Village of Buchanan

BUCHANAN, NEW YORK 10511
Tel. PEekskill 7-1033

GEORGE V. BEGANY, Mayor
FRANK R. COLACINI, Clerk & Treasurer
CARL D'ALVIA, Village Attorney
HUGH GREGORY, Village Consulting Engineer
CHARLES WHITE, Building & Plumbing Inspector

Trustees:
WILLIAM DURR
JAMES P. EDGAR
JACK LOEBER
WILLIAM MCNALLY

13 April 1976

Re: Draft Environmental Statement
Closed Cycle Cooling System Selection
Indian Point Unit No. 2
Docket No. 50-247 (Published February 1976)

U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Director, Division of Site Safety
and Environmental Analysis

Gentlemen:

Under date of 24 March 1976, one copy of the subject Draft Environmental Statement was directed to Mayor Begany of the Village of Buchanan, New York. It was received on 29 March 1976.

The Mayor has requested that I review this material and set forth my own findings and opinions in a direct report to you. This letter constitutes such report. It is additional to the Mayor's own statement which is being sent herewith.

My review constituted the general perusal of the NRC report, with extraction of the items deemed of major consequence to our community, as well as those items in which inaccuracies, untrue and unsupported statements of fact occur.

The information extracted is set forth and referenced hereinafter, with appropriate comments, factual data and opinions immediately following each item. The items appear in numerical page order, not necessarily in order of significance to us.

Page 3-9.

Lent's Cove Beach use for disposal of materials.

Lent's Cove Beach and adjacent land is at present the property of the Village, having been deeded thereto by Con Edison. The origi-

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nal State grant to Con Edison allowed filling of the entire cove within the grant limits. The dedication deed from Con Edison to the Village provides that the area be used for Village Recreational purposes. The Village is presently proceeding with installation of Boat Launching and Landing Facilities and other improvements. The use of the beach for disposal is not permissible. It is also unreasonable that the recreational use be restricted during construction.

Page 3-13.

Discharge of Sulphuric Acid, Chlorine and other pollutants.

The total design discharge to the river comprises 15M gpm of polluted effluent, diluted by 30M gpm of service water, and 318M gpm from Unit 1, or about 1/3 of the combined discharge from "once through" cooling systems for Units 1 and 2. It is to be noted that Unit 1 has been "off line" since October 1974, and will remain so at least until 1978, with the probability of complete abandonment. Therefore the discharge of properly diluted effluent meeting State Standards seems difficult of achievement.

Page 5-1.

Relative merits of two additional closed cycle systems warrant further investigation.

I concur with this opinion.

Page 5-4, 5-5.

Drift: Wetting of vertical surfaces of structures and Biota downwind can cause damage or corrosion to structures as well as disease to plants.

The Village is within the area of maximum deposition of salt. It has approximately 550 dwellings, 60-80% of which have tilled gardens, with the larger garden areas on Bleakley Avenue and Broadway, in the area of major contamination. Most of the remaining gardens are between Westchester Avenue and Henry Street, the area directly in the path of the major drift. The drift would not only destroy the gardens and landscaping, but have a devastating effect on the dwelling units as well. Although it is pointed out that the salt deposit will have no accumulative effect, which may be true on impervious surfaces, it is obvious that on cultivated garden land it will be 100% accumulative, and will result in severe damage to or destruction of food vegetable crops.

Page 5-8, 5-14, 5-28, 5-31.

Estimates have been predicated on the use of models.

Such estimates are inaccurate at best, and could well be in error on the lower side, rather than be considered conservative. The analyses and assumptions of the Con Edison report are equally as valid as those in this report. Without question a safety factor of two or more should be a requirement, using the higher estimates rather than the lower. Use of the latter minimizes all effects. In my judgment, the element of error should rather favor the maximum estimated effects.

Page 5-34.

Defoliation and destruction of Plantings.

Disagreement is taken to the statement that "the threshold chosen appears unnecessarily conservative". Possibly, the dogwood, hemlock, and white ash will be the most affected. However, it is obvious that there are many other species of common landscaping plants which are incompatible with even minor salt dosage. In my own experience, English boxwood, several varieties of ilex, and lilacs have been seriously affected on my own property from the drift from the salt applications to the public roadway. Defoliated dogwoods and browned hemlocks, with recovery a year away, then a repeat performance, is hardly a condition to be tolerated by any householder. To replace such plantings under the same conditions of imminent destruction is asinine, totally unsatisfactory to both owner and utility.

It is to be noted that our Village has a history of complaints of damage to resident's trees and shrubs, especially where any liability whatever can be attached to the Village or other public authorities. It is emphasized that our citizen's pride in their homes and grounds is exceptional. The impact of such a condition, both actual and psychological, would be tremendous.

Some suitable, simple means of indemnification for damages must be established, including incontestible joint responsibility by both Con Edison and the New York State Power Authority.

Page 5-37.

The effect of towers for both Units 2 and 3 can be approximated at twice the drift levels for Unit 2 alone.

This means simply a doubling of the destructive effects above-

mentioned.

Reference must be made at this point to the wooded area of 80 acres to the north of the plant center site. Among the conditions under which the Site Plan received Planning Board approval was the requirement that this area be forever maintained in its natural in its natural, wooded state. Since this is directly in the path of maximum salt drift, its maintenance as natural woods seems impossible. The visualization of this area as a greenless, barren stretch is terrible to contemplate.

Page 5-44 to 5-60.

Noise.

Basically, the conclusion relating to noise effects has been based on the erronious assumption that there have been "no complaints and threats of legal action."

Actually, since the start of construction there has been a history of complaints of noise and smoke and particle emissions. These complaints have been made mainly at Village Board meeting appearances, or informally to Village Board members. The traffic noise has been tolerated on the assurance that there will be a major reduction on completion of construction.

Other complaints registered were as follows:

1. Steam blow-off from Unit 2. This is being alleviated by the design and installation of mufflers for the blow-off. (Unit 3 installed. Unit 2 in process).

2. Operation of Gas Turbines. Enclosures and other measures being taken to reduce this most disturbing noise.

A background noise increase resulting from the cooling towers is projected to affect most seriously the Lent's Cove area. Unquestionably this will be objectionable for the present and planned uses by Village residents.

Again, there will be double the noise nuisance from the addition of the cooling tower for Unit 3.

Page 5-74.

Conclusion - "none of these factors (environmental effects) are likely to be of sufficient magnitude to cause rejection of any

of the cooling tower types".

I must disagree. A summary of the five various types investigated, attached hereto as Exhibit A, indicates that the natural draft type selected is the most objectionable from the standpoint of visible intrusion, towering to elevation 610 or 470 feet above the Broadway Ridge of elevation 140, a non-esthetic monstrosity visible from as far south as Yonkers. The alternate selection of the fan-assisted natural draft type is some 183 feet lower, still at objectionable, monstrous height. The remaining types have top elevations below the Broadway Ridge. It is to be noted that the ND type selected ranks number three in plume effect, and number one in only drift, noise and cost. It is my understanding that the relative differences of the latter effects between all types are inconsequential, with reductions in the alternate types possible. It is difficult to understand the statement that the low profile MD towers do not present appreciable esthetic advantages over the ND types.

Page 6-6.

Installation of gas turbines.

In my opinion the installation of additional gas turbines is objectionable on the basis of noise and atmospheric pollution, as well as being completely impracticable economically.

Page 6-31.

Major Employers.

Standard Coated Products of Buchanan no longer operational, and Standard Brands of Peekskill greatly reduced.

Page 6-35.

Future Development and Planning.

Contrary to the mis-information contained in the report, the Village of Buchanan has both a Planning Board and has retained Planning Consultants since 1951. There is not, and never has been an Industrial Development Authority. The Zoning Ordinance was adopted in 1951 and the preparation of a Village Master Plan authorized in 1964, but never completed. The Zoning Map, prepared in 1969 has served as the Master Plan to the present. Due to the fact that Village development was virtually complete except for the Industrial Area, the Planning Board, established by the Zoning

Ordinance in 1951, has jurisdiction over all site development plans. It made the determination that a Master Plan with pre-planned road network was unfeasible, undesirable and unnecessary, since Con Edison and Georgia-Pacific owned the major portion of undeveloped land. Ultimate use of the remaining land will determine criteria for such subdivision and planning. Also most of the remaining undeveloped land can be improved without construction of additional roads and utilities. In the few instances in which such construction may be required, the particular situation dictates the planning, which is controlled by the Zoning Ordinance and subject to approval by the Planning Board.

Site development and building construction of the Con Edison and Georgia-Pacific parcels was controlled by the Planning Board. It was required that all buildings constructed therein maintain a low profile, well below the crest of the Broadway Ridge, to insure their exclusion from the view of the remainder of the Village. The proposed cooling towers violate this fundamental planning principle established and maintained by the Planning Board.

The Village of Buchanan has been and is the leading community in the area in providing sewers serving 100% of its residential population. The Village operates its own Sewage Treatment Plant which maintains the highest standards of treatment and operation in the region.

The Village Consulting Engineer has prepared comprehensive studies for improvements to the Water Distribution System, the Sewerage System, the Sewage Treatment Plant, the Drainage Facilities, and the Highway System, for which implementation programs have been continuing each year.

Page 6-38.

Impacts on Terrestrial Biota.

It is my opinion that there is sufficient doubt, as pointed out hereinbefore, to question the conclusion that the level of damage to Terrestrial Biota (Human, Animal and Plant) is non-existent, both on-site and off-site. These doubts are sustained by the recommendation that the drift and salt deposition, as well as sensitive plant species be monitored to determine their significance. This, of course, after the fact.

Page 6-44.

Visual characteristics of plumes.

The conclusions relating to plume formations from plume-tower

combinations are unacceptable. Much discussion has been devoted to rating the various types of towers in more or less degree of detraction. The simple truth is they are all obnoxious. The shadow over the Village from a plume continually changing shape will create intolerable living conditions, with constant changes from light to darkness. Doubtless it will cause a complete change in family living modes, with residents avoiding the use of natural light. This, of course, will increase the use of energy, and the cost to the residents.

Page 6-51, 6-52.

Real Estate Values.

Again I disagree with the conclusions set forth. The Buchanan situation is unique in that the entire Village is within the radius designated as "on-site" in most of the cases used for comparison. In other words, in those cases the nearest dwelling was remote from the station. The example most nearly comparable to the Buchanan case is that of the Bochum Station in West Berlin. In this case the value of the abutting properties was depressed.

Page 7-1,2.

Evaluation of Proposed Action.

It seems to me that the conclusions reached have been based upon insufficient and inaccurate data. There is little of fact, much of speculation, with many variables of wind, weather and other indeterminate conditions.

The Village is not satisfied that the proposed closed cycle cooling system is the best solution, compared either to the "once-through" system or to other closed cycle systems. Much further research and study must be devoted to improving the effectiveness and reducing the hazards and objectionable features of any system considered.

The overall environmental effect of the closed cycle system seems much greater than that of the "once-through" system, with the latter limited to affecting the river and aquatic biota only. However, the chemical discharge from blowdown of the closed cycle system may more seriously affect the aquatic life and result in other serious problems.

In the original study it was pointed out that the "once-through" system resulted in a heat level in the Hudson exceeding the limit by only a slight margin. With Unit 1 non-operative and with heat discharge limited to Unit 2, such heat discharge to the River would be reduced to about 77% of that from Units 1 and 2, and with Units 2 and 3 on line reduced to about 88% of that from the three units. Thus, the plant could operate within the specified heat limit, pro-

vided Unit 1 remains inoperable.

It is to be noted that the thermal effect on the aquatic life is still under study. Results of the present moratorium on fishing in the Hudson may well reverse the original conclusions attributed to present cooling methods, considering also the improvements made to reduce impingement. More fish are killed during winter than in summer due to the lower water temperature making the fish slower and less active. This is controlled to the extent that the plant river water intake is reduced to 60% of normal, with a corresponding reduction in power output. When the water temperature drops to 40°, consideration might be given to discharging a portin of the heated effluent into the river at a pointsome distance from the intake, thus raising the river temperature and attracting fish activity in areas remote from the intake. Also consideration is warranted to study the possibility of discharging the higher temperature effluent into the river at several remote points to provide distribution of the heat into a larger volume of river water.

An additional hazard to terrestrial biota with the closed cycle system is the possibility of accidental contamination, including radioactive pollution, of the condenser cooling water by failure in the circulating water system. This could result in released aerosol contamination with greater potential danger to terrestrial biota, particularly humans.

It is also to be noted that due to the thin shell concrete in the superstructure, the Village Building Department will require special concrete design precautions to insure against structural failure from salt and acid attack.

The final conclusion must be drawn that, in the interests of preventing the destruction of the Village and seriously affecting adjoining neighborhoods, construction must be deferred until all doubts of the potential damages are resolved.

Yours very truly,

Hugh S. Gregory

HSG/sg Village Consulting Engineer

Atts: Exhibit A - Summary of CT Types (1)

Summary of Cooling Tower Types
(from NRC Report - Docket #50-247)

Type Tower	Hght (ft)	Elevation Base	Elevation Top	Preference Rank* Visual Intrus.	Plume	Drift	Noise	Cost
CMDCT	74	32	106	2	1	3	3	3
FANDCT	382	45	427	4	2	2	2	2
NDCT**	565	45	610	5	3	1	1	1
LMDCT	68	32	100	3		Not	Rated	
W/DCT	74	32	106	1		"	"	

The Elevation of the Broadway Ridge is 140 ±

* Ranking by NRC.
** NRC Recomended Type.

Extracted from NRC Report by Hugh S. Gregory, Village Consulting Engineer, to accompany Report to NRC.

WILLIAM W. SHUSTER, D. Ch. E.
ENVIRONMENTAL ENGINEERING CONSULTANT

RENSSELAER POLYTECHNIC INSTITUTE
TROY, NEW YORK 12181
518-270-6363

April 12, 1976

To: Mayor and Board of Trustees
Village of Buchanan
218 Westchester Ave.
Municipal Building
Buchanan, New York 10511

Gentlemen:

In response to your recent request, I have reviewed the Draft Environmental Statement for Selection of the Preferred Closed Cycle Cooling System at Indian Point Unit No. 2, Docket No. 50-247, published February 1976 by the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation. I would like to offer a number of reactions to this statement.

The Draft Environmental Statement is based on the assumption that the present method of once-through cooling will be disallowed and that some type of closed cycle cooling system will be preferable. I have stated previously, and I would like to reiterate that I strongly disagree with this position because of the particular features of the situation at Indian Point, perhaps not found typically at any other location. My reasons for this opinion are summarized in the following paragraphs.

The principal arguments which have been presented against the use of once-through cooling include the following:

1. The withdrawal of cooling water from the river will result in the killing of substantial numbers of fish by impingement on the intake screens.

2. The discharge of heated effluent will, under certain conditions, be in violation of the New York State thermal discharge criteria.

3. Discharged cooling water will contain objectional levels of residual chlorine resulting from treatment used to prevent development of biological growths on heat exchange equipment.

4. That thermal discharges will interfere with the life cycle of fish and other aquatic life, especially the striped bass.

5. That dissolved oxygen levels in the river will be seriously depleted.

While these arguments are well considered and important, it would be well to examine them closely.

1. It is indeed important that steps be taken to minimize the effects of inflow on the impingement of fish on inlet screens. It is felt that a number of possibilities exist for redesigning the intakes to alleviate this condition. It is felt that innovative approaches can solve or at least markedly reduce the magnitude of the problem.

2. Whether the discharge of heated effluent will violate New York State thermal discharge criteria is highly in doubt. Predictions of behavior are based on mathematical models which depends upon field data which is largely inadequate, and upon numerous unproven assumptions. This has been clearly stated in the Impact Statement of the U.S. Nuclear Regulatory Commissiin. Even with the results of such models, any predicted violations are marginal.

3. It is anticipated that any residual chlorine in discharged water will rapidly be dissipated by dilution and by consumption by oxidizable materials naturally present in the river water.

4. It seems highly unlikely that the heated discharges will have any marked effect on life cycles of aquatic species, since the temperature levels at worst will barely exceed acceptable limits. Even under these relatively rare occurrences, which by-the-way are most likely to occur at times other than normal spawning times, most life forms may find that they can adjust to such minor excesses, or avoid them entirely. It may be noted that some reports have indicated that some life forms instead of being injured by thermal discharges, actually thrive in them.

5. Again occasional marginal temperature excesses, if they occur at all, will hardly have a significant effect on dissolved oxygen content in excess of that anticipated for temperatures within acceptable limits.

In the present Draft Environmental Statement, the NRC has considered various alternatives to once-through cooling in the form of a number of closed cycle cooling systems. It is felt that a number of points in their analysis are at fault and that the conclusions are subject to criticism in several respects.

1. It is felt that the use of cooling towers at Indian Point does not represent an improved solution to the thermal problem. As the draft statement itself says, "CCC does not eliminate thermal pollution, but transfers the primary impact from the hydrosphere to the atmosphere."

2. It is stated that the blowdown of twice concentrated recirculated cooling water, containing treatment chemicals including sulfuric acid, will be diluted with water from Unit No. 1 and discharged back to the river. Unit No. 1 has been shut down for some time

and all indications are that it will not be returned to service. Hence, the dilution water is not available.

3. The position is taken that ground level fogging will not be serious. It is stated, however, that while fogging is usually not anticipated to be a problem, Hosler reported an instance where the tower plume did reach the ground in a mountainous terrain. The area of Indian Point might well be so described.

4. It is stated that the estimates of salt deposition and drift as presented by Conn Ed are unduly high. This appears to be highly questionable in view of other experimental evidence. The NRC staff estimates are based on mathematical models which of necessity must contain simplifying assumption. One such assumption, as stated in the report, is that surrounding terrain is uniform in elevation and that wind speed is independent of elevation. This is obviously far from the facts.

5. It is admitted that salt drift has deleterious effects on exposed surfaces such as various metals. It is stated that such effects fall off with distance. However, such distances are not clearly stated. The estimates are based on seashore experience at low altitudes, much different from the situation at Indian Point. No mention is made of possible cumulative effects.

6. The statement is made that only white ash, flowering dogwood and Eastern Hemlock appears to be sensitive to salt deposition. However, it is noted that more than 44% of properties in the area have at least one of these sensitive species. The NRC staff suggests that replacement of killed trees is possible. This unfeeling statement does not take into account the inconvenience to the homeowner nor the loss in property values resulting from killed or partially effected vegetation.

7. A real possibility exists of the interactions of tower plumes with stack effluents containing SO_2 to produce sulfuric acid rain. The Indian Point Plant uses 0.3% S fuel and in light of the peculiarities of wind currents in the area, such intermixing is entirely possible.

8. It is felt that NRC overlooked entirely the impact of cooling towers on the terrestrial biota in the area proposed for tower construction. Great concern was expressed about the impact of once-through cooling on aquatic biota, but the same concern was not expressed with regard to the bird and animal life of the area. It is casually stated that they can probably find a home in other areas, without however, considering any resulting ecological impacts. This is viewed as a serious oversight on the part of the NRC staff.

9. The claim is made that there is an extremely small potential for sever damaging episodes resulting from the operation of cooling towers at the Indian Point site. However, the report goes on to say that the licensee should monitor drift and salt deposits and determine their significance. Why the concern about drift and salt deposition if no problems are anticipated? It is interesting to speculate what NRC would suggest if later studies, after towers were constructed, indicated serious salt deposition was taking place.

10. NRC claims that no cumulative effects from salt deposition should be expected. Yet experience with spray irrigation has shown that salt does accumulate in soils, often through an ion exchange mechanism, and that the resulting accumulations have serious effects on plant life.

11. The report describes the opinions of a panel of "experts" on the projected aesthetics of cooling towers. It is quite apparent, however, that none of the experts were property owners from the Indian Point area. It is easy enough to express opinions on matters of no impact to the people involved. It was also of note that the aesthetic comparisons were between tower alternatives, but no comparisons were between "towers" and "no towers."

12. It should be noted that the NEPA states as an objective:

    "Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings."

It is strongly felt that the construction and operation of closed cycle cooling towers will violate the spirit and intent of the NEPA for a segment of population long established in the area. While one can be coldly objective and say that the destructive effects of cooling towers involve a relatively small area and only a moderate number of people, the people of Buchanan are human beings and their rights are just as important as those who are making decisions from afar.

I trust these remarks will be of help to you and if I can be of further service, please let me know.

Yours truly,

Dr. William W. Shuster, P.E.
Director of Environmental Programs
Rensselaer Polytechnic Institute

Mayor
GEORGE V. BEGANY

Trustees:
WILLIAM DURR
JAMES EDGAR
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Village of Buchanan

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May 3, 1976

AGENDA OF MEETING IN OPPOSITION OF COOLING TOWERS TO BE HELD ON SATURDAY, MAY 8, 1976, 10:00 A.M. AT THE BUCHANAN-VERPLANCK SCHOOL, WESTCHESTER AVENUE, BUCHANAN, NEW YORK.

1. Recent developments by those present
2. Review Dr. Shuster's report before Buchanan Zoning Board of Appeals, May 6, 1975
3. Review Dr. Shuster's report of April 12, 1976 to N.R.C.
4. Review Mr. Gregory's report of April 13, 1976 to N.R.C.
5. Discuss Con Edison's air quality permit before Department of Environmental Conservation
6. Discuss E.P.A. Thinking
7. Conclusions and action to be taken

Attached is Dr. Shuster's Report before Zoning Board of Appeals. Copies of other reports you have received. Also attached is a list of those invited to meeting.

George V. Begany
George V. Begany
MAYOR

Senator Buckley
Would appreciate if you could fill us in on the conclusions of the Robert Pollard Hearings held by the Joint Congressional Committee of Nuclear Safety. BVB

TO: Mayor and Board of Trustees
Village of Buchanan
218 Westchester Avenue
Municipal Building
Buchanan, New York 10511

May 6, 1975

Presentation to Village Board - by Dr. William W. Shuster

Impact of Cooling Towers on Village of Buchanan

It is a real pleasure to have the opportunity to meet with you and to share with you some thoughts regarding the impact that a large power generating station, such as the one at Indian Point, has on a community such as Buchanan.

I believe that we all realize that within the framework of our present way of life and our present level of economy there are tremendous demands for large, continuous and reliable reservoirs of electrical power. To supply this demand we require substantial numbers of large generating stations such as the one at Indian Point. Such installations require not only large investments of time, talents and money, but they are also demanding of fuel resources as a source of energy and they impact markedly on surrounding areas because of the large quantities of heat energy which is associated with power generation and which cannot be directly utilized and which must be dissipated.

In the generation of electrical power some type of fuel (nuclear or fossil) is utilized to generate large quantities of high pressure steam from water. This steam is allowed to expand in driving steam turbines which, in turn, are connected to electrical generators which yield the large amounts of desired electrical energy. After doing its work in the turbines, the steam emerges from the turbine as low pressure steam and must be condensed before being returned to the boilers for reuse. To condense the steam, large quantities of cold water are taken from the Hudson River and used to absorb the heat from the steam. At the present time, this cooling water which has become elevated in temperature is returned to the Hudson River.

In evaluating the impact that this large heat load has on the environment, the U. S. Nuclear Regulatory Commission has recommended that the Consolidated Edison Company, who operates the generating plant, cease using a once-through type of cooling process, and instead, design, build and operate a closed cycle system of cooling. Based upon studies of various alternatives, it appears that natural draft wet evaporative cooling towers would be the most suitable alternative to

once-through cooling. What is not so apparent are magnitudes of the impact of the alternatives on the surrounding environment.

When I was first asked to express an opinion on the relative merits of the alternatives, I had considerable misgivings about reaching a definitive decision. Both alternatives seemed to have both advantages and disadvantages and it was not at all obvious which was the better direction to take. However, after considerable study of all aspects of the matter, I have become convinced that there are particular features of the situation at Indian Point, perhaps not found typically at other locations, that suggest that the best solution from a balanced point of view can be found through the use of once-through cooling, rather than by such alternate means as a closed system using natural draft cooling towers. This opinion I express with full knowledge, as an environmental engineer, of possible effects from the discharge of heated effluents to the Hudson River.

The principal arguments which have been presented against the use of once-through cooling include the following:

1. The withdrawal of cooling water from the river will result in the killing of substantial numbers of fish by impingement on the intake screens.
2. The discharge of heated effluent will, under certain conditions, be in violation of the New York State thermal discharge criteria.
3. Discharged cooling water will contain objectionable levels of residual chlorine resulting from treatment used to prevent development of biological growths on heat exchange equipment.
4. That thermal discharges will interfere with the life cycle of fish and other aquatic life, especially the striped bass.
5. That dissolved oxygen levels in the river will be seriously depleted.

While these arguments are well-considered and important, it would be well to examine them closely.

1. It is indeed important that steps be taken to minimize the effects of inflow on the impingement of fish on inlet screens. It is felt that a number of possibilities exist for redesigning the intakes to alleviate this condition. It is felt that innovative approaches can solve or at least markedly reduce the magnitude of the problem.

2. Whether the discharge of heated effluent will violate New York State thermal discharge criteria is highly in doubt. Predictions of behavior are based on mathematical models which depend upon field data which is largely inadequate, and upon numerous unproven assumptions. This has been clearly stated in the Impact Statement of the U. S. Nuclear Regulatory Commission. Even with the results of such models, any predicted violations are marginal.
3. It is anticipated that any residual chlorine in discharged water will rapidly be dissipated by dilution and by consumption by oxidizable materials naturally present in the river water.
4. It seems highly unlikely that the heated discharges will have any marked effect on life cycles of aquatic species, since the temperature levels at worst will barely exceed acceptable limits. Even under these relatively rare occurrences, which by-the-way are most likely to occur at times other than normal spawning times, most life forms may find that they can adjust to such minor excesses, or avoid them entirely. It may be noted that some reports have indicated that some life forms instead of being injured by thermal discharges, actually thrive in them.
5. Again occasional marginal temperature excesses, if they occur at all, will hardly have a significant effect on dissolved oxygen content in excess of that anticipated for temperatures within acceptable limits.

Of all possible alternatives to once-through cooling, it has been suggested that the best would be to use a natural draft wet evaporative cooling tower to cool the condenser water in a closed system. It is strongly felt that such an alternative would be entirely unsatisfactory for the following reasons:

1. The extremely large investment required would result in a significant increase in the cost of electric power furnished. The use of cooling towers would result in increased turbine back pressure resulting in lost energy output which would result in added costs to replace.
2. The towers are huge (560 feet high) and would represent an aesthetically displeasing imposition.

3. The particular location of the plant and direction of prevailing winds results in the tower discharge of water vapor and salt droplets impinging upon the Town of Buchanan and surrounding territory.

4. The vapor plume can impact on Buchanan in several ways:

(a) It has been reported that tower vapor plume can effect local weather conditions quite markedly through fogging, icing and by reducing solar energy input. It has been predicted that such effects in Buchanan would be minimal but this remains to be proven.

(b) More seriously, because the cooling water is recycled in a closed system and because of the relatively high salt concentration in the river water used in cooling, the plume from the tower will contain droplets of salt solution which will be distributed over an appreciable area which includes portions of the Town of Buchanan and surrounding areas. Various estimates of salt deposition rates have been made for various distances from the plant, but a rate of about 400 $Kg/Km^2/mo.$ seems to be about average. Just what does this mean to the average land-owner in Buchanan? I have estimated that a medium size car will occupy about 117 $ft.^2$ of ground area, and based upon the above rate, one can expect that about 4.4 grams of salt will be deposited. The heaviest deposits are most likely during periods when there will be the least rainfall to wash off salt deposits from various surfaces. In terms of deposits on home properties, it is estimated that close to 2 lbs. of salts will be deposited on a 1/2 acre plot of ground. The effects of salt deposits on vegetation are not completely known but it appears to be clear that at least three species of trees have the potential for severe injury. They include hemlock, dogwood and white ash, all of which are common in the area. The damage to vegetation can be expected to vary with location and specific conditions but may range from slight damage to outright killing of some forms.

per year

In addition to damage to vegetation, various other effects from salt deposition can be anticipated. Deposits on metal surfaces may well hasten rates of corrosion and cause local problems. Recent findings have indicated that salt deposits on high voltage transmission lines have increased the occurrence of arcing and increased the likelihood of ozone generation with its attendant hazards to plant, animal and human life.

In summary, the particular characteristics associated with the location and mode of operation of the Indian Point Plant strongly suggest that the use of cooling towers is not a satisfactory method of handling heated water from this plant. The impact of heated discharges on the Hudson River is not at all clear at present and at worst, its effects seem to be marginal. Before eliminating this method of operation, it is strongly urged that more complete studies of the impact of such discharges be made and thoroughly evaluated. The use of cooling towers would be aesthetically disastrous and have serious impacts on property values in surrounding areas. While one can be coldly objective and say that the destructive effects of cooling towers involve a relatively small area and only a moderate number of people, the people of Buchanan are human beings and their rights are just as important as those who are making decisions from afar.

I believe that those making decisions should be entirely honest in answering the question, "Would I prefer to forevermore stare at the structure of a cooling tower pouring out a plume of vapor from which salt is raining down on my property and my possessions in which I have invested my life savings, in preference to very uncertain effects resulting from thermal discharges to the river on the biological life in the river?"

Thank you for your attention.

THE LETTER REGARDING THE MAY 8, 1976, MEETING WAS SENT TO THE FOLLOWING PEOPLE:

Supervisor Muriel H. Morabito
Town of Cortlandt
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