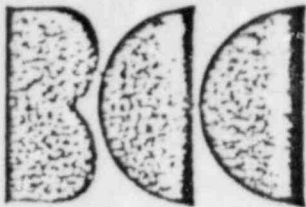
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- 1978 "A Survey of Cultural Resources in the Area of the Proposed Point Pleasant Pumping Facilities, Combined Transmission Main, Bradshaw Reservoir, North Branch Main and Perkiomen Main, Bucks County, Pennsylvania." Report submitted to E.H. Bourquard Associates, Harrisburg, PA.

BUCKS COUNTY



CONSERVANCY

Copies - Sullivan

BUCKS COUNTY CONSERVANCY

11 North Main Street, Doylestown, Pennsylvania 18901

(215) 345-7020

December 1, 1981

Mrs. Brenda Barrett
Bureau of Historic Preservation
Pennsylvania and Museum Commission
P.O. Box 1026
Harrisburg, Pennsylvania 17120

RE: Point Pleasant Historic &
Archaeological District

Dear Brenda:

Enclosed are the Conservancy's Comments and Criticisms regarding
the Request Determination of Eligibility prepared by Ms. Elizabeth
Mintz for the U.S. Army Corps of Engineers August 1981. Through
our survey and register work of the past four years, we have
gained extensive knowledge and understanding of Bucks County's
resources and development trends. In seeing flaws in the docu-
mentation prepared by Ms. Mintz we felt it our responsibility to
contribute our information in order that Point Pleasant be prop-
erly recorded. We request that our comments always be kept with
the Mintz Report.

Thank you.

Kathryn

Kathryn Ann Auerbach
Director, Historical Sites Survey

KAA/utl

Enc.

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Directors: William Amey • Mrs. Robert Biddle III • Norman J. Drustrup • Mrs Paul Flack • Kenneth W. Gemmill, Esq.
William F. Hoelzer, Esq. • Lewis Hull • Virgil Kauffman • Lloyd H. Klatzkin • Lloyd Lawrence • Mrs. Fred W. Little
Charles M. Meredith III • William C. Rudge • Edward C. Ruver • Harley L. Stowell
Peter A. Glascoth, Esq., Solicitor • Robert W. Pierson, Executive Director

BUCKS COUNTY



CONSERVANCY

BUCKS COUNTY CONSERVANCY

11 North Main Street, Doylestown, Pennsylvania 18901
(215) 345-7020

October 19, 1981

Dr. Larry Tise, Executive Director
Pennsylvania Historical and Museum Commission
Post Office Box 1026, William Penn Museum
Harrisburg, PA 17120

Dear Dr. Tise:

I am writing with regard to the review of the proposed Point Pleasant Pumping Station project by the Bureau of Historic Preservation. As was mentioned in our July 23 meeting, there is great concern about the impact of the project on the valuable cultural and historical sites in the immediate area, particularly the Delaware Division of the Pennsylvania Canal and the prehistoric Lower Village Site investigated by Dr. Henry Mercer. I am enclosing a copy of Dr. Mercer's report on his findings in Point Pleasant with the village account beginning on page 70. I have also provided a copy of a letter from DEL-AWARE, an organization of citizens concerned about the use of the Delaware River and its environs, to Rep. James Greenwood. This letter outlines the inadequacies of the Cultural Resources assessment prepared by Edward Shortman and Patricia Urban in 1978. The Conservancy is in agreement with Del-AWARE in seeing the need to re-review the impacts of this project on Point Pleasant's historical resources.

I would appreciate knowing whether you have instituted an additional review based on the importance of the Mercer site and your awareness of the inadequacies of the Cultural Resources study available when initial reviews were made.

Sincerely,

Robert W. Pierson
Executive Director

Enclosures

cc. Rep. James Greenwood
Del-AWARE

DIRECTORS: William Amey • Mrs. Robert Biddle III • Robert C. Bodine • T. Sidney Cadwallader, Esq. • Norman J. Drustrup
Mrs. Paul Flack • Kenneth W. Commill, Esq. • William F. Heefner, Esq. • Lewis Hull • Virgil Kauffman
Lloyd H. Klitzkin • Lloyd Lawrence • Mrs. Fred W. Little • Mrs. Benton Meininger, Jr. • William C. Ridge • Harley L. Stowell
Martin Sutton • Peter A. Glascott, Esq., *Solicitor* • Robert W. Pierson, *Executive Director*

ARCHEOLOGICAL INVESTIGATIONS
OF THE
POINT PLEASANT AREA
A
Preliminary Report

By:

Samuel W. Landis

in conjunction with
Dr. Richard Jordan, et al

Dept. of Anthropology
Bryn Mawr College
Bryn Mawr, PA.

August 23, 1982

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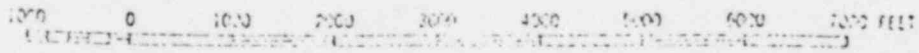
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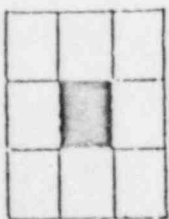


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Archeological Investigations / Point Pleasant: Preliminary Report

ABSTRACT

The vicinity immediately surrounding the Point Pleasant area in the middle Delaware Valley was identified nearly a century ago by Henry C. Mercer as being an extremely important key to understanding the Indian of southeastern Pennsylvania. It was here that the Indian not only lived for thousands of years but also obtained a type of lithic material, argillite, from which he fashioned his tools. The importance of any archeological site is, indeed, questionable due to what data it may have to offer. Clearly some sites are of far greater importance than others. Although any river flat will generally produce at least some evidence of prehistoric habitation, the area in and around Point Pleasant is indeed unique for a variety of reasons.

1. The entire river flat N & S of Tohickon Creek shows surface indication of continuous prehistoric occupation.
2. The entry of the Tohickon Creek, a high order stream originating in the Piedmont of upper Bucks County, into the Delaware River on the flood plain provided easy access to both the river and the Piedmont for prehistoric travelers.
3. This area of continuous occupation on the river flat is immediately adjacent to the lithic workshops and quarrying activities of the Indian, a scenario seldom seen anywhere.
4. From surface indication, there is a definite difference in lithics from the area south of the Tohickon on the flat and the area north of the Tohickon on the flat. Although it is entirely too early in preliminary investigations to make a conclusive statement regarding this fact, we can assume that some definite travel patterns and/or settlement patterns should become evident.

Archeological Investigations / Point Pleasant: Preliminary Report

5. The area under preliminary investigation represents deep & well-stratified deposits. This fact, in itself, is of paramount archeological importance when dealing with any site. This, along with the other facts concerning the Point Pleasant vicinity, indeed, makes the area quite unique and possibly important even to the prehistory of the entire northeastern region of the United States.

The purpose of this preliminary report is an attempt to determine depth of deposits, area of occupation, age, chronological sequences, etc. as a result of some archeological testing on the river flat. However, due to the time element involved, and the unexpected depth of stratification encountered, conclusive interpretive results are not possible at this time. We merely state given facts and individual situations as encountered thus far.

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The area under investigation includes the entire flood plain along the Delaware River both north and south of where the Tohickon Creek enters the river. However, for the purpose of this preliminary report, the area considered includes only that portion of the flood plain north of where the Tohickon Creek enters the Delaware River, and then only a small series of test squares on the Walter's Nursery property recorded with the Pennsylvania Historical and Museum Commission as 36BU2.

The most recent geological formation on the flood plain, a thin, plow-disturbed humus, is nearly entirely absent on the nursery property. Due to the fact that as recently as forty years ago much of the nursery property was bulldozed to sell the topsoil, and the continual disturbance thereafter from nursery activities creates to some degree an interpretation problem of the geology of the property. At any rate, the upper zone throughout the property is a relatively low organic content plow-turned sand. This sand is subject to continuous wind and wash erosion, particularly the third and fourth terraces above the river. Beneath this zone lies an alluvial sand formation ranging from 0.5 to (unknown) in depth which probably represents intermittent flood deposition. There are some individual sand strata within this zone ranging from about 0.5 cm to 3.0 cm in thickness. At some places these are separated by red clay luminae which were probably

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dropped from suspension during times when water velocities were low.

Beneath the alluvial sand lie two distinct formations. The first encountered, Trenton gravel, is a coarse river-laid gravel of glacial outwash. Beneath this gravel, particularly at points where it is cross-bedded, lies a strongly developed boulder bed. The courser deposits may represent the work of the early formed Delaware River during the Pleistocene when the valley was being cut to its present levels.

In relatively recent years, such major floods as those occurring in 1903, 1936, and 1955, caused marked changes in the topography of the flood plain. This, along with the top-soil removal indicated earlier, caused much of the later evidence of occupation to be destroyed. This is especially true of the third and fourth terraces where there exists in most places only 1.5 m of alluvial sand above the Trenton gravels. There is no distinct occupation levels evident in this sand and for the most part it is completely devoid of any lithic material. Such is not the case, however, with the second terrace. It is considerably lower than the third and fourth and therefore was subject to an unusually large amount of slopewash and erosion from the higher terraces. In most cases, there appears to be approximately 50.0 cm of disturbed sand above the last or uppermost level of occupation. Taking into consideration the prior removal of the topsoil from this terrace, a protected

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overburden overlays this last occupation. Such a situation lended greatly to the fine protection of the cultural levels below and affords a classic example of an exceptionally well stratified area.

It is therefore this second stratified terrace which shall be the focus of this preliminary report.

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EXCAVATION

A test square of two meters was dug on the second terrace adjacent to the private road which runs parallel to the summer homes between Walters Nursery and the Delaware River. The area has not been utilized for nursery activities for at least 10 years and was subject to a slight undergrowth of grass and weeds. Approximately twenty trees were left growing by the nursery owners immediately above this terrace in an effort to decrease slopewash and erosion from the upper terraces. This square was excavated in 10.0 cm levels and all soil screened through 0.25 in wire mesh.

All of the first four levels and a portion of the fifth level (52.0 cm) was found to contain a mixture of prehistoric material in addition to historic and modern refuse. Most of this accumulation was a result of slopewash and erosion from the upper terraces and the disturbance caused by nursery activities. There were several fragments of fire-cracked stone recovered, as well as several flakes of jasper, chert, and argillite. One untyped broken projectile point was recovered from this area at a depth of 34.5 cm. No pottery fragments whatsoever were recovered. At exactly 53.0 cm, an undisturbed level 4.0 cm in thickness of flood-deposited alluvial sand was encountered, beneath which lies the first intact level of occupation. This level is 6.0 cm in thickness and is very apparent from a vertical profile due to the dark color of the deposit. It is found to exist throughout

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EXCAVATION

the entire square. It is intermixed with charcoal and fire-cracked rock and as a result of artifact recovery apparently represents a level of occupation from the Late Woodland Period. Although no features were exposed in this test square, the following diagnostic artifacts were associated with it.

Late Woodland pottery fragments representing interior/exterior smoothed, interior smoothed, exterior corded, and one sample of Overpeck Incised.

Two fragments of clay pipe bowls

Two notched pebble netsinkers

In addition to these artifacts, several hundred flakes of lithic material were recovered. Representative percentages are as follows:

Chert	70%
Jasper	20%
Argillite	8%
Chalcedony	1%
Other	1%

It is interesting to note that even given the proximity of the argillite quarries, this Late Woodland level holds true to other such levels excavated elsewhere in that the Indians apparently preferred higher quality flints to the argillite.

Beneath the Late Woodland deposit there exists another level of

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alluvial sand of at least 35 cm in depth. The soil is intermixed with considerable charcoal and occasional fragments of fire-cracked rock and lithic chippage. In this level at a total overall depth of 88 cm a small hearth was exposed, evidenced by an unusually large amount of charcoal, woodash, calcined bone fragments and some fire-cracked rock. No associated artifacts were found in association with this feature, although charcoal samples were taken for dating purposes. Further excavation from this point will continue, but as stated earlier, due to the time element involved, this is the extent of excavation thus far.

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PRELIMINARY ANALYSIS OF EXCAVATION

The presence of a well stratified terrace has been demonstrated at least up to the present extent of our excavation. Based on past experience, it can be reasonably assumed that the site does in fact contain well stratified deposits to considerable depth. Due to the lack of diagnostic artifacts in association with features, and the limited amount of excavation thus far prohibits any definite analysis of our field work.

Archeological Investigation / Point Pleasant: Preliminary Report

SUMMARY

In addition to our limited test excavations on the Walter's Nursery property, we had the opportunity to examine a considerable number of artifacts in the possession of the property owners which were recovered as a result of nursery operations over a forty year period. Such material represents a time span of perhaps 6000 years of Indian occupation, including many artifact forms of the Archaic tradition. Grooved axes and spearthrower weights as well as a wide spectrum of other Archaic tool forms and projectile points are quite abundant. The area south of the Tohickon Creek, specifically an area to which Henry Mercer referred as the Lower Black Eddy site, is also a well stratified deposit. Mercer indicated in 1893 after his excavations, a distinct difference in tool forms from different levels. Even today, as a result of bulldozing operations in the area, well defined strata are visible along with excessively large amount of lithic material and pottery fragments being exposed from erosion. This site is clearly in danger of destruction not only from this natural action, but as a result of its recent discovery by several local collectors. Hopefully from further archeological field work in the area, the unique importance of the Point Pleasant area will be acknowledged. The entire area of this river flat, both north and south of the Tohickon Creek has the distinct potential of providing a vast

Acheological Investigations / Point Pleasant: Preliminary Report

SUMMARY

amount of information in not only the middle Delaware Valley, but also by providing a key to solving problems concerning Pennsylvania's archeological heritage.

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WATER QUALITY ANALYSES
AREA-SPECIFIC DILUTION STUDIES
REGION III

Prepared For:

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Office of Water Planning and Standards
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hydrologic features were used to identify reach boundaries (political boundaries and structures, such as bridges, were not used). All river segments connecting reaches receiving waste discharge were given a reach designation even if no discharge occurred within the segments.

PRIORITY POLLUTANT DISCHARGE CHARACTERISTICS

Since the priority pollutant discharge characteristics of the discharge pipes in the dilution study areas had rarely if ever been directly determined, estimates were used. In all cases, estimates were derived from the SIC of the activity generating the wastewater discharged based on one of two methods.

For some SIC categories, nationwide screening surveys had previously been conducted by the EPA Effluent Guidelines Division (EGD) to identify the priority pollutants found in the dilution study areas, these data were used to describe the types of priority pollutants present in the respective SICs. Where no screening data were available, estimates of the anticipated types of priority pollutants discharged were obtained from EPA personnel. A matrix showing the priority pollutants present for all SICs represented the dilution study areas is provided as Appendix B.

Preliminary screening data were available for only a few of the SICs in the dilution study areas. Although the information contained in this report will incorporate the uncertainty introduced by this data deficiency, the automated analysis system developed for the project allows for easy revision of the calculations in the future when better data become available.

Where priority pollutants were determined to be present by one of the two methods described above, the discharge concentration of each pollutant from industrial sources was assumed to be equal to the estimated 30-day average discharge concentration achievable with the judicious application of "Best Available Treatment" (BAT) techniques (2,3,4). For POTWs (SIC 4952), the priority pollutant discharge concentrations were assumed to equal the median of the values obtained from the nationwide discharge screening program since discharge concentrations are typically below the BAT treatability estimates. The priority pollutant concentration values used for both industrial and municipal discharges are presented in Table 2-1.

RIVER CONCENTRATION CALCULATIONS

Calculations of priority pollutant concentrations in the rivers and streams of each study area were performed at selected locations using the approach described below. "Calculation points" were located at the downstream end of each reach and immediately below the junction of two or more reaches.

The basic operations which the system performed for each reach were as follows:

1. The volume of average daily process discharge flows were summed by SIC classifications;
2. The total process flow (in cfs) from each SIC was multiplied by the BAT concentration of each priority pollutant present to obtain a mass loading for each pollutant;
3. The mass loadings for all SICs were summed to give a total loading for each pollutant; and
4. Each mass loading was divided by the mean annual flow and the 7-day, 10-year low flow (cfs) at the downstream end of the reach to obtain the estimated concentration of each pollutant under the two flow conditions.

Since conservative transport (no degradation/transformation after discharge) of the priority pollutants through the study areas was assumed for calculation purposes, mass loadings from upstream reaches were added prior to dividing by the river flow. An example of the relationships between reaches, river flows and calculation points is shown in Table 2-2. Table 2-2 indicates that the river concentrations at calculation point No. 1 were obtained by dividing the mass loadings resulting from discharges in reach No. 1 by 194 cfs and 19 cfs to obtain values for mean annual and low flow conditions, respectively. For calculation point No. 3, the sums of the mass loadings from reaches No. 1 and 2 were divided by 498 cfs and 42 cfs to obtain the mean annual and low flow concentrations.

Assumptions required to perform the dilution study analysis tend to both over-estimate and under-estimate instream priority pollutant concentrations. Under-estimates tend to result from the following assumptions:

- water upstream of the dilution area was pristine;
- BAT treatability levels are met by all discharges;
- no non-point source pollution (low flow); and
- zero growth (no increase in discharge flows over time).

Over-estimates tend to result from the assumptions that:

- all plants in the same SIC category discharged the same pollutants
- degradation and transformation of the priority pollutants was negligible;

- discharge levels were BAT treatability levels, these may be much higher than trace amounts in some dischargers;
- BAT treatment levels were not zero discharge; and
- some discharge flows were permit flows or design flows if actual flows were not available.

AMBIENT WATER QUALITY CRITERIA ANALYSIS

Ambient water quality criteria for the 129 priority pollutants are currently under development by the EPA. The water quality criteria published in the November 28, 1980 Federal Register were used in the dilution study analysis and are shown in Table 2-3. Where criteria development has not been completed, threshold levels for freshwater aquatic life and cancer risk levels for human health effects were used as specified by EPA. Where calculated river concentrations of priority pollutants were found to exceed the 24 hr. average fresh water toxicity criteria values, upstream discharge sources were examined to determine the source(s) of the violations(s).

Specific findings concerning criteria violations based on calculated river concentrations are presented in the following individual dilution study area report sections.

TABLE 2-3 (CONTINUED)

Priority Pollutant (pp) Name and Category	Priority Pollutant Number	24-Hr. Average Fresh Water Criteria	Human Health Criteria
II. METALS AND INORGANICS (CONTINUED)			
Lead	30	C	50.0
Mercury	31	0.00057	-
Nickel	32	D	13.4
Selenium	33	35	10.0
Silver	34	E ⁺⁺	50
Thallium	35	40	13
Zinc	36	47	-
III. PCB'S AND RELATED COMPOUNDS			
PCB-1016	37	0.014	0.00079*
PCB-1221	38	0.014	0.00079*
PCB-1232	39	0.014	0.00079*
PCB-1242	40	0.014	0.00079*
PCB-1248	41	0.014	0.00079*
PCB-1254	42	0.014	0.00079*
PCB-1260	43	0.014	0.00079*
2-Chloronaphthalene	44	1,600 ⁺⁺	-
IV. HALOGENATED ALIPHATICS			
Methane, bromo-	45	-	1.9*
Methane, chloro-	46	-	1.9*
Methane, dichloro	47	-	-
Methane, chlorodibromo	48	11,000 ⁺⁺	-
Methane, dichlorobromo	49	-	1.9*
Methane, tribromo	50	-	1.9*
Methane, trichloro	51	1,240 ⁺	1.9*
Methane, tetrachloro	52	-	4.0*
Methane, trichlorofluoro	53	-	1.9*
Methane, dichlorodifluoro	54	-	1.9*
Ethane, chloro	55	-	-

TABLE 2-3 (CONTINUED)

Priority Pollutant (pp) Name and Category	Priority Pollutant Number	24-Hr. Average Fresh Water Criteria	Human Health Criteria#
IV. HALOGENATED ALIPHATICS (CONTINUED)			
Ethane, 1,1-dichloro	56	-	-
Ethane, 1,2-dichloro	57	20,000 ⁺	9.4
Ethane, 1,1,1-trichloro	58	-	18,400
Ethane, 1,1,2-trichloro	59	9,400 ⁺	6.0
Ethane, 1,1,2,2-tetrachloro	60	2,400 ⁺	1.7
Ethane, hexachloro	61	540 ⁺	19
Ethene, chloro	62	-	20
Ethene, 1,1-dichloro	63	-	0.33
Ethene, trans-dichloro	64	11,600 ⁺⁺	-
Ethene, trichloro	65	-	27
Ethene, tetrachloro	66	840 ⁺	8
Propane, 1,2-dichloro	67	5,700 ⁺	-
Propene, 1,3-dichloro	68	224 ⁺	87
Butadiene, hexachloro	69	9.3 ⁺	4.47
Cyclopentadiene, hexachloro	70	5.2 ⁺	206
V. ETHERS			
Ether, bis (chloromethyl)	71	-	0.000038*
Ether, bis(2-chloroethyl)	72	-	0.3*
Ether, bis(2-chloroisopropyl)	73	-	34.7
Ether, 2-chloroethyl vinyl	74	-	-
Ether, 4-bromophenyl phenyl	75	122 ⁺	-
Ether, 4-chlorophenyl phenyl	76	122 ⁺	-
Bis (2-chloroethoxy) methane	77	122 ⁺	-
VI. MONOCYCLIC AROMATICS (EXCLUDING PHENOLS, CRESOLS, PHTHALATES)			
Benzene	78	-	6.6*
Benzene, chloro	79	-	0.0072*
Benzene, 1,2-dichloro	80	763 ⁺	400
Benzene, 1,3-dichloro	81	763 ⁺	400

TABLE 2-3 (CONTINUED)

Priority Pollutant (pp) Name and Category	Priority Pollutant Number	24-hr. Average Fresh Water Criteria	Human Health Criteria#
VI. MONOCYCLIC AROMATICS (EXCLUDING PHENOLS, CRESOLS, PHTHALATES) (CONTINUED)			
Benzene, 1,4-dichloro	82	763 ⁺	400
Benzene, 1,2,4-trichloro	83	-	0.0072*
Benzene, hexachloro	84	-	0.002*
Benzene, ethyl	85	-	1,400
Benzene, nitro	86	-	19,800
Toluene	87	-	14,300
Toluene, 2,4-dinitro	88	230 ⁺	1.1*
Toluene, 2,6-dinitro	89	-	-
VII. PHENOLS AND CRESOLS			
Phenol (s)##	90	2,560 ⁺	3,500
Phenol, 2-chloro	91	2,000 ⁺	-
Phenol, 2,4-dichloro	92	365 ⁺	-
Phenol, 2,4,6-trichloro	93	970 ⁺	12*
Phenol, pentachloro#	94	3.2 ⁺	1,010
Phenol, 2-nitro	95	150**	-
Phenol, 4-nitro	96	150**	-
Phenol, 2,4-dinitro	97	-	70
Phenol, 2,4-dimethyl	98	2,120 ⁺⁺	-
m-Cresol, p-chloro	99	-	-
o-Cresol, 4,6-dinitro	100	-	13.4
VIII. PHTHALATE ESTERS			
Phthalate, di-n-methyl##	101	3 ⁺	313,000
Phthalate, di-n-ethyl##	102	3 ⁺	350,000
Phthalate, di-n-butyl##	103	3 ⁺	34,000
Phthalate, di-n-octyl##	104	3 ⁺	-
Phthalate, bis(2-ethylhexyl)##	105	3 ⁺	15,000
Phthalate, butyl benzyl##	106	3 ⁺	-

TABLE 2-3 (CONTINUED)

Priority Pollutant (pp) Name and Category	Priority Pollutant Number	24-hr. Average Fresh Water Criteria	Human Health Criteria#
IX. POLYCYCLIC AROMATICS HYDROCARBONS			
Acenaphthene	107	520**	-
Acenaphthylene	108	-	0.028*
Anthracene	109	-	0.028*
Benzo (a) anthracene	110	-	0.028*
Benzo (b) fluoranthene	111	-	0.028*
Benzo (k) fluoranthene	112	-	0.028*
Benzo (ghi) perylene	113	-	0.028*
Benzo (a) pyrene	114	-	0.028*
Chrysene	115	-	0.028*
Dibenzo (a,n) anthracene	116	-	0.028*
Fluoranthene	117	-	0.028*
Fluorene	118	-	42
Indeno (1,2,3-cd) pyrene	119	-	0.028*
Naphthalene	120	620 ⁺	0.028*
Phenanthrene	121	-	-
Pyrene	122	-	0.028*
X. NITROSAMINES AND OTHER NITROGEN-CONTAINING COMPOUNDS			
Nitrosamine, dimethyl	123	-	0.014*
Nitrosamine, diphenyl	124	-	49*
Nitrosamine, di-n-propyl	125	-	-
Benzidine	126	-	0.0012*
Benzidine, 3,3-dichloro	127	-	0.103*
Hydrazine, 1,2-diphenyl	128	-	0.422*
Acrylonitrile	129	-	0.58*

TABLE 2-3 (CONTINUED)

Footnotes:

A $e(1.05 \ln(\text{Hardness}) - 8.53)$: Cd

B $e(1.08 \ln(\text{Hardness}) + 3.48)$: Cr

C $e(2.35 \ln(\text{Hardness}) - 9.48)$: Pb

D $e(0.76 \ln(\text{Hardness}) + 1.06)$: Ni

E $e(1.72 \ln(\text{Hardness}) - 6.52)$: Ag

Exposure through ingestion of contaminated water and contaminated aquatic organisms.

The Human Health Criteria value was used in the dilution study calculations in place of the lower 24-Hr. Average Fresh Water threshold value.

+ Chronic threshold value.

++ Acute threshold value.

* Concentration which may result in a cancer risk of 10^{-5} over a lifetime.

** Toxicity level to one species of algae.

- 16 Saucon Creek
- 17 Lehigh River between Saucon Creek and
Delaware River

* Reaches include all tributaries to the main stream described.

As shown in Figure 3-2, 25 calculation points were selected as locations for comparing calculated river concentrations of the priority pollutants with the available ambient water quality criteria. The relationship between reaches and calculation points as well as relevant flow information is shown in Table 3-1.

The dischargers located on Figure 3-1 are described in Table 3-2. As shown, a total of 88 discharges from 42 facilities in 27 SIC categories were included in the study. Facilities located in the area surveyed, but not included in the study because 1) the facility is no longer a direct discharger; 2) no reliable data on discharge flow or facility location is available; or 3) the NPDES permit is not currently active, are shown in Table 3-3.

Calculated river concentrations of the priority pollutants thought to be discharged in the study area are shown in Table 3-4. Violations of the ambient water quality criteria are indicated in Table 3-4 by an asterisk, and summarized in Table 3-5. Note that the value for total hardness used to define the water quality criteria for cadmium, chromium, lead, nickel, and silver was 102 mg/l (mean total hardness from USGS station number 01452150 on the Lehigh River from 1969 to 1970).

As shown, 52 of the priority pollutants were found to be discharged in the study area. Draft water quality criteria were available for 48 of the pollutants, and 15 pollutants were found to violate the criteria in at least one location. Calculated river concentrations exceeded the criteria for at least one constituent at 20 calculation points for both low flow conditions and mean flow conditions except at calculation point Nos. 12, 13, 14, 16 and 17 where only low flow violations occurred.

The violations shown in Table 3-5 are summarized as follows:

<u>Violation Cause</u>	<u>Number of Violations</u>	
	<u>Mean Flow</u>	<u>Low Flow</u>
Industrial only	40	60
Municipal only	7	31
Industrial or Municipal	31	47
Industrial plus Municipal	1	0

Thus, the majority of violations for both mean and low flow conditions resulted from industrial only discharges.

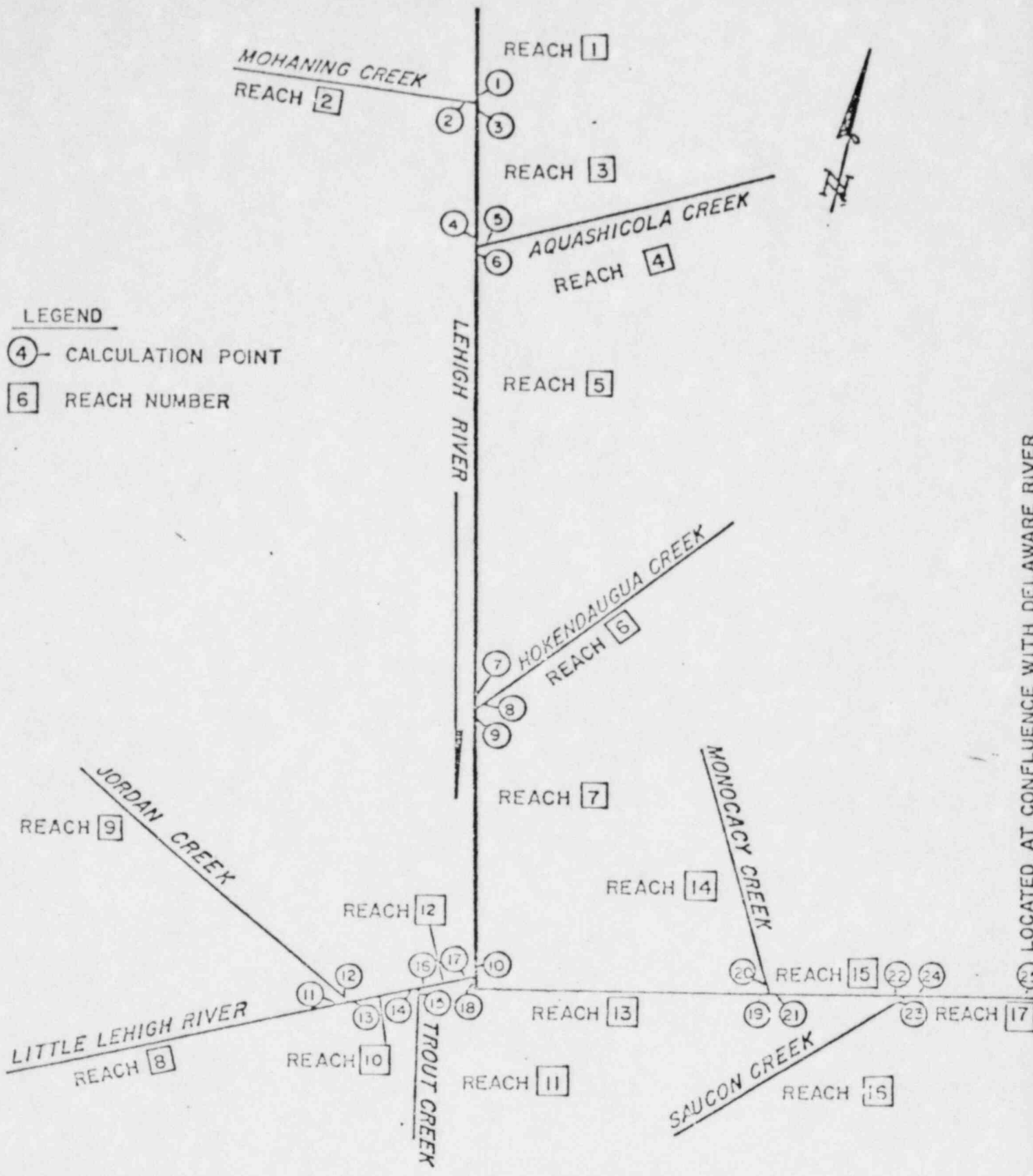


Figure 3-2. Allentown, PA dilution study area schematic.

TABLE 3-1. (CONTINUED)

Calculation Point No.	Mean Flow (cfs)	Low Flow ⁺ (cfs)	Primary USGS Gauging Sta.	Secondary USGS Gauging Sta.	Resolution*	Reach Numbers															
						1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
017	240	40	01451500	01452000	M												X	X	X	X	X
018	2,410	350	01453000	01452500	M	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
019	2,419	355	01453000	01452500	A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
020	52	12	01452500		A																X
021	2,471	367	01453000		A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
022	2,480	370	01453000		M	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
023	90	86	01454500		M																X
024	2,570	456	01453000	01454500	M	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
025	3,032	653	01454700		A	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

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* Flow Data Resolution:

- A = Flow Equal to Nearby Station
- M = Flow Estimate from Adjacent Station(s)
- E = Flow Estimate from Model; Flow Unit Area, etc.

+ 7-day 10-year Low Flow

TABLE 3-4. (continued)

AVERAGE AND LOW FLOW CONCENTRATIONS PER CALCULATION POINT

PRIORITY POLLUTANT	CALC. POINT 25	CRITERIA
22 ANTIMONY	0.01860 0.08650	146.00000
23 ARSENIC	1.00000* 5.02000*	0.00022
25 BERYLLIUM	0.33400* 1.55000*	0.03700
26 CADMIUM	14.50000* 67.40000*	0.02490
27 CHROMIUM	13.00000 63.90000	4690.00000
28 COPPER	16.80000* 78.10000*	5.60000
29 CYANIDES	27.70000* 129.00000*	3.50000
30 LEAD	15.90000* 73.70000*	3.83000
31 MERCURY	1.44000* 6.58000*	0.00057
32 NICKEL	17.00000* 82.50000*	13.40000
33 SELENIUM	0.06460 0.30000	10.00000
34 SILVER	1.41000 6.56000*	4.06000
35 THALLIUM	1.08000 5.01000	13.00000
36 ZINC	22.20000 103.00000*	47.00000
41 PCB-1248	0.02040* 0.09480*	0.00079
49 DICHLOROBROMO- METHANE	0.00510 0.02370	1.90000

TABLE 3-4. (continued)

AVERAGE AND LOW FLOW CONCENTRATIONS PER CALCULATION POINT

PRIORITY POLLUTANT	CALC. POINT 29	CRITERIA
51 TRICHLOROMETHANE	0.00357 0.01660	1.90000
52 TETRACHLORO- METHANE	0.00255 0.01190	4.00000
58 1,1,1-TRICHLORO- ETHANE	0.03450 0.16000	18400.00000
59 1,1,2-TRICHLORO- ETHANE	0.00015 0.00070	6.00000
60 1,1,2,2-TETRA- CHLOROETHANE	0.00263 0.01220	1.70000
61 HEXACHLOROETHANE	0.00004 0.00018	19.00000
65 TRICHLOROETHENE	0.00372 0.01730	27.00000
66 TETRACHLORO- ETHENE	0.00263 0.01220	8.00000
78 BENZENE	0.00179 0.00829	6.60000
82 1,4-DICHLORO- BENZENE	0.00128 0.00592	400.00000
84 HEXACHLORO- BENZENE	0.00051 0.00237	0.00720
85 ETHYLBENZENE	0.33400 1.55000	1400.00000
87 TOLUENE	0.33600 1.56000	14300.00000
89 2,6-DINITRO- TOLUENE	0.00255 0.01190	3500.00000
90 PHENOL	3.81000 17.70000	2000.00000
91 2-CHLOROPHENOL	0.00255 0.01190	2000.00000

TABLE 3-4. (continued)

AVERAGE AND LOW FLOW CONCENTRATIONS PER CALCULATION POINT

PRIORITY POLLUTANT	CALC. POINT 25	CRITERIA
92 2,4-DICHLORO-PHENOL	0.00255 0.01190	365.00000
93 2,4,6-TRICHLORO-PHENOL	0.00217 0.01010	12.00000
94 PENTACHLORO-PHENOL	0.00051 0.00237	1010.00000
95 2-NITROPHENOL	0.00255 0.01190	150.00000
98 2,4-DIMETHYL-PHENOL	0.00255 0.01190	2120.00000
99 PARA-CHLORO-META-CRESOL	0.00255 0.01190	
100 4,6-DINITRO-ORTHO-CRESOL	0.00128 0.00592	13.40000
101 DIMETHYL-PHTHALATE	0.00128 0.00592	313000.00000
102 DIETHYL-PHTHALATE	0.00128 0.00592	350000.00000
103 DI-N-BUTYL-PHTHALATE	0.67900 3.15000	34000.00000
104 DI-N-OCTYL-PHTHALATE	0.16800 0.78200	
105 BIS(2-ETHYL-HEXYL) PHTHALATE	0.27100 1.26000	15000.00000
106 BUTYL DENZYL-PHTHALATE	0.00026 0.00118	
107 ACENAPHTHENE	0.00051 0.00237	520.00000
108 ACENAPHTHYLENE	0.00051 0.00237	0.02800
117 FLUORANTHENE	0.00051 0.00237	42.00000

TABLE 3-4. (continued)

PRIORITY POLLUTANT	CALC. POINT 23	AVERAGE AND LOW FLOW CONCENTRATIONS PER CALCULATION POINT	CRITERIA
118 FLUORENE	0.00051 0.00237		0.02800
120 NAPHTHALENE	0.00179 0.00829		620.00000
122 PYRENE	0.00005 0.00024		0.02600
129 ACRYLONITRILE	0.00357 0.01660		0.58000

TABLE 3-5. ALLENTOWN, PA CRITERIA VIOLATION SUMMARY

Priority Pollutant No.	Priority Pollutant Name	Stream Flow	Calculation Point No.																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
23	Arsenic	Mean Flow	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I				
		Low Flow	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I			
25	Beryllium	Mean Flow																				
		Low Flow																				
26	Cadmium	Mean Flow	I/M	I/M	I	I	I/M	I	I	M	I/M	I/M	I/M	I/M	I/M	I/M	I/M	I/M	I/M			
		Low Flow	M	I/M	M	I/M	I/M	I/M	M	M	M	M	M	M	M	M	M	M	M	M		
28	Copper	Mean Flow																				
		Low Flow																				
29	Cyanides	Mean Flow																				
		Low Flow																				
30	Lead	Mean Flow																				
		Low Flow																				
31	Mercury	Mean Flow	M	I/M	M	I/M	I/M	I/M	I/M	M	I/M	I/M	I/M	I/M	I/M	I/M	I/M	I/M	I/M	I/M	I/M	
		Low Flow	M	I/M	I/M	I/M	I/M	I/M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
32	Nickel	Mean Flow																				
		Low Flow																				
34	Silver	Mean Flow																				
		Low Flow																				
35	Thallium	Mean Flow																				
		Low Flow																				
36	Zinc	Mean Flow																				
		Low Flow																				
41	PCB-1248	Mean Flow																				
		Low Flow																				
84	Benzene, hexa-	Mean Flow																				
		Low Flow																				
106	Acenaphthylene	Mean Flow																				
		Low Flow																				
118	Fluoreno	Mean Flow																				
		Low Flow																				

Legend:

- I - Indicates criteria exceeded due to Industrial discharges
- M - Indicates criteria exceeded due to municipal (POTW) discharges
- I+M - Indicates criteria exceeded the combined effect of industrial and municipal discharges
- I/M - Indicates criteria exceeded by the sum of industrial and municipal discharges. In addition, either industrial or municipal discharges alone would exceed the criteria.

SECTION 4

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PLANNING AID REPORT

The Sensitivity of the Delaware Estuarine
Ecosystem to Alteration of the Natural
Cycle of Salinity Change

Prepared for

U.S. Army Corps of Engineers
Philadelphia District

Prepared by

U.S. Department of the Interior
Fish and Wildlife Service

July 1981

Preparer: Michael T. Chezik
Project Leader: Charles J. Kulp

Eth 6

E. Synopsis of Salinity Effects on the Ecosystem with Emphasis on the Oligo-mesohaline Reach

The information we have reviewed shows that salinity exerts strong influence on the Delaware estuarine ecosystem. Briefly, it influences the distribution of marsh plants, benthic invertebrates, fishes and certain wildlife. Relatively few aquatic species are tolerant of the entire salinity gradient from fresh water to salt water. Most species occupy portions of the gradient beyond which survival is threatened. Salinity affects seed germination and growth of marsh plants; oyster drill predation and probably MSX disease in the oyster seed beds; movement of blue crab larvae; location of blue crab spawning, nursery and mating grounds; movement of fish eggs and larvae; location of spawning, nursery and feeding grounds of fishes; muskrat production; and, waterfowl feeding and resting grounds. The overall effect of the salinity gradient is to create numerous niches, fostering wide ecologic diversity and high productivity. Literally hundreds of plant and animal species, some with populations numbering in the many thousands, utilize the Delaware estuary.

The salinity gradient is broadest in the lower river and upper bay or the oligo-mesohaline zone (Daiber and Smith, 1972; Ichthyological Associates, 1980). The dynamic nature of salinity and other physiochemical factors in this 45 mile reach results in a variable and demanding environment. However, these factors also create an abundance of food resources attractive to species tolerant of the salinity fluctuations. Tidal fluctuations enhance productivity by supplying food, nutrients and oxygen. Additionally, vertical mixing recycles and traps nutrients, sediments, detritus and planktonic organisms. The adjoining marshland also contributes to the food base (Ichthyological Associates, 1980).

This highly productive brackish reach is important to shellfish and fishery resources. Oysters thrive in it partly because of protection against predation by oyster drills. Blue crabs mate there and young, after a period of early development in downbay areas, move into the region to mature. Atlantic menhaden, weakfish, striped bass, white perch, bluefish, summer flounder, American eel, white catfish, carp, Atlantic silverside, bay anchovy, mummichog and spot use these waters for early growth. Besides offering food to these species, the region also offers protection from predators incapable of tolerating the salinity regime. Also, higher water temperature during spring and summer probably results in faster growth (Ichthyological Associates, 1980).

Euryhaline organisms occupying this reach have a distinct advantage over stenohaline types. Not only can they tolerate wide salinity variation, but they use this ability to maintain their populations. In summary, the salinity characteristics of this reach favor an abundant food supply, protection from predation and early growth. These functions are important in maintaining populations of valuable commercial and recreational species.

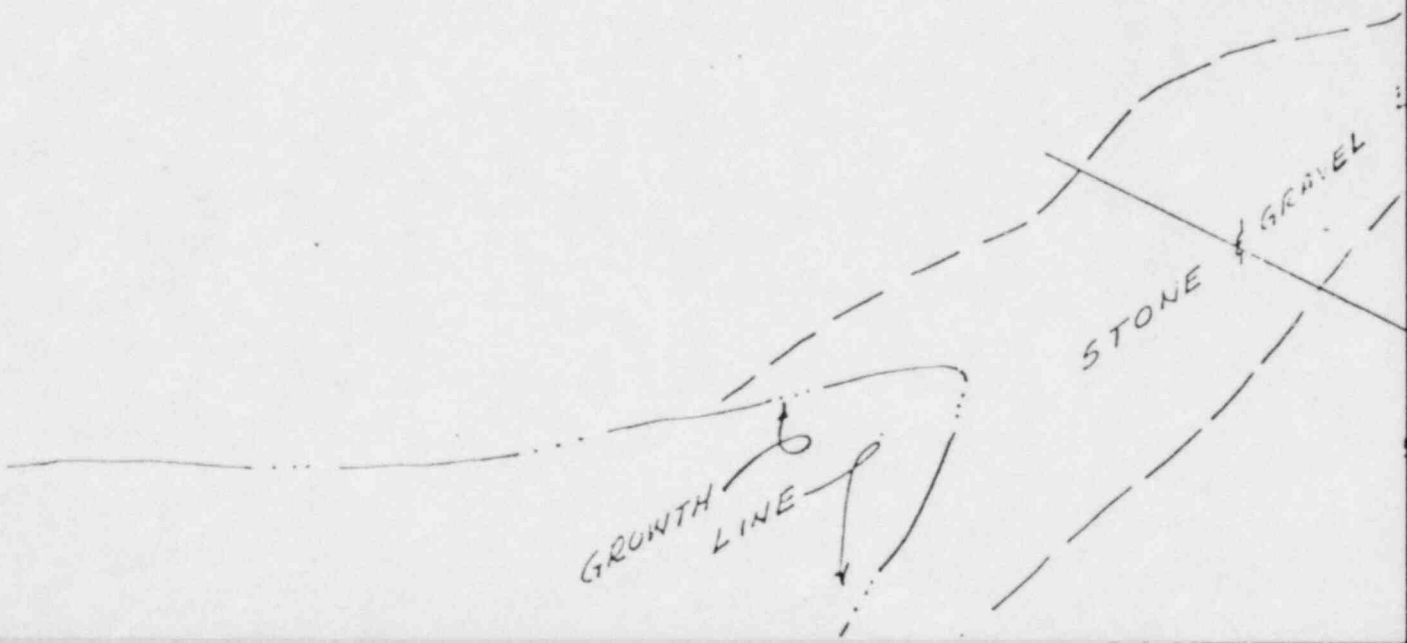
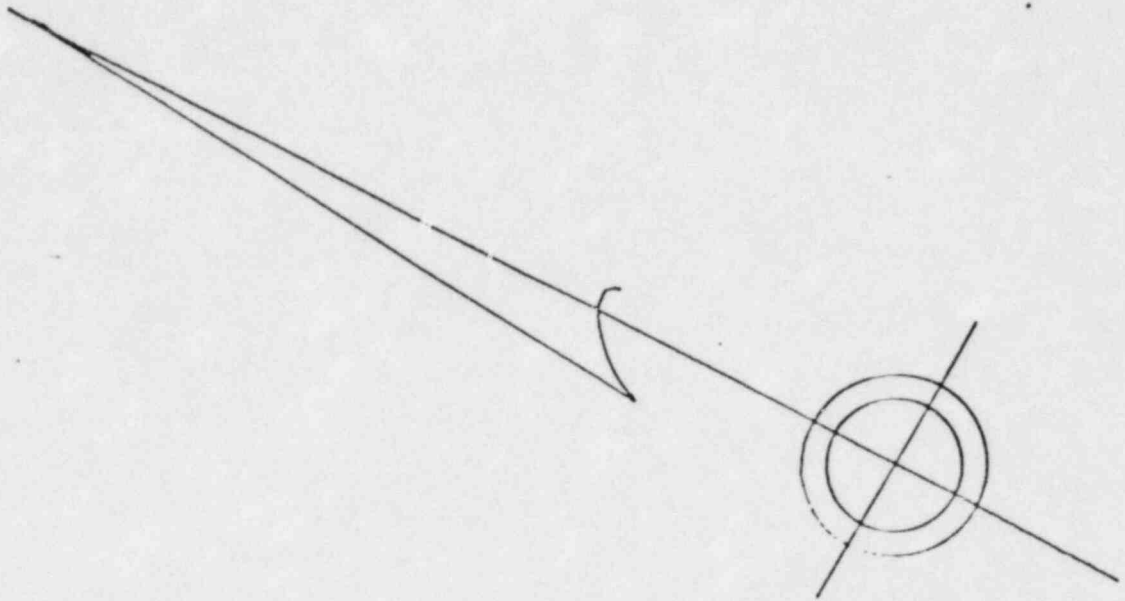
IV. Potential Effects of Altering the Salinity Regime on the Delaware Ecosystem

As we have previously noted, the zones of salinity shown in Figure 1 are displaced in different directions depending mainly on freshwater outflow and

It may be possible to benefit from low flow augmentation without reducing spring flows. Our study did not uncover evidence indicating a salinity increase in winter would be harmful to the ecosystem. Perhaps sufficient volumes of water could be stored during winter to limit salinity intrusion.

This report only addresses changes in the salinity regime. Water circulation, turbidity, water quality, temperature, sedimentation, scouring and nutrient loading may also be affected by altering runoff patterns. These factors should be assessed in other studies. We would particularly like to see a study of circulation patterns and the effects of changes on fish and benthic invertebrate egg and larval movements.

In view of these findings, the Service recommends that reducing freshwater outflow in spring be avoided, and if it can't be avoided, be minimized to protect and maintain the health of the Delaware estuarine ecosystem.



N-407,500

DELAWARE RIVER

WATER ELEV. 71.66

STONE & GRAVEL BAR SHALLONS

WATER ELEV. 71.64

GROWTH LINE

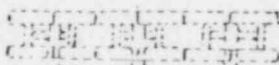
FISH SPAWNING AREA

DE. 75
110

E-2,749,000

350' ±

3" INTAKE CONDUITS



END PROPOSED PIPE

60.0

60.1

60.4

60.1

59.8

62.2

61.1

60.6

63.6

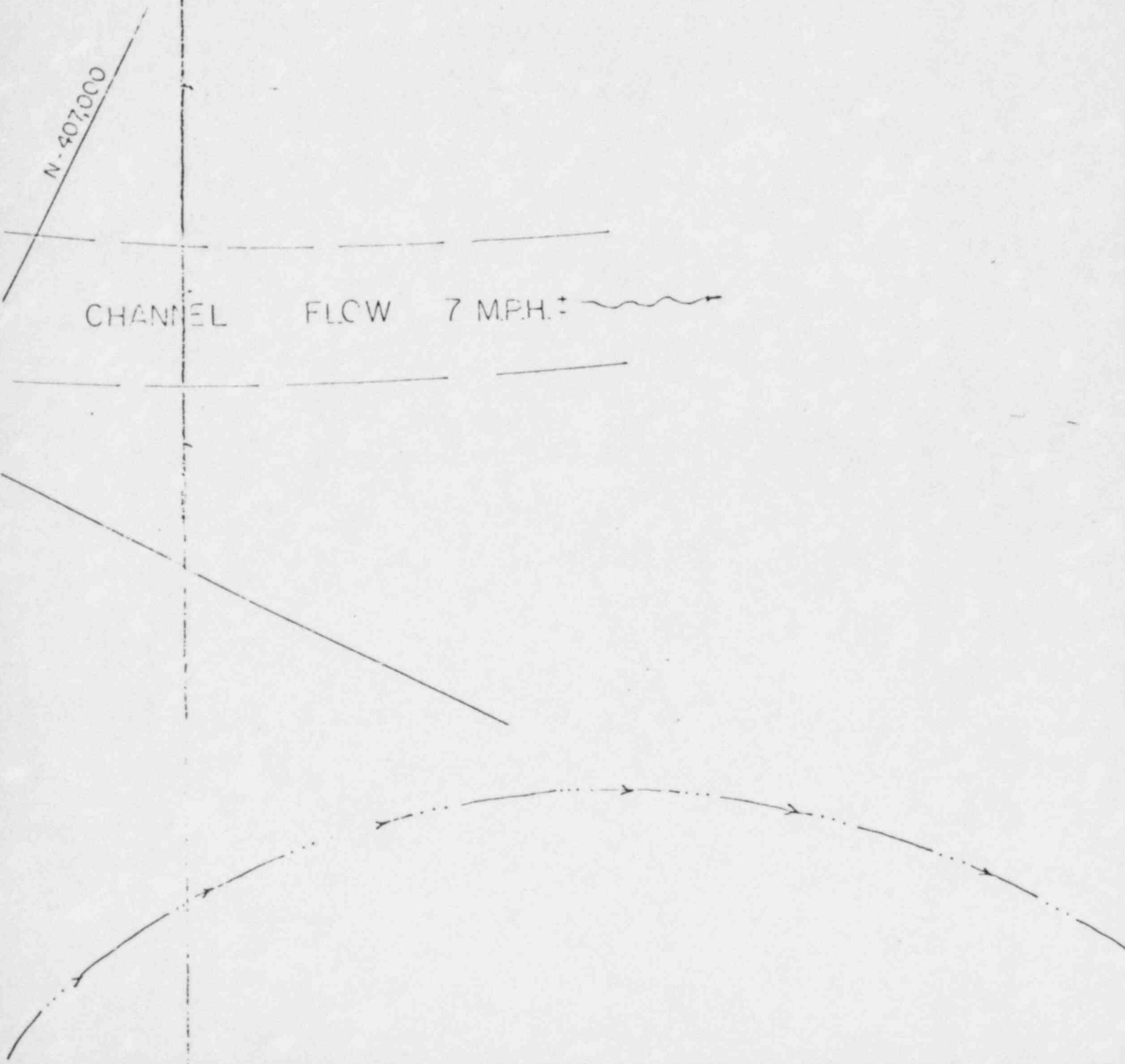
62.6

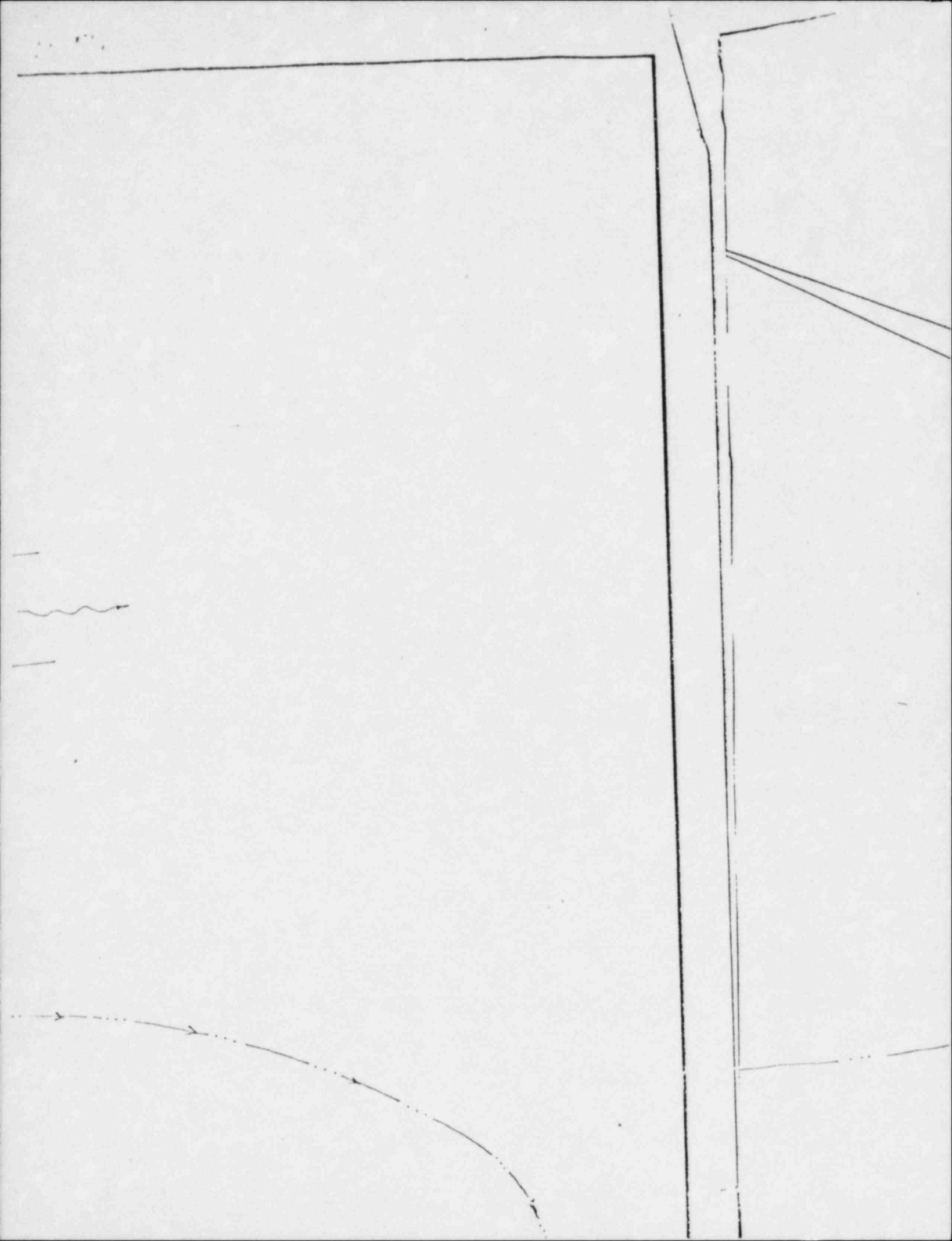
62.7

EAD CALM AREA
NOTE WATER ELEVATIONS

N-407,000

CHANNEL FLOW 7 M.P.H. →






1. Pipe
FO

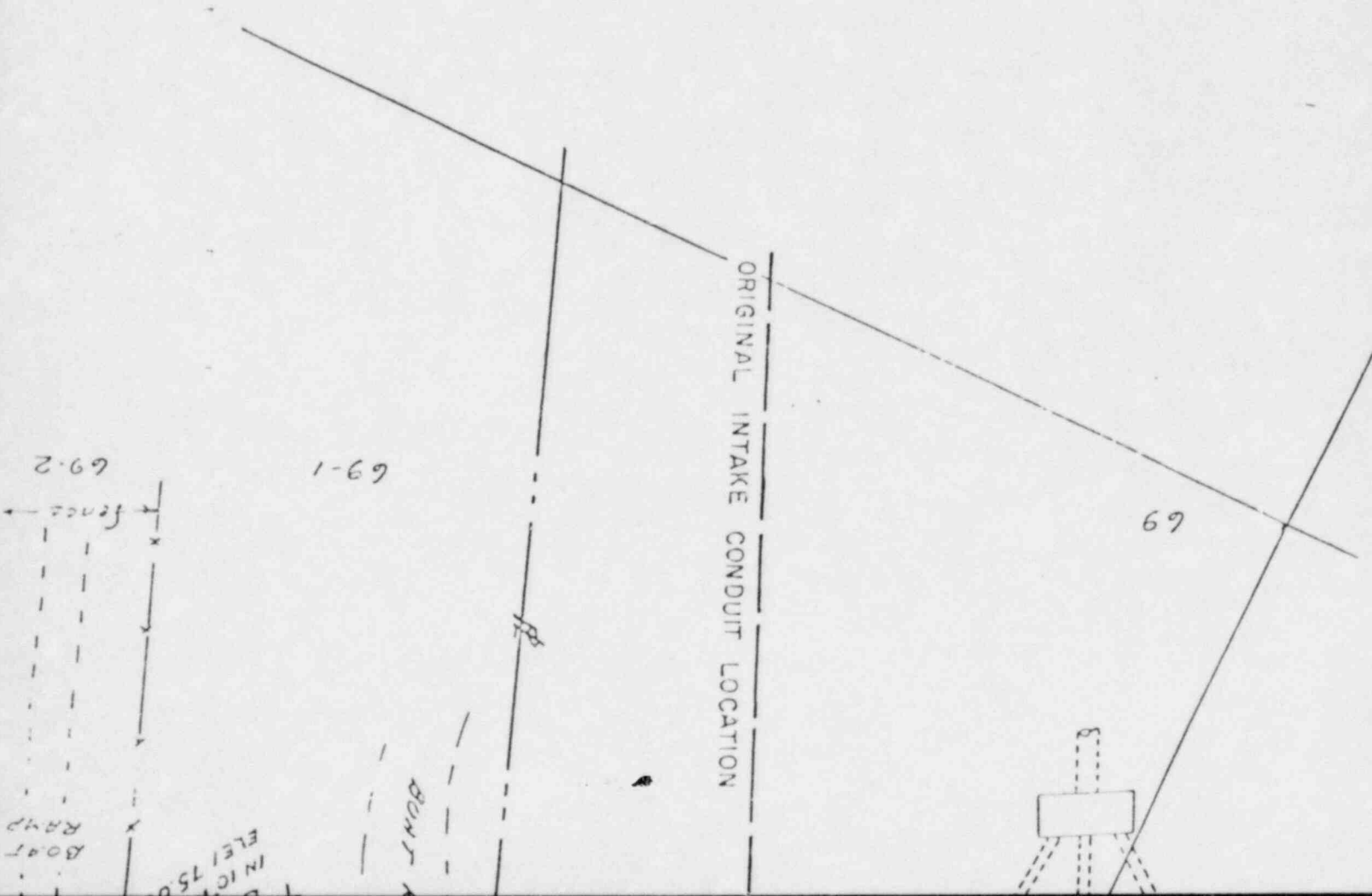
at location
flow 4550 cfs (7)

REV No.	DESCRIPTION	BY	DATE
1	add limits of current in time of survey	MLL	6-22-81

<p style="text-align: center;">TOPOGRAPHIC SURVEY OF PORTION OF DELAWARE RIVER SITUATE IN PLUMSTEAD TWP, BUCKS COUNTY, PA.</p>	TAX PARCEL
	REFERENCE
	DRAWN BY <i>A.J.L.</i>
	CHK'D BY
	DATE 6-9-81
 <p style="text-align: center;">EZRA GOLUB ASSOC. ENGINEERS - SURVEYORS 4141 WOERNER AVENUE LEVITTOWN Pa 19057 215-943 2230 609-387 1566</p> <p style="text-align: center;"><i>Ezra Golub</i></p>	SCALE 1"=50'
	DWG NO D-1873 01
	D-59

ELEVATIONS ARE USCA
1929 SEA LEVEL DATUM

Note: Limits of current are for peak
and time of survey only, currents
VARY WITH VOLUME & STS



69

E-2,748,500

69-4

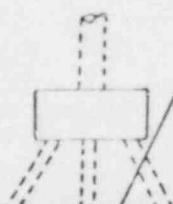
1
2
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No.
20
191

ORIGINAL INTAKE CONDUIT LOCATION

69

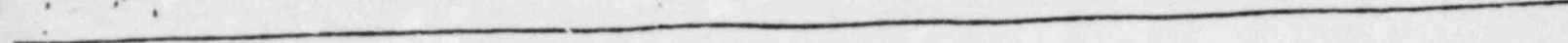
E-2,748,500



7-69

OVERFLOW

10



CANAL OVERFLOW

CK-OR

MAIN CHANNEL

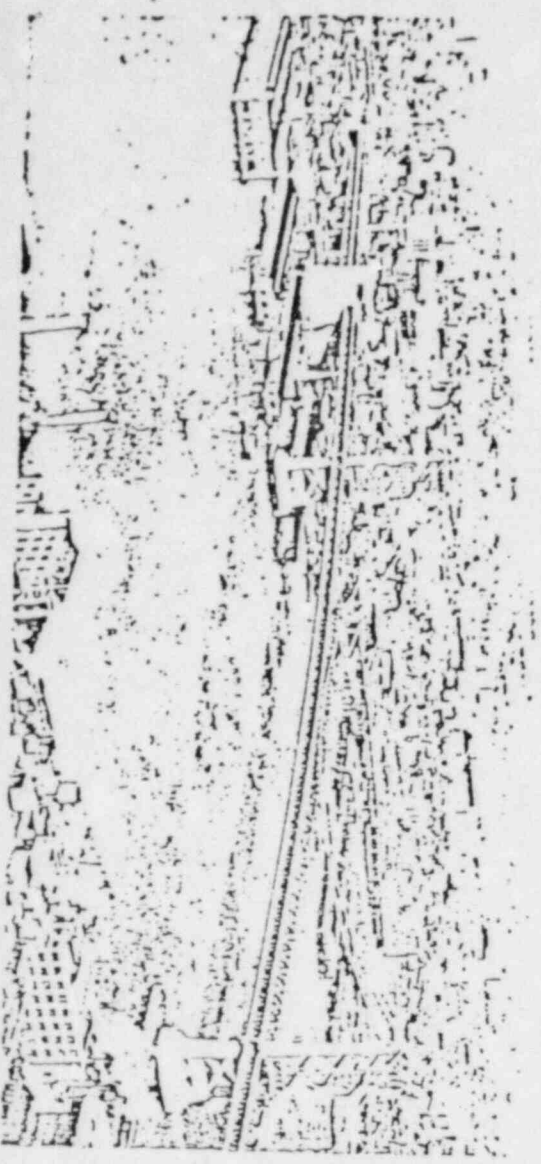
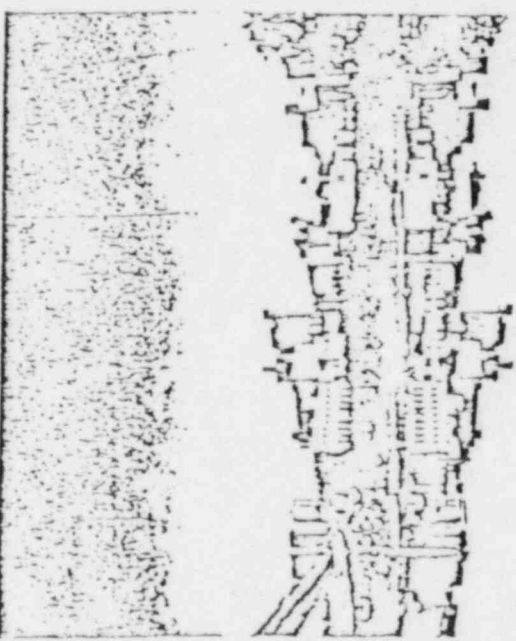
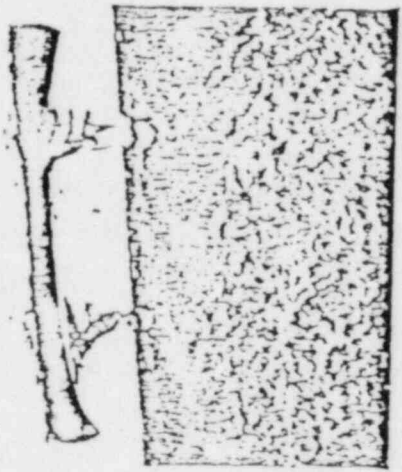
THICK

Alan A. Shtelman, C.P.A.
RD 1, Box 8
Frenchtown, N.J. 08825

THE DELAWARE RIVER BASIN

THE FINAL REPORT AND ENVIRONMENTAL IMPACT STATEMENT
OF THE LEVEL B STUDY - MAY 1981

THE DELAWARE RIVER BASIN COMMISSION



2. Water Quality

a. Problem Statement

Philadelphia, Camden and Trenton are major Estuary dischargers which have not met the treatment levels required under the National Pollutant Discharge Elimination System and the Commission waste load allocations. No management options are included for this problem statement, since the cases are being handled on an individual basis. Compliance is expected by the mid-1980's.

Dissolved oxygen standards in the central portion of the Delaware Estuary do not maximize the fisheries potential of the Delaware River.

Increased coordination among water quality planning programs would improve their effectiveness.

There is increasing concern about the possible threat of toxic substances in the surface and ground waters of the Basin.

b. Water Quality in the Delaware Estuary

The dissolved oxygen standards chosen for Zones 3, 4, and part of 5 of the Delaware Estuary are less than the usual criteria for "fishable" waters under the Clean Water Act. These standards were accepted by EPA in 1973 as the highest feasible under treatment requirements then considered realistic. The development of a new, more sophisticated mathematical model for water quality in the Estuary provides the opportunity to reexamine the existing standards.

This reexamination has several aspects. First, an ad hoc Task Force to Evaluate Dissolved Oxygen Requirements of Indigenous Estuary Fish was appointed by the DRBC. The Task Force was established to provide fisheries expertise and guidance to both Level B and to DRBC's program now under way to reevaluate its current wasteload allocations. A determination was needed of the amount of fisheries resource in the Estuary which would satisfy the "fishable" goal, and the dissolved oxygen levels required to attain the goal. The Task Force met five times between September 1978 and January 1979. The final recommendations (DRBC, Ad-Hoc Task Force, March 1979) of the Task Force included two sets of recommended dissolved oxygen standards. For immediate consideration was a set of standards recommending an Estuary-wide minimum dissolved oxygen standard of not less than 5.0 mg/l except in the critical reach of the Estuary where a minimum of 4.0 mg/l was deemed acceptable. The critical reach represents the area of greatest dissolved oxygen deficit in the Philadelphia-

Camden area. Ultimate standards of 6.0 mg/l and 5.0 mg/l (critical reach) were recommended for future consideration.

The new water quality model for the Estuary is being used to estimate the dissolved oxygen levels which can be achieved under present and increased degrees of pollutant reduction. The model will consider both dry-weather and storm conditions, nitrogenous as well as carbonaceous oxygen demand, and the effects of tributary wasteloads and accumulated sediment deposits.

Concurrent with the determination of a feasible dissolved oxygen "target", the most cost-effective mix of measures must be determined to reduce oxygen-demanding wasteloads affecting the Estuary. These loads, as implied above, include municipal and industrial discharges, combined sewer overflows and other storm runoff, tributaries as well as the main stem Delaware River as it enters the tidal reaches, and bottom deposits. With decreased discharge loads because of the DRBC wasteload allocations program and the requirements of the Clean Water Act, the non-point sources become relatively more important. Treating these sources may be less costly than increasing treatment levels for point source dischargers. However, much detailed analysis remains to be done to determine best management practices for non-point pollution sources. Non-point source treatment will be compared to additional point source treatment before resorting to additional point source treatment.

Figure 12 shows computed dissolved oxygen (DO) profiles along the tidal Delaware River from Trenton to Liston Point, for low-water slack tide, under different levels of flow regulation. These DO curves were determined with the one-dimensional version of DRBC's current water-quality model of the Estuary. The model simulations indicate that increasing the Trenton flow from 2,000 cfs to 3,475 cfs would cause a DO increase of 0.13 mg/l at river-mile 98, on the downslope of the DO "sag", and 0.08 mg/l at the bottom of the sag. Seaward of the critical sag point, as water quality improves with distance, DO levels tend to be slightly lower at higher flows. Flow changes have a significant impact on DO in Zone 2, from Trenton to about mile 113, where DO increases of a mg/l or more may result. The effects shown should be taken as relative rather than absolute, since the sensitivity of the model results to changes in waste loads has not been fully tested.

Other water quality issues in the Estuary include thermal loads and the threat of contamination with toxic substances. The ad hoc Task Force, while directing its effort to dissolved oxygen, agreed on the importance of these factors for an improved fishery in the Estuary. The new Estuary model will explore the relationship between temperature and dissolved oxygen levels at critical periods. It is not designed to evaluate the problem of contamination of the Estuary waters with trace quantities of toxic substances. These are addressed later in this section.

The new model will be used to investigate point and non-point source controls for various dissolved oxygen criteria for a range of low-flow conditions consistent with the various flow maintenance objectives at Trenton.

In Zone 2, the upper portion of the Estuary, more detailed investigations of water quality issues are needed: (1) the effect of bottom deposits on water quality should be examined, (2) water quality characteristics of the River as it enters the zone should be monitored, and (3) the effects of flow changes (which are more significant here than for the lower Estuary zones) should be evaluated. Zone 2 is impacted by drainage from 60 percent of the Delaware River Basin. The background carbonaceous and nitrogenous loads carried by the Delaware River as it enters the Estuary at Trenton are immense. Studies have demonstrated that loads entering the Estuary from the non-tidal river are predominately from non-point sources of pollution, suggesting that a truly interstate impact is being thrust upon Zone 2. A proposed Study by DRBC would determine practical methods of removing the effects of organic loads from the River and distributing the cost of the solution equitably to the contributing areas.

c. Other Water Quality Management Issues

The consequences of a lowered flow maintenance objective for the River above Trenton may also need to be explored. A water-quality model is available for this analysis for this section of the River.

d. Overall Water Quality Management and Improvement

Non-point source problems and the measures to mitigate them can be conveniently divided according to the types of land uses involved: urban areas, suburban/developing areas, and rural or predominantly agricultural lands. To varying degrees, for each of these categories only limited information is available on specific causes of observed water-quality problems and the effectiveness of potential management measures, which may be costly and difficult to enforce. The detailed investigations which may be required to resolve

such issues are also likely to be costly. In this context EPA has been slow to specify Best Management Practices to serve as guidelines for local management. Yet in many areas, non-point source problems should be resolved before point source controls are imposed.

In urban areas, after currently required treatment levels have been achieved, trade-offs must be considered between higher degrees of waste treatment and treatment of combined sewer overflows or storm flows. Such stormwater management measures may prove to be less costly for Philadelphia and other metropolitan areas in the Basin than tertiary sewage treatment for the same degree of stream improvement.

In suburban and developing areas, facilities planning for the last decade has focused on local or regional sewage treatment facilities large enough to handle anticipated increases in loads. At the same time, suburban growth has proceeded on the implicit assumption that sewers would follow. In many cases, housing patterns have been too dense to allow continued use of traditional onsite systems, and too scattered to allow sewerage at a reasonable cost. The result has been an expensive network of sewers feeding a regional plant, with problems of diminished streamflow and depleted ground water in the areas served.

Several completed "208" reports take such problems into account. In particular, proposals have been made to achieve conservation by maintenance of onsite systems wherever possible, and to plan at a community level for land application of waste. Under the federal Clean Water Act, land application measures are to receive a high level of consideration.

A variety of state, county, and local ordinances apply to sediment and erosion control and storm runoff in developing areas, some with the goal of accelerating rather than preventing runoff. Stormwater management policies or regulations normally have consequences for flood control and conservation as well as water quality, and planning must consider all these purposes together.

In rural areas, land treatment and other measures carried out under the programs of the Soil Conservation Districts have been directed primarily at reducing erosion and sedimentation and improving farm productivity.

The West Branch of the Delaware River above Cannonsville Reservoir was chosen by the New York Department of Environmental Conservation for analysis by the Soil Conservation Service. Management practices were identified which appear both to be acceptable to landowners and to show promise in mitigating water-quality problems. Implementation of many of these

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ROBERT RAYMOND ELLIOTT, P. C.*
COUNSEL

* NOT ADMITTED IN PA.

August 3, 1982

Mr. Jordan Tannenbaum
Advisory Council on Historic Preservation
Chief, Eastern Division of Project Review
1522 K Street NW
Washington, D.C. 20005

Dear Mr. Tannenbaum:

These comments are filed by Del-AWARE Unlimited on the proposed memorandum of agreement between the Advisory Council, NWRRA, and Pennsylvania SHPO, concerning the proposed construction of the Point Pleasant intake, in and through the Pennsylvania Canal (Delaware Division), a National Historic Landmark, the Point Pleasant eligible Historic District, and the very significant and critical archeological sites in the vicinity of both of those designated or eligible places.

The Del-AWARE also adopts and reaffirms the comments of the Bucks County Conservancy, contained in their letter to you dated July 21, 1982. The expertise and objective approach of the Bucks County Conservancy, in addition to its authoritative role as spokesman for conservation of major elements of historic value in Bucks County, is illustrated by the quality of its leadership, including its chairman, the Honorable Hart Rufe, a Judge of the Bucks County Court of Common Pleas. The Conservancy therefore speaks not only to the technical issues addressed in their comments, but also to the importance that they hold for the community.

Del-AWARE wishes to address the interrelationship between the fish and wildlife issues, which have been raised and are under consideration by Fish and Wildlife Service and the Pennsylvania Fish Commission, and the historic issues addressed in the Memorandum of Agreement, in terms of the impact of the project on the values thus represented.

Point Pleasant is an extremely important site for the ancient Delaware River civilization. The Delaware River valley at Point Pleasant, was inhabited by prehistoric natives as long

ago as the time of Christ, and has been a center of human activity related to river culture periodically since that time. In the fourteenth through eighteenth centuries, the historic age Indians centered at Point Pleasant as a fishing and trading location. The abundance of food and water supported an intensive industrial civilization related to the river, which produced blades and other trade items, and because of its access both by water and by land, Point Pleasant served as a trading center as far west as Lancaster, Pennsylvania, and upstream and downstream along the Delaware River.

The English settlers were not long in realizing the value of Point Pleasant, and succeeded the Indians at an early time in English settlement. Among the first activities established by the English settlers was a commercial fishing venture, and among the early following activities was as ferry across the Delaware River. The construction of Ferry Road along the old Indian trails to the west followed, and Point Pleasant as an English settlement succeeded the Indian settlement.

However, the early settlers respected their Indian predecessors, and at least several Indian sites remain essentially intact, having been explored by Henry Mercer in the late nineteenth century, but otherwise undisturbed until the present time. Among the most important of these sites, if not the most important, is the area which is now the proposed location for the intake conduit for the proposed water diversion.

As the English settlement grew, it quickly became a center for logging activity, because of the eddy. Thus, Black Eddy has served as a major historic center of human activity because of its abundance of fish, its lack of currents (making it suitable for fording), and its ponding characteristics, making it suitable as a resting place for loggers coming downstream.

As a result of these converging factors, the Mountainside Inn was developed at Point Pleasant as a major center of river commercial activity.

Likewise, when the Pennsylvania Canal (Delaware Division) was constructed in the 1820's, Point Pleasant became a major stopping place along the canal, both because of its preexisting facilities, its convenience as a crossing of the river, and the locks which were naturally related to the eddy (the fall off in the river at Point Pleasant).

Similarly, in its turn the canal gave rise to a further but limited growth of activities related to the canal and to the river as a commercial center.

This kind of village activity related to the water and the land surrounding it, has been preserved throughout the twentieth century as a result of the passage of commercial activities

to other areas more suited to the large scale water and land activities of the twentieth century. For this reason, and because of the earlier prosperity associated with it, and of the quality of buildings and facilities constructed, Point Pleasant has remained intact and represents a major National resource for appreciation of the periodic return of human civilization to river roots.

Although some of the foregoing is reflected in the Memorandum of Agreement and the underlying work, the underlying historic documentation prepared by consultants and the Corps' case report also reflects a systematic understatement of the significance of the historic elements and a total failure to interrelate these significant areas of importance, and therefore completely fails to present the historic meaning and significance of Point Pleasant.

Similarly, the draft MOA and Case Reports show a clear failure to appreciate the harm that would be caused to the Landmark and the surrounding historic areas of significance by the proposed project. The project would unavoidably alter the present natural historical character of the Landmark in the vicinity of the project, destroy the visual and historic integrity of the area surrounding the canal and especially related to the Mountainside Inn, which is part of the Landmark designation, and through its destruction of the hillside and the natural run of Hickory Run, as well as the natural character of the foliage on the hillside, unavoidable and permanently irreparably damage the overall ambience of the historic area. The MOA does not reflect this, and indeed once admitting the project into the area, cannot reflect this.

In these circumstances, it is most unfortunate and of greatest concern to Del-AWARE that despite the provisions of Section 110f of the National Historic Act Amendments of 1980, no effort has been made to plan or act to adopt practicable measures and actions to minimize injury to the Landmark. Alternatives to the project are readily available, and while they were rejected by the applicant, the Delaware River Basin Commission and by Philadelphia Electric Company prior to the Landmark and distinct determinations enactment of Section 110f, they have not been evaluated either in the light of the passage of Section 110f, which mandates a more rigid comparison of alternatives weighted to minimize harm to the Landmark, nor have they been evaluated in light of the significant changes in the project proposal, including substantial increases in the amount of blasting, implemented in 1981 and 1982, and the resolution to terminate Unit 2 of the Limerick Generating Station, a major justification for the project, adopted in May, 1982 by the Pennsylvania Public Utility Commission.

In this connection, Del-AWARE Unlimited has repeatedly

sought the opportunity to discuss some mitigation alternatives under Section 110f with the applicant and Philadelphia Electric Company, but has never been given the opportunity to do so. It is especially untimely that a MOA be entered into at this time, in view of the recent decision by the Nuclear Regulatory Commission to examine alternatives to Point Pleasant for the first time, in connection with their operating licence proceeding for the Limerick Generation Station. (Previously, the Nuclear Regulatory Commission had assumed the construction of Point Pleasant as a portion of NWRA activities, and therefore had not considered the existence or not of Point Pleasant as an option in evaluating Limerick, and had passed no judgment on it. The NRC will now, presumably, make a finding under Section 110f in connection with the operating licence proceeding, or a pending request by Del-AWARE to reconsider and to amend the construction permits for Limerick in light of the present situation, in which the Point Pleasant pumping station would not be constructed without the financial participation of Philadelphia Electric Company.)

Enclosed are discussions of available alternatives presented by NWRA and PECO, respectively, in their 1979 Environmental Reports. As you can see, nowhere in these reports is there a statement that the utilization of these alternatives is not a practicable measure which will minimize harm to the Landmark.

Therefore, Del-AWARE Unlimited requests that the MOA be revised to require that, prior to execution, the Corps conduct a full investigation of alternatives, in light of the significance of the area and the impact, as described above, and take every action possible to minimize harm to the Landmark, pursuant to Section 110f of the National Historic Preservation Amendments of 1980. Such action by the Corps should be then submitted to the Advisory Council for comment pursuant to Section 110f, and the Advisory Council given a full opportunity to comment on the Corps' proposed undertaking, as required by that section.

We do understand that the Advisory Council is amending the proposed MOA to include a representation by the Corps that it has complied with Section 110f, and while we view this as a critical step forward, in that it will require the Corps to consider, itself, whether it has so complied, it does not discharge the Corps' responsibility under Section 110f, nor does it discharge the Council's responsibility to afford comment to the Corps on such compliance.

We look forward to the opportunity to cooperate with the Council in further development of its cooperation with the Corps, and we particularly welcome the Council's assurance that we will, at our request, be included in meetings to be held with the Corps.

We further understand that the Department of Interior, National Park Service, is being afforded an opportunity to comment on the draft MOA and the undertaking, and we look forward to the opportunity to consult with the Park Service before they have finalized their comments, and will be communicating with them in that regard.

With renewed appreciation for the opportunity to comment,

Sincerely,

A handwritten signature in black ink, appearing to read "Robert J. Sugarman". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Robert J. Sugarman

Encls.

bcc: Ms. Loretta Newman
Ms. Kathy Auerbach
Ms. Virginia Forrest
Ms. Virginia Hutton ✓
Mr. Paul Pritchard
Aubra Anthony, Esquire
Ms. Colleen Wells
Mr. Val Sigstedt

BEFORE THE DELAWARE RIVER BASIN COMMISSION

IN RE: NESHAMINY WATER RESOURCES)	Docket No. D-65-76-CP
AUTHORITY AND PHILADELPHIA)	
ELECTRIC COMPANY'S WITHDRAWAL FROM)	Docket No. D-69-210-CP
THE DELAWARE RIVER AT POINT)	
PLEASANT.)	Docket No. D-79-52-CP

AMENDED PETITION TO REOPEN AND FOR RECONSIDERATION AND, TO
SET ASIDE PRIOR ORDERS, AND TO TAKE OTHER ACTION AS
APPROPRIATE

Del-AWARE, Unlimited, Inc., Val Sigstedt, Honorable Rita Banning, Limerick Ecology Action, Delaware Water Emergency Group, Phyllis Zitzer, Richard McNutt, Mary Ellen Noble, C. J. Gilmore, Anne P. Carney, Judy Zipkin, Jane and Falton Gross, Lee Goldberg, Carla Van Dyk and Michelle and Graham Kinsman, by their attorneys, petition this Honorable Commission to reopen and set aside its Orders in the within proceedings, pursuant to Sections 3.8, 13.1 and 15.1 (s) 1 of the Compact and Sections 2-1.4, 2-1.7, 2-4.16 of the Rules, and the Administrative Procedure Act, 5 U.S.C. §701 et seq., and to further revise the Comprehensive Plan pursuant to Section 13.1 thereof, and aver as the basis thereof the following:

1. On February 18, 1981, this Commission granted "final" approval, under Section 3.8 of the Compact and to the inclusion in the Comprehensive Plan, of the proposed

Neshaminy Water Resources Authority and Philadelphia Electric Company withdrawals, as modified, via an intake at Point Pleasant, Pennsylvania, of 95 mgd, subject to certain understandings, conditions, and limitations.

2. All or most of the Petitioners were objectors regarding the foregoing Orders.

3. No construction has been initiated in reliance on the above-mentioned Orders.

4. Reconsideration, reopening, and rescission is warranted and necessary in the public interest for the following reasons, all of which have come into existence and/or been newly recognized since February 18, 1981, and all of which represent significant adverse environmental impacts not previously considered.

A. The Commission's acceptance of the Level B Study, and the issuance of draft Recommendations of the Parties regarding Interstate Basin Management, and Background Report, issued in July, 1982, reflect a recognition of the inability of the Delaware River Basin to reliably sustain the proposed withdrawal without unacceptable adverse effects on the water quality and water use needs of the Basin. The Level B Study and the Recommendations specifically acknowledge that the proposed withdrawal will further expand depletive withdrawals beyond the capacity of Basin supplies to prevent salinity contamination, and to insure against excessive dissolved oxygen sags in drought and severe drought conditions, in violation of the present salinity and

dissolved oxygen standards, in the absence of substantial additional storage capacity. Thus, when joined with existing uses, there is not adequate water to support the proposed use. In these circumstances, Commission must rescind the above-mentioned Orders.

B. There is no present or foreseeable likelihood that the new offsetting storage proposed in the Level B Study and Recommendations can and will be provided in full, or at least, there is no commitment to do so, and prerequisite environmental reviews are not yet completed, thus legally precluding a present decision. Moreover, the Commission's environmental studies of Merrill Creek show that withdrawals for storage would exacerbate present inability to reliably meet salinity standards. Other proposed storage projects have not been studied and/or present similar or other problems. Implementation of the proposed Point Pleasant withdrawals in the absence of a determination of approvability and feasibility of the necessary replacement or additional storage, would practically preclude the no build option, which must be preserved in order to make meaningful environmental decisions regarding the proposed replacement and additional storage.

C. The proposed depletive use for Limerick Unit 2 is not a beneficial use of the waters. The decision of the Pennsylvania Public Utility Commission at Docket No. 180100431, on August 27, 1982, represents a decision by Pennsylvania that present or near-term construction of

Limerick Unit is not in the public interest. This finding requires rescission or suspension of the Order with regard to 23 mgd for Unit 1, and implementation of an alternative available to supply the needs for cooling Unit 1, which would not further harm the Delaware River, including (a) placing the already constructed cooling towers in series, (b) providing alternative storage in the Schuylkill River Basin, deemed less desirable for two units, but more desirable than Point Pleasant for one unit, and which might be directed by this Commission in the public interest, (c) utilizing storage available at the Blue Marsh Reservoir, and (d) utilizing other potential local sources of supply in the Schuylkill River Basin, directly or indirectly under the control of this Commission.

D. Relevant agencies have identified an adverse impact on a National Historic Landmark and on very significant archeological sites, which might require, pursuant to procedures set forth by the Advisory Council on Historic Preservation, in situ preservation of the archeological finds as a result of preproject test digging and studies or entail loss of significant unique resources.

E. Contrary to expectation, it is now clear that in its present location, the intake will adversely affect Lower Black's Eddy, a spawning and nursery area, and an important shore fishing area, through the creation of turbidity and through entrainment and impingement, thus destroying a

significant habitat for American shad, a major species, and other species.

F. The National Marine Fisheries Service has identified the probable presence of a habitat for shortnose sturgeon, an endangered species, in the nursery and/or spawning stages, rendering them subject to injury by the project, and recommended further studies to determine such effects. While NMFS believed that the intake design would limit exposure, its finding was based in part on the erroneous information supplied to it that the intake would not operate at maximum velocity when river flows are lower than 3,000 cfs (Trenton).

G. Philadelphia Electric Company has identified TCE's, and the Environmental Protection Agency has identified significant amounts of other toxic materials, in the Delaware River from the Lehigh confluence downstream, and including Point Pleasant, which would adversely impact the Perkiomen and Neshaminy Creeks, and cause toxicity in those creeks and the groundwater aquifers, since the Perkiomen is a recharge stream in some reaches.

H. The NWRA use is not a beneficial use in that

(1) Local suppliers in Warminster and Warrington no longer need Delaware River water because Pennsylvania DER has determined that the water quality in their local wells is suitable for human consumption as a result of treatment.

(2) Contrary to previous information, this Commission's ground water study has established the availability of adequate new groundwater sources in local aquifers to supply Bucks and Montgomery County needs.

(3) Use of these resources would add to rather than deplete river flows, and thus aid in meeting water quality and use objectives.

(4) The dedication of Lake Nockamixon for drought flow augmentation in the River makes it no longer detrimental to use Lake Nockimixon for drought flow augmentation of local water supply rather than of the Delaware River. Contrary to the situation in 1980.

I. The Merrill Creek draft EIS regards the Merrill Creek Project as a necessary element of the Point Pleasant diversion to offset the adverse effect of PPD on salinity levels.

J. The approvals should be reopened and reconsidered as a result of the individual and cumulative impact of all of these factors, which require a finding that the withdrawal is not a beneficial use of the water, that there is not adequate water available to permit them, and that less consumptive alternatives are available in light of the changing economic and water needs within the Delaware River Basin, and this Commission's concern over the cumulative effect of depletive withdrawals in the Delaware River Basin.

5. In its 1981 decisions, expressly and in subsequent correspondence, this Commission made it clear that it was leaving resolution of matters relating to historic impacts and local effects of the intake on fish to the U.S. Army Corps of Engineers and NMFS. Thus, the 1981 decisions themselves require reconsideration and reevaluation in light of the present state of the record on those matters, as described in paragraph 4.

6. In its 1981 PECO decisions, this Commission or at least its federal member deferred final determination of the Limerick withdrawal, including determination of the environmental issues related thereto, to the Nuclear Regulatory Commission. The United States District Court expressed a similar expectation in DELWEG vs. HANSLER. In that the Point Pleasant diversion is no longer financially viable without the Limerick subsidies, the Nuclear Regulatory Commission has recognized the need to evaluate certain environmental impacts of the diversion in more depth. However, the NRC Board has held that this Commission's determination as to the environmental impacts of the allocation of Delaware River water to Limerick (as distinguished from the effects of specific aspects of the diversion) in February 1981 is final. In that this Commission or at least its federal member did not so finally determine, it is necessary for this Commission to reconsider its prior determination in light of the significance now placed on it by the NRC, which is inconsistent with this


Commission's action as of February 1981. The present state of the record is that since neither Commission has accepted responsibility for setting forth and weighing all the environmental effects and full range of benefits and costs with respect to the Point Pleasant diversion, no such disclosure or weighing pursuant to the National Environmental Policy Act is or will have been made by any agency unless this Commission does so.

7. As a result of the foregoing, the decisions represented and reflected in the above-mentioned dockets in February, 1981, are no longer in the public interest, are incompatible with the Compact and the Commission's Comprehensive Plan, and must be reconsidered, revised, rescinded, and reopened.

8. In light of the foregoing, implementation of the project as approved will substantially and adversely affect the petitioners, their members, the environment, and the interest of users of the river throughout the Delaware River Basin, and therefore cannot be permitted to stand, consistent with the Compact, the National Environmental Policy Act of 1969, the Historic Preservation Act Amendments of 1980, the Endangered Species Act, the Fish and Wildlife Coordination Act, Section 404 of the Clean Water Act, Section 10 of the River and Harbors Act, and the Atomic Safety and Licensing Act, and the regulations thereunder, respectively.

9. The impacts of the changes discussed herein have never been considered in any Environmental Assessment. In view of the substantiality of the changes, and the significant adverse effects as a result thereof, an Environmental Impact Statement is necessary to evaluate them.

WHEREFORE, petitioners request that the Commission reopen and suspend, and, after hearing, and compliance with all relevant statutes, including an updated Environmental Impact Statement, set aside, and rescind its Orders of February 1981 in these proceedings, and award such other relief as may be just and appropriate, including attorney's fees and costs.



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