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IN THE BOARD OF COUNTY COMMISSIONERS

FOR CLATSOP COUNTY, OREGON

ORDINANCE NO. 81-7

DEC 30 1981

(AN ORDINANCE AMENDING THE TEXT OF THE (SEASIDE RURAL COMMUNITY PLAN AS ADOPTED (BY THE BOARD OF COMMISSIONERS, AND AS (AMENDED, INCLUDING REVISIONS OF EXCEPTIONS (TAKEN TO THE ESTUARINE RESOURCES AND (COASTAL SHORELANDS GOALS AND RESCINDING (INCONSISTENT PROVISIONS.

The Board of County Commissioners of Clatsop County, Oregon ordain as follows:

SECTION 1. SHORT TITLE.

This ordinance shall be known as the Cannon Beach Wetlands/Marsh Wastewater Treatment System Amendment to the Seaside Rural Community Plan.

SECTION 2.

The Board of County Commissioners of Clatsop County, Oregon recognizes that the Clatsop County Comprehensive Plan for the Seaside Rural Community as adopted by the Board of County Commissioners, as amended, needs periodic revision and amendment.

The Amendment as included herein shall be an element of the Seaside Rural Community Plan and the Board of Commissioners finds that the Amendment herein complies with the following goals of the Land Conservation and Development Commission: 1 through 14 and 16 through 18.

The Board of County Commissioners further determines and takes notice that the adoption procedure for this ordinance amending the Comprehensive Plan particularly complies with Goal 1 of the Land Conservation and Development Commission, the Citizen Involvement Goal. The County Planning Commission has sought review and comment and has conducted the public hearing process pursuant to the requirements of ORS 215.050 and 215.060. A Planning Commission hearing was held on November 24, 1981. (The Board received and considered the Planning Commission's recommendations

on this proposed amendment. The Board of Commissioners held hearings pursuant to law on this ordinance on December 7, 16, and 30, 1981).

SECTION 3. CONFORMITY WITH THE LAW.

This ordinance shall not substitute for nor eliminate the necessity for conformity with any and all laws or rules of the State of Oregon or its agencies, or any ordinance, rule or regulation of Clatsop County.

SECTION 4. INCONSISTENT PROVISIONS.

This ordinance shall supercede, control and repeal any inconsistent provision of the Clatsop County Comprehensive Plan, as amended, the Clatsop County Land and Water Development and Use Ordinance, as amended, or any other ordinance or regulation made by Clatsop County.

SECTION 5. SEPARABILITY.

If any section, subsection, sentence, clause, phrase or any portion of this ordinance is for any reason held invalid or unconstitutional by a court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision and such holding shall not affect the validity of the remaining portions of this ordinance.

SECTION 6. EFFECTIVE DATE.

This ordinance will be in full force and effective 30 days following its passage and enactment by the Board of County Commissioners.

SECTION 7. ADOPTION CLAUSE.

Exhibit "A", entitled an Exception to Permit a Wetlands/Marsh Wastewater Treatment System in and Adjacent to the Ecola Creek Estuary, and labeled A-1 through A-8, is adopted in its entirety and by reference herein each made a part of this ordinance.

ENACTED this 30 day of December, 1981.

BOARD OF COUNTY COMMISSIONERS
FOR CLATSOP COUNTY, OREGON

By _____
Bob Westerberg, Chairman

By _____
Roger A. Berg, Commissioner

By _____
Don R. Church, Commissioner

Vote: Aye BOB WESTERBERG, ROGER A. BERG, DON R. CHURCH

Nay -0-

Absent -0-

ATTEST:

_____
Norma Hunsinger, Recording Secretary to the Board

Date: 12-30-81

CLATSOP COUNTY COUNSEL
COURTHOUSE, ASTORIA, OREGON 97103
TELEPHONE 325-8615

EXHIBIT A

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568 226

AN EXCEPTION TO PERMIT A WETLANDS/MARSH WASTEWATER TREATMENT SYSTEM IN AND ADJACENT TO THE ECOLA CREEK ESTUARY

Description of the proposed action

The construction of a wetland/marsh wastewater treatment system within and adjacent to the Ecola Creek estuary, directly east of Highway 101 and the existing Cannon Beach sewage treatment lagoons (see attached drawing). The marsh, consisting of about 15 acres, would provide tertiary sewage treatment capacity during the summer months.

An exception is being taken to that portion of the estuarine resources goal which state that,"dredge, fill or other reduction or degradation of these natural values by man shall be allowed only:

1) if required for navigation or other water dependent uses that require an estuarine location,..."

The major elements of the project that involve alteration of the estuary are:

1. The construction of a portion of a perimeter dike across a a drainage channel that connects with Ecola Creek.
2. Facing of the water-ward perimeter of the dike with rip-rap.
3. The construction of a discharge point allowing effluent treated in the wetland/marsh treatment system to enter the drainage channel east of highway 101.

An exception is also being taken to that portion of the coastal shorelands goal which state that "major marshes, significant wildlife habitat, coastal headlands, exceptional aesthetic resources, and historic archaelogical sites shall be protected". The site provides significant wintering habitat for a herd of 18 to 20 Roosevelt elk.

The major elements of the project that involve possible impact on this significant habitat are:

1. construction of a perimeter dike, to an elevation of 11' to 11½' M.S.L. of the northeast and south sides of the proposed treatment area; and
2. Pumping prechlorinated effluent from the City's stabilization ponds into the wetland/marsh area in the southern portion through a number of inlets; and
3. Construction of internal baffles for controlling flows of introduced effluent.

Need

Sewage treatment in Cannon Beach is presently provided by a three-celled stabilization pond system. During the winter months the plant operates well below design capacity and discharges chlorinated effluent into Ecola Creek in conformance with both present and anticipated future winter effluent limitations established by the Department of Environmental Quality. During the summer, however, the plant operates near or in excess of design capacity and effluent quality exceeds the more stringent summer discharge limitations. Because the present sewer system cannot meet the summer effluent discharge standards, the Department of Environmental Quality is requiring that the City upgrade its wastewater treatment facility.

Alternatives

1. Alternative Treatment Systems.

There have been four studies conducted to evaluate alternative wastewater treatment methods: CH2M-Hill Inc. "Wastewater Facilities Plan-City of Cannon Beach," 1976, and CH2M-Hill Inc. "Supplement to Wastewater Facilities Plan-City of Cannon Beach," 1977; KCM "Development and Evaluation of Alternative Wastewater Treatment Schemes-City of Cannon Beach Facilities Plan Addendum," 1978; and KCM "Development and Evaluation of Wetlands/Marsh Wastewater Treatment System, Facilities Plan Addendum No. 1", 1981.

The 1976 study evaluated numerous alternatives. Their advantages and disadvantages are summarized in Table 1. Three main alternatives were focused on: chemical treatment, isolation ponds and ocean out-fall. Their advantages and disadvantages are summarized in Table 2. Ocean disposal was rejected primarily because of high cost and questions about technical feasibility. The main resons for rejecting the chemical treatment alternatives were cost, the difficulty of operating sophisticated equipment by a small town, and the disposal of sludge. Phase isolation ponds' major disadvantages were found to be its requirement for an extensive land area and its experimental nature. A similar system later proved unsuccessful in Ontario, Oregon.

Subsequently an evaluation of a biological treatment plant (activated sludge) was made. This system was found to have major problems involving high cost, disposal of sludge and the aesthetic implications of converting existing settling ponds to sludge holding ponds. These were felt to outweigh the advantage of the known reliability of this most conventional of sewage treatment methods.

Based on the City's dissatisfaction with the presented alternatives, a third study examining systems that required low amounts of energy that were non-mechanical in nature was made. This is consistent with the 1977 Federal Clean Water Act amendements which encourage innovative systems. Three systems were investigated; a marsh system, a marsh/aquaculture system, and an intermittent sand filtration system. The selected alternative was the marsh system.

The major advantages of this system were found to be: the lowest cost of all systems reviewed, little consumption of energy, and no sludge to be disposed of. The major disadvantages were short-term environmental disturbances resulting from conversion of the present wetland to an artificial marsh, the potential loss of elk wintering habitat, and introduction of new plant species.

Because of State and Federal resource management agency's concerns about the possible impact of the artificial marsh system on the elk wintering habitat and the effects of introducing non-native plants, a fourth study was prepared. This study further reviewed alternatives that would use a natural filtration system and would meet expressed resource management agency concerns. Three alternatives were examined. A natural wetlands system utilizing 100% natural overland flow through the existing wetlands. This alternative would require 40 acres. Second, development of a semi-natural wetland/marsh system which would rely on 50% natural over land flow 50% controlled flow. This alternative would require 25 acres. The third alternative was development of a wetlands/marsh system utilizing an internal baffle system through the entire treatment area to maintain controlled flows and treatment. This alternative would require 15 acres.

The third alternative was selected because the highest degree of treatment could be achieved through the most completely controlled wetlands/marsh system and because the overall wetlands impact would be minimized through the use of the least amount of wetland area.

2.Alternative sites

In addition to the proposed site, other marsh treatment site alternatives have been investigated. An alternative "wetland" site located between the present sewage lagoons and Spruce Street was

evaluated. This site has the advantage of being in closer proximity to the existing sewage treatment facility. Its disadvantages were insufficient land area, the possible loss of the area's important flood retention capability with regard to the town center, and its use as an elk wintering area. The disadvantages were found to substantially outweigh the advantages. Higher upland sites were not considered desirable because of the accepted engineering practice of locating sewage treatment facilities at as low an elevation as possible.

3. Design alternatives within the selected site

The proposed wetlands/marsh treatment system uses Highway 101 as the dike on the west side of the treatment system. A design alternative considered was to build a dike parallel to Highway 101 just enough to the east that the northern dike would not have to cross the drainage channel entering Ecola Creek. This alternative was not selected for two reasons.

First, a primary concern of federal resource management agencies was that the development of the system minimally disrupt the fresh water wetland that functions as elk wintering habitat. The construction of a second dike, parallel to Highway 101, would disrupt substantially more habitat then would the alternative using Highway 101 as the western dike. Second, it is estimated that the construction of a parallel dike would raise overall system construction cost by $100,000.-$125,000.

Environmental Consequences

The area enclosed by the dike would be altered by felling of trees in the dike/baffle areas and changes in hydraulics resulting from construction of the dikes. Trees would be cut within those areas occupied by the alder/spruce community and the western portion of the spruce/elderberry community.

Felling trees, especially the older and larger spruce, alder, and maple, where dikes and baffles are constructed, would reduce cover for a variety of wildlife, roughly in proportion to the acreage disrupted. Flycatchers, warblers, kinglets, wrens, both chickarees and grey squirrels, racoons and many other birds and mammals utilize this habitat. The construction of perimeter dikes enclosing the wetlands area would result in some vegetation and wildlife habitat being destroyed or disrupted.

The increase in water levels in the wetlands/marsh area would result in:

a) Changes in the wildlife community with more aquatically oriented species increasing in population at the expense of other coastal forest and brush inhabitating species.
b) The twinberry and other vegetation, including alder and spruce, will likely die off, sedges and emergent species would increase in populations.
c) The developed wetlands/marsh area would likely have less diversity in plant and animal communities than the existing wetlands.

Less mobile animals, such as small rodents, frogs, and salamanders, could be killed during construction of the Cannon Beach system. During the operational phase, these aquatic organisms, along with herons and waterfowl, should quickly repopulate the marsh.

The wildlife community would change with more aquatically oriented species such as ducks, rails, and herons, muskrat and marsh shrews increasing in population at the expense of other coastal forest and brush inhabiting species including flycatchers, warblers,kinglets, song sparrows, bobcats and coyote. Because elk feed on slough sedge

and skunk cabbage, the herd should continue to wander through the project area. Most of the lengths of dike would not be high enough to prevent significant elk movement. No endangered or threatened wildlife or plants are known to exist on the project site.

The construction of perimeter dikes and baffles may result in temporary degradation of water quality due to increases in turbidity from erosion and siltation processes.

Ecola Creek water quality would be improved during the summer months with the discharge of a higher quality effluent. Probably greater phosphorus and nitrogen removals would be achieved by the wetlands/ marsh system than by conventioanl treatment.

Depending on Ecola Creek flow and DO levels, the organic content and consequent BOD_5 of the effluent from the marsh system (10 mg/l) could cause a localized area of relatively low DO levels near the outfall structure during summer months. It is anticipated that quick mixing with the creek water would minimize any effects from low DO levels. Recommended level for salmonid populations is above 5 ppm. Tidal actions affecting Ecola Creek in this area would also act to dissipate effluent twice daily.

Changes in hydraulics would result from the dike diverting runoff, mainly from south of the site during the summer, and the introduction of secondary wastewater effluent. Winter runoff from south of the site would continue through the site through a flood structure located on the south. A channel would route this runoff around the dike to Ecola Creek during the summer. The three flood structures, situated along the eastern dike, would allow winter flood water to flow through the site if desireable for flushing. High flood waters of over 12-13 feet MSL in elevation would spill over the dike into the marsh pond and out the outlet structure. The flooding would be unlikely to disturb the slough sedge, a rhizomatous perennial, which is well rooted and adapted to flooding (and is indeed, subjected to periodic flooding now).

The creek's fish resources should be positively affected through and improvement in water quality.

This method of treatment does not create sludge that must be disposed of.

The project will be designed to minimize any adverse impacts, this will be ensured through the State/Federal Permit process.

The project includes the filling of between 1,000-1,500 square feet of estuarine surface area. This loss of estuarine surface area is judged to be of minimal significance. First, because of the small portion of the total estuarine surface area that is being filled. Secondly, because the area to be filled does not consist of habitat that contribute significantly to the productivity of the estuary. The area does not include major tracts of salt marsh, tideflats and seagrass/algae beds (the criteria for natural estuarine management units) nor does it include smaller tracts of salt marsh tideflats, seagrass and algae beds and oyster and clam beds (the criteria for conservation estuerine management units). The project includes a small alteration of estuarine area and thus may require mitigation as defined by O.R.S. 541-6.05-541.665. Whether mitagation will be required will be determined by the Division of State Lands in the permitting process.

Economic, Social and Energy Consequence

The wetlands/marsh system is the least expensive of all alternatives evaluated because of its low energy and capital equipment requirements.

Development of the wetland/marsh system will increase knowledge about this type of innovative wastewater treatment system.

An archaelogical survey established the existence of a previously undocumented archaelogical site approximately 25 meters south of Ecola Creek, approximately 100 meters east of Ecola Creek bridge on Highway 101. The proposed design avoids any construction activity in this area. If construction is planned on or near the locality, archaelogical testing will be undertaken to determine the significance of the site.

Compatability

The immediately adjacent areas are presently vacant. The existing City wastewater treatment plant is located west of the site, across Highway 101. The Cannon Beach Comprehensive Plan and the Cannon Beach Zoning Ordinance designate the area to the South as Residential-Alternative Mobile Homes. This is a residential zone which permits conventional built housing and mobile homes. No conflicts between the artificial marsh and residences are foreseen. The area to the southeast is designated by both the Clatsop County and Cannon Beach Comprehensive Plans and Zoning Ordinances as Residential Very Low Density. This is a holding zone inside the City's urban growth boundary permitting single family residences on 1 acre lots. When sufficient City services become available such areas may annex into the City and request higher density residential zoning. No conflicts between the artificial marsh and either low density or higher density residences are foreseen.

The Ecola Creek estuary has been classified by both Cannon Beach and Clatsop County as a conservation estuary. Furthermore, because Ecola Creek is small it functions more as a tidal stream then an estuary. There are no areas within Ecola Creek that meet the Goal #16 criteria for natural management units(i.e. major tracts of salt marsh, tideflats and seagrass/algae beds) therefore, there are no natural management units within Ecola Creek. The purpose of a conservation estuary and estuary management units is to provide for long-term uses of available resources that do not require major alteration of the estuary. The wetlands/marsh is compatible with this intent. The wetlands marsh system represents a long term use of available resource. With the wetlands, both estuaine and fresh-water, being the available resource. The diking of approximately 1,500 square feet of the esturary is a minimal alteration of the estuary. The project will not preempt any other anticipated or foreseeable water-dependent use.

The design of the treatment area's periphery is such that it will minimize the impact on the continued use of the area as elk-wintering habitat.

Conclusions

There is a need for the City of Cannon Beach to upgrade its wastewater treatment plant. The proposed wetlands/marsh treatment system and its location is the alternative selected after more than four years of study and the evaluation of numerous alternatives. The design alternatives selected is the one with the minimal impact of elk wintering habitat and has the least cost. The environmental, social, economic and energy consequences of the project are acceptable. The project will be compatible with the overall management objectives of Ecola creek, the existing elk wintering habitat and the anticipated development of the surrounding area.

TABLE 1

ALGAE REMOVAL TREATMENT PROCESS ALTERNATIVES

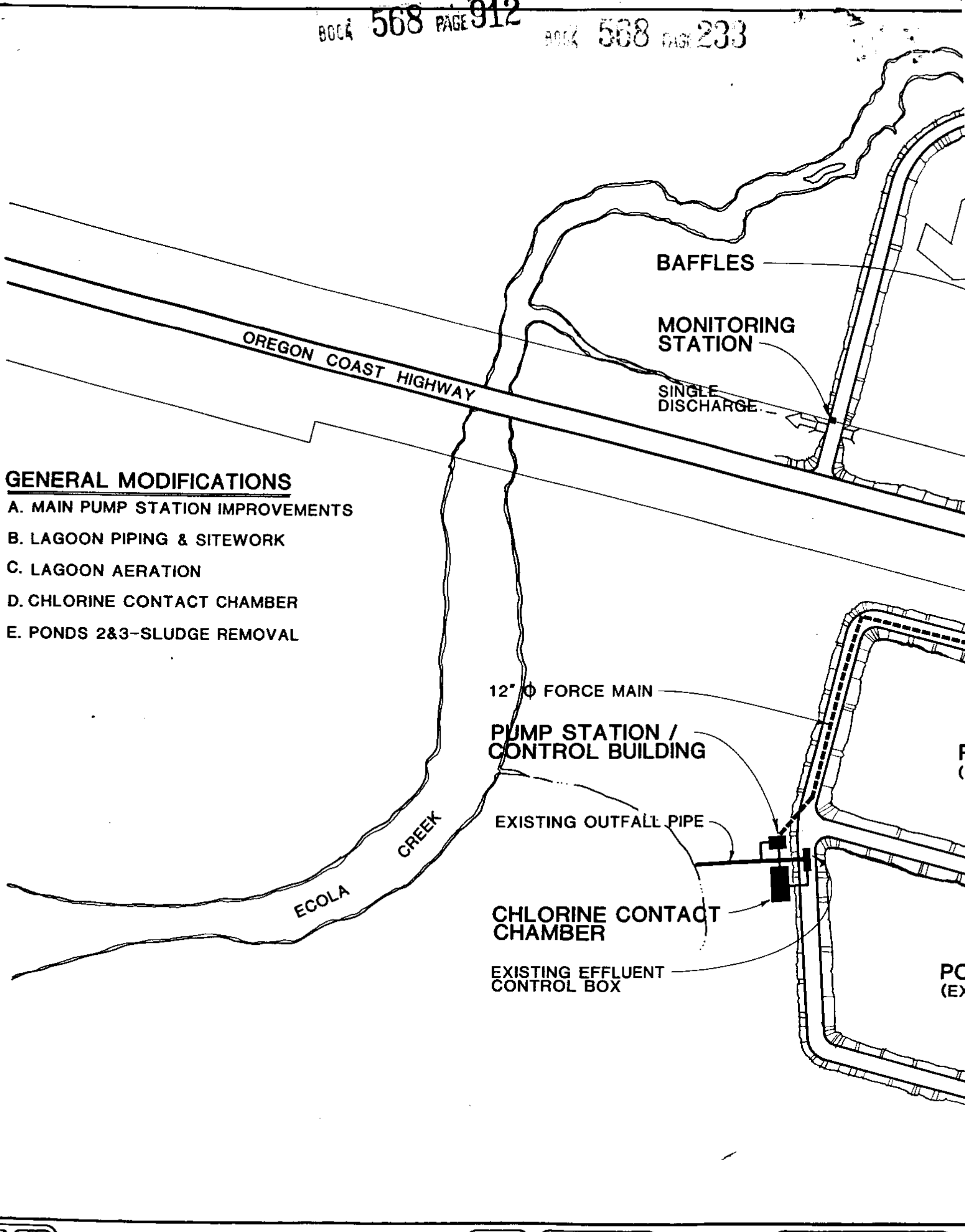
Treatment Method (References*)	Advantages	Disadvantages
Chemical Coagulation with Settling (1,2,3,11,14,15)	1. Consistent effluent quality 2. Simple mechanical operation 3. Flexible process control 4. Considerable test data	1. Requires attention to chemical addition for process control 2. Possible natural flotation of algae 3. Need to add filtration to assure 10/10 effluent quality 4. Dilute sludge produced
Chemical Coagulation with Flotation (1,4,6,18)	1. Consistent effluent quality 2. Flexible process control 3. Concentrated sludge produced 4. Considerable test data	1. More complex mechanical operation 2. Requires attention to chemical addition and flotation variables for process control 3. Need to add filtration to assure 10/10 effluent quality
Mixed-Media Filtration (6,15)	1. Consistent effluent quality	1. Need to precede by chemical coagulation and settling (or flotation) to prevent rapid headloss buildup in filter 2. More complex mechanical operation
Sand Filtration (7,8)	1. Simple mechanical operation 2. Consistent effluent quality 3. Considerable test data	1. Tested process only for low algae concentrations 2. Labor-intensive operation to clean and replace sand 3. Wet climate may require covered filter area
Rock Filtration (9,10)	1. Simple mechanical operation 2. Considerable test data	1. Inconsistent effluent quality 2. Untested process for high algae concentrations
In-Pond Chemical Coagulation and Settling (5,15)	1. Simple mechanical operation (motorboat application of chemicals)	1. Inconsistent effluent quality 2. Not possible to control process once chemicals are added 3. Only tested once
Isolated Algae Removal Pond (Phase Isolation) (16)	1. Simple mechanical operation 2. Full scale system in operation	1. Relies upon natural algal precipitation; process control not possible 2. Additional large pond area required for adequate detention
Microscreening (1,2)	1. Simple mechanical operation	1. Inflexible process control 2. Unreliable process on single-cell algae 3. May need to precede by chemical coagulation

*References are listed in Appendix C.

TABLE 2

SUMMARY OF ALTERNATIVE EVALUATION

Alternative	Major Advantage	Major Disadvantage
	ENGINEERING EVALUATION	
1A and 1B (Chemical Treatment)	Well demonstrated treatment system for algae removal.	Pilot testing required to determine best sludge dewatering method.
2 (Isolated Ponds and Future Chemical Treatment)	Requires least attention to additional treatment process.	Pilot testing required to determine isolated pond performance.
3 (Ocean Outfall)	No additional treatment process to control.	Permanence of outfall pipe installation is uncertain.
	ENVIRONMENTAL EVALUATION	
1A and 1B (Chemical Treatment)	Retains maximum buffer zone around plant site.	Uses considerable amounts of chemicals and requires sludge disposal.
2 (Isolated Ponds and Future Chemical Treatment)	May delay requirement for chemical treatment.	Uses large land area and leaves minimal buffer zone around plant site.
3 (Ocean Outfall)	Uses least amount of natural resources and energy.	More disruption of community during construction.
	ECONOMIC EVALUATION	
1A and 1B (Chemical Treatment)	Process combinations could reduce capital costs.	Highest O&M costs.
2 (Isolated Ponds and Future Chemical Treatment)	Lowest overall present worth, and amenable to staging.	Capital costs will increase if land must be purchased.
3 (Ocean Outfall)	Lowest O&M costs.	Highest overall present worth.



GENERAL MODIFICATIONS

A. MAIN PUMP STATION IMPROVEMENTS

B. LAGOON PIPING & SITEWORK

C. LAGOON AERATION

D. CHLORINE CONTACT CHAMBER

E. PONDS 2&3-SLUDGE REMOVAL

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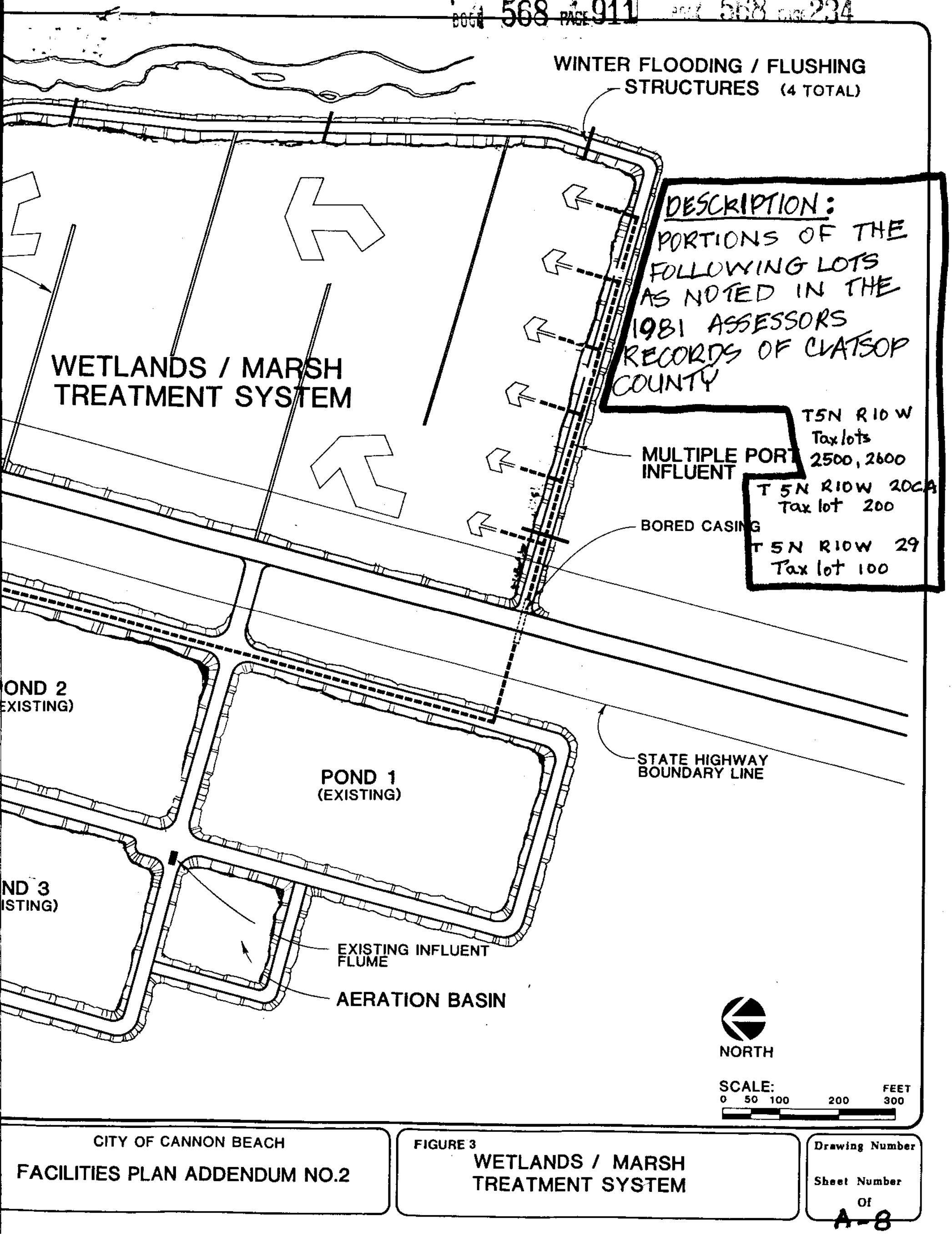
Date	9/81
Scale	AS SHOWN
Designed By	JDM
Drawn By	FMF
Checked By	
Approved By	

Revisions



CITY OF CANNON BEACH

FACILITIES PLAN ADDENDUM NO.2

FIGURE 3

WETLANDS / MARSH TREATMENT SYSTEM

Drawing Number

Sheet Number

Of

A-8