

WATER MONITORING: PROTECTING THE AQUATIC ENVIRONMENT

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FOREWORD

This report was prepared in response to House Concurrent Resolution No. 118, H.D. 1, adopted during the Regular Session of 2004, that requested the Legislative Reference Bureau to undertake a study of the open ocean fish farm and cruise ship industries to determine whether a water monitoring program with an emphasis on the environment should be established.

The Resolution directed the Bureau to determine whether the water monitoring program should be placed in the Department of Land and Natural Resources and consider its relationship to the Department of Health, the Office of Planning within the Department of Business, Economic Development, and Tourism, and the counties. State, county and federal agencies and private industry stakeholders were contacted for information as to existing water monitoring and other programs aimed at protecting the aquatic environment from potential pollution from the fledgling open ocean fish farm industry and the expanding cruise ship industry in the State.

The Bureau would like to thank all parties contacted who were very generous with their time and information.

Ken H. Takayama
Acting Director

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SUMMARY

WATER MONITORING: PROTECTING THE AQUATIC ENVIRONMENT

The early years of the 21st century have seen the State of Hawaii reap some successes in promoting two different industries to diversify the visitor industry dominated economy of the State. Today, the State has its first commercial open ocean fish farm in operation one mile off the coast of Ewa on Oahu. Cates International, Inc. is producing locally popular *moi* in two large submerged cages attached to the ocean floor for wholesale and restaurant customers. Satisfaction is high and demand is growing. Another ocean fish farm has its permits and is set to develop off the coast of Keahole on the Kona coast of the Big Island. This fish farm will be producing local native *kahala* for the local and mainland markets in up to six submerged cages.

At the same time, thanks in part to federal legislation, the cruise industry in Hawaii is on the verge of tripling its activities over the next two years. This year, in addition to the usual pass-through cruises that visit the State, NCL America has placed in operation, under the United States flag, the *Pride of Aloha* with a capacity of 2,000 passengers, dedicated exclusively to inter-island cruises within the State. NCL America plans to add two additional cruise ships with a similar capacity over the next two years also dedicated solely to inter-island cruise operations.

While both new industries were strongly promoted and welcomed by the State, many are concerned with the potential pollution of the aquatic environment that may be caused by these two new industries. House Concurrent Resolution No. 118, H.D. 1, adopted during the Regular Session of 2004, expressed concern that Hawaii's waters that are so necessary for the visitor industry, cultural practices, subsistence, and ocean recreation could be the victim of pollution created by the development of the new open ocean fish farms and the expansion of the cruise ship operations in the State. The Resolution recognized that the Department of Health conducts a water monitoring program to protect the public health but requested that the Legislative Reference Bureau undertake a study to determine whether there should be a separate water quality monitoring program established in the Department of Land and Natural Resources with an emphasis on the environment.

A large portion of the water quality monitoring programs presently in operation are handled by the Clean Water Branch of the Department of Health (hereafter DOH). The Bureau found that the mission of DOH and its water quality monitoring efforts was equally directed at protecting the public health and the aquatic environment. Additionally, water quality monitoring is being conducted by the several counties and some private parties. The Bureau further reviewed the regulatory oversight imposed on the open ocean fish farm industry and cruise ship operations in the State.

The regulatory oversight of the fish farm industry is based primarily on Chapter 190D, Hawaii Revised Statutes, relating to ocean and submerged land leasing, and is the primary responsibility of the Department of Land and Natural Resources (hereafter DLNR). DLNR is charged with reviewing and approving conservation district use applications and issuing ocean leases for ocean fish farm operations. It also conducts ongoing oversight through its Division of Aquatic Resources that does periodic site inspections. This oversight is shared by DOH, through the implementation of the federally-mandated National Pollutant Discharge Elimination System (hereafter NPDES) program. DOH is responsible for issuing NPDES permits for fish farms that require extensive water monitoring for potential toxicity and overloading of nutrients in the area of the underwater fish cages. The NPDES permit also requires quarterly bottom biological community surveys that are reviewed by DLNR.

The environmental oversight of cruise ship operations in the State is shared by the United States Coast Guard and the State. Under federal laws, primarily the Clean Water Act, the Coast Guard is the principal enforcer of environmental laws and regulations in the navigable waters of the United States. Additionally, the State has entered into a Memorandum of Understanding with most of the cruise ship operators engaging in cruise ship operations in the State. By law, the Coast Guard makes regular inspections of all cruise ships plying the navigable waters of the United States to ensure that the mechanisms in place for the prevention of pollution from the various waste streams produced by the ships are in operation. DOH, at the invitation of the Coast Guard, is a regular participant in these inspections and is further charged with the review of records for maritime sanitation devices periodically submitted pursuant to the Memorandum of Understanding.

While there can be no guarantee that there will not be any instance of pollution from the fish farm or the cruise ship operations, the regulatory oversight presently in place appears to be working. The cooperation and coordination of efforts by the agencies of the various levels of government is effective in overseeing the operations of fish farms and cruise ships and the prevention of pollution from these operations. The establishment of a separate, additional water monitoring program in the DLNR would, to a great extent, be duplicative of the program operated by DOH and very costly to implement. Accordingly, the answer to the question posed by the Resolution is "NO", there is not a present need for the establishment of an additional water monitoring program with an emphasis on the environment in the DLNR.

TABLE OF CONTENTS

	<i>Page</i>
FOREWORD	<i>iii</i>
SUMMARY	<i>iv</i>
1. INTRODUCTION	1
Scope of Work	1
Research.....	2
Organization.....	3
Glossary	3
Endnotes.....	4
2. WATER POLLUTION CONTROLS AND MONITORING PROGRAMS	5
Water Pollution Controls	5
National Pollutant Discharge Elimination System	8
State and County Water Monitoring Programs.....	9
Other Water Monitoring Requirements	11
Endnotes.....	12
3. MARICULTURE OR FISH FARMS	14
Introduction.....	14
Cates International, Inc.	15
Black Pearls, Inc.	19
Kona Blue Water Farms	20
Ahi Farms	21
Discussion.....	21
Case Study: Cates Fish Farm.....	22
Endnotes.....	25
4. CRUISE SHIP INDUSTRY	27
Introduction.....	27
PCL America	27
Pollution Streams and Environmental Protection.....	28
Environmental Laws and Regulations	28
International	28
United States Laws	29
Maritime Sanitation Devices	30
State of Alaska.....	31
Hawaii Cruise Ship Operations: Memorandum of Understanding.....	31

	<i>Page</i>
ICCL Cruise Industry Waste Management Practices and Procedures ("ICCL Standards").....	33
United States Coast Guard Environmental Inspection Protocol.....	34
Department of Health Clean Water Branch Review.....	36
Cruise Industry Response	36
Endnotes.....	36
5. CONCLUSIONS	38
Emphasis on the Environment.....	38
Fish Farms.....	40
Cruise Ships	41
Summary	41
Endnotes.....	42

Appendices

A. House Concurrent Resolution No. 118, H.D. 1	43
B. First Amendment to the Memorandum of Understanding between the State of Hawaii and the North West CruiseShip Association.....	46
C. Hawaii Department of Health Grant for the Development of Coastal Recreational Water Quality Monitoring and Public Notification Programs for Hawaii's Beaches	94
D. Approval letter from DLNR Land Division for the Cates International, Inc., CDUA	127
E. Authorization to Discharge Under the National Pollutant Discharge Elimination System.....	131
F. Approval letter from DLNR Land Division for the Black Pearl, Inc., CDUA.....	157
G. Approval letter from DLNR Land Division for the Kona Blue Water Farms CDUA	161
H. Letter to Grant Kidani from OCCL	166
I. Memorandum from DLNR/DAR to OCCL.....	168
J. Letter from Food Products Laboratory, Inc.	176
K. Letters from Department of Health to Norwegian Cruise Lines	179

Chapter 1

INTRODUCTION

Scope of Work

During the Regular Session of 2004, the Legislature adopted House Concurrent Resolution No. 118, H.D. 1 (hereafter "Resolution"), entitled "Requesting the Legislative Reference Bureau to Study the Feasibility of Establishing a Water Quality Monitoring Program for Marine Waters that Emphasizes Environmental Protection." (See Appendix A) The Resolution recognized the extreme value of the State's pristine Class A ocean waters and the aquatic resources therein as an asset to our island residents for recreation, sustenance, and cultural purposes. It further recognized that Hawaii's ocean waters provide a valuable economic asset that supports tourism, sport fishing, diving, and other ocean recreation businesses.

The Resolution further acknowledged the growing interest in the aquaculture development of open ocean fish farms and the increased activity by the cruise ship industry locally. These new industries while desired and promoted, "have the potential to degrade Hawaii's pristine ocean waters thereby harming native fish and other marine animals, destroying ocean plants, endangering fragile coral reefs, and disrupting the overall marine ecosystem."¹ While the Resolution acknowledged that the Clean Water Branch of the Department of Health already tests waters with an emphasis on human health, it stated that Hawaii also "needs a water quality monitoring program that stresses environmental protection."²

The direct task of the Bureau was "to study the feasibility of establishing a suitable monitoring program that emphasizes environmental protection."³ Further, it requested that the Bureau consider:

- "The placement of the monitoring program in the Department of Land and Natural Resources and its relation to the Department of Health, the Office of Planning within the Department of Business, Economic Development, and Tourism, and the counties, in areas such as sharing of water quality data;
- The need to enact legislation that would provide the monitoring program with enforcement powers to take action against violators; and
- Possible sources of funding for the monitoring program, such as an aquaculture development special fund, the real estate conveyance tax, or impact fees generated from activities that pollute Hawaii's oceans;..."⁴

Research

In undertaking this task, the Bureau engaged in research in the following areas:

- Reviewed the Beaches Environmental Assessment and Coastal Health Act of 2000,⁵ the current water monitoring program presently operated by the Clean Water Branch of the Department of Health, and water monitoring programs or activities of other agencies, including the Department of Land and Natural Resources;
- Reviewed Chapter 190D, Hawaii Revised Statutes, relating to Ocean and Submerged Lands Leasing, and the Conservation District Use Applications for various open ocean fish farms in operation or being proposed;
- Reviewed the file in the Office of Conservation and Coastal Lands in the Department of Land and Natural Resources for Cates International, Inc. for an open ocean fish farm off of Ewa Beach, including its approved Conservation District Use Application, its executed Mariculture Lease with the Board of Land and Natural Resources, its National Pollutant Discharge Elimination System Permit issued by the Department of Health, and various correspondence from the Division of Aquatic Resources of the Department of Land and Natural Resources;
- Met with the operator of the only operating open ocean fish farm, Cates International, Inc.;
- Reviewed the National Pollutant Discharge Elimination System of the Clean Water Act, as amended,⁶ and Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category; Final Rule;⁷
- Reviewed the First Amendment to the Memorandum of Understanding between the State of Hawaii and the North West CruiseShip Association, dated February 18, 2004, along with its appendices, including the International Council of Cruise Lines Cruise Industry Waste Management Practices and Procedures and United States Coast Guard Navigation and Vessel Inspection Circular No. 04-04. (See Appendix B), along with similar Memoranda of Understanding entered into by the states of Florida and Washington;

INTRODUCTION

- Reviewed laws of other coastal states, including Alaska, Washington, and Oregon, relating to cruise ships and ocean farming;

In addition to the above research, the Bureau met with, had telephone interviews, or corresponded with personnel in the following agencies:

1. Office of Conservation and Coastal Lands and Division of Aquatic Resources, Department of Land and Natural Resources;
2. Clean Water Branch, Environmental Management Division, Department of Health;
3. Planning Departments for counties of Maui, Hawaii, and Kauai, and the City and County of Honolulu;
4. Office of Planning, Communications and Publications Office, and Land Use Commission, Department of Business, Economic Development, and Tourism;
5. Statewide Transportation Planning Office, Department of Transportation;
6. United States Coast Guard;
7. Representatives of Cates International, Inc.; and
8. Representatives of NCL America.

Organization

This chapter provides the direction and task set forth by the Resolution and research undertaken by the Bureau. The following Chapter 2 reviews the various water monitoring programs presently operated by the Department of Health and other existing water monitoring programs or agency requirements. Chapter 3 discusses activities of open ocean fish farms and the water monitoring requirements imposed on these operations. Chapter 4 reviews the operations of cruise ships in the State and the monitoring requirements on those operations. Finally, Chapter 5 contains the Bureau's conclusions and recommendations.

Glossary

For the convenience of review, the following frequently referred to abbreviations or acronyms are used in the order that they appear in the text:

DOH	Department of Health, State of Hawaii
HAR	Hawaii Administrative Rules
NPDES	National Pollutant Discharge Elimination System
EPA	Environmental Protection Agency
CWB	Clean Water Branch, Environmental Management Division, Department of Health
LUC	Land Use Commission, Department of Business, Economic Development, and Tourism, State of Hawaii
NELHA	Natural Energy Laboratory of Hawaii Authority, Department of Land and Natural Resources, State of Hawaii
CDUA	Conservation District Use Application
DLNR	Department of Land and Natural Resources, State of Hawaii
Cates	Cates International, Inc.
ZOM	Zone of mix
OCCL	Office of Conservation and Coastal Lands, Department of Land and Natural Resources
BLNR	Board of Land and Natural Resources, State of Hawaii
DLNR/DAR	Division of Aquatic Resources, Department of Land and Natural Resources
DOTHD	Harbors Division, Department of Transportation, State of Hawaii
MARPOL	International Convention for the Prevention of Pollution from Ships of 1973
RCRA	Resource Conservation and Recovery Act
MSD	Maritime Sanitation Device
NWCA	North West CruiseShip Association
MOU	First Amendment to the Memorandum of Understanding between the North West CruiseShip Association and State of Hawaii
ICCL	International Council of Cruise Lines

Endnotes

1. See House Concurrent Resolution No. 118, H.D. 1, Regular Session of 2004, designated as Appendix A.
2. *Id.*
3. *Id.*
4. *Id.*
5. Pub. L. No. 106-284, 114 Stat. 870.
6. 33 U.S.C. §1251 *et seq.*
7. 40 C.F.R. Part 451 (2004).

Chapter 2

WATER POLLUTION CONTROLS AND MONITORING PROGRAMS

Water Pollution Controls

Hawaii's statutory framework and administrative rules relating to water pollution are primarily implemented or overseen by the Department of Health (hereafter "DOH") and the Director of Health, who are responsible for implementing the State's water pollution law, Chapter 342D, Hawaii Revised Statutes. The chapter applies to all waters of the State including inland, coastal, and ocean waters.

Section 342D-50, Hawaii Revised Statutes, provides the following:

§342D-50 Prohibition. (a) No person, including any public body, shall discharge any water pollutant into state waters, or cause or allow any water pollutant to enter state waters except in compliance with this chapter, rules adopted pursuant to this chapter, or a permit or variance issued by the director.

(b) No person, including any public body, shall knowingly establish, extend, or alter any system of drainage, sewage, or water supply, or undertake any project in sewage outfall areas where there may be a possibility of alteration of currents depended upon for dilution without first securing approval in writing from the director.

(c) No person, including any industrial user, shall discharge any water pollutant or effluent into a publicly owned treatment works or sewerage system in violation of:

- (1) A pretreatment standard established by the department or the publicly owned treatment works; or
- (2) A pretreatment condition in a permit issued by the department or a publicly owned treatment works.

(d) No person, including any public body, shall violate any rule adopted pursuant to this chapter or any permit or variance issued or modified pursuant to this chapter.

Pursuant to section 342D-50, Hawaii Revised Statutes, a person may discharge a water pollutant if a permit is issued pursuant to section 342D-6, Hawaii Revised Statutes, or a variance is issued pursuant to section 342D-7, Hawaii Revised Statutes, by the Director of Health.

Section 342D-6(c) permits the director to issue a permit "if the director determines that it will be in the public interest." Section 342D-6(g) emphasizes the importance of safeguarding the environment, by providing that:

(g) In determining the public interest regarding permit issuance or renewal, the director shall consider the *environmental* impact of the proposed action, any adverse *environmental* effects which cannot be avoided should the

action be implemented, the alternatives to the proposed action, the relationship between local short-term uses of the *environment* and the maintenance and enhancement of long-term productivity, any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented, and any other factors which the director, by rule, may prescribe; provided that any determination of public interest shall promote the optimum balance between economic development and *environmental* quality. (Emphasis added)

For purposes of Chapter 342D, definitions for "Permit," "State waters," "Water pollutant," and "Water pollution" are as follows:

"Permit" means written authorization from the director to discharge waste or to construct, modify, or operate any water pollution source. A permit authorizes the grantee to cause or discharge waste or water pollution in a manner or amount, or to do an act, not forbidden by this chapter or by rules adopted under this chapter, but requiring review by the department.

"State waters" means all waters, fresh, brackish, or salt, around and within the State, including, but not limited to, coastal waters, streams, rivers, drainage ditches, ponds, reservoirs, canals, ground waters, and lakes; provided that drainage ditches, ponds, and reservoirs required as a part of a water pollution control system are excluded.

"Water pollutant" means dredged spoil, solid refuse, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical waste, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, soil, sediment, cellar dirt and industrial, municipal, and agricultural waste.

"Water pollution" means:

- (1) Such contamination or other alteration of the physical, chemical, or biological properties of any state waters, including change in temperature, taste, color, turbidity, or odor of the waters, or
- (2) Such discharge of any liquid, gaseous, solid, radioactive, or other substances into any state waters,

as will or is likely to create a nuisance or render such waters unreasonably harmful, detrimental, or injurious to public health, safety, or welfare, including harm, detriment, or injury to public water supplies, *fish and aquatic life and wildlife, recreational purposes* and agricultural and industrial research and scientific uses of such waters or as will or is likely to violate any water quality standards, effluent standards, treatment and pretreatment standards, or standards of performance for new sources adopted by the department. (*Emphasis added to note that while the Resolution states that the DOH's emphasis is on protecting human health, Chapter 342D also addresses aspects of the environment, including fish and aquatic life and recreation issues.*)

Section 342D-5 provides the following:

[§342D-5] Rules; specific. The director may establish by rule, water quality standards, effluent standards, treatment and pretreatment standards, and standards of performance for specific areas and types of discharges in the control of water pollution, thereby allowing for varying local conditions.

Pursuant to section 342D-5, DOH adopted Chapter 11-54 of the Hawaii Administrative Rules (hereafter "HAR") relating to the discharge of water pollutants and establishing standards for water quality for all State waters. State waters are classified as either inland or marine and both classes are further broken down into separate sub-classifications and types.¹ Section 11-54-4, HAR, establishes basic water quality standard criteria applicable to all waters for toxicity purposes. Section 11-54-4(a) provides the following:

§11-54-4 Basic water quality criteria applicable to all waters. (a) All waters shall be free of substances attributable to domestic, industrial, or other controllable sources of pollutants, including:

- (1) Materials that will settle to form objectionable sludge or bottom deposits;
- (2) Floating debris, oil, grease, scum, or other floating materials;
- (3) Substances in amounts sufficient to produce taste in the water or detectable off-flavor in the flesh of fish, or in amounts sufficient to produce objectionable color, turbidity or other conditions in the receiving waters;
- (4) High or low temperatures; biocides; pathogenic organisms; toxic, radioactive, corrosive, or other deleterious substances at levels or in combinations sufficient to be toxic or harmful to human, *animal, plant, or aquatic life*, or in amounts sufficient to interfere with any beneficial use of the water;
- (5) Substances or conditions or combinations thereof in concentrations which produce undesirable *aquatic life*; and
- (6) Soil particles resulting from erosion on land involved in earthwork, such as the construction of public works; highways; subdivisions; recreational, commercial, or industrial developments; or the cultivation and management of agricultural lands. (Emphasis added)

Limits are stated for the presence of ninety-six different potential toxic pollutants that can cause harm to humans and aquatic life. Any discharges that cause these limits to be exceeded are a violation of Chapter 342D.

The rules further establish additional criteria for the various classes and sub-classes of waters with limits on the presence of total nitrogen, ammonia nitrogen, nitrate + nitrite nitrogen, total phosphorus, chlorophyll, and turbidity. Marine waters have additional criteria relating to oxidation reduction and soil sedimentation. The Director of Health may impose additional parameters and criteria for the protection of bottom biological communities.²

Sections 342D-30 through 33, Hawaii Revised Statutes, provide for civil, administrative, and criminal penalties for violations of Chapter 342D or the rules adopted thereto. Persons violating the chapter or rules are subject to civil penalties of up to \$25,000 for each separate offense, with each day of a continuing violation being a separate offense. Negligent violations of Chapter 342D or any rules may result in criminal penalties of up to \$25,000 per day or imprisonment for not more than one year,

or both. Knowing violation of the chapter or rules may result in penalties of up to \$50,000 per day or imprisonment for not more than three years, or both. Any knowing violation after a first conviction may result in penalties of up to \$100,000 per day or imprisonment of not more than six years, or both.

National Pollutant Discharge Elimination System

The other key component of the statutory and regulatory requirements to prevent water pollution is the implementation of the National Pollution Discharge Elimination System (hereafter "NPDES") permit program for the State. The NPDES is the federal program for issuing, monitoring, and enforcing pretreatment requirements pursuant to the Clean Water Act, as amended.³ The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into the waters of the United States. These sources may include private industrial, municipal, federal, and other facilities (including open ocean fish farms, discussed below). Included in these facilities are municipal wastewater treatment facilities that discharge treated effluent into marine waters. The NPDES permit imposes conditions upon the discharge of pollutants by permittees. The United States Environmental Protection Agency (EPA) delegated the permit processing duty to the Department of Health that operates the program through the Engineering Section of its Clean Water Branch.

On November 7, 2004, the Department of Health amended chapter 11-55, HAR, relating to the issuing, reissuing, modifying, monitoring, and enforcing of NPDES permits for the State. The latest amendments are viewed as generally strengthening the environmental provisions of chapter 11-55. The State's general policy of water pollution control as set forth in section 11-55-02 contains a strong emphasis on conservation and environmental protection. The section reads in part as follows:

§11-55-02 General policy of water pollution control. (a) It is the public policy of this State:

- (1) To conserve state waters;
- (2) To protect, maintain, and improve the quality of state waters:
 - (A) For drinking water supply, and food processing;
 - (B) For the growth, support, and propagation of shellfish, fish, and other desirable species of marine and aquatic life;
 - (C) For oceanographic research;
 - (D) For the conservation of coral reefs and wilderness areas; and
 - (E) For domestic, agricultural, industrial, and other legitimate uses;
- (3) To provide that no waste be discharged into any state waters without first being given the degree of treatment necessary to protect the legitimate beneficial uses of the waters;
- (4) To provide for the prevention, abatement, and control of new and existing water pollution; and

- (5) To cooperate with the federal government in carrying out the objectives listed in paragraphs (1) through (4).

State and County Water Monitoring Programs

There are several agencies in the State that have oversight of or are operating water monitoring programs. In addition, the various counties, the federal government, and private parties operate water monitoring programs. However, by far, the most extensive water monitoring program is that operated by the Clean Water Branch, Environmental Management Division, Department of Health (hereafter "CWB").⁴ Generally speaking, the Monitoring Section of CWB is charged with identifying sources of water pollution in marine and inland waters of the State through monitoring programs, surveillance, and investigating complaints.

As part of its monitoring responsibilities in marine waters, CWB takes weekly water samples at high recreationally impacted public beaches under a program funded by the federal government under the Beaches Environmental Assessment and Coastal Health Act of 2000.⁵ The CWB water monitoring program is in its third year of operation and currently receives \$250,000 annually from the federal government.

CWB has determined that there are 376 coastal beaches in the State. Due to the infeasibility of monitoring all the beaches in the State, all beaches were ranked on a risk based evaluation. Based on the evaluation, CWB has established a core and five-year rotation program to monitor priority beaches. Beaches on the islands of Oahu, Kauai, Maui, and Hawaii are included in the core and five-year program. Due to logistical reasons, Lanai and Molokai are not included in the program. Also, due to the presence of unexploded ordnance on its shoreline and in its near shore waters, Kahoolawe is not being monitored at this time.

On Oahu, there are ten core beaches that are monitored weekly. For each of the next five years, an additional seven different beaches will also be monitored weekly, resulting in a total of 17 beaches being monitored weekly every year. Similarly, on Maui, there are seven core beaches that are monitored weekly, with an additional four rotational beaches added every year for the next five years, for a total of 14 beaches being monitored weekly each year.⁶

The primary factors in ranking beaches are two-fold: All waters with very high or high frequency of primary recreational use and waters known to be polluted or impaired based on federal clean water standards. The risk based evaluation results in a listing of all beaches in the State into 11 tiers or sub-tiers.⁷

In accordance with the guidelines established by the EPA, the CWB analyzes weekly water samples for the presence primarily of, *Enterococcus* and, secondarily, *Clostridium perfringens* to determine the potential hazards associated with waterborne pathogens and contaminants found in the marine waters. (Both *Enterococcus* and *Clostridium perfringens* are pathogenic water borne bacteria used as a measure to

determine whether a water body is polluted.) In addition to the presence of the two pathogens, the samples include data as to the time the sample was taken, salinity, turbidity, and narrative remarks by the sampler noting anything out of the ordinary. The additional data may in certain cases explain the presence of one or both pathogens in densities above certain standard levels.

If the presence of *Enterococcus* exceeds certain levels set forth in the State of Hawaii Water Quality Standards,⁸ in five successive samples over 30 days, the beach is put on a "Watch" status declaring the beach on an alert or monitor status. If the *Enterococcus* densities exceed certain higher density levels, the beach may be put on a "Warning" status that will trigger a beach survey, including interviews with beach users and life guards, and an investigation of potential pollution sources. The exceeding of additional higher levels of *Enterococcus* could trigger an "Alert" status that will result in a beach closure until levels return to safer densities. Public notices and posted signs will keep the public aware of such beach conditions and when they return to normal status.

In addition to beach monitoring, CWB also monitors certain enbayments that are subject to high potential for pollution. These enbayments include Honolulu Harbor, Hilo Harbor, Kahului Harbor, Kaneohe Bay, and Pokai Bay. This monitoring is done quarterly.

CWB does further monitoring, surveillance, and investigating on a case-by-case basis, based upon complaints or in other circumstances when public interest requires. The beach monitoring program will continue to be modified as beaches are further ranked and CWB has expressed interest in expanding the regular beach monitoring program subject to funding and further staffing.⁹

All the data collected are analyzed by the microbiological laboratory in the DOH. All beach monitoring data are sent to EPA and are also available to the public online.

In addition to the DOH water monitoring programs and in accordance with its NPDES permits for its four wastewater facilities with ocean outfalls, the City and County of Honolulu monitors 23 beaches in proximity to its four ocean outfalls serving wastewater treatment plants at Sand Island, Honouliuli, Kailua, and Waianae. The military facility at Fort Kam and the private wastewater plant in East Honolulu are also required to operate water monitoring programs. Additionally, the County of Hawaii is also subject to water monitoring requirements at three of its effluent ocean outfalls. NPDES permits for these facilities require periodic water monitoring and reporting to CWB, which reports are also forwarded to the EPA. (The Counties of Maui and Kauai do not have ocean outfalls.)¹⁰

Finally, the University of Hawaii conducts random deep ocean water monitoring in waters in excess of sixty feet. The program is funded by the DOH with funds from the EPA. The University has its samples reviewed by a private laboratory for the presence of heavy metals and pesticides. The DOH laboratory also reviews these samples for the presence of bacteriological pathogens.

Other Water Monitoring Requirements

In several Land Use Commission (hereafter "LUC") land reclassification dockets, the LUC has imposed a condition relating to a water monitoring requirement due to the location of the land in question, certain other factors relating to surrounding lands, or at the request of a party to the proceedings.

In a Haseko (Hawaii) Inc., Docket No. A89-645, the petitioner was requesting the reclassification of 125 acres for a residential subdivision in north Kona. This residential project was to be serviced with a private wastewater treatment facility utilizing a leach field for the disposal of effluent. The project was on the east or mauka side of Queen Kaahumanu Highway and approximately a mile from the shore where the Natural Energy Laboratory of Hawaii Authority (hereafter "NELHA") facility is located. The predecessors of the NELHA, the Natural Energy Laboratory of Hawaii (hereafter "NELH") and the Hawaii Ocean Science and Technology (hereafter "HOST") Park, stated that their tenants were attracted to their facility due to the availability of nutrient rich, practically pathogen free ocean water. The concern was that the leached effluent might eventually find its way to the ocean and negatively impact the ocean water source utilized at the facility. In response to that concern the LUC added the following condition to the Findings of Fact, Conclusions of Law, Decision and Order in this docket:

Petitioner shall pay for its pro rata share for a baseline study and monitoring program regarding the impacts of the proposed development upon the nearshore waters as may be required by NELH and HOST Park. A schedule for the implementation of Petitioner's participation including the total costs to be paid by Petitioner shall be provided to the Petitioner by NELH and HOST Park with a reasonable period of time after the effective date of this Decision and Order.¹¹

(Of note, presently one of the lessees at NELHA is bottling 200,000 one and a half liter bottles of water daily for shipment and sale in Japan. The water is sold for \$4 to \$6 a bottle. The water is deep ocean water collected by NELHA at a depth of 2,000 feet off the coast of Kona and supplied to the private bottling company that desalinates and bottles the water. The State collects royalties and rent for the bottling plant at NELHA from the private company. There are now four other private companies hoping to join the existing company at NELHA.)

On the island of Maui, for over a decade the Makena Resort on the southwest coast of Maui has undertaken a voluntary water monitoring program to determine whether chemicals, such as herbicides, pesticides, and fertilizers being applied to its golf courses, were finding their way to the ocean through surface runoff or leaching. This program was in response to public concerns regarding periodic algae blooms occurring along the western coast of Maui. Four stations are established offshore, and quarterly samples are taken at various distances from the shore and at varying depths in the water column. The collected samples are analyzed by a Mainland laboratory and are submitted to DOH upon receipt. While there are no limits imposed other than those contained in

chapter 11-54, HAR, to date, no undue amount of chemicals applied on the golf courses is finding its way to the ocean.

In LUC Docket No. A97-721 Findings of Fact, Conclusions of Law, and Decision and Order, dated February 19, 1998, for the reclassification of additional resort lands at the Makena Resort from the Agricultural District to the Urban District, the LUC added the following condition, thereby making the voluntary monitoring program a mandatory requirement:

Petitioner shall initiate and fund a nearshore water quality monitoring program. The monitoring program shall be approved by the State Department of Health in consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Services, and the State Division of Aquatic Resources, DLNR. Petitioner shall coordinate this consultative process with the concurrence of the State Department of Health. Mitigation measures shall be implemented by Petitioner if the results of the monitoring program warrant them. Mitigation measures shall be approved by the State Department of Health in consultation with the above mentioned agencies.¹²

Also, in LUC Docket No. A93-696, Kukuiula Development Company (Hawaii), LLC, Findings of Fact, Conclusions of Law, Decision and Order, dated August 8, 2003, for the reclassification of 783.676 acres of land near the shore in Kukuiula, Kauai, for the development of a mixed golf course, residential, and resort project, the LUC added the following condition, similar to the Makena Resort:

Petitioner shall initiate and fund a nearshore water quality monitoring program. The monitoring program shall be approved by the State Department of Health in consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the State Division of Aquatic Resources, Department of Land and Natural Resources. Mitigation measures shall be implemented by the Petitioner if the results of the monitoring program warrant them. Mitigation measures shall be approved by the DOH in consultation with the above mentioned agencies, and the County Public Works Department. Petitioner shall coordinate this consultation process with the concurrence of the DOH.¹³

In both the Makena Resort and the Kukuiula Resort Decision and Orders, the principal agency to oversee the monitoring program is DOH.

Endnotes

1. Hawaii Administrative Rules, §11-54-2.
2. Hawaii Administrative Rules, §11-54-7.
3. 33 U.S.C. §1251 *et seq.*

WATER POLLUTION CONTROLS AND MONITORING PROGRAMS

4. The program mission of CWB is "to protect the public health of residents and tourists who recreate in and on Hawaii's coastal and inland water resources, and to also protect and restore inland and coastal waters for marine life and wildlife. The mission is to be accomplished through statewide coastal water surveillance and watershed-based environmental management through a combination of permit issuance, monitoring, enforcement, sponsorship of polluted runoff control projects, and public education." Source: <http://www.hawaii.gov/health/environmental/water/cleanwater>.
5. Pub. L. No. 106-284, 114 Stat. 870 (2000).
6. The list of core and rotational beaches being monitored can be found in Hawaii Department of Health Grant for the Development of Coastal Recreational Water Quality Monitoring and Public Notification Programs for Hawaii's Beaches, p. 2 through 6, attached hereto as Appendix C.
7. Specific criteria for ranking beaches in tiers can be found in Appendix C, p 6 and 7.
8. Chapter 11-54, Hawaii Administrative Rules (Department of Health).
9. In a meeting with CWB on November 15, 2004, CWB indicated that, with recent increases in staff, it now monitors 22 beaches on Oahu twice a week. Further, the yearly rotation schedule is now a six month rotation schedule.
10. A list of these other agencies and the frequency of their reporting can be found in Appendix C, Attachment B.
11. Land Use Commission, State of Hawaii, Docket No. A89-645, p. 31.
12. Land Use Commission, State of Hawaii, Docket No. A97-721, p. 33.
13. Land Use Commission, State of Hawaii, Docket No. A93-696, p. 91.

Chapter 3

MARICULTURE OR FISH FARMS

Introduction

Act 91, Session Laws of Hawaii 1986, as subsequently amended by Act 176, Session Laws of Hawaii 1999, and Act 203, Session Laws of Hawaii 2002, and codified as Chapter 190D, Hawaii Revised Statutes, is entitled the Hawaii Ocean and Submerged Lands Leasing Act. The purpose of this Act was to establish procedures for the leasing of state marine waters for the development of ocean resources.¹

Persons desiring to lease state marine waters are required to submit to the Board of Land and Natural Resources (hereafter "BLNR") a Conservation District Use Application (hereafter "CDUA") for specific activities in any specific area or areas. Section 190D-11 sets out the requirements for a CDUA and specifically requires the BLNR to consider the following in its evaluation of a CDUA:

- (1) The extent to which the proposed activity may have a significant adverse effect upon any existing private industry or public activity, including the use of state marine waters for the purposes of navigation, fishing, and public recreation;
- (2) Whether the proposed activity may have an adverse or permanent effect upon the *wildlife, aquatic life, or environment* of the surrounding area; and
- (3) Other potential uses of the area, including competing uses, which may be in the public interest.² (Emphasis added)

The statute provides that the board may not approve a CDUA unless it finds that:

- (1) The applicant has the capacity to carry out the entire project; and
- (2) The proposed project is clearly in the public interest upon consideration of the overall economic, social, and *environmental* impacts.³ (Emphasis added)

Furthermore, the BLNR "may impose conditions so that the proposed use or extent of the area in which the proposed activity may take place is no greater than is required to conduct the approved activity properly."⁴

Presently, there are three approved CDUA proposing the leasing of state marine waters. The first approval was obtained by Cates International, Inc. on January 26, 2001, for the development and operation of an open ocean fish farm to commercially raise Pacific Threadfin, a native species known locally as *moi*. The second CDUA was approved on May 11, 2001, permitting Black Pearls, Inc. to develop and operate an oyster farm, again utilizing a native species Hawaiian Black-lipped Pearl oyster, for the commercial production of pearls. The third CDUA was approved on August 8, 2003,

permitting Kona Blue Water Farms to develop and operate a commercial open ocean fish farm to commercially raise native species of fin fish, initially Amberjack, Jack Trevally, and Dorado or Dolphinfish, known locally as *kahala*, *ulua*, and *mahimahi*.

A CDUA by Ahi Farms for the development and operation of an open ocean fish farm raising *ahi* off the Waianae coast of Oahu was found to be incomplete by DLNR and returned on December 16, 2003.

So far, of the three approved CDUA's, only Cates has obtained a mariculture lease and has established and is operating its commercial fish farm.

Cates International, Inc.

Cates International, Inc. (hereafter "Cates") received the approval of its CDUA for the development and operation of a state marine waters fish farm approximately two miles offshore of Honouliuli, Ewa, Oahu.⁵ The leased area is a rectangular area comprising of twenty-six acres on a gently sloping sandy bottom with a depth at its center of approximately 150 feet. With the exception of discarded scrap metal that attracted small marine communities and ornamental fish and a nearby small patch of eel beds, no other species of marine animals or plants were observed in the "benthic" or bottom of the ocean area at the site. The nearest coral reef is approximately a quarter of a mile shoreward.

The approved CDUA permits the installation of two cages, with the possible addition of two additional cages, following environmental review and approval by the Chairperson of DLNR. The cages are bi-conical in shape, with a frame of steel tubing covered with a tight synthetic mesh netting material. The cages are anchored to the bottom with a central cement block weight and a series of danforth type anchors. Each cage is submerged 40 feet below mean sea level and is 80 feet wide and 60 feet tall, resulting in an internal volume of 92,000 cubic feet. Entry of personnel is by zippered openings in the mesh.

The juvenile fish are provided by a hatchery operated by Oceanic Institute and are inserted into the cage at a length of about three inches. They are raised and harvested in a six-month cycle with daily feeding. At harvest, each fish will weigh approximately one pound. The maximum capacity of a single cage is roughly 150,000 pounds per harvest period, with an initial target for production at 75,000 pounds per cage per harvest period.

Of the 26 conditions to the approval letter of the CDUA, (Appendix D), the following are pertinent to this study:

4. The applicant shall comply with all applicable Department of Health administrative rules (including those in chapter 11-54 and 11-55 of the Hawaii Administrative Rules);⁶
15. The applicant shall forward details of all monitoring efforts to the DLNR and water quality results to the Department of Health two weeks after

- receipt of results. The department shall be immediately notified of the failure of the mooring system, a disease outbreak, theft or vandalism; and
16. The applicant, at their (sic) own expense, shall develop and conduct a water quality, benthic and coral reef monitoring protocol acceptable to the Chairperson (of the Board of Land and Natural Resources). Such environmental monitoring shall continue indefinitely as specified by the Chairperson unless authorization for its suspension or reinstatement is specified by the Chairperson;

Based upon the approved CDUA, the BLNR entered into General Lease No. S-5654, between the State of Hawaii and Cates, dated August 23, 2002, for a mariculture lease of 28.077 acres in the offshore waters of Puuloa, Ewa, Oahu, Hawaii. The term of the lease is twenty years, commencing on March 9, 2001, and terminating on March 8, 2021. Annual lease rent for the first ten years is set at \$1,400 or one percent of the gross revenue. The annual lease rent is to be reopened and redetermined on March 9, 2011. The lessee is subject to all the conditions contained in the approved CDUA.⁷

In addition and complementary to the DLNR CDUA conditions, Cates was also subject to the provisions of the Clean Water Act, as amended,⁸ Chapter 342D, Hawaii Revised Statutes, and Chapters 11-54 and 11-55, Hawaii Administrative Rules. Included in the Clean Water Act is the federally mandated National Pollutant Discharge Elimination System (hereafter "NPDES") permit program. The objective of the NPDES program is the control of point sources of pollution that can pollute the waters of the United States. Point sources can be private or public industrial, municipal, or commercial facilities. The NPDES program for the State of Hawaii is administered by the DOH.

The requirements of the NPDES program resulted in the issuance of NPDES permit No. HI 0021792 to Cates by the DOH on July 26, 2001.⁹ It appears that, at the time the Cates facility received its NPDES permit, it was deemed to be a concentrated animal feeding operation, a point source that required an NPDES permit.¹⁰

The Cates NPDES permit authorizes Cates "to discharge fish excrement, ammonia excretions, unconsumed fish food, and medications approved or authorized for investigational use by the Federal Drug Administration (FDA) under the Investigational New Animal Drug Program, associated with its concentrated aquatic animal production facility ... in accordance with the effluent limitations, monitoring requirements and other conditions set forth herein, and in the attached Department of Health 'Standard NPDES Permit Conditions,' dated May 3, 1999."¹¹ The permit was effective thirty days after the date of issuance and will expire on July 26, 2006.

The monitoring protocol established for the Cate's fish farm, pursuant to conditions 4, 15, and 16 of the CDUA, consists of three separate requirements, two different types of monthly water sampling and analysis reports, and a quarterly bottom biological communities monitoring report. The first of the two water sampling requirements, referred to as a whole effluent toxicity and monitoring requirement, requires the taking of water samples down current from the cage with the highest biomass at the surface, mid-cage, and bottom of the receiving water. The surface sample shall not

be less than one meter nor more than five meters below the surface, and no farther than ten meters down current from the cage. The mid-cage sample shall be taken at mid-cage depth no farther than one meter down current from the cage. The bottom sample shall not be less than one meter nor more than five meters above the sea floor, and no farther than ten meters down current from the cage.

All water sampling at the Cates site are taken by a private consultant and sent to a laboratory on the Mainland for analysis. Results are turned over to DOH upon receipt from the laboratory. These water samples are analyzed for dissolved oxygen, temperature, salinity dissolved oxygen range, total phosphorus, ammonia nitrogen, nitrate+nitrite nitrogen, turbidity, and pH range. Total values for these chemicals or factors are to be reported with no limitations; however, there is a whole effluent toxicity limit discussed below.

To monitor for effluent toxicity, additional water samples are then used in an approved Environmental Protection Agency test exposing live species to the water samples to determine the level of any toxins present in the water to ensure that any toxins present are within the whole effluent toxicity limit. There must be an at least 80% survival of the species exposed to the water samples. While it was not certain what species of ocean animal is used in the Cates testing, DOH indicated that, in the case of the testing by the City at its wastewater treatment plant outfalls, the species of ocean animal used in those tests is a type of sea urchin. If the acute toxicity limit is exceeded in two consecutive tests, a pre-approved toxicity reduction evaluation (hereafter "TRE") work plan is implemented. The TRE work plan provides steps that the permittee intends to follow in investigating and evaluating the potential sources or causes of toxicity and a method of identifying the toxin if necessary. The TRE work plan must further set forth the actions the permittee will undertake to mitigate the discharge, correct the noncompliance, and prevent the recurrence of toxicity.

The second water sampling requirement, referred to as zone of mixing (hereafter "ZOM") limitations and monitoring requirements, requires the analysis of water samples for toxic and non-toxic materials. The ZOM for toxic materials is established solely for the assimilation of approved and authorized medications that may be applied to the cages for the prevention of the spread of diseases in the caged fish population. The ZOM for toxic materials includes the dimensions of the cage receiving the medications. Chemical toxins in concentrations identified as toxic to aquatic organisms are prohibited beyond this ZOM. Further, the DOH indicates that a test similar to the whole effluent toxicity test described above must be done with a water sampling taken no farther than one meter down current from the cage receiving the medication, at mid-cage level of the receiving water immediately after the medication diffuses outside of the cage. The requirement of at least 80% survival remains the same.

The ZOM for non-toxic materials is established to monitor the assimilation of fish excrement, ammonia excretions, and unconsumed fish food outside the cages. The ZOM for non-toxic materials shall include an elliptical area with the fish cages at its center. The major axis of the ellipse is established in an east-west direction and its vertices are

3,000 feet from the center of the ellipse. The points on the ellipse on its minor axis are 2,000 feet from its center. The ZOM extends from the surface to the ocean floor.

Water samples are taken at two control stations up current from the cages where the water quality is not affected by the cages and represents ambient conditions of the receiving water. Also samples are taken at four compliance stations down current from the cages at the periphery of the ZOM. In all cases, surface, mid-cage, and bottom samples are taken at the same depths as the earlier described water samples are taken. Samples at the compliance stations have limits set forth in the NPDES permit for total nitrogen, ammonia nitrogen, nitrate+nitrite nitrogen, total phosphorus, turbidity, and pH range. Exceeding the limits set forth in the NPDES permit is deemed a violation of the permit.

Additionally, there are other narrative limitations to the water monitoring protocol. Generally, any discharge from the cages cannot result in a visible oil sheen, foam or floating solids, contain materials in concentrations or combinations that are hazardous or toxic to aquatic life, or that would impair the existing or designated uses of the receiving waters. The discharge cannot result in undesirable or nuisance aquatic species, adversely affect aquatic life, or violate Chapter 11-54 or 11-55 Hawaii Administrative Rules.

Finally, in addition to the water monitoring, Cates must perform quarterly bottom biological community monitoring, including sediment and infauna analysis. Generally, this requirement is to determine what, if any, impacts the discharge from the cage activities is having on the existing bottom biological communities. This monitoring, at minimum, must include visual surveys using continuous video footage, documentation of diversity and distribution of the bottom biological community, identification of infauna organisms, and sediment analysis. (Cates informed the writer that this bottom biological community monitoring is presently done by a private consultant with the analysis being performed at the University of Hawaii. This work is presently done under a government grant and Cates is concerned with the cost of this monitoring requirement once the grant funds are exhausted.)

In addition to these monitoring requirements, the NPDES permit also sets forth best management practices that Cates must operate under with regard to fish operations, disease control, and spill controls of petroleum and other hazardous materials. Presently, the water monitoring results are sent to DOH and the quarterly bottom biological community monitoring data and video goes to the Office of Conservation and Coastal Lands. DOH has indicated that, while there may have been some instances of limit exceedances in water samplings, no violations of the NPDES permit has ever been issued to Cates.

Black Pearls, Inc.

Black Pearl, Inc. (hereafter "BPI") received an approval of its CDUA on May 11, 2001, for the development and operation of a pearl oyster farm in state marine waters at the reef runway borrow pit adjacent to the Honolulu International Airport Reef Runway at Keehi Lagoon, Honolulu, Oahu.¹² The borrow pit is an area previously dredged to obtain fill for the construction of the reef runway. The proposal called for a 20-year lease of state marine waters for the development of an oyster farm growing the native Hawaiian black lipped pearl oyster on suspended net panels in a 75-acre farm area. The average depth in the area of the farm is approximately 40 feet. The facility will be submerged three to 15 feet below the surface and anchored to the ocean bottom while surface floats would lie on the surface. Two small farm structures of post and pier construction were proposed for operation and maintenance.

Upon full build-out, the farm will be stocked with 50,000 oysters, yielding approximately 20,000 pearls per year within five years. Since oysters are filter feeders that feed on material suspended in the water column, the farm's oysters, unlike a fish farm, will not be fed any supplemental feed, but will excrete a small amount of ammonia. However, BPI anticipates that the farm and oyster presence would improve water quality as oysters clean the surrounding waters. DOH has indicated that if BPI does not apply any feed to the oyster farm, a NPDES permit may not be required.

According to BPI, while the proposal would result in the loss of some public access, since the site has been historically highly disturbed when used as a borrow pit during the reef runway construction, the area is seldom utilized by the public. However, the DLNR noted that the site is within a designated thrill craft operating area and would require the removal of the farm area from the designated thrill craft operating area and the replacement of the 75 acres to the thrill craft operating area elsewhere.

Of the 25 conditions to the approval letter of the CDUA, (Appendix F), the following is pertinent to this study:

20. Monitoring and record keeping of resource use in the area shall be continuously conducted. At least every five years, the applicant shall obtain the services of independent parties to conduct monitoring of public use, oyster health, water quality, the benthic environment and oyster stocks in the farm area and its surroundings. Compiled reports and raw data of all monitoring efforts shall be submitted to the department upon each five year anniversary of this approval. Reports shall also be submitted for years one and three of the project.

At this time, although lease terms are generally agreed to, the DLNR Division of Boating and Ocean Recreation has not been successful in relocating the thrill craft operating area. Nor has an appraisal necessary to set the lease rent been completed. Once those steps have been completed, BPI will need to review and reestablish its financing plans due to substantial changes in the pearl market within the last five years. BPI anticipates that it is at least a year or more away from the commencement of the

installation of the facility. In the meantime, a commercial hatchery is established and research and development continues.

Kona Blue Water Farms

Kona Blue Water Farms, a division of Black Pearls, Inc., (hereafter "KBWF") received an approval of its CDUA for the development and operation of a state marine waters fish farm approximately 2,600 feet offshore of Ulualoha Point near the Natural Energy Laboratory of Hawaii Authority (NELHA) and Kona-Keauhou International Airport at Kona, island of Hawaii.¹³ The area of use is a rectangular area consisting of 90 acres to eventually contain up to six submerged fish cages. The gently sloping bottom at an approximate depth of 200-220 feet comprises of a bare substrata with medium to coarse sand.

The approved CDUA permits six submerged cages at least 20 feet below the ocean surface and two surface cages not to exceed 45 feet in diameter that KBWF intends to use for hatchery and harvesting purposes. Initially KBWF intends to start with two cages. (Unlike the Cates CDUA, no further approval by the Chairperson of DLNR is required for the installation of the additional cages.) The initial species approved are *kahala*, *uluu*, and *mahimahi*. The fish will be provided from a commercial hatchery KBWF operates at NELHA. The addition of other species requires the approval of the Chairperson of DLNR.

The cages to be utilized are bi-conal with a diameter of 80 feet and a height of 60 feet, resulting with an internal capacity of approximately 90,000 cubic feet. They will be situated between 20 to 30 feet beneath the ocean surface and secured to the ocean bottom with concrete blocks and anchors. At optimum commercial operation, the farm will produce approximately 790,000 pounds of fish a year, with a standing stock at any time of 180,000 pounds.

Of the 27 conditions to the approval of the CDUA, the three conditions pertinent to this study are the same verbatim conditions contained in the pioneer Cates approved CDUA set forth above on page 15 and 16.

At this time, the terms of the lease with DLNR have been generally agreed to and the parties are awaiting an appraisal to determine the lease rent. Once the lease is executed, KBWF intends to install its first two cages in three to four months, to be followed by two more cages about six months later. The first species to be raised will be *kahala* for the local and Mainland markets. (KBWF states that due to parasitic worms and the potential for the presence of ciguatera in local wild *kahala*, there is little local demand for the fish; however, these two concerns are eliminated with hatchery-produced fingerlings and commercial feed and could result in more demand for *kahala*, which KBWF views as a positive benefit of open ocean fish farms.)

A final environmental assessment prepared by KBWF finds that, due to the depth at the facility, strong currents in the area, and a bare substrata lacking in any large marine species, the farm will result in little detriment to water quality or benthic ecosystems. Finally, the NPDES for KBWF is still being discussed with DOH, and KBWF expects that its requirements will be very similar to the Cates NPDES.

Ahi Farms

Ahi Farms submitted a CDUA for the development of an open ocean fish farm at two noncontiguous areas off of Maili Point and Kepuhi Point (between Makaha and Makua) on the leeward coast of Oahu. The proposal requested a state marine waters lease for two areas, each comprising of 90 acres, to contain nine fish cages each for the raising of yellow fin or big eye tuna. Rather than using hatchery stock, the proposal called for the capture of juvenile fish in the western Pacific and transferring the juvenile fish to the fish cages to be fed until commercially ready for harvest when the fish reached approximately 100 pounds each.

The cages would be placed approximately one mile offshore at approximately a depth of 100 feet. This facility would comprise of surface pens, 28 meters in diameter and 23 meters in height, and not submerged cages.

On December 16, 2003, DLNR returned the CDUA, noting "the CDUA and accompanying Environmental Assessment at this time does not adequately identify the primary, secondary, and the cumulative as well as the short-term and long-term effects of the proposed project."¹⁴

Discussion

The first step in the development and operation of an open ocean fish farm is obtaining the approval of a CDUA. An application must be prepared and filed with the Board of Land and Natural Resources (hereafter "BLNR") in accordance with section 190D-11, Hawaii Revised Statutes. The CDUA will be referred to the Office of Conservation and Coastal Lands (hereafter "OCCL") in the office of the Chairperson. OCCL will circulate copies of the CDUA to a number of agencies for comment. A typical CDUA for a fish farm off shore of Oahu would be sent to, at minimum, the following agencies: DLNR Division of Aquatic Resources (hereafter "DLNR/DAR");¹⁵ DLNR Division of Boating and Ocean Recreation, DLNR Land Division; DLNR Division on Historic Preservation; DLNR Division on Conservation and Resources Enforcement; Office of Hawaiian Affairs; DOH Clean Water Branch; Department of Transportation Division of Harbors; Department of Agriculture Aquaculture Development Program; City and County of Honolulu Department of Planning and Permitting; National Marine Fisheries Service; Department of the Army Corps of Engineers; Department of the Interior Fish and Wildlife Service; United States Coast Guard; Environmental Protection Agency; and any interested community groups.

Upon receipt and review of submitted comments and its own analysis of the CDUA, OCCL will submit a report with recommendations to the BLNR. Pursuant to the provisions of section 190D-11, Hawaii Revised Statutes, the BLNR may approve or deny the CDUA. If approved, the approved CDUA will contain conditions, including, but not limited to, the commencement of development, limits of operations (acreage, size of facility, number and types of cages, type of species to be raised, *et cetera*), and water sampling and benthic biological monitoring requirements. The applicant must then negotiate a mariculture lease with DLNR Land Division pursuant to section 190D-21, Hawaii Revised Statutes, prior to commencement of development and operation.

Case Study: Cates Fish Farm

As Cates Fish Farm is, thus far, the only operating open ocean fish farm, it serves as a case study to examine the water quality monitoring program in place and its level of emphasis on environmental protection.

In September 2000, DLNR was reviewing a completed CDUA for the Cates operation. The application was heard by the BLNR at a regular scheduled meeting on January 26, 2001, and approved on that day with conditions.

As a practical matter, once the Cates CDUA was approved with conditions, OCCL permitted DOH, with its water quality expertise and the combined myriad of rules of the DOH and the Environmental Protection Agency, to implement condition 16 through DOH's NPDES permit process. The protocol referred to in condition 16 to be approved by the Chairperson, relating to water quality sampling was established and determined by DOH, although DOH believes that the bottom biological community monitoring portion of the NPDES permit, discussed on page 18 of this chapter, came from DLNR. Presently, Cates submits the monthly water sampling reports described above that it receives from a Mainland laboratory to DOH for review. A quarterly benthic biological report, comprising of a continuous running video inspection of the areas directly under the cages is submitted to OCCL. OCCL in turn makes the video available to DLNR/DAR.

In addition to the video monitoring, the University of Hawaii was engaged in monitoring of sediment infauna beneath and in vicinity to the Cates cages. The University submitted a report of its monitoring sometime prior to June 2003 that indicated a possible phase shift beneath the cages. Apparently, this information combined with a monitoring video submitted by Cates that showed the presence of a cyanobacterial mat under the cages was sufficient to raise some concerns within DLNR/DAR. ("A phase (or habitat) shift occurs when a species of organism displaces many, if not most, of the other species found within a habitat; the resulting shift can cause a cascade effect through an ecosystem as predator-prey, competitor, and symbiont species normally found within a habitat are all effected by the preliminary loss of species presence."¹⁶)

Thereafter, state marine biologists with DLNR/DAR dove to the cages for close up inspections on July 3, 2003, and October 9, 2003, followed by a report of their findings contained in a memorandum to Ms. Deidre S. Mamiya, Acting Administrator, OCCL, dated March 2, 2004. This DLNR/DAR report indicated the absence of the cyanobacterial mat and suggested that the prior presence of the cyanobacterial mat may have resulted from a seasonal accumulation or that its absence may have resulted from a subsequent dispersal by currents. The primary concern expressed in the memorandum, however, related to accumulated biomass growing on the cages, particularly an alien species of soft coral referred to as a Snowflake coral. Although the state biologists did not have the capacity, at the time of their dives, to verify the possible phase shift noted in the earlier University of Hawaii report, that report, coupled with the earlier presence of the cyanobacterial mat and the presence of the alien biomass growing on the cages, raised the concern on the part of some that more monitoring may be appropriate for early detection of benthic habitat changes and the effects that it may have on an adjacent nearshore reef, approximately a quarter mile shoreward of the cages.

In a cover memorandum from DLNR/DAR to OCCL, dated March 4, 2004, DLNR/DAR stated "it is the position of the Division that based on what has been accomplished to date, there is insufficient evidence provided to support the conclusion that excess nutrients produced as a result of Cate's cage culture operations are having substantive negative impacts." Nevertheless, the memorandum goes on to state: "We also feel that further in-depth monitoring and research should be conducted independent of the permittee to assure unbiased evaluations of observed changes and projections of potential future impacts." However, the memorandum concedes that "[b]ecause associated questions are in the realm of basic research and are more applicable to future decision-making, the permittee should not be expected to cover associated costs."

In response to these memoranda, on or about March 16, 2004, OCCL conducted a meeting with the principals of Cates and a representative from the Department of Agriculture, Aquaculture Development Program. The various concerns raised by DLNR/DAR were discussed. In another memorandum dated March 16, 2004, OCCL noted "the concerns were minor in scope. The OCCL further notes a meeting will take place in several months, and names will be submitted to the OCCL to form a working group of stakeholders to address monitoring issues."¹⁷

In a separate study still underway in September 2004, sediment taken from three locations beneath the cages and three controlled locations approximately 300 yards up current from the cages were compared to determine whether there was any shift in micro-fauna beneath the cages. The DNA was extracted from micro-bacteria taken from the sediment and compared. This study found no significant shift or difference in the micro-fauna found beneath the cages from that found at the controlled sites. It is noted that this was a one-time sampling and that more numerous samplings, especially taken shortly after the cages are cleaned of biomass growing on the cages and over a period of time may be more significant.¹⁸

Based on various discussions with OCCL, DLNR/DAR, and Cates, and without attributing these comments to any specific office or person, it would appear at this time that the regulatory community, while recognizing the cost implications, continues to support further benthic biological monitoring. While all persons contacted are proponents of open ocean fish farms, there appears to be a basic philosophical difference being expressed here. On the one hand, some people want to avoid any artificial nutrient loading on the ocean bottom beneath the cages, whether it be excess food, fish excrement, or falling biomass growing on the cages. Their position is that any potential resultant phase change or shift is undesirable, as it may extend to impact the nearby reef. On the other hand, the industry questions whether *any* change in the benthic below the cages is necessarily bad. Since the bottom where the cages are now located was very barren of macro benthic fauna or infauna species, it may be posited that any changes brought on by the presence of the cages may be viewed as positive. It is uncertain, though who is in a position to make that determination.

At any rate, the concerns being expressed by the industry, primarily Cates, basically concern safety and cost. The DLNR/DAR biologists admitted that they did not have the capacity to confirm the University of Hawaii sediment infauna study results. It should be noted that the Cates facility is at a depth of 150 feet. The next facility coming online, the KBWF facility, will be at a depth of 200 to 220 feet. The depth at which these facilities are located is positive in that they permit the facilities to be situated further offshore and away from nearshore reefs. Further, the depths provide for more opportunity for dispersal of any excess nutrients (food, excrement, or biomass growing on the cages), thereby limiting excess nutrients from reaching the ocean bottom in any concentration. However, the deeper the facilities, the greater the safety concerns for divers conducting any monitoring. This safety factor in turn raises the costs of benthic biological monitoring at these depths.

Cates notes that much of the benthic biological monitoring to date, other than the quarterly video monitoring, is being done by third parties utilizing government grants or other public funding. For Cates or any other permittee to carry this ongoing cost may be economically infeasible or, as pointed out by DLNR/DAR, an unfair imposition on the permittee. (It should be pointed out that the study that DLNR/DAR relies heavily upon regarding the possible phase change beneath the cages was done by the University of Hawaii. The presently on-going study described previously,¹⁹ relating to the micro-bacteria in the sediment beneath the cages, was done by a private party under a grant from the National Sea Grant Colleges Program that is administered by the National Oceanic and Atmospheric Administration.)

At this time, Cates remains the only open ocean fish farm in the State, supplying fresh *moi* to wholesalers and some direct hotel and restaurant customers. Satisfaction with the product remains high and demand continues to grow.²⁰

Endnotes

1. Act 176 made several substantive amendments to Act 91. The main ones added commercial purposes in the definition of "mariculture" and permitted the Department of Land and Natural Resources to issue state marine water leases without the prior approval of the Legislature. In addition, after this measure was heard by the Senate Committee on Water, Land, and Agriculture, a sunset provision was added to the effective date of this measure deleting all its provisions in five years. There is no reference to this sunset provision in written testimony submitted to the committee, nor any reason stated in the committee report for this sunset provision. (See Senate Standing Committee Report No. 133, Regular Session of 1999.) At any rate, Act 203 amended Act 176 by deleting the sunset provision, thereby leaving the other amendments made by Act 176 in place in Chapter 190D.
2. Hawaii Revised Statutes, §190D-11(d).
3. Hawaii Revised Statutes, §190D-11(e).
4. Hawaii Revised Statutes, §190D-11(f).
5. The approval letter from DLNR Land Division for the Cates International, Inc. CDUA, dated January 30, 2001, is attached as Appendix D.
6. *See* discussion in Chapter 2.
7. According to the Land Division of DLNR, the one per cent of gross revenues provision has kicked in and DLNR has received annual lease rents of \$4,486.75 in 2002 and \$11,356.19 in 2003. Further, pursuant to section 190D-33, Hawaii Revised Statutes, eighty per cent of those proceeds have been deposited in the Special Land and Development Fund, established by section 171-19, Hawaii Revised Statutes, to be used for planning, research, and development of the aquaculture industry and twenty per cent have been deposited with the Office of Hawaiian Affairs, pursuant to Chapter 10, Hawaii Revised Statutes.
8. 33 U.S.C. §1251 *et seq.*
9. The NPDES Permit issued to Cates International, Inc., dated July 26, 2001, is attached as Appendix E.
10. On June 30, 2004, the Environmental Protection Agency adopted a final rule to establish pollution controls for concentrated aquatic animal production facilities, otherwise known as fish farms. In anticipation of this new rule, it appears that DOH, in reviewing and establishing the protocol for the monitoring program for the Cates NPDES permit, may have taken into consideration the contents of the proposed rule then under consideration.
11. *See* Appendix E, p. 1.
12. The approval letter from DLNR Land Division for the Black Pearl, Inc. CDUA, dated May 18, 2001, is attached as Appendix F.
13. The approval letter from DLNR Land Division for the Kona Blue Water Farms CDUA, dated August 19, 2003, is attached as Appendix G.
14. *See* letter to Grant Kidani from OCCL, dated December 15, 2003, attached as Appendix H.
15. For purposes of this study, the most pertinent agency comments to the CDUA will probably be those of DLNR/DAR and DOH. The approval letter from DLNR Land Division for the Kona Blue Water

Farms CDUA, dated August 19, 2003, is attached as Appendix G. The language contained in condition 16 of the Cates approved CDUA (See p. 16) was probably proposed by DLNR/DAR, although OCCL had the final pass at the language in the condition prior to its submittal to the BLNR. At any rate, OCCL, apparently being comfortable with that language, repeated it in the KBWF approved CDUA.

16. Appendix I (see note 17, below), Memorandum from DLNR/DAR to OCCL, dated March 2, 2004, p. 1.
17. The memoranda from DLNR/DAR to OCCL, dated March 2, 2004 and March 4, 2004, a letter to Cates, dated March 9, 2004, and the internal OCCL memorandum, dated March 19, 2004, are collectively attached as Appendix I.
18. Telephone interview with the researcher, Mr. Brandon Yosa, on September 28, 2004. Mr. Yosa indicated that his final written report has not been completed.
19. *See* note 18 above.
20. One satisfied wholesale customer, Tropic Fish & Vegetable Center, Inc., had the *moi* tested at a Mainland laboratory for the presence of any pesticide or herbicide chemical residue. The test for the presence of twenty-five different types of chemicals, including notably two types of DDT and two types of Heptachlor, found no detected levels of the twenty-five chemicals present. (See Letter from Food Products Laboratory, Inc., dated July 23, 2004, attached hereto as Appendix J.)

Chapter 4

CRUISE SHIP INDUSTRY

Introduction

Over the recent years, the State of Hawaii has seen an increase in cruise ship landings in the State. While neither the Department of Business, Economic Development, and Tourism or the Department of Transportation has projections on the future growth of the industry in the State, it is clear that the number of landings will be increasing, if for no other reason than the introduction in the State of the Norwegian Cruise Lines (now known locally as PCL America), Pride of Aloha, providing seven day cruises from Honolulu to Kona and Hilo, with overnight stays on Kauai and Maui, and the planned introduction of two additional cruise ships, all to be dedicated exclusively to interisland cruises.

Presently, the Department of Transportation Harbors Division (hereafter "DOTHD") has a schedule of planned cruise ship arrivals at the various harbors that it posts on its web site.¹ DOTHD has stated that most cruise ship companies will not make reservations for ship berthings more than one year in advance due to the uncertainty in the industry and, accordingly, does not have projections beyond one year at any given time. According to the schedule, DOTHD anticipates 136 cruise ship statewide dockings in the calendar year 2004, 50 of which will be by Pride of Aloha on its interisland cruises.

Based on past cruise line traffic, DOTHD has recently spent \$1,000,000 on improvements to Kahului Harbor, enclosing an area at the pier for a cruise passenger terminal, along with extending the pier to accommodate the presence of a cruise ship and a cargo barge operation simultaneously. Similar planned harbor expansion projects are being considered for Hilo Harbor and Nawiliwili Harbor. In Honolulu Harbor, the principal berths for cruise ships are presently at piers 10 and 11, with pier 2 and piers 19 and 20 as backup. DOTHD is moving ahead with plans for major improvements at pier 2, turning that pier into a dedicated cruise ship passenger terminal to be primarily utilized by PCL America operations.

PCL America

Pride of Aloha was built in 1999 and originally christened the Norwegian Sky, operating under a Bahamian flag. Pride of Aloha is 853 feet in length, containing twelve separate decks, and can carry a total of 2002 guests and 800 crew members. The other two ships that PCL America is planning to bring to Hawaii, Pride of Hawaii and Pride of America, are of comparable size and capacity.

Prior to last year, under the provisions of the federal maritime laws, cruise ships that were foreign built and operated under foreign flags and offered cruises among the Hawaiian Islands had to stop at a foreign port between landings in any United States ports, a restriction that greatly hampered Hawaii interisland cruises. Under an exemption to the law passed in Congress last

year, NCL America was permitted to reflag Norwegian Sky to operate under the United States flag, although it was foreign built, so long as it employed a United States crew and complied with United States labor laws. In order to enjoy this exemption, Pride of Aloha is restricted to Hawaiian waters and may not offer cruises to include stops at any Mainland ports.

The law is also extended to the two additional cruise ships that NCL America plans to bring to Hawaii, Pride of America in July 2005 and Pride of Hawaii in the summer of 2006. The addition of these three cruise ships alone, all dedicated exclusively to interisland cruises, will dramatically increase cruise ship activities in the State.²

Pollution Streams and Environmental Protection

It is this projected increase in cruise ship activities and the potential for the degradation of the environment that is a stated concern in House Concurrent Resolution No. 118, H.D. 1. Cruise ships are literally floating cities, some with as many as 5,000 passengers and crews, having the potential to daily generate 37,000 gallons of oily bilge water, 30,000 gallons of sewage or black water, 255,000 gallons of non-sewage waste water or gray water, fifteen gallons of toxic chemicals, seven tons of garbage and solid waste, and air pollution from diesel engines at a level equivalent to thousands of automobiles.³

Cruise ships have the potential to impact the marine environment through five separate waste streams, as recognized by the United States Coast Guard, the principal enforcer of environmental laws and regulations in the navigable waters of the United States: oil pollution, black water, gray water, hazardous waste, and non-hazardous waste.

Sources of oil pollution on ships are the oil water separator, transfer and sludge containment systems. Black water refers to the collection and disposal of human waste. Gray water refers to the discharges from galleys, sinks, washbasins, showers, and baths. Hazardous wastes may be the remains or residue from dry cleaning operations on board a ship, paint and thinners, and photo processing operations. Non-hazardous wastes include solid waste, such as plastics, metals, glass, food, cardboard, and certain medical waste.

Environmental Laws and Regulations

International

Laws and regulatory provisions for the prevention of pollution of the marine environment from operational or accidental causes include international convention and federal law and regulation.

In response to international concern over the pollution of the marine environment, initially in response to oil tanker spills, the 152 member nations of the United Nations International Maritime Organization (hereafter "IMO"), on October 2, 1983, ratified the International Convention for the Prevention of Pollution from Ships of 1973, as modified by the

Protocol of 1978 (hereafter "MARPOL").⁴ MARPOL includes regulations aimed at preventing and minimizing pollution from ships and includes six technical annexes.

- Annex I relates to prevention of pollution by oil;
- Annex II relates to control of pollution by noxious liquid substances;
- Annex III relates to prevention of pollution by harmful substances carried by sea in packaged form;
- Annex IV relates to prevention of pollution by sewage from ships;
- Annex V relates to prevention of pollution by garbage from ships; and
- Annex VI relates to prevention of air pollution from ships.

All signatory states must accept Annexes I and II, the remainder are voluntary. The enforcement of the provisions of MARPOL is by the party state within whose territorial jurisdiction a violation occurs and is punishable either under the law of that state or of the flag state. There have been numerous amendments to MARPOL. (For instance, Annex VI was adopted by amendment in September 1997, but does not enter into force until May 19, 2005.)

United States Laws

The United States Coast Guard, the Environmental Protection Agency, and the Department of Justice are the primary federal agencies with jurisdiction over cruise ships in United States waters. The Coast Guard has primary investigative and regulatory oversight of the cruise ship industry; the Environmental Protection Agency develops standards and regulations, in consultation with the Coast Guard, pertaining to marine pollution and vessel discharges; and the Department of Justice prosecutes violations of federal law and regulation.

The Act to Prevent Pollution from Ships incorporates several provisions of MARPOL into United States law.⁵ Pursuant to its provisions, the Secretary of Homeland Security, through the Coast Guard, enforces the protocols of the convention and the provisions of Annexes I, II, and V of MARPOL. The Act applies to United States flagged vessels anywhere in the world and all foreign – flagged vessels within the navigable waters of the United States or while in a port under the jurisdiction of the United States.

The other key federal law governing discharges of material into United States waters is the Clean Water Act.⁶ The Clean Water Act generally prohibits the discharge of any pollutants by any person within three nautical miles of the United States and of oil and hazardous substances within twelve nautical miles of the United States. As discussed in detail below, section 312 of the Act and the regulations promulgated thereto deal specifically with certified maritime sanitation devices for the treatment and discharge of black water.⁷ This Act applies to all United States vessels and all foreign – flagged vessels while they are in United States waters.

Another federal law that applies to the operations of cruise ships is the Resource Conservation and Recovery Act (hereafter "RCRA").⁸ Generally, the Act regulates the transporting and disposing of hazardous waste and is applicable to the hazardous waste generated on board cruise ships.

Finally, the IMO adopted the International Safety Management Code. The Code requires a documented management system or Safety Management System (hereafter "SMS") for all large vessels, including cruise ships, designed to achieve clear objectives to provide for the prevention of accidents involving ships that could cause casualties and damage to the marine environment. Each ship's SMS is to set forth measures to ensure that safety and pollution prevention objectives and policies are being met, provide positive response plans for a shipboard emergency, and contain an effective system for corrective and preventive action to avoid recurrences of incidents or accidents causing casualties or pollution to the marine environment. Effective July 1, 1998, any ship required to be in compliance with the Code must be certified and have a SMS on board upon entry into a United States port.⁹

Maritime Sanitation Devices

Of special interest to the State is the subject of maritime sanitation devices (hereafter "MSDs"), a technical term for toilets on board ships. Section 312(b)(1) of the Clean Water Act directs the Administrator of the Environmental Protection Agency, in consultation with the Coast Guard, to adopt federal standards of performance for MSDs on ships, "designed to prevent the discharge of untreated or inadequately treated sewage into or upon the navigable waters." Section 312(f)(1)(A) provides that "no State or political subdivision thereof shall adopt or enforce any statute or regulation of such State or political subdivision with respect to the design, manufacture, or installation or use of any marine sanitation device on any vessel subject to the provisions of this section." However, under section 312(k), a state may enforce the provisions of this section.

All cruise ships operating in navigable waters of the United States must have certified and identified MSDs pursuant to 33 C.F.R. Part 159. Ships longer than 65 feet must treat sewage with Type II or III MSDs. The standards for Type II MSDs require that fecal coliform bacteria count in 38 of 40 samples of effluent must be not greater than 200 per 100 milliliters. Further total suspended solids in 38 of 40 of these samples must be not greater than 150 milligrams per liter. Type III MSDs are defined in the regulations as devices that are designed to prevent the overboard discharge of treated or untreated sewage or any waste derived from sewage, essentially on board holding tanks. In the case of Type III devices, discharge can take place by proper disposal on land or at sea beyond the three mile limits.

In addition to the Type II MSDs common on most cruise ships, evolving technology is producing advanced wastewater treatment devices with extremely effective processes that can exceed Environmental Protection Agency standards for land based sewage treatment facilities requiring secondary treatment.

State of Alaska

With this new technology at hand, the State of Alaska, concerned with numerous cruise ship violations of the various discharge laws and regulations, obtained more stringent controls on the operations and discharge by cruise ships in Alaskan waters. According to the National Association of Attorneys General, seventy-five per cent of the so-called "treated sewage" from large cruise ships tested by the State of Alaska exceeded standards for suspended solids in sewage.¹⁰ Alaska tests also showed that gray water samples contained contaminants exceeding sewage standards by as much as 50,000 times.¹¹ In addition, many MSDs use chlorine, which is toxic to marine life, to treat waste. With this information in hand, Alaska received special attention with federal legislation addressed at Alaskan waters.¹²

Under the special provisions for cruise ship operations in Alaskan waters, the discharge of treated sewage (black water) or gray water is not allowed unless the ship is underway and proceeding at a speed of not less than six knots and is not less than one nautical mile from the nearest shore. However, utilizing the latest technological advances in MSDs, discharge may take place at any time if the following conditions are met:

1. The discharge satisfies the minimum levels of effluent quality as required for secondary treatment by the Environmental Protection Agency;
2. The geometric mean of samples from the discharge during any 30-day period does not exceed 20 fecal coliform per 100 milliliters and not more than 10 per cent of the samples exceed 40 fecal coliform per 100 milliliters; and
3. Concentrations of total residual chlorine may not exceed 10.0 milligrams per liter;

and the operator can demonstrate continuous compliance with the requirements above by taking periodic sampling, at least five per 30-day period, of the effluent being discharged.

Hawaii Cruise Ship Operations: Memorandum of Understanding

With concerns that the various laws and regulatory schemes were not sufficient to ensure the protection of the marine environment in Hawaii waters, on October 24, 2002, the State and the North West CruiseShip Association (hereafter "NWCA"), representing ten cruise line companies frequenting Hawaii, entered into a Memorandum of Understanding with the objective of further protecting the marine environment. The Memorandum of Understanding was amended on October 28, 2004, with the First Amendment to the Memorandum of Understanding between the North West CruiseShip Association and the State of Hawaii (hereafter "MOU"). (See Appendix B.) The principal provisions of the MOU are as follows:

1. Under section 1.1, NWCA will not discharge untreated black water, treated black water, or gray water within four nautical miles beyond the 100 fathom contour line of any of the Hawaiian Islands; provided that if the effluent is from an advanced wastewater treatment facility that meets standards for continuous discharge set forth in the Alaska exception discussed above, the effluent may be discharged while the ship is underway and proceeding at a speed of not less than six knots and is not less than one nautical mile from shore.¹³
2. With regard to solid waste, hazardous waste, and waste water, NWCA will comply with the International Council of Cruise Lines Industry ("ICCL") Standard E-01-01, titled Cruise Industry Waste Management Practices and Procedures (hereafter "ICCL Standards"), attached to the MOU as Appendix II and discussed in further detail below.
3. NWCA will not use on board incinerators while in port and will limit visible air emissions to not exceed twenty percent opacity for periods of time exceeding six minutes in any sixty minute period.
4. To the extent feasible, the NWCA ships will utilize fuel with a sulfur content of less than two and eight tenths percent by weight.
5. The parties acknowledge that the United States Coast Guard has federal jurisdiction over environmental matters in the navigable waters of the United States, and the State accepts Coast Guard's Navigation and Vessel Inspection Circular No. 04-04, attached to the MOU as Appendix IV, as the procedure to conduct waste management inspections on board cruise ships.
6. The parties accept a procedure developed by the Environmental Protection Agency for the identification of all hazardous waste generators for the uniform application of the Resource Conservation and Recovery Act relating to the handling and disposal of hazardous waste.
7. Each party reserves the right to cancel the MOU upon ninety days written notice.

Pursuant to section 1.1 of the MOU, DOH has acknowledged that advanced wastewater treatment systems for Pride of Aloha and another Norwegian Cruise Line ship, Norwegian Wind, meet the required standards for continuous discharge not less than one nautical mile from shore.¹⁴ Under provisions of this approval, effluent samplings must take place at least twice monthly and sample results submitted to DOH every three months. Further, records with regard to effluent quality and all discharges, including time and location, are submitted to CWB for review. CWB noted that a number of other cruise ships that operate in Alaska waters will also be applying to have their advanced wastewater treatment systems approved for Hawaii waters.

ICCL Cruise Industry Waste Management Practices and Procedures ("ICCL Standards")

ICCL Standards, made part of the MOU with the State, acknowledge that the industry, to a great extent, must police itself in protecting the marine environment. The ICCL requires strict compliance by its members with MARPOL, and United States laws, including the Clean Water Act and the Resource Conservation and Recovery Act. In addition, the ICCL Standards identify twelve different specific types of waste and recommended methods of disposal to be followed by its members. These are as follows (See Appendix B.):

1. Photography processing waste can include spent photographic fixers, spent cartridges, expired film, and silver flake as a by-product of film processing. The recommended procedure is to chemically remove any silver content down to 5 parts per million and dispose the waste on shore or pursuant to the requirements of MARPOL.
2. Dry cleaning waste that can contain a resultant chlorinated solvent called perchlorethylene, a hazardous waste under RCRA, and must be disposed on shore pursuant to RCRA.
3. Print shop waste traditionally contains solvents that are hazardous under RCRA and must be disposed on shore in accordance with RCRA.
4. Photo copying and laser printing operations result in waste cartridges, inks, toner residue, all containing non-hazardous chemical components and must be disposed on shore.
5. Unused and outdated pharmaceuticals include non-narcotic, narcotic, and listed (hazardous) pharmaceuticals. Non-narcotic pharmaceuticals must be returned to its source; narcotic pharmaceuticals must be recorded and destroyed on board by incineration; and listed pharmaceuticals must be landed and disposed in accordance with law.
6. Fluorescent and mercury vapor lamp bulbs may contain small amounts of mercury that can be harmful to humans and the environment and must be landed and disposed of in accordance with law.
7. Batteries, including lead-acid, nickel-cadmium, lithium, or alkaline must be landed and disposed of in accordance with law.
8. Bilge water and oily water residue, in accordance with MARPOL, must be treated to reduce oil residue to not more than 15 parts per million and not leave an oily sheen on the ocean surface when being discharged while a ship is "en route" or underway.

9. Solid wastes, including glass, cardboard, aluminum, and steel, may be landed and disposed ashore, incinerated on board, or discharged at sea, in accordance with MARPOL, Annex V.
10. Incinerator ash may contain hazardous or non-hazardous waste. In case of the former, the waste should be landed and disposed of in accordance with RCRA and, in the case of the latter, may be disposed of at sea in accordance with MARPOL.
11. Gray water, coming from dishwashers, showers, laundry machines, baths, and wash basins, may be discharged while a ship is underway at a minimum of six knots and is at least four nautical miles from shore.
12. Black water, coming from toilets, urinals, medical waste, and other similar facilities must be treated with a certified MSD and may be discharged at sea. Untreated black water may be discharged at least four nautical miles from shore in accordance with MARPOL.

In addition to the required framework for the proper disposal of all the different types of ship board waste, the ICCL Standards further set forth certain training and educational programs for crew members, relating to safety and environmental protection, and methods of communication with public address systems and signage for passenger awareness.

United States Coast Guard Environmental Inspection Protocol

As it set forth in United States laws and also acknowledged in the MOU, the Coast Guard is the principal enforcer of all environmental laws and regulations relating to cruise ships. The Coast Guard conducts its inspections in accordance with its Navigation and Vessel Inspection Circular No. 04-04 for periodic certificate of compliance examinations.¹⁵ The circular contains a checklist that is an extensive list of possible inspection items related to pollution prevention equipment, operation, plans, and records. Not all items of the checklist must be checked on every inspection, rather the checklist is a guide for inspectors to utilize. While the circular requires that inspectors select at least one of the five identified waste streams discussed above for a thorough and detailed inspection during every periodic inspection, the Coast Guard relies on the individual marine inspector's experience, knowledge, and judgment to determine the depth and scope of any inspection. The waste stream selection will be based on the inspector's discretion, taking into account the inspector's impression of the conditions of the various waste stream systems on board, the last time a particular waste stream was inspected in detail, and maintaining a randomness so the operator of the ship has no advanced notice of which waste stream will be inspected in detail.

A brief description of the scope and method of inspecting each of the five waste streams is contained in page 4 and 5 of the circular, with the detailed checklist for each contained in Enclosure 1 of the circular. With regard to the oil pollution prevention system, the inspector must verify that: the oily water separator is functioning properly; alarms are working; the crew

is knowledgeable; and proper maintenance is carried out. With regard to the black water system, the inspector must ensure that: the MSDs are certified and properly installed; there is adequate capacity in the system for the number of persons on board; records of maintenance equipment and supplies are kept; and the crew are knowledgeable in the operation and are maintaining the system properly.

In inspecting the gray water system, the inspector should be sure that the operator is utilizing procedures in accordance with the ship's Safety Management System documentation. If the gray water is added to the MSD system, the inspector must ensure that the capacity of the MSD system is not overtaxed. With regard to hazardous waste, the inspector must check the on board management of hazardous wastes to ensure that they are not released into the environment and that accountability is demonstrated through adequate waste disposal records. Finally, with regard to non-hazardous waste, the inspector must check disposal and incineration records and procedures to ensure that hazardous and non-hazardous waste are not mixed and that plastics and synthetics are not discarded overboard.

The Coast Guard inspects all foreign-flagged ships that operate in United States waters at least twice each year. The inspections are usually scheduled by the operator in advance to accommodate the ship's schedule, although surprise inspections are sometimes scheduled by the Coast Guard. United States-flagged ships are subject to more frequent inspections. By way of example, the *Pride of Aloha* has been the subject of at least twenty inspections since it arrived here in July 2004. A normal inspection will take a three- or four-person inspection team approximately eight hours.

The first thing the team will do once on board is inspect the ship's records, including, but not limited to, its certificates, equipment data, oil records (as required by MARPOL), waste disposal records, the ship's Safety Management System records, black and gray water discharge and water sample records, and supply consumption records (such as the amount of chemicals that were consumed by the MSD system). Following the records check, part of the team will inspect the ship's safety and fire fighting equipment and procedures, and check the crew's knowledge with regards to safety and fire fighting procedures. The rest of the team will go below deck to inspect engineering and environmental equipment. This will include all of the five waste stream systems to ensure compliance with MARPOL, federal laws, regulations, the ship's Safety Management System, and ICCL Standards.

The Coast Guard has indicated that since the Memorandum of Understanding between the State and the cruise ship industry first went into effect on October 24, 2002, there have been no violations, major or minor, issued to any cruise ship in Hawaii waters.¹⁶

In addition to these routine inspections, the Coast Guard will investigate any potential or alleged violation of law and regulations upon discovery through aerial or ocean visual sightings, third party reports, or reports by operators themselves. However, beyond these inspections and investigations, the Coast Guard acknowledges that it is difficult to monitor ships on the open ocean. There are no fixed shipping lanes that cruise ships follow between islands. While economics would call for a straight line between ports of call, diversions may be made for

weather purposes, safety or comfort purposes, or cruise passenger enjoyment, such as sightseeing or whale watching.

Department of Health Clean Water Branch Review

DOH is routinely invited to join the Coast Guard on any ship inspection undertaken by the Coast Guard. With regard to cruise ships, CWB goes on inspection trips twice a year to inspect a ship's sanitary system. NCL America representatives noted that there have been a number of visits by CWB to the Pride of Aloha and they have become well acquainted with the CWB personnel. In addition, with regard to the two NCL ships that have qualified advance wastewater treatment systems, CWB regularly reviews the quarterly submitted reports relating to effluent samplings and effluent discharge data. The Clean Air Branch of DOH will also occasionally join these inspections to check on opacity monitoring equipment on board.

Cruise Industry Response

In a meeting with two representatives of PCL America, both emphasized, not surprisingly, that it was in the cruise ship industry's interest to maintain and enhance a safe and aesthetically pleasing marine environment. Moreover, they indicated that regulation and enforcement by the Coast Guard and, to a lesser extent, DOH is sufficient and that more regulation and enforcement is unnecessary. The representatives stressed that the overall industry's and their particular company's standards for environmental protection were more stringent than statutory and regulatory requirements. The company's Safety Management System that the company dubbed its Safety and Environmental Management System is more stringent than the ICCL Industry Standard E-01-01. Further, they pointed out that two of their ships traveling in Hawaii waters are outfitted with advanced wastewater treatment systems and that the two ships to be brought to Hawaii in 2005 and 2006 will also be outfitted with them.

Endnotes

1. <http://www.hawaii.gov/dot/harbors/2004cruise.html>.
2. DOTHD notes that while PCL America is planning to bring these two additional cruise ships to Hawaii over the next two years and is requesting substantial onshore infrastructural improvements to be made to harbor facilities, there is no definitive binding commitment to bring the ships here as presently scheduled. According to DOTHD, these large assets are portable and their location will be dependent on the worldwide cruise ship market.
3. The Ocean Conservancy, "Cruise Control: A Report on How Cruise Ships Affect the Marine Environment" May 7, 2002, p. 3.
4. http://www.imo.org/Conventions/contents.asp?doc_id=678&topic-id=258.
5. 33 U.S.C. 1901-1911.
6. 33 U.S.C. 1319, 1321, and 1322.

CRUISE SHIP INDUSTRY

7. 33 U.S.C. 1322; 33 C.F.R. Part 159.
8. 42 U.S.C. 6901 *et seq.*
9. United States Coast Guard Marine Safety Office (Honolulu) Inspection Note #53. <http://www.uscg.mil/d14/units/msohono/inspnote/inspnote53.htm>.
10. "Cruise Ship Wastewater Treatment Systems", <http://www.surfrider.org/sebastianinlet/msdvsawt.html>.
11. It is noted that normally MSDs do not treat gray water. Further, discharge of gray water is not regulated by MARPOL or the Clean Water Act.
12. Title XIV, Pub.L.No. 106-554, §1(a)(4) (2000).
13. This, all be it voluntary, restriction exceeds the MARPOL and Clean Water Act three nautical miles range. Further it exceeds the Alaska restrictions that permit continuous discharge if the effluent meets the stricter standards by still requiring that, in Hawaii waters, the ship must be underway and not less than one nautical mile from shore.
14. Letters from Department of Health to Norwegian Cruise Lines, dated July 23, 2004 and July 26, 2004, attached hereto as Appendix K.
15. The Coast Guard circular attached to the MOU as Appendix IV is stamped "Draft-Work in Progress"; however, the Coast Guard indicated that Circular 04-04 is in operation.
16. Telephone conference with the United States Coast Guard Marine Safety Office (Honolulu), November 18, 2004.

Chapter 5

CONCLUSIONS

Emphasis on the Environment

House Concurrent Resolution No. 118, H.D. 1 (2004) raised some genuine concerns with regard to the potential negative impacts to the environment caused by the growing open ocean fish farm and the cruise ship industries. However, it would appear that the statutory and regulatory mechanisms in place more than adequately address this potential. While DOH and specifically CWB are concerned with protecting human health, by its mission statement and, more importantly, through its activities, CWB is clearly and earnestly involved with protecting the environment. Working with the Environmental Protection Agency implementing the Beach Environmental Assessment and Coastal Health Act and the NPDES program, assisting the United States Coast Guard enforcing the Clean Water Act and the State's Memorandum of Understanding with the cruise industry, and coordinating with DLNR in overseeing the open ocean fish farms water quality monitoring program, CWB has a full plate, and its fingerprints appear in many areas.

The main purpose of the Resolution was to determine whether, while acknowledging that DOH presently maintains a water monitoring program, a separate water monitoring program with an emphasis on the environment should be established within DLNR. It appears that the proponents of the Resolution may not be completely aware of the present infrastructure in place under international, federal, and state laws and regulations relating to the protection of the environment with regard to open ocean fish farms and the cruise ship industry and the roles of both DOH and DLNR, along with federal regulators in enforcing the statutory and regulatory provisions.

The most visible effort at water sample monitoring is undertaken by DOH pursuant to the Beach Environmental Assessment and Coastal Health Act of 2000.¹ The primary emphasis of the Act is the protection of human and public health and not the protection of the aquatic environment. However, DOH, and specifically CWB, does not limit its mission or efforts to human and public health. There are numerous references to the protection of the aquatic environment within the responsibility of DOH and CWB.

- The mission statement of CWB includes the undertaking to "protect and restore inland and coastal waters for marine life and wildlife."²
- "Water pollution" as defined in section 342D-1, Hawaii Revised Statutes, includes contaminants and discharge injurious to "fish and aquatic life and wildlife."

CONCLUSIONS

- The basic water quality criteria contained in section 11-54-4, HAR, refers to waters being free from substances "toxic or harmful to human, animal, plant, or aquatic life." Further, pursuant to section 11-54-7, HAR, the Director of Health may impose additional parameters and criteria in addition to those already contained in Chapter 11-54, HAR, for the protection of benthic biological communities.
- The Clean Water Act that requires DOH to enforce the National Pollutant Discharge Elimination System for point sources of pollution, including fish farms, and marine sanitation devices for cruise ships includes in its purposes the restoration and maintenance of the nation's "water quality which provides for the protection and propagation of fish, shellfish, and wildlife."³
- Chapter 11-55, HAR, that implements the NPDES program in the State by DOH provides in section 11-55-02, HAR, in part, that it is the public policy of the State "[t]o protect, maintain, and improve the quality of state waters... [f]or the growth, support, and propagation of shellfish, fish, and other desirable species of marine and aquatic life."
- As discussed in chapter 3, the NPDES permit issued by DOH for the Cates International, Inc. fish farm requires water monitoring to protect the aquatic environment at and in the vicinity of the fish cages. The permit further requires a benthic biological monitoring program that is shared with DLNR.
- In a number of dockets, the Land Use Commission requested that DOH oversee water monitoring programs and potential mitigative measures in conjunction with the U.S. Fish and Wildlife Service, the National Marine Fisheries Services, and the DLNR Division of Aquatic Resources.⁴
- DLNR through the CDUA process partners with DOH in the monitoring of fish farm operations for the protection of the aquatic environment.

Accordingly, the efforts of DOH and its water monitoring programs are not limited to human and public health but are equally focused on the protection of the aquatic environment.

Fish Farms

DLNR's OCCL and DLNR/DAR review and report to the Board of Land and Natural Resources on CDUAs submitted to future fish farms, along with recommendations for conditions. OCCL and DLNR/DAR regularly review quarterly benthic biological monitoring at the existing fish farm's cage site. DLNR/DAR biologists have done further onsite diving inspections of the existing fish farm. DOH's CWB through the NPDES program is overseeing the water quality surrounding the only operating fish farm in the State, receiving and analyzing monthly water quality data from the private laboratory that processes the water samples collected for toxicity and zone of mix chemical limits. A similar monitoring process will occur when the next fish farm goes into operation.

While there was some alarm raised by DLNR/DAR regarding the existing fish farm and there remain differing opinions as to whether more in depth biological monitoring is required, there is apparent agreement that there have not been any substantial negative impacts on the environment caused by the existing fish farm. Further, while there may have been some minor exceeding of water quality standards imposed by the NPDES permit, CWB has never cited the fish farm with any violation.

The discussion between and among the government regulators and the private fish farm operators that OCCL has initiated should continue. Questions that go beyond this study, such as that relating to whether a biological phase shift is *a priori* a negative occurrence or could, in some instances, have a positive impact on the benthic environment, must continue to be addressed. The possibility that fish farms may in some instances encourage exotic species to flourish should be explored. These and other questions should be addressed through continued discussions between the government regulators and the industry.

As fish farms get bigger, with Kona Blue Water Farms projected to have six cages, and at possible deeper depths, monitoring gets more expensive. The fact that these fish farms are open ocean operations and not on land or coastal hugging operations makes this monitoring different and expensive. DLNR/DAR acknowledges that while the fish farm operators are responsible for the costs of monitoring their operations, some of the cost for in-depth monitoring with general application should not be borne solely by the operators. Future discussion should include a determination of an equitable cost sharing between government and private operators to pay for this monitoring, with the government share logically coming from the Special Land and Development Fund established pursuant to section 171-19, Hawaii Revised Statutes, into which a large portion of the lease rents from fish farm leases are deposited. As an alternative, if the private operators are to bear these higher monitoring costs, other incentives could be implemented to offset these costs. Incentives may take the form of tax credits, lease rent discounts, or a number of other measures presently applied to assist land-based agriculture and other industries that the State deems important.

Cruise Ships

With regard to cruise ship operations, a water monitoring program in DLNR with an emphasis on the environment is not necessary or practical. The Coast Guard has the primary role in enforcing the environmental controls in all United States waters. Regular and random inspections by the Coast Guard reviewing the ship records and data keeping and the various on-board waste stream systems, are the Coast Guard's responsibility under federal law. CWB, along with other branches of DOH, participate in these inspections. Additionally, CWB receives and reviews quarterly reports from operators of advanced wastewater treatment systems. Further, as part of its water monitoring program, CWB does quarterly monitoring in the harbors visited by the major cruise ships. CWB may want to consider the merits of additional periodic water monitoring in the Lahaina Roads and off of the Kailua-Kona pier where cruise ships sometimes moor and tender passengers to shore.

The Coast Guard acknowledges that much of the enforcement of environmental requirements occurs through self-enforcement by the industry. Without permanent shipping lanes or on board inspectors situated on a cruise ship 24 hours a day, 365 days a year, there is not much beyond the present enforcement efforts that is practical. In the future, technology may be developed for on board monitoring equipment for all waste streams with a data collecting system operating 24 hours a day, 365 days a year, that may not be altered or tampered with by the ship operator. In the meantime, the State and the North West CruiseShip Association continue to operate under the MOU. While the MOU has no enforcement provisions and may be terminated by either party with ninety days written notice, the cruise ship industry remains subject to international maritime conventions and federal laws and their enforcement provisions and also remains subject to the water quality standards and enforcement provisions of Chapter 342D, Hawaii Revised Statutes, and Chapter 11-54, Hawaii Administrative Rules.

Summary

In short, the answer to the specific question as to whether there should be a separate, additional water quality monitoring program in DLNR with an emphasis on the environment is 'NO.' There are sufficient federal and state statutory and regulatory safeguards in place addressing the protection of the environment. Further, there are sufficient enforcement powers in Chapters 190D and 342D, Hawaii Revised Statutes, the Hawaii Administrative Rules, and the myriad of federal statutes and rules to enforce these existing safeguards.

While the measures in place are not perfect and cannot guarantee that there will never be any instance of water pollution caused by the fish farm industry or the cruise ship industry, the controls appear to be working. Establishing a water quality monitoring program in DLNR to do much of what is presently being done by DOH's CWB would appear to be duplicative and costly.⁵

Endnotes

1. *See* Chapter 1, p. 4, endnote 5.
2. *See* Chapter 2, p. 13, endnote 4.
3. 33 U.S.C. 1251(a)(2).
4. *See* Chapter 2, p. 11.
5. While firm estimates have not been explored, several state officials have indicated that the replication of a laboratory similar to the DOH laboratory that would be required for DLNR to establish its own water sample monitoring program would cost millions of dollars. The alternative would be costly referral of samples to Mainland laboratories or a laboratory at the University of Hawaii.