

ANALYSIS OF U.S. EPA REGION III  
COMMENTS ON THE U.S. ARMY COE DRAFT  
ENVIRONMENTAL IMPACT STATEMENT FOR THE  
POTOMAC RIVER WATER SUPPLY INTAKE STRUCTURES

by  
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ANALYSIS OF U.S. ENVIRONMENTAL PROTECTION AGENCY REGION III  
COMMENTS ON THE U.S. ARMY CORPS OF ENGINEERS DRAFT ENVIRONMENTAL  
IMPACT STATEMENT FOR THE POTOMAC RIVER WATER SUPPLY INTAKE STRUCTURES<sup>1</sup>

March 27, 1978

Serious concerns regarding the potential environmental impacts of the proposed Potomac River Water Supply structures are contained both in Mr. Schramm's letter and the attached "Detailed Comments". Many of the concerns, particularly those dealing with the impacts on the free-flowing portions of the Potomac, are well founded, although, because of the conservative nature of the Draft Environmental Impact Statement (DEIS) analysis, somewhat overstated. Other concerns, however, seem to be based on misinterpretation of the information contained in the DEIS. This report will attempt to place those concerns in proper perspective. It will deal with the letter and the detailed comments on a paragraph by paragraph basis.

The second paragraph of Mr. Schramm's letter states the two major objections to the proposed intake structures. The first, dewatering of the free-flowing river in the vicinity of the Washington Suburban Sanitary Commission (WSSC) weir and the Corps of Engineers Washington Aqueduct Division (WAD) Little Falls Pumping Station is the primary impact of the project.<sup>2</sup> It is not an irreversible impact, as will be discussed later, and can easily be mitigated when additional water supplies become available. Regardless of the approval or disapproval of the required permits, substantial incentive exists for finding such additional supplies.

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At first, as stated in the DEIS, the frequency of this impact will be quite low, increasing as time goes on and water demands increase. But, as water demands increase, so will the incentive to find new water supplies, because of the increasing impact of water supply shortages. The environment and the people of the Metropolitan Area will suffer together, and for this reason, the environmental impact will be limited to frequencies well below those projected for the year 2030. The Low Flow Allocation Agreement among the States and the withdrawers of water from the Potomac contains a restriction stage on withdrawals at 80% of the flow. The restriction stage triggers mandatory water conservation measures, further limiting the environmental impact which would occur without the agreement.

Mr. Schramm's second paragraph also states that "severe disruption of the very delicate estuarine ecosystem in the lower portions of the Potomac Riverine System (sic) will result if the intake structures operate at maximum withdraw capacity during periods of low flow. This disruption may be irreparable".

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- 1) Prepared by Daniel P. Sheer, Ph.D., Planning Engineer, Interstate Commission on the Potomac River Basin, 4350 East West Hwy., Bethesda, Md. 20014. U.S. EPA Region III comments are contained in the February 27, 1978 letter and attachment from Regional Administrator Jack J. Schramm to Col. G.K. Withers, District Engineer, Baltimore District, Corps of Engineers
  - 2) Only the channel below the WSSC weir to the tip of Watkins Island and the portion of the river between the Little Falls intake and the Emergency Estuary Pumping Station would be dewatered. Flows on the south side of Watkins Island and between the island and the Little Falls intake would be maintained at a level equal to the WAD's allocation of the river flow (about 200 mgd at the low flow of record) plus whatever flow-by is specified as provided in the Low Flow Allocation Agreement. As a practical matter, these requirements will insure flows in excess of 500 cfs in this section of the river under all but the most extreme drought conditions.

This statement is not borne out by either the facts presented in the DEIS or by common sense. Runs of EPA's own Potomac Dynamic Estuary Model (DEM), supervised by the author and presented in the DEIS, indicate the extent of the water quality impacts on the estuary on no flow over Little Falls. Results are presented in figures one and two. The runs assume EPA mandated AWT at metropolitan area STPs. It is clear from the figures that both Dissolved Oxygen and Chlorophyl A effects are strictly limited to the stretch of the estuary above Hains Point, and that the effects can hardly be called "severe" or "irreparable". D.O. levels of 4mg/l are normal in estuarine situations, and the increase in chlorophyl A levels represents a spreading out of the enrichment effects. These will occur regardless of a 500 cfs discharge over the weir.

The DEIS itself states "the overall impact on estuarine hydrography would be minimal, since approximately 70 to 80 percent of the water would be returned to the river as sewage effluent. Flushing rates in the extreme upper estuary would be decreased in extreme low flow periods, but would be essentially unaffected 98 percent of the time. The additional input at the estuarine sewage treatment plants would not have a major hydrologic impact, given the large volume of the estuary and the short duration of extreme low flow periods. There is no indication that the salt wedge would reposition".

"EPA's Detailed Comments" begin with a discussion of construction impacts. Several suggestions for the mitigation of the impacts are made. These can certainly be arranged with the proposed permittees. In sum, however, construction impacts should be minimal and, by themselves, certainly would not warrant calling the project "environmentally unacceptable".

Page 2 of the comments discusses the impacts of the operation of the proposed projects on the free-flowing Potomac. As noted earlier, these are by far the most significant of the project. Dewatering of river channels directly below intakes and reduced flows in the river would occur with some frequency, as discussed earlier, unless additional water supplies are found. Although the time to recovery of the system is questioned in the comments, there is no doubt that these impacts are transient in nature and will disappear given the return of sufficient water for a small number of years (see p. 8-39 and 8-40 of the DEIS). Reduced flows will occur even in the absence of the projects as the WSSC will continue to construct emergency weirs in the case of low flow (see p. 9-7 of the DEIS). Further, in the absence of the permits, increased use will almost certainly be made of the existing 450 mgd WAD intake at Little Falls.

Significant impacts from the proposed actions are not expected with high probability much prior to the year 2000. Denial of permits has the potential for causing quite severe water shortages in the Fairfax County Water Authority (FCWA) and WSSC service areas for some 20 years prior to that date. It could well be argued that the short term impacts of denial would be more severe than the long term impacts of approval.

It is not unreasonable to further argue that the long run environmental impacts of denial will be larger than those associated with approval. Low flows are aggravated by current facilities. Additional facilities to increase flows in the Potomac will alleviate those impacts. With no assurance that permits for withdrawal facilities on the Potomac will be granted, development of

such facilities is substantially less likely.

Consider the possibility of interconnecting the Potomac and local reservoir water supplies as a case in point. Even without augmentation from Bloomington, such interconnections would raise the dependable yield of the total local water supply to about 900 mgd gallons per day over a prolonged drought with a 50 year recurrence interval. Some of this water could be used to reduce drought impacts on the Potomac River and Estuary. Such interconnections are totally impractical without permit approval. Due to lack of intake facilities, additional water could not be withdrawn from the Potomac during high flow periods to maintain water levels in the local reservoirs for use during low flow periods. Better operation of Bloomington reservoir, the only large upstream source of water supply, is also of little value if the permits are denied.

The first full paragraph on page 3 contains several inaccuracies. Three of the four "major problems" cited are not problems in this section of the river. Sediment is not a problem during low flows. Acid mine drainage never affects water quality in this area, regardless of flows. There are no wastewater discharges containing organic loadings in this section of the river, either. Any water withdrawal in this section of the river will remove a proportionate share of contaminants. The DEIS (p. 8-12 and 8-13) states: "In the [free-flowing] river, only minor changes in water quality are expected due to decreased flow volume....The extent of the impact is flow dependent; however, as long as continuity of flow is maintained water quality should remain similar to that above the intakes, based upon a high reaeration rate in this portion of the river and the relatively short distance involved". Water quantity, not water quality is the issue in discussing environmental impacts on the free-flowing river. The statement that project operations will cause severe degradation of water quality in the free-flowing river is false.

The discussion of effects on the Potomac Estuary also contains major inaccuracies. The model does not predict dissolved oxygen violations under no project conditions, unless treatment requirements at area STP's are reduced by EPA to secondary treatment. This is unlikely, to say the least. Likewise, Chlorophyl levels of 50-60 ug/l rather than 175-200 mg/l (sic) are predicted, unless both nitrogen and phosphorus removal requirements are eliminated. (If the nitrogen removal requirement alone is relaxed, predicted chlorophyl levels rise to 70-80 ug/l according to runs made for the Washington Water Resources Planning Board). The effects or lack of effects of no flow conditions on the estuary have already been documented. Again, contrary to assertions in the text, there is absolutely no reason to believe salinity will be affected. The inference, contained in the text, that "stagnant pools" will form in the estuary as a result of project operations is absurd. The estuary is a tidal body of water whose level is barely affected by even moderate inflows. It can be said that flushing rates in the estuary above Blue Plains will be reduced, particularly in the upper 5 miles, but to call even that a "stagnant pool" is extremely misleading, given currents associated with a natural tidal range of about 2 feet.

The comments state that a minimum flow must be maintained into the estuary. The Low Flow Allocation Agreement provides: "In calculating the amount of water available for allocation, the Aqueduct will determine, in consultation with the parties and based upon then current conditions and information, any amount needed for flow in the Potomac River downstream from the Little Falls dam for the pur-

\* Environmental  
Flow-by

pose of maintaining environmental conditions ('environmental flow-by'), and shall give substantial weight to conclusions for the environmental flow-by submitted by the State". This is an eminently rational position. The environmental effects of severe water shortage on 3 million people, with potential loss of fire protection and sanitary facilities far outweigh the potential effects on the river outlined above. This author thoroughly agrees that a study be undertaken to recommend a minimum desirable flow to the estuary, however. EPA might then request the stipulation of the risk of water shortage which should be taken to maintain such a flow. Provision for using the results of such a study could be made in the permits without delaying their approval.

The last paragraph of the comments, "Discussion of Alternatives", indicates a complete misreading of the DEIS and a total lack of understanding of the water supply situation in the Metropolitan Area. Flows from the Bloomington reservoir were clearly included in all the frequency analyses in the DEIS. The impacts discussed in the DEIS and in this paper take full account of the expected 135 mgd. There is not now, nor is there planned, a 100 mgd "Potomac Estuary Advanced Water Filtration Facility" (sic). There is under construction a 100 mgd Emergency Estuary Pumping Station which will be capable of pumping 100 mgd of estuary water to the WAD's Dalecarlia water treatment plant which provides conventional water treatment. Such is the concern over the use of this water that the U.S. Army Corps of Engineers is constructing a 1 mgd "Potomac Estuary Pilot Treatment Plant" to test the feasibility of using estuary water. Regardless of the feasibility of treatment, operation of the Emergency Pumping Station will do nothing to alleviate the environmental impacts discussed here or in the DEIS, unless 100 mgd is allowed to flow over the Little Falls weir to be pumped there. In that case, the 1.2 miles of rock channel separating the facilities would have a small flow maintained at the expense of the quality of drinking water supplied to the people of the Metropolitan Area. As its third and final alternative to the proposed intakes, the comments suggest water conservation during droughts. The Low Flow Allocation Agreement discussed in the DEIS requires conservation measures be instituted whenever withdrawals are expected to equal or exceed 80% of flows. While such conservation will reduce the environmental impacts of withdrawals below those projected in the DEIS, it is also necessary from a practical, operational standpoint. A reserve of water in the river is necessary for the safe operation of the water supply system. When more water is drawn from a water supply system than is pumped in, disruption of service results. As stated earlier, the provisions of the Low Flow Allocation Agreement, coupled with the practical requirements of operating the area's water supply systems will ensure substantial flows (around 500 cfs) down to Little Falls, and some minimal flow-by to the estuary in all but the most severe droughts. Operation of the water supply systems would be impossible were this not true.

In summary, the issues raised in EPA's comments on the DEIS are either minor or based on substantial misinterpretations of the data presented, with the exception of comments concerning the dewatering of channels immediately below the WSSC weir and the Little Falls pumping station and the reduction of flow in the river between the WSSC and Little Falls. Even those effects, while serious, are overstated and not irreversible given additional augmentation of river flow. The EPA comments do not discuss any alternatives which would reduce the impacts or avert the very serious consequences of severe water supply

shortages in the Washington Metropolitan Area. Because the potential impacts of withdrawals will not become severe until the end of the century, the issue of permit approval is a balancing of the present and future risks of water supply shortage in the Metropolitan Area against the potential future environmental impacts on the free-flowing Potomac. Should the permits be granted, the environmental impacts and the impacts of water supply shortage can both be avoided with the provision of additional water supply.

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FIGURE 1

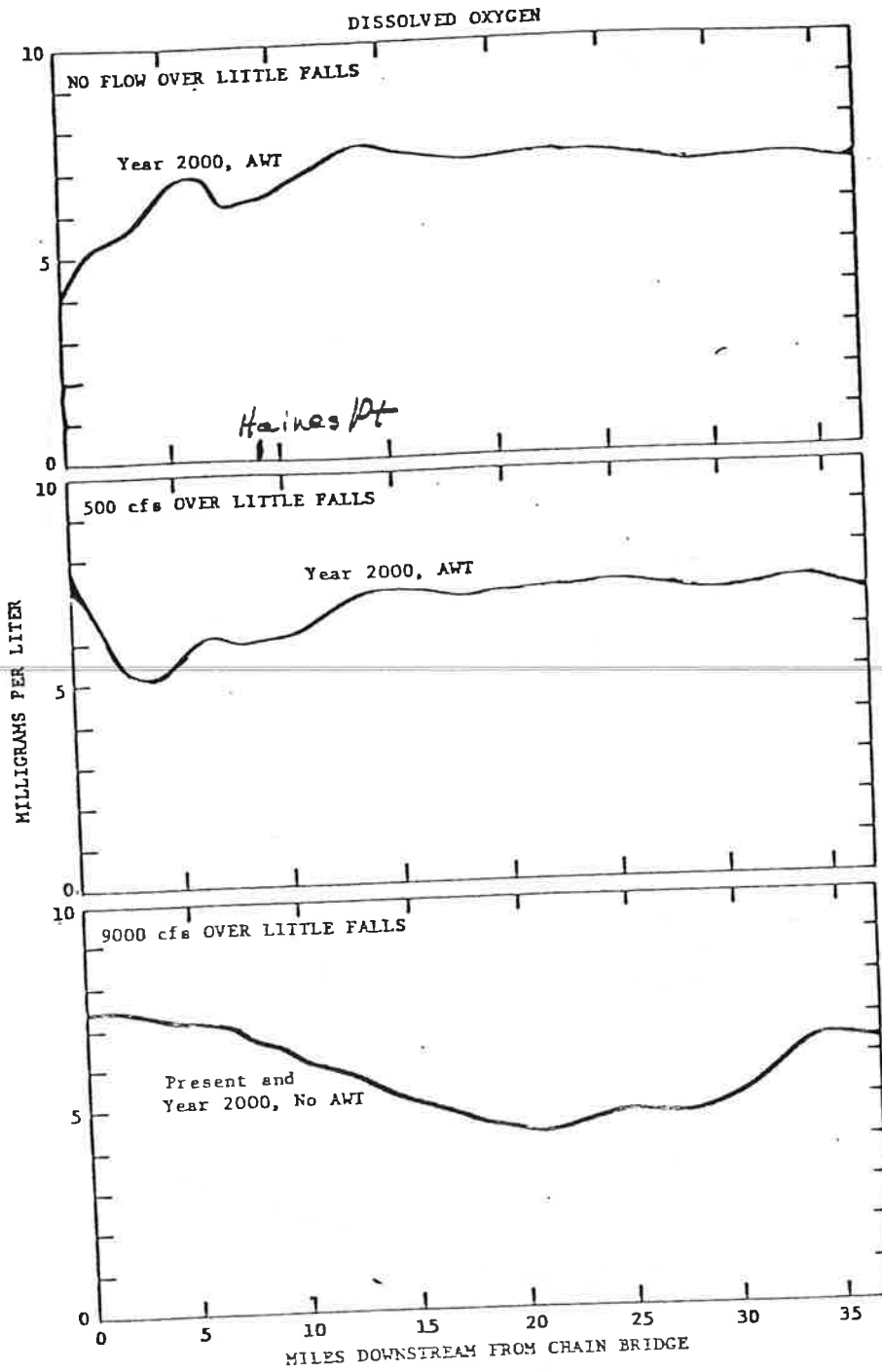


FIGURE B-5  
DISTRIBUTION OF DISSOLVED OXYGEN IN THE  
POTOMAC ESTUARY AS PREDICTED BY THE WATER  
QUALITY SIMULATION MODEL

FIGURE 2

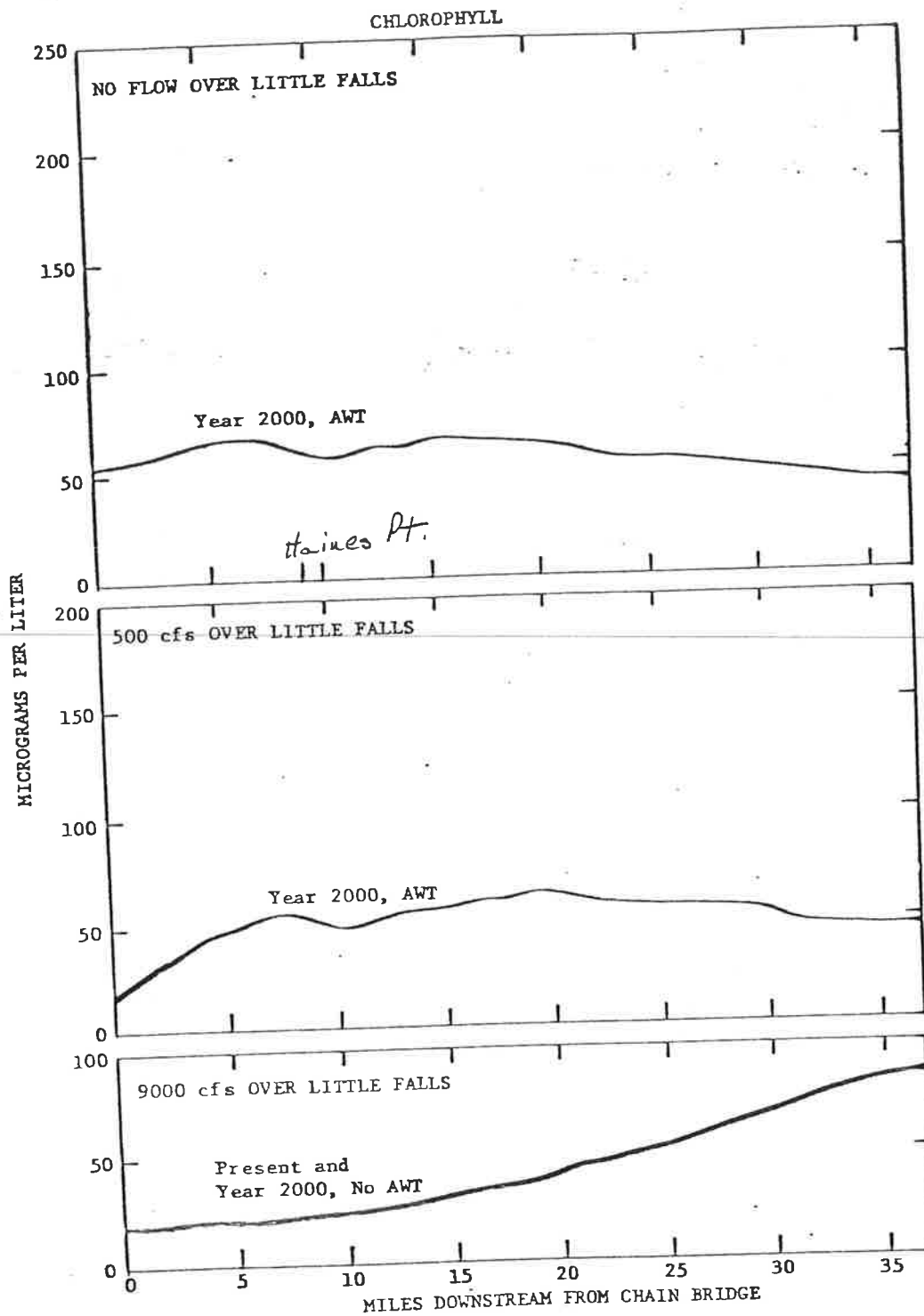


FIGURE 8-6  
DISTRIBUTION OF CHLOROPHYLL IN THE POTOMAC ESTUARY  
AS PREDICTED BY THE WATER QUALITY SIMULATION MODEL