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- Preliminary report on Sewer Capacities in Bedminster

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# A PRELIMINARY REPORT ON SEWER CAPACITIES IN BEDMISTER TOWNSHIP, NEW JERSEY

March 27, 1984

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## A. Introduction

In his cover letter of March 21, 1984 to Judge E. D. Serpentelli, R. T. Coppola made the following statements with regard to treatment plant capacity in Bedminster:

1) that parcels "H-N" (except for "I") are within the franchise area of the Environmental Disposal Corporation treatment plant and by implication, can be accommodated within the design capacity of the plant;
2) that parcels "C and D" can be accommodated within the existing Bedminster plant when the infiltration problems are solved.

These statements are erroneous and are not supported by the facts which will be introduced in this report.

## B. Environmental Disposal Corporation

1. The Environmental Disposal Corporation (EDC) built a treatment plant to primarily serve the development in Bedminster now known as the Hills. The EDC plant has a design capacity of 850,000 gallons/day (gpd) (NJ PDES No. 0033995), not 858,000 gpd as stated in the Coppola letter of 3/21/84.

The internal allocation of the effluent coming into the plant is not on file with NJDEP in Trenton as they are more concerned with the total discharge going into the receiving watercourse

(North Branch Raritan in this case). In the absence of specific reports on this matter, the following internal allocations are believed to best represent the estimated effluent generation within the franchise area:

| | | gpd |
|---|---|---|
| a) | Hills Development (includes residential units in both Bedminster and Bernards) | 756,250 |
| b) | Hills Development: commercial (350,000 sq. ft. at 0.125 gpd/sq. ft.) | 43,750 |
| | Subtotal Hills | 800,000 |
| c) | Pluckemin Village (existing units) | 27,500 |
| d) | City Federal | 22,500 |
| | Total | 850,000 |

2. In his 3/21/84 Report entitled "Fair Share Housing Analysis, Bedminster Township, N.J.," R. T. Coppola proposed the following rezoning for parcels "H-N":

| Parcel | Proposed Total Units Multi-Family |
|---|---|
| H | 449 |
| I | 257 |
| J (Ellsworth tract) | 599 |
| K (Hills) | 1,287 |
| L | 177 |
| M (Hills-top) | 900 |
| Subtotal | 3,669 |
| N | 150 |
| Total | 3,819 |

Coppola has previously used an estimated effluent generation value of 240 gpd/unit. This estimate presumably averages out the range of effluent flows from 1, 2 and 3 bedroom multi-family units. NJDEP guidelines on this matter only indicate that the estimated effluent flows are 75 gals/person/day (gpcd) from multi-family and 100 gpcd from single family homes. Therefore, in order to be consistent with previous work, the Coppola estimate of 240 gpd/unit will be employed as follows:

3669 units (240 gpd/unit) = 880,560 gpd

3819 units (240 gpd/unit) = 916,560 gpd

In either case, the flows of 880,560 gpd and 916,560 gpd are clearly in excess of the design capacity of the EDC plant. Furthermore, Coppola makes no mention of what would happen to the proposed Hills residential units in Bernards and the commercial sector in Bedminster. Note that Hills plans to build over 1,000 units in Bernards alone.

3. Coppola states in his cover letter of 3/21/84 that parcel "I" is not in the franchise area of the EDC but could be included since it is in the general area. Parcel "H" is even further away from the EDC plant and is included in the franchise area by Coppola.

Examination of Figure 7-3 in the 201 Upper Raritan Wastewater Report by Malcolm Pirnie indicates that Parcel "H" may not be in the service area. However, the scale of the map is 1" = 2

miles which is at too small a scale to clearly delineate which parcels are included within the service area. At any rate, any change in the boundaries of a service area means that the 201 wastewater facilities plan for the upper Raritan, which has already been approved by local, state and federal officials, would have to be modified. This procedure requires public hearings and a new round of approvals at various governmental levels.

4. Any expansion of the design capacity of the EDC plant would require approval by NJDEP, in addition to the previously mentioned approval process reuqirements for 201 revision. Furthermore, the EDC plant is using state of the art technology in nutrient (nitrates and phosphates) removal by biological means (Carrousel-Bardenpro process). Discussions with NJDEP suggest that the efficacy of this new process would have to be established before plant expansions could even be considered. Since plant efficacy cannot even be evaluated until there is sufficient flow coming into the plant, the entire process will take years. What this means is that plant expansion, which appears to be required in the Coppola proposal, is not something that is likely in the near future.

To be more specific, evaluation of the treatment capabilities of the EDC plant would require an effluent flow of about one-third of the design capacity of the plant, or about 280,000 gpd. The current flow into the plant is only 8,000 gpd. At least 1,000 units would have to be built and occupied in order to provide

enough flow to test the plant. Although the exact date when enough flow would be generated is difficult to predict, it is safe to assume that it would take several years at the earliest.

Assuming that NJDEP is satisfied with the operation of the existing plant and that effluent limitations are being met, the next step in expanding the plant would be the preparation of a fully documented water quality impact assessment report that would be part of an application for a new permit. Since the North Branch Raritan River is upstream of the proposed Confluence Reservoir, the State would be particularly concerned with treatment plant discharges and nutrient loads. Another period of time, estimated to be from 1-2 years, would be required to obtain all of the necessary approvals at the various levels of government.

Assuming that a new permit is obtained, design and construction of a plant expansion would take at least another 2-4 years. Therefore, expanding the EDC plant is an involved process which could take the better part of a decade.

C. Bedminster Treatment Plant

1. The Bedminster treatment plant has a design capacity of 203,750 gpd (NJPDES No. 0028495). In a similar manner with the EDC plant, there is no internal allocation report on file with NJDEP in Trenton. However, the 201 Report on the upper Raritan by Malcolm Pirnie states that Far Hills and AT&T have service

agreements with Bedminster to handle 35,000 and 100,000 gpd, respectively. This would leave 68,750 gpd for Bedminster as follows:

| | gpd |
|---|---|
| AT&T | 100,000 |
| Far Hills | 35,000 |
| Bedminster | 68,750 |
| TOTAL | 203,750 |

2. It should be noted at the outset that the use of average flow values for the Bedminster plant can be misleading. For example, AT&T accounts for about one-half of the entire flow coming into the plant (See Table 1). At first glance, the monthly average for the 60-month period from 3/79-2/84 of 72,500 gpd appears to be well below the 100,000 gpd service agreement. However, this is a statistical artifact inasmuch as the flow from AT&T is essentially zero on weekends and holidays since the office operates on a standard 5-day workweek. The weekday flow averages from AT&T would be higher than the monthly average which is based on all of the days in the month. This downward bias in the "average" figures for AT&T must be recognized when plant capacity is being considered.

Thus, the average flow for the Bedminster plant is actually higher than the 146,000 gpd value shown in Table 1 if weekday values were selected.

TABLE 1

AVERAGE FLOWS FOR THE BEDMINSTER TREATMENT PLANT (GPD)

| | Far Hills | A T & T | Bedminster | Total Flow |
|---|---|---|---|---|
| Maximum Monthly Average * | 67,000 (1/82) | 115,000 (1/80) | ** | 204,000 (4/83) |
| Minimum Monthly Average * | 17,500 (12/79) | 40,000 (11/81) | ** | 108,000 (12/79) |
| Monthly Average * | 38,500 | 72,500 | 34,000 | 146,000 |
| Percent of Total Flow | 26 | 50 | 24 | 100 |
| Service Agreement | 35,000 | 100,000 | -- | -- |

Notes: * based on monthly flow records for the period 3/79 - 2/84.

** breakdown not available on a monthly basis.

All flow values rounded to the nearest 500 gallons.

3. The estimated average flow for Bedminster itself is 34,000 gpd. This would indicate that some modest increase in effluent flow could come in from development in Bedminster Township, but not of the magnitude proposed by Coppola. When one considers the special characteristics of the AT&T flow in terms of time, then the plant is actually close to its design capacity.

4. The infiltration problems with the Far Hills collection system were recognized in the 201 Report by Malcolm Pirnie. No estimate was given in the 201 Report regarding the anticipated decrease in flow if the infiltration problems were resolved, nor was an estimate provided of time necessary to perform such repairs. When corrections are made to the Far Hills collection system, the flow would diminish by some amount, but the exact quantity is not now known.

5. Coppola proposes 201 new units for Parcels "C and D" which will generate an additional effluent flow of 48,240 gpd (201 x 240 gpd/unit = 48,240). This amount could not be accommodated in the existing Bedminster plant unless the facilities were expanded.

## D. Onsite Treatment for the Dobbs Tract

As discussed in a previous submission, wastewater disposal on the Dobbs' site for residential and/ or commercial use can be accommodated by an onsite tertiary sewage treatment plant (STP) with subsurface disposal. This method, which has already been

with subsurface disposal. This method, which has already been approved for a 440-unit townhouse development in Passaic County, does not involve any point source discharge into the North Branch Raritan River. Instead, wastewater effluent flows into the STP where it receives advanced waste treatment prior to being pumped into disposal fields located on the most appropriate soils on the site.

The major advantages of this system are as follows:

1. The treated effluent recharges the ground water and is therefore available for further use within the watershed.

2. A ground water discharge permit from NJDEP would be required. It is estimated, based on the previous approval, to take only 6-12 months compared to several years for a surface water discharge permit.

3. All mechanical components of the STP can be housed in an architecturally compatible structure.

4. The disposal field can be landscaped and does not require any fencing. The homeowners would see only a grassy area with trees and therefore residential units can be located nearby.

5. There is no odor generated either at the plant or in the disposal field area.

## E. Conclusions

1. The 3,669 or 3,819 new units proposed by Coppola for Parcels "H-N" will generate an estimated effluent flow of 880,560 or 916,560 gpd, respectively. Either value will be in excess of the design capacity of 850,000 gpd for the EDC plant.

2. Coppola makes no mention of what will happen to the effluent generated by the Hills development in Bernards or the 350,000 sq. ft. of commercial development in Bedminster which is part of the Hills proposal.

3. The 201 new units proposed by Coppola for Parcels "C and D" will generate an estimated effluent flow of 48,240 gpd. Without expansion, this anticipated flow could not be accommodated in the existing Bedminster plant which is close to its design capacity.

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# VITA

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American Association for the Advancement of Science
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**Positions Held in Professional Organizations:**

President-Elect and President, New Jersey Section, American Water Resources Association, 1972-74.

Chairman, Local Arrangements Committee, National Symposium on Urban Runoff and Water Pollution Control, June 29 - July 2, 1975, Rutgers University. Sponsored by the American Water Resources Association and the Urban Water Resources Research Council of ASCE.

Member, Local Arrangements Committee, Annual Meeting of the Association of American Geographers, April 1976, New York City.

Chairman, Physical Geography Caucus, Association of American Geographers, 1975-76.

Secretary-Treasurer, Vice-President, and President, Middle States Division of the Association of American Geographers, 1976-78.

Rutgers University representative to the Inter-Agency Advisory Group to the Statewide Comprehensive Water Supply Master Plan, 1978-79.

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ROBERT M. HORDON is a faculty member in the Department of Geography at Rutgers University, New Brunswick, New Jersey. His teaching responsibilities include undergraduate and graduate courses in physical geography, land use systems, water resources management, and fluvial processes. Dr. Hordon is also a consultant in the areas of environmental management and water resources management.

Dr. Hordon has been a participant in two water research projects sponsored by the Office of Water Resources Research of the U.S. Department of the Interior. The first project concerned the development of a simulation model for the water supply networks of the New York-New Jersey metropolitan area. The same region (with all of its associated complexity) was used as a case study for an empirically-derived water quality simulation model. In both projects, Dr. Hordon was responsible for the acquisition, storage and retrieval of the pertinent hydrologic and geologic data.

Another study, sponsored by the Center for Urban Policy Research at Rutgers University, concerned an environmental assessment of a large housing development proposed for a site in Mahwah, New Jersey. Both onsite aspects and regional issues of water supply and wastewater disposal were considered. Dr. Hordon was a member of an interdisciplinary team at Rutgers University that prepared a large scale Environmental Impact Statement on the proposed Manasquan Reservoir Project for NJDEP. His areas of concern on the Manasquan Project pertained to the development of water demand projections for the study area on a purveyor by purveyor basis.

Dr. Hordon was a consultant to the Special Studies Branch of the Northeastern Water Supply Study (NEWS) of the U.S. Army Corps of Engineers in New York. He prepared a report on water supply agency interconnections in northern New Jersey. Additional consulting experiences include participation in a Natural Resources Inventory (NRI) for Chatham Township, New Jersey and the preparation of an NRI sourcebook for the Institute of Environmental Studies at Rutgers University. The latter work was sponsored by the Department of Community Affairs in Trenton.

Academic degrees include a B.A. from Brooklyn College and an M.A. and Ph.D. in Geography from Columbia University. He has authored a number of technical reports and journal articles. Recently, he was President of the New Jersey Section of the American Water Resources Association. Dr. Hordon is a member of the Association of American Geographers, American Geophysical Union, American Geographical Society, Sigma Xi, and the American Water Resources Association.