VILLAGE OF JAMAICA BEACH

ORDINANCE NO. 93-5

AN ORDINANCE ADOPTING THE AMENDED DUNE PROTECTION AND BEACH ACCESS PLAN IN THE VILLAGE OF JAMAICA BEACH, TEXAS, AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, BY Ordinance 93-4, the Village of Jamaica Beach, has heretofore adopted a Dune Protection and Beach Access Plan, and certain amendments are required to update said Plan,

NOW, THEREFORE, BE IT ORDAINED by the City Council of the Village of Jamaica Beach, Texas:

SECTION 1: That certain documents, entitled AMENDED MASTER DUNE PROTECTION AND BEACH ACCESS PLAN, a true and correct copy of which has this day been exhibited to and approved by the City Council of the Village of Jamaica Beach, Texas, is hereby adopted and incorporated herein by reference to the same extent as though such document and all of its terms and provisions were fully set forth verbatim herein.

SECTION 2: This Ordinance shall be and become effective from and after its adoption with the approval of said Ordinance by the State of Texas Attorney General's Office and General Land Office.

SIGNED AND SEALED this 6th day of December, 1993.

Kenneth R. Dennis
Mayor

T D White
Terisa White
City Secretary

Dune Protection and Beach Access Plan

City of

Village of Jamaica Beach

TABLE OF CONTENTS

COASTAL DEVELOPMENT

STATEMENT OF PURPOSE AND INTENTION

Jamaica Beach is on an island in the Gulf, and is commonly subjected to extremes in such natural hazards as storm, flood and shoreline erosion. To combat these hazards, Jamaica Beach developed this Ordinance.

The Open Beaches Act and the Dune Protection Act require the General Land Office to promulgate rules for the protection of critical dune areas and public beach use and access. The General Land Office is required to protect the public beach from erosion or reduction and adverse effects on public access and critical dune areas by regulating beachfront construction and other activities occurring along the shoreline of the Gulf of Mexico. The purpose of these standards is to augment General Land Use rules and to protect the public health, safety and welfare by minimizing losses due to flood, storm, waves, and shoreline erosion. These standards are in compliance with those minimum standards established by the General Land Office and formulated to be consistent with all Federal mandates. It provides standards for managing the public beach and human activities occurring on the property fronting the Gulf of Mexico consistent with the Texas Natural Resources Code, Sec. 61.001 (Open Beaches Act), Sec. 63.001, et seq.

In the event of a conflict between these Zoning Standards, Federal Laws, the Open Beaches Act; Dune Protection Act; Title 31, Part 1, Chapter 15, Subchapter A, Sections 15.1 - 15.10, and General Land Office, Federal and State regulations shall prevail.

DEFINITIONS - The following words and terms, when used in this Ordinance, shall have the following meanings, unless the context clearly indicates otherwise.

Affect - As used in this subchapter regarding dunes, dune vegetation, and the public beach, "affect" means to produce an effect upon dunes, dune vegetation, or public beach use and access.

Amenities - Any nonhabitable major structures including swimming pools, bath-houses, detached garages, cabanas, pipelines, piers, canals, lakes, ditches, artificial run-off channels and other water retention structures, roads, streets, highways, parking areas and other paved areas underground storage tanks, and similar structures.

Backdunes - The dunes located landward of the foredune ridge which are usually well vegetated but may also be unvegetated and migratory. These dunes supply sediment to the beach after the foredunes and the foredune ridge have been destroyed by natural or human activities.

Beach Access - The right to use and enjoy the public beach, including the right of free and unrestricted ingress and egress to and from the public beach.

Beach Area - The beach area is that portion of the public beach-North of the Mean Low Tide (Water) of the Gulf of Mexico and South of the Line of Vegetation as protected by V.A.T.C.S. Natural Resources Code, (Chs. 61 - 63: Open Beaches Act Provisions) Chapter 61.

Beach/Dune System - The land from the Line of Mean Low Tide (Water) of the Gulf of Mexico to the landward limit of dune formation.

Beachfront Construction Certificate - Document issued certifying that the proposed construction is consistent with the City's Dune Protection and Beach Access Plan. If the construction is inconsistent with the City's Plan, inconsistencies will be specified as required by the Open Beaches Act, 61.015.

Beach Maintenance - The cleaning or removal of debris from the beach by Handpicking, raking, or mechanical means.

Beach Profile - The shape and elevation of the beach as determined by surveying a cross section of the beach.

Blowout - A breach in the dunes caused by wind erosion.

Breach - A break or gap in the continuity of a dune caused by wind or water.

Bulkhead - A structure or partition built to retain or prevent the sliding of land. A secondary purpose is to protect the upland against damage from wave action.

Coastal and Shore Protection Project - A project designed to slow shoreline erosion or enhance shoreline stabilization, including, but not limited to, erosion response structures, beach nourishment, sediment bypassing, construction of man-made vegetated mounds, and dune revegetation.

Commercial Facility - Any structure used for providing, distributing, and selling goods or services in commerce including, but not limited to, hotels, restaurants, bars, rental operations, and rental properties.

Construction - Causing or carrying out any building, bulkheading, filling, clearing, excavation, or substantial improvement to land or the size of any structure. "Building" includes, but is not limited to, all related site work and placement of construction materials on the site. "Filling" includes, but is not limited to, disposal of dredged materials. "Excavation" includes, but is

not limited to, removal or alteration of dunes and dune vegetation and scraping, grading, or dredging a site. "Substantial improvements to land or the size of any structure" include, but are not limited to, creation of vehicular or pedestrian trails, landscape work that adversely affects dunes or dune vegetation, and increasing the size of any structure.

Coppice Mounds - The initial stages of dune growth formed as sand accumulates on the downwind side of plants and other obstructions on or immediately adjacent to the beach seaward of the foredunes. Coppice mounds may be unvegetated.

Cumulative Impact - The effect on beach use and access, on a critical dune area, or an area seaward of the Dune Protection Line which results from the incremental effect of an action when added to other past, present, and reasonably forseeable future actions regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Dune - An emergent mound, hill, or ridge of sand, either bare or vegetated, located on land bordering the waters of the Gulf of Mexico. Dunes are naturally formed by the windward transport of sediment, but can also be created via man-made vegetated mounds. Natural dunes are usually found adjacent to the uppermost limit of wave action and are marked by an abrupt change in slope landward of the dry beach. The term includes coppice mounds, foredunes, dunes comprising the foredune ridge, backdunes, swales, and man-made vegetated mounds.

(Critical) Dune Areas - Those portions of the beach/dune system as designated by the General Land Office that are located within 1,000 feet of mean high tide (water) of the Gulf of Mexico that contain dunes and dune complexes that are essential to the protection of public beaches, submerged land, and state owned land such as public roads and coastal public lands, from nuisance erosion, storm surge, and high wind and waves. Critical dune areas include, but are not limited to, the dunes that store sand in the beach/dune system to replenish eroding public beaches. The two terms are used interchangeably in this code.

Dune Complex - Any emergent area adjacent to the waters of the Gulf of Mexico in which several types of dunes are found or in which dunes have been established by proper management of the area. In some portions of the Texas coast, dune complexes contain swales.

Dune Permitting Area - Area as identified by the General Land Office, Section 15.2. Specifically, an area extending 75' seaward of the Dune Protection Line.

Dune Vegetation - Flora indigenous to natural dune complexes on the Texas Coast and can include coastal grasses and herbaceous and woody plants.

Dune Protection Line - A line located 75 feet landward from the North toe of the Critical Dune Area. Jamaica Beach establishes a buffer area of 25 feet landward of the north toe of the dunes. No construction is permitted in this area without mitigation sequence and as defined under "Construction of Dune Walkovers." Where no dunes exist, the line shall connect the nearest Dune Protection Line on the East with the nearest Dune Protection Line on the West. This term is used synonymously with "Dune Protection Line" as defined by the regulations of the General Land Office at 31 T.A.C. Sec. 15.2. Construction is not permitted seaward of the Dune Protection Line except as defined under "Construction of Dune Walkovers" and as defined under Requirements For Permit (a) (b) and (c).

Dune Protection Permit or Permit - The document issued to authorize construction or other regulated activities in a specified location seaward of a dune protection line or within a critical dune area as provided in the Texas Natural Resources Code, 63.051.

Effect or Effects - "Effects" include: Direct Effects - those impacts on public beach use and access, on critical dune area, or on dunes and dune vegetation seaward of a Dune Protection Line which are caused by the action and occur at the same time and place; and Indirect Effects - those impacts on beach use and access, on Critical Dune Areas, or on dunes and dune vegetation seaward of a Dune Protection Line which are caused by an action and are later in time or farther removed in distance than a direct effect, but are still reasonably foreseeable. Indirect effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems. "Effects" and "Impacts" as used in this ordinance are synonymous. "Effects" may be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative.

Erosion - The wearing away of land or the removal of beach and/or dune sediments by wave action, tidal currents, wave currents, drainage, or wind. Erosion includes, but is not limited to horizontal recession and scour and can be induced or aggravated by human activities.

Erosion Response Structure - A hard or rigid structure built for shoreline stabilization which includes, but is not limited to, a

jetty, retaining wall, groin, breakwater, bulkhead, seawall riprap, rubble mound, revetment, or the foundation of a structure which is the functional equivalent of these specified structures.

FEMA - The United States Federal Emergency Management Agency.

Foredunes - The first clearly distinguishable, usually vegetated, stabilized large dunes encountered landward of the Gulf of Mexico. On some portions of the Texas Gulf Coast, foredunes may also be large, unvegetated, and unstabilized. Although they may be large and continuous, foredunes are typically hummocky and discontinuous and may be interrupted by breaks and washover areas. Foredunes offer the first significant means of dissapating storm-generated wave and current energy issuing from the Gulf of Mexico. Because various heights and configurations of dunes may perform this function, no standardized physical description applies. Foredunes are distinguishable from surrounding dune types by their relative location and physical appearance.

Foredune Ridge - The high continuous line of dunes which are usually well vegetated and rise sharply landward of the foredune area but may also rise directly from a flat, wave-cut beach immediately after a storm.

Groin - Short walls built perpendicular to straight stretches of beach and designed to trap sand flowing in the longshore current.

Habitable Structures - Structures suitable for human habitation including, but not limited to, single or multi-family residences, hotels, condominium buildings, and buildings for commercial purposes. Each building of a condominium regime is considered a separate habitable structure, but if a building is divided into apartments, then the entire building, not the individual apartments, is considered a single habitable structure. Additionally, a habitable structure includes porches, gazebos, and other attached improvements and amenities.

Industrial Facilities - Include, but are not limited to, those establishments listed in Part 1, Division D, Major Groups 20-39 and Part 1, Division E, Major Group 49 of the Standard Industrial Classification Manual as adopted by the Executive Office of the President, Office of Management and Budget (1987 ed). However, for the purpose of this Ordinance, the establishments listed in Part I, Division D, Major Group 20, Industry Group Number 209, Industry Numbers 2091 and 2092 are not considered "Industrial Facilities". See Appendix, Exhibit A.

Line of Vegetation - The extreme seaward boundary of natural vegetation which spreads continuously inland typically used to determine the landward extent of the public beach. Where there is no natural vegetation line, the landward extent of the public

beach may be determined as provided by Sec. 61.016 and Sec. 61.017, Texas Natural Resources Code.

Man-made Vegetated Mound - A mound, hill or ridge of sand created by the deliberate placement of sand or sand trapping devices including sand fences, trees, or brush and planted with dune vegetation.

Motor Vehicle or Vehicle - A vehicle as defined by the Texas Uniform Act, Art. 6701d, Texas Revised Civil Statutes Annotated.

National Flood Insurance Act - 42 United States Code, 4001, et seq.

Natural Resources - Land, fish, wildlife, insects, biota, air, surface water, groundwater, plants trees, habitat of flora and fauna, and other such resources.

Open Beaches Act - Texas Natural Resources Code, 61.001, et seq.

Person - An individual, firm, corporation, association, partnership, consortium, joint venture, commercial entity, the United States Government, a State, a municipality, commission, political subdivision, or any international or interstate body or any other governmental entity.

Pipeline - A tube or system of tubes used for the transportation of oil, gas, chemicals, fuels, water, sewerage, or other liquid, semi-liquid, gaseous substances.

Production and Gathering Facilities - The equipment used to recover and move oil or gas from a well to a main pipeline, or other point of delivery such as a tank battery, and to place such oil or gas into marketable condition. Included are pipelines used as gathering lines, pumps, tanks, separators, compressors, and associated equipment and roads.

Public Beach - As used in this ordinance, "Public Beach" is defined in the Texas Natural Resources Code, Sec. 61.013(c).

Practicable - In determining what is practicable, the City shall consider the effectiveness, scientific feasibility, and commercial ability of the technology or technique. The City shall also consider the cost of the technology or technique.

Restoration - The process of constructing man-made vegetated mounds, repairing damaged dunes, or vegetating existing dunes.

Retaining Wall - A structure designed primarily to contain material and to prevent the sliding of land.

Sand Budget - The amount of all sources of sediment, sediment

traps, and transport of sediment within a defined area. From the sand budget, it is possible to determine whether sediment gains and losses are in balance.

Seaward of a Dune Protection Line - The area between a Dune Protection Line and the Line of Mean High Tide (Water).

Seawall - An erosion response structure that is specifically designed to withstand wave forces.

Small-scale construction - Construction activity less than or equal to 5,000 square feet of habitable structures less than or equal to two stories in height. Single-family habitable structures are typical of this type of construction.

Structure - Includes, without limitation, any building or combination of related components constructed in an ordered scheme that constitutes a work or improvement constructed on or affixed to land.

Surveying - The measurement of dimensional relationships as a method of finding Mean High Tide (Water), Mean Low Tide (Water), Elevations, the Dune Permitting Line and Vegetation Line, conducted by a licensed surveyor in the State of Texas.

Swales - Low areas within a dune complex located in some portions of the Texas Coast which function as natural rainwater collection areas and are an integral part of the Dune Complex.

Washover Areas - Low areas that are adjacent to beaches and are inundated by waves and storm tides from the Gulf of Mexico. Washovers may be found in abandoned tidal channels or where foredunes are poorly developed or breached by storm tides and wind erosion.

REQUIREMENT FOR PERMIT

Authority: Jamaica Beach is authorized by delegation in the Galveston County Dune Management and Beach Access Plan to adopt Dune Protection and Beach Access Plans within its jurisdiction, consistent with Title 31. Natural Resources and Conservation, Part 1, Chapter 15, Subchapter A, Section 15.1 - 15.10, and the City may enter into interlocal cooperation contracts for the administration of this program under the Interlocal Cooperation (Article 4413(32c), Vernon's Texas Civil Statutes). Jamaica Beach shall establish the jurisdictional boundaries of the Dune Protection Line and identify the line by map.

(1) No person shall engage in the construction of any structure or make an addition or alteration to any structure or sand dune within Jamaica Beach's Beachfront Construction and Dune Protection Permitting Area until he has secured a Dune Protection Permit and Beachfront Construction Certificate for such addition, alteration or construction from the Building Official. This prohibition shall not apply to routine repairs, maintenance and upkeep of existing structures that won't enlarge, expand or redesign the existing structures, except in the case of existing erosion reponse structures as defined in General Land Office Rules 15.6 (c). Final determination of whether repairs, maintenance or upkeep constitutes enlargement, expansion or redesign shall be the responsibility of the Building Official.

(2) No Permit shall be issued for any activity within the Dune Permitting Area unless such issuance is approved by the Building Official.

(3) Jamaica Beach shall review its Dune Protection Line every five years to determine whether the line is adequately located to achieve the purpose of preserving Critical Dune Areas as identified by the General Land Office. In addition to the five year review, Jamaica Beach shall review the adequacy of the location of the Dune Protectio Line within 90 days after a tropical storm or hurricane affects Jamaica Beach's Coast or anytime significant changes occur.

(a) Structures within the Dune Permitting Areas

All structures built in the Dune Permitting Area must comply with the following requirements:

(1) Construction that is likely to adversely affect dunes or dune vegetation may only be undertaken utilizing the mitigation sequence.

(2) Any structure built must adhere to FEMA's construction standards for flood hazard areas as adopted in Ordinance 87-1.

(3) Piers shall be set and the structure shall be constructed with minimum destruction of the existing terrain and vegetation.

(4) Entries and exits to or from stairways and landings shall not be located within the 25 foot buffer area landward of the north toe of the critical dune area except when approved using the mitigation sequence.

(5) The structure and lot design shall provide for the gradual and dispersed drainage of storm water run-off, such that run-off within the lot approximates natural rates, volumes, and direction of flow. Drain spouts, if any, shall be located so as to collect rainwater and distribute same evenly under the structure. Porches, patios, and balconies shall be constructed to allow rainwater to pass through. All drainage from the lot shall not increase natural drainage to the public beach.

(b) Vegetation

In accordance with GLO rule 15.7(e) and as promulgated in this Ordinance, unless otherwise unavoidable during construction, removal or destruction of vegetation within the area seaward of the Dune Protection Line is prohibited. Any area where vegetation is removed or destroyed shall be revegetated. Likewise, alteration of the existing topography is prohibited unless otherwise unavoidable during construction. Any unavoidable alteration of the contour as a result of construction activities shall be restored and revegetated, and any breach in the Dunes, whether caused by man or nature, shall be restored and revegetated before the Issuance of Order for Permanent Electrical Power. If no electrical power is needed and site is not restored and/or revegetated, penalties shall be assessed in accordance with Ordinance 77-1 or legal proceedings implemented after proper notification to the offender.

(1) All areas shall be restored to their original elevation. Breaches shall be restored to the contour of the adjacent dunes.

(2) If the area is located in the Critical Dune Area, then it shall be revegetated with Bitter Panicum (Panicum Amarum) planted on two (2) foot centers with one hundred (100%) percent coverage of the area and a mixture of Bitter Panicum (Panicum - + Amarum) and Marshy Cordgrass (Spartina Patens) planted on one (1) foot centers with one hundred (100%) percent coverage of the area.

(3) Sand fencing shall be required.

(4) Revegetation shall not be considered complete until the area has been returned to its original condition prior to the time of destruction as stated in GLO rule 15.4(f)(5) and 15.4(g)(5). The Building Official is responsible for determining if and when compensation is complete and will notify state agencies of completion of compensation.

(c) Pre-existing Uses: Destruction

Not withstanding that a use or structure was in existence prior to adoption of this Ordinance, such structure or use shall comply with the provisions hereof including all applicable provisions of the Zoning Standards where such use or structure is expanded by any degree, or moved to a new location, or destroyed in excess of fifty (50%) percent of its value by fire or other catastrophe at the time of such destruction. When a property which has been damaged less than (50%) percent, but is seaward of the Dune Protection Line, and by determination by the Building Official, as stated in this ordinance and GLO rule 15.4(a),(b), and (c), that the proposed development will damage or deplete the Critical Dune Area, such reconstruction of the development shall require Beachfront Construction Certificate & Dune Protection Permit. In no event shall a permit or certificate be issued as stated in GLO rule 15.6 (d).

(d) Dune Walkovers

Dune walkovers will be permitted only as outlined in GLO rule 15.7 (f).

Construction of Dune Walkovers shall meet the following standards and shall be constructed so that they do not interfere with or restrict public use of the beach at normal high tide (water):

(1) A dune walkover shall not not exceed four (4) feet in width, the deck or floor of which shall be constructed at a height above the dune of not less than the width of said walkover.

(2) Except with respect to paired posts constructed on each side of the walkover, posts shall be placed at intervals no closer than six (6) feet.

(3) Any vegetation or contours disturbed during construction shall be restored as provided herein.

(4) Only one dune walkover shall be permitted per resididental lot.

(5) Dune walkovers must be constructed to allow rain and sand to pass through the decking.

(6) The walkover must start at the northern boundary of the Critical Dune Area and shall end on the beach, approximately ten (10) feet seaward of the vegetation line. Dune walkovers may not impede or restrict access to the

public beach.

(7) All walkovers built in public areas shall be constructed with two (2) handrails.

(8) All walkovers shall be constructed according to Southern Building Code Standards.

(9) It shall be the duty of the property owner, pursuant to the requirements of this Ordinance to keep and maintain said dune walkover in good condition (repaired and maintained).

(10) Permittees must relocate walkovers to follow any landward migration of the public beach or seaward migration of the dunes and maintain the walkover height to approved levels.

(11) All dune walkover construction, improvement or repair must be permitted through the office of the Building Official.

(e) Beachfront Construction and Dune Protection Requirements

(1) For all proposed construction (large- and small-scale), within the Dune Permitting Area, applicants shall submit the following items and information:

a. The name, address, phone number, fax number, and the name of the property owner if different from the applicant.

b. A complete legal description of the tract and a statement of its size in acres or square feet.

1. the site by its legal description, including, where applicable, the subdivision, block, and lot.

2. the location of the property lines and a notation of the legal description of adjoining tracts.

3. the number and location of the structures and whether the structures are amenities or habitable structures.

4. a description (including location) of proposed roadways and driveways, parking, dune walkovers, and proposed landscaping activities on the tract.

5. the approximate percentage of existing and finished open spaces (areas completely free of structures).

6. the floor plan (s) and elevation view of the structure proposed to be constructed or expanded.

7. the approximate duration of construction.

8. a grading and layout plan identifying all elevations (in reference to the National Oceanographic and Atmospheric datum), existing contours of the project area (including location of dunes and swales), and proposed contours for the final grade.

9. photographs of the site which clearly show the current location of the vegetation line and the existing dunes on the tract.

10. the effects of the proposed activity on the beach/dune system which cannot be avoided if the activity is permitted, including but not limited to damage to dune vegetation, alteration of dune size and shape, and changes to dune hydrology.

11. a comprehensive mitigation plan which includes a detailed description of the methods which will be used to avoid, minimize mitigate and/or compensate for any adverse effects on dunes or dune vegetation.

12. proof of financial capability to mitigate or compensate for adverse effects on dunes and dune vegetation (submit an irrevocable letter of credit or a performance bond) or to fund eventual relocation or demolition of structures (as through proof of Upton Jones coverage in the National Flood Insurance Program etc).

13. the location of the structures, the footprint or perimeter of the proposed construction on the tract.

14. the location of any seawalls or any other erosion response structures on the tract and on the properties immediately adjacent to the tract.

15. if known, the location and extent of any man-made vegetated mounds, restored dunes, fill activities, or any other pre-existing human modifications on the tract.

16. a copy of the FEMA elevation certificate.

17. additional information shall be required as stated in GLO rule 15.3(s)(4)(c).

2) For all proposed large-scale construction, in the Dune Permitting Area, applicants shall submit the following additional items and information:

a. if located in a subdivision and the applicant is the owner or developer of the subdivision, a certified copy of the recorded plat of the subdivision, or if not a recorded subdivision, a plat of the subdivision certified by a licensed surveyor, and a statement of the total area of the subdivision in acres or square feet.

b. in the case of multiple-unit dwellings, the number of units proposed.

c. alternatives to the proposed location of construction on the tract or to the proposed methods of construction which would cause fewer or no adverse effects on dunes and dune vegetation or less impairment of beach access; and

d. the proposed activity's impact on the natural drainage pattern of the site and the adjacent lots.

A person proposing to conduct an activity requiring a Beachfront Construction Certificate & Dune Protection Permit shall submit a complete application to the Building Official who will act upon it in the indicated time period. The Building Official shall forward the complete application, including materials required in GLO rule 15.3s(4)(d), to the GLO, the Attorney General's Office and, if necessary, the Corps of Engineers. The application, any documents associated with the application, and information as to when the decision will be made must be received by the GLO and the Attorney General's Office no later than 20 days before the City is first scheduled to act on the permit.

(f) Termination of Permit

(1) A permit may be terminated if:

a. The permit is inconsistent with this Ordinance at the time the permit was issued.

b. A material change occurs after the permit or certificate is issued; or a permittee fails to disclose any material fact in the application.

c. "Material Change" includes human or natural conditions which have adversely affected dunes, dune vegetation, or beach access and use that

either did not exist at the time of the original application, or were not considered by the Building Official in making the permitting decision because the permittee did not provide information regarding the site condition in the original application.

d. A permit or certificate automatically terminates if construction comes to lie within the boundaries of the public beach by artificial means or by natural causes.

e. Work approved under this Permit shall be completed within one (1) year from the date of the Permit except Master Planned Developments which shall be completed in two (2) years. If work is not completed in this time period, it will be necessary for the applicant to reapply for a Dune Protection Permit.

BEACHFRONT CONSTRUCTION CERTIFICATE & DUNE PROTECTION PERMIT STANDARDS

Authority: Title 31, Natural Resources & Conservation, Part I, Chapter 15, Subchapter A, Section 15.4, requires Jamaica Beach to comply with the following standards in issuing, denying or conditioning a Beachfront Construction & Dune Protection Permit for those areas within the Critical Dune Area.

Before issuing a permit within the Dune Permitting Area the Building Official must find that:

(1) The proposed activity is not a prohibited activity as defined in these Standards.

(2) The proposed activity will not materially weaken dunes or materially damage dune vegetation seaward of the Dune Protection Line based on substantive findings as defined in "Technical Standards" of this Ordinance.

(3) There are no practicable alternatives to the proposed activity that is located seaward of the Dune Protection Line and adverse effects cannot be avoided as provided in the Mitigation Sequence as outlined in these Zoning Standards.

(4) The applicant's mitigation plan, for an activity seaward of the Dune Protection Line, if required, will adequately minimize, mitigate, and/or compensate for any unavoidable adverse effects.

(5) The proposed activity complies with any applicable requirements of: Requirements for Beachfront Construction Certificate & Dune Protection Permit and Management of the Public Beach of this Ordinance.

(6) No concrete slabs or other impervious surfaces are within 200 ' landward of the natural vegetaion line (concrete slab may be permitted in the described area if it supports and does not extend beyond the perimeter of a habitable structure elevated on pilings and if no walls are erected that prohibit the natural transfer of sand; an impervious surface may be permitted in the described area if it does not exceed 5% of the area of the permitted habitable structure).

The proposed activity will be considered inconsistent with this Ordinance, and therefore, will not be approved if the activity:

a. Reduces the size of the public beach or encroaches on the public beach in any manner, except for man-made vegetated mounds and dune walkovers constructed in compliance with the requirements of this Ordinance.

b. Functionally supports or depends on or is otherwise related to proposed or existing structures that encroach on the public beach, regardless of whether the encroaching structure is on land that was previously landward of the public beach.

c. Closes any existing public beach access or parking area, unless equivalent or better public access or parking is established.

d. Cumulatively or indirectly impairs or adversely affects public use of or access to and from a public beach, including failure to comply with any requirements in Management of the Public Beach unless equivalent or better access or parking is established.

e. Fails to comply with Requirements for Beachfront Construction & Dune Protection Permits.

(g) Prohibited Activities

The Building Official shall not issue a permit or certificate authorizing the following actions within and seaward of the Dune Permitting Area.

(1) Activities that are likely to result in the temporary or permanent removal of sand from the portion of the beach/dune system located on or adjacent to the construction site, including:

a. Relocating sand which lies seaward of the Dune Protection Line.

b. Temporarily or permanently moving sand off the site, except for purposes of permitted mitigation, compensation, or an approved dune restoration or beach nourishment project and then only from areas where the historical accretion rate is greater than one foot per year, and the project does not cause any adverse effects on the sediment budget.

(2) Depositing sand, soil, sediment, or dredged spoil which contains any of the toxic materials listed in Volume 40 of the Code of Federal Regulations, Part 302.4, in concentrations which are harmful to people, flora, and fauna as determined by applicable, relevant, and appropriate requirements for toxicity standards established by the Local, State, and Federal Governments.

(3) Depositing sand, soil, sediment, or dredged spoil seaward of the Dune Protection Line, which is of an unacceptable mineralogy or grain size when compared to the sediments found on the site.

(4) Creating dredged spoil disposal sites, such as levees and weirs without the appropriate local, state, and federal permits.

(5) Constructing or operating industrial facilities not in full compliance with all relevant laws and permitting requirements prior to the effective date of this Ordinance.

(6) Operating recreational vehicles; dune buggy, marsh buggy, minibike, trail bike, jeep, or any other mechanized vehicle that is being used for recreational purposes, but does not include any vehicle not being used for recreational purposes. (Chapter 63. Section 63.002(4), Texas Natural Resource Code).

(7) Mining the dunes.

(8) Constructing concrete slabs or other impervious surfaces seaward of the Dune Protection Line.

(9) Depositing trash, waste, or debris including inert materials such as concrete, stone, and bricks that are not part of the permitted on-site construction.

(10) Constructing cisterns, septic tanks, and septic fields seaward of any structure serviced by the cisterns, septic tanks, and septic fields, with the exception of structures located in subdivisions platted before the enactment of this Ordinance.

(11) Detonating bombs or explosives.

(12) A permit or certificate will not be issued that does not comply with FEMA minimum requirements or with Ordinance 87-1.

(13) Erosion response structures as per title 31. Natural Resources & Conservation, Part I, Ch. 15, Subchapter A, Section 15.6;

a. Construction affecting natural drainage patterns will not be permitted unless the construction and property design minimizes impacts on natural hydrology and does not cause erosion to adjacent properties, critical dune areas, or the public beach.

b. Retaining walls are prohibited within 200 feet landward of the Line of Vegetation.

c. Repairing existing erosion response structures within 200 feet landward of the Vegetation Line except in the following circumstances.

1. Failure to repair the structure, as determined by the Planning Commission, will cause unreasonable hazard to a public building, public road, public water supply, public sewer system, or other public facility immediately landward of the structure.

2. Failure to repair the structure, as determined by the Planning Commission, will cause unreasonable flood hazard to habitable structures because adjacent erosion response structures will channel floodwaters to the habitable structure.

(14) The following activities are prohibited within the area seaward of the Dune Protection Line without a Beachfront Construction & Dune Protection Permit:

a. Any activity that shall damage, destroy, or remove a portion or all of a sand dune.

b. Any activity that shall kill, destroy, or remove any vegetation growing on a sand dune or within a critical dune area.

c. Construction of dunes.

d. Placement of fill within the Critical Dune Area.

(15) Where it is shown that a loss of sand, silt, shell, sediment, vegetation or any other geologic or biological component of the Critical Dune Area will result, the following activities, Seaward of the Dune Protection Line, shall be prohibited:

a. Parking of any motor vehicle except in an area approved by the City Council for parking of a motor vehicle.

b. Storage of goods, equipment, building materials, junk, household items, boats, furniture, wares or merchandise of any kind.

c. Any type of construction work, other than that on the main structure or on a main building.

d. Construction of substructures under the main building.

e. Use or placement of playground equipment, volley ball nets, showers, barbecues, stables, utilities, or other apparatus.

f. Horse riding.

g. Wandering, grazing, or running at large of animals, (Ordinance 77-3).

h. Operation of any motor vehicle except for necessary maintenance and clean up.

i. Mowing.

j. Paving of any type.

k. Creation of roads, trails or paths except those access roads approved by Jamaica Beach as part of its access plan.

(h) Technical Standards

Authority: Title 31. Natural Resources & Conservation, Part I, Chapter 15, Subchapter A, Section 15.4, requires Jamaica Beach to comply with the following technical standards when issuing, denying or conditioning a Beachfront Construction & Dune Protection Permit within the Critical Dune Area.

The following standards will be used to determine material weakening and material damage of dune vegetation within a critical

dune area or seaward of the Dune Protection Line. Failure to meet any one of these standards will result in a finding of material weakening or material damage and the Building Official shall not approve the application for the construction as proposed.

(1) The activity shall not result in the potential for increased flood damage to the proposed construction site or adjacent property.

(2) The activity shall not result in run-off or drainage patterns that aggravate erosion on or off the site.

(3) The activity shall not result in significant changes to dune hydrology.

(4) The activity shall not result in adverse affects on dune complexes or dune vegetation.

(5) The activity shall not significantly increase the potential for washovers or blowouts to occur.

(6) Factors other than as stated in Glo 15.3 (s)(7) to be considered are as follows:

a. Cumulative & indirect effects of the proposed construction on all dunes & dune vegetation within the Critical Dune Area or seaward of that area.

b. Cumulative and indirect effects of other activities on dunes and dune vegetation located on the proposed construction site.

c. The pre-construction type, height, width, slope, volume, and continuity of the dunes, the pre-construction condition of the dunes, the type of dune vegetation, and percent of vegetation cover on the site.

d. The local historical erosion rate as determined by the University of Texas at Austin, Bureau of Economic Geology, and whether the proposed construction may alter dunes and dune vegetation in a manner that

may aggravate erosion.

e. The applicant's mitigation plan for any unavoidable adverse effects on dunes and dune vegetation and the effectiveness, feasibility, and desirability of any proposed dune reconstruction and revegetation.

f. The impacts on the natural drainage patterns of the site and adjacent property.

g. Any significant environmental features of the potentially affected dunes and dune vegetation such as their value and function as flora or fauna habitat or any other benefits the dunes and dune vegetation provide to other natural resources.

h. Wind and storm patterns including a history of washover patterns.

i. Location of the site on the flood insurance rate map.

j. Success rates of dune stabilization projects in the area.

k. All comments submitted to the local government by the General Land Office and the Attorney General.

(i) The Mitigation Sequence
The Mitigation Sequence shall be used by local governments in determining whether to issue a permit for an activity seaward of the Dune Protection Line, after the determination that no material weakening of dunes or material damage to dunes will occur within Critical Dune Areas or seaward of the Dune Protection Line. The mitigation sequence is as follows:

(1) Avoiding the impact altogether by not taking a certain action or parts of an action.

(2) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(4) Compensating for the impact by replacing resources lost or damaged.

The above sequence shall be followed as per guidelines promulgated in Title 31. Natural Resources and Conservation, Part I, General Land Office, Chapter 15. Coastal Area Planning, Subchapter A. Management of the Beach/Dune System, Section 15.4 Dune Protection Standards. The permittee shall be deemed to have failed to achieve compensation if a 1.1 ratio has not been achieved within three years after beginning compensation efforts. If, for any reason, an applicant cannot demonstrate the ability to mitigate adverse effects on dunes and dune vegetation, the Building Official is not authorized to issue the Permit.

SPECIAL STANDARDS FOR ERODING AREAS SOUTH OF THE DUNE PROTECTION LINE

Authority: Title 31. Natural Resources and Conservation, Part I, Chapter 15, Subchapter A, Section 15.6, requires Jamaica Beach to comply with the following standards for eroding areas, when issuing, denying or conditioning a Beachfront Construction & Dune Protection Permit.

An eroding area is defined as follows: A portion of the shoreline which is experiencing an historical erosion rate of greater than one foot per year based on published data of the University of Texas at Austin, Bureau of Economic Geology. In addition to those standards previously promulgated in this Ordinance, in eroding areas, the City shall require:

(1) That structures be elevated in accordance with Fema minimum standards.

(2) That structures located on property adjacent to the public beach be designed for feasible relocation (ie. on piers).

(3) Prohibit paving or altering the ground below the lowest habitable floor for those properties located in eroding areas (gravel or crushed limestone may be used to stabilize driveways).

(3) Require financial assurance to fund eventual relocation or demolition of the proposed structure (e.g., through proof of Upton-Jones coverage in the National Flood Insurance Program).

MANAGEMENT OF THE PUBLIC BEACH

Authority: Title 31. Natural Resources & Conservation, Part I, Chapter 15, Subchapter A, Section 15.7, requires Jamaica Beach to apply the following standards in issuing, denying or conditioning Beachfront Construction & Dune Protection Permits relating to management of the public beach.

(1) The City shall encourage carefully planned beach nourish-

ment for erosion response and prohibit erosion response structures within the public beach and 200 feet landward of the natural vegetation line.

(2) Permittees are required to notify the General Land Office and the City of any discernible change in the erosion rate on their property, as stated in GLO 15.7(c).

(3) Requirements for Beach Nourishment Projects:

a. The project must be consistent with the City's dune and beach policies;

b. The sediment to be used must be of effective grain size, mineralogy, and quality or the same as the existing beach material, may be used for a sub-base for dune enhancement projects subject to the approval of the City Council;

c. The material must be free of toxins as defined in Volume 40 of the Code of Federal Regulations, Part 302.4 in concentrations which are harmful to people, flora, and fauna as determined by applicable, relevant, and appropriate requirements for toxicity standards established by the local, state, and federal governments;

d. There will be no adverse environmental effects on the property surrounding the area from which the sediment will be be taken or to the site of the proposed nourishment;

e. The removal of sediment will not have adverse impacts on flora and fauna;

f. There will be no adverse effects caused from transporting the nourishment material;

g. The City may allow restoration of dunes on the public beach up to 20 feet, if it is determined that the seaward migration of the dunes would occur naturally. Dune Restoration seaward of the 20 foot limit must receive GLO approval. Interference with public use of the beach is prohibited. Dune reconstruction must approximate the natural formation of dunes and indigenous vegetation must be used. The following methods and materials shall not be permitted:

1. hard or engineered structures.

2. non-biodegradable items.

3. fine clay or silty sediments.

4. toxic materials as previously defined in this Ordinance.

Restored or man-made dunes will be protected under the same standards as natural dunes.

(j) Public Beach Use and Access

Authority: Title 31. Natural Resources & Conservation, Part I, Chapter 15, Subchapter A, Section 15.7, requires Jamaica Beach to regulate pedestrian and vehicular access, traffic and parking on the beach only in a manner that preserves or enhances existing public right to use and have access to and from the beach.

Jamaica Beach shall presume that any beach fronting the Gulf of Mexico within its jurisdiction is a public beach unless the owner of the adjacent land obtains a Declaratory Judgment otherwise under the Open Beaches Act, Sec. 61.019. The Attorney General shall make the determination on issues relating to the location of the boundary of the public beach and encroachments on the public beach pursuant to the requirements of the Open Beaches Act.

Jamaica Beach shall regulate pedestrian and vehicular beach access, traffic and parking on the public beach only in a manner that preserves or enhances existing public access and use. The following standards will be observed when regulating access and parking on the beach. The street on the south side of State Highway 3005, adjacent to the State Park on Jamaica Beach's eastern boundary, allows access to the beach. Another access point is Buccaneer Drive.

(1) Parking requirements for all new or replatted developments on or adjacent to the beach, will be calculated at one (1) space for each 15 linear feet of beach frontage.

(2) Signs shall be displayed in a conspicuous location identifying access and parking for the public beach.

(3) All parking and access plans must be consistent with General Land Office regulations as promulgated in Title 31. Natural Resources and Conservation, Part I. General Land Office, Chapter 15. Coastal Area Planning, Subchapter A. Management of the Beach/Dune System, Section 15.7 and Section 61.015. Natural Resources Code.

(4) Jamaica Beach is granted authority to regulate animals on public beaches by Subchapter D of Section 61 of the Texas Natural Resources Code (Section 61.122b); however, livestock grazing is exempt from the Dune Protection Act.

(5) Beach Traffic Orders: All beach traffic orders, including but not limited to, parking, access, signage, obstructions, and speed limits shall be in conformance with Jamaica Beach City Codes.

(6) Beach Maintenance Activities:

a. Jamaica Beach shall prohibit beach maintenance activities which will result in the significant redistribution of sand or which will significantly alter the beach profile. Jamaica Beach contracts with the City of Galveston for beach maintenance.

b. All sand moved or redistributed due to beach maintenance activities shall be returned to a location within the Critical Dune Areas.

c. It is prohibited to display on or adjacent to any public beach any sign, marker, or warning, or make or allow to be made any written or oral communication which states that the public beach is private property or represent in any other manner that the public does not have the right of access to and from the public beach or the right to use the public beach as guaranteed by the Open Beaches Act and the Common Law Right of the public.

(7) Beach User Fees:

a. Jamaica Beach may charge public beach users a fee in exchange for providing services to public beach users in general. Currently, no public beach user fee is charged.

b. Jamaica Beach may only impose a public beach user fee in accordance with GLO rule 15.8(c) based on the cost of providing public services and facilities directly to the public beach.

c. A new or amended beach user fee shall be preceded by a State approved beach user fee plan submitted by the City.

d. Revenues from beach user fees may be used only for beach-related services as defined by Title 31. Natural Resources and Conservation, Part I, Chapter 15, Subchapter A, Section 15.8 and Section 63.053, Natural Resources Code.

e. Accounting and administration of all beach user fees shall be in conformance with those policies promulgated

in Title 31. Natural Resources and Conservation, Part I, Chapter 15, Subchapter A, Section 15.8.

PENALTIES

Authority: Title 31. Natural Resources & Conservation. Part I, Chapter 15, Subchapter A, Section 15.9, establishes the following penalties.

Any person who violates the Dune Protection Act - Texas Natural Resources Code 63.001, the Open Beaches Act - 61.013, and General Land Office rule 15.2, or a Permit Condition established by this regulation is liable to the General Land Office for a civil penalty of not less than $50 nor more than $1000 per violation per day. Each day the violation occurs or continues is considered a separate violation.

Any violation of a Permit requirement, Dune Protection and Beach Access Plan, the Dune Protection Act, the Open Beaches Act, Title 31, Part I, Chapter 15, Subchapter A, Sections 15.3 - 15.10, Management of the Beach/Dune System, shall be reported by the City to the General Land Office within 24 hours.

REPEAL OF CONFLICTING ORDINANCES - SEVERABILITY

If any section, subsection, paragraph, sentence, clause, phrase or word in this Ordinance, or the application thereof to any person of circumstance, be held invalid, such holding shall not affect the

validity of the remaining portion of this order. In the case of a conflict between this Ordinance and any other City Ordinances, the Ordinance containing higher standards for Dune Protection will prevail.

MASTER PLANNED DEVELOPMENTS

A. "Master Planned Development" means proposed development for which approval is requested by submission of a comprehensive plan containing maps, drawings, narrative, tables, and other information about the proposed use of specific land and/or water including descriptions of uses and use intensities, building and/or site improvement locations and sizes, relationships between buildings and improvements, vehicular and pedestrian access and circulation systems, parking, utility systems, stormwater management and treatment systems, geography, geology, impact assessments, regulatory-approved checklist, and phasing. Information in the master plan may be conceptual or detailed depending on the status of its regulatory approval.

b. At least 60 days prior to acting on a request for approval of a master planned development within the area

subject to this Ordinance, Jamaica Beach shall send the plan to the General Land Office and the Attorney General's office for review.

c. When acting on a request for approval of a master planned development, the City Council shall consider:

1. The development's potential effects on dunes, dune vegetation, public beach use and access, and the applicant's proposal to mitigate for such effects throughout the construction.

2. The contents of the plan.

3. Whether any component of the development, such as installation of roads or utilities, will subsequently require a permit or a certificate.

d. If the City Council determines that any development, contemplated by the plan complies with all requirements of this Ordinance, a permit and/or certificate for the development may be issued.

e. If the City Council determines that any development contemplated by the plan does not comply with the requirements of this Ordinance and therefore can not be approved without an amendment to this Ordinance, the City

Council shall not issue a permit and/or certificate, but shall submit the plan to the General Land Office and the Attorney General's Office for approval as an amendment to this Ordinance.

E X H I B I T - A

APPENDIX I

A local government is not authorized to issue a permit or certificate authorizing construction or operation of the dune areas or seaward of a dune protection line, as provided in 15.4(c) (5) of this title (relating to Dune Protection Standards), with the exception of activities in Part 1, Division D, Major Group 20, Industry Group 209, Industry Numbers 2091 and 2092, as provided in the definition of "Industrial Facilities" in 15.2 of this title (relating to Definitions). This appendix is taken from the Standard Industrial Classification Manual as adopted by the Excecutive Office of the President, Office of Management and Budget (1987 ed.).

DIVISION D. MANUFACTURING

Major Group 20.	Food and kindred products, except Industry Numbers 2091 and 2092
Major Group 21.	Tobacco products
Major Group 22.	Textile mill products
Major Group 23.	Apparel and other finished products made from fabrics and similar materials
Major Group 24.	Lumber and wood products, except furniture
Major Group 25.	Furniture and fixtures
Major Group 26.	Paper and allied products
Major Group 27.	Printing, publishing, and allied industries
Major Group 28.	Chemicals and allied products
Major Group 29.	Petroleum refining and related industries
Major Group 30.	Rubber and miscellaneous plastics products
Major Group 31.	Leather and leather products
Major Group 32.	Stone, clay, glass, and concrete products
Major Group 33.	Primary metal industries
Major Group 34.	Fabricated metal products, except machinery and transportation equipment
Major Group 35.	Industrial and commercial machinery and computer equipment
Major Group 36.	Electronic and other electrical equipment and components, except computer equipment
Major Group 37.	Transportation equipment
Major Group 38.	Measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks
Major Group 39.	Miscellaneous manufacturing industries

DIVISION E. TRANSPORTATION, COMMUNICATIONS, ELECTRIC, GAS, AND SANITARY SERVICES

Major Group 49.	Sanitary services (sewerage systems, refuse systems, sanitary services not elsewhere classified)

E X H I B I T - A

Appendix I - continued

MISCELLANEOUS FOOD PREPARATION AND KINDRED PRODUCTS

Industrial facilities listed in Industry Number 2091 are not considered "industrial facilities" as defined in 15.2 of this title (relating to Definitions).

2091 Canned and Cured Fish and Seafoods

Establishments primarily engaged in cooking and canning fish, shrimp, oysters, clams, crabs, and other seafoods, including soups; and those engaged in smoking, salting, drying, or otherwise curing fish and other seafoods for the trade. Establishments primarily engaged in shucking and packing fresh oysters in nonsealed containers, or in freezing or preparing fresh fish, are classified in Industry 2092.

- Canned fish, crustacea, and mollusks
- Caviar, canned
- Chowders, fish and seafood: canned
- Clam bouillon, broth, chowder, juice: bottled or canned
- Codfish: smoked, salted, dried, and pickled
- Crab meat, canned and cured
- Finnan haddie (smoked haddock)
- Fish and seafood cakes: canned
- Fish egg bait, canned
- Fish, canned and cured
- Fish: cured, dried, pickled, salted, and smoked
- Herring: smoked, salted, dried, and pickled
- Mackerel: smoked, salted, dried, canned, and pickled
- Oysters, canned and cured
- Salmon: smoked, salted, dried, canned, and pickled
- Sardines, canned
- Seafood products, canned and cured
- Shellfish, canned and cured
- Shrimp, canned and cured
- Soups, fish and seafood: canned
- Stews, fish and seafood: canned
- Tuna fish, canned

E X H I B I T - A

Appendix I - continued

MISCELLANEOUS FOOD PREPARATIONS AND KINDRED PRODUCTS

Industrial facilities listed in Industry Number 2092 are not considered "industrial facilities" as defined in 15.2 of this title (relating to Definitions).

2092 Prepared Fresh or Frozen Fish and Seafoods

Establishments primarily engaged in preparing fresh and raw or cooked frozen fish and other seafoods and seafood preparations, such as soups, stews, chowders, fishcakes, crabcakes, and shrimp-cakes. Prepared fresh fish are eviscerated or processed by removal of heads, fins, or scales. This industry also includes establishments primarily engaged in the shucking and packing of fresh oysters in nonsealed containers.

- Chowders, fish and seafood: frozen
- Crabcakes, frozen
- Crabmeat picking
- Crabmeat, fresh: packed in nonsealed containers
- Fish and seafood cakes, frozen
- Fish Fillets
- Fish sticks
- Fish: fresh and frozen, prepared
- Oysters, fresh: shucking and packing in nonsealed containers
- Seafoods, fresh and frozen
- Shellfish, fresh: shucked, picked, or packed
- Shrimp, fresh and frozen
- Soups, fish and seafood: frozen
- Stews, fish and seafood: frozen

TITLE 31. NATURAL RESOURCES AND CONSERVATION
CHAPTER 15. COASTAL AREA PLANNING
SUBCHAPTER A. MANAGEMENT OF THE BEACH/DUNE SYSTEM
SECTION 11. CERTIFICATION OF LOCAL GOVERNMENT DUNE PROTECTION AND BEACH ACCESS PLANS

<p>The General Land Office proposes new <*>15.11 concerning certification of local government dune protection and beach access plans ("plans"). The Texas Natural Resources Code, Chapters 61 and 63, and 31 TAC <*>15.3(o) require all local governments with jurisdiction over gulf beaches to submit plans to the General Land Office. The General Land Office adopted rules for management of the beach/dune system (31 TAC <*><*>15.1-15.10) in February, 1993, which provide the minimum standards for content and implementation of local plans.

<p>The General Land Office has reviewed the plans identified in <*><*>15.11(a) and (b) of this section and hereby certifies that all thirteen plans comply with state law. Subsection 15.11(a) of this section identifies eight local governments whose plans are certified without conditions; <*>15.11(b) of this section certifies five plans with the condition that the pertinent local governments modifying their plans consistent with General Land Office comments sent to the local governments and referenced in <*>15.11(b) of this section. Such modification of plans identified in <*>15.11(b) of this section must be formally

adopted by the local governments on or before 180 days from the effective date of this section, unless the provisions of <*>15.11(d)(2) of this section apply.

<p>Caryn K. Cosper, deputy commissioner for Resource Management, has determined that there will be fiscal implications as a result of enforcing or administering the section. The effect on state government for the first five-year period of the section will be due to additional time spent by staff reviewing a limited number of local government permits either (1) at the request of the local government or (2) as part of an audit to be conducted by the General Land Office to monitor compliance with state law. Because staff is already performing this function, any increase in fiscal implications is expected to be minimal. Specific fiscal impacts cannot be identified as the annual number of permits and certificates reviewed by General Land Office staff varies according to the rate of construction occurring within the geographic scope of the area regulated by this chapter.

<p>The estimated effect on local governments for the first five-year period the section will be in effect are expected to be minimal. All local governments impacted by this subchapter participate in the Federal Flood Insurance Program, and therefore have adopted commissioners court orders or ordinances governing beachfront construction, in addition to any local building code requirements. The application requirements in <*>15.3(s)(4) of

this chapter were extracted from various existing requirements for construction applications created by local governments along the Gulf Coast. In addition, this section allows local governments to implement a system for collection of beach user fees which is specifically authorized for expenditures relating to the public beach.

<p>The cost of compliance with the section for small and large businesses is best addressed through a discussion of the cost of compliance for individuals, as businesses are considered "individuals" or "persons" pursuant to the definition of the latter term in 31 TAC <*>15.2. Estimated cost of compliance for individuals is expected to be minimal, based on the cost of providing information required for a dune protection permit and a beachfront construction certificate. Because the information required under the various plans largely mirrors those necessary to obtain other authorizations for beachfront construction, the cost is expected to be moderate. However, costs are difficult to estimate since the applicants will have differing capacities for providing the required information and the information required will vary from site to site depending not only on the terrain but also the nature and scope of the proposed project. In general, it is anticipated that smaller projects (e.g., a single-family seasonal residence) would incur significantly lower costs than a large-scale commercial project.

<p>In addition to the information costs, costs will be incurred if the applicant proposes damage to dunes or dune vegetation for which mitigation is required. These costs are not predictable on a uniform basis, as they will vary considerably depending on the amount of mitigation required.

<p>Individuals will incur costs when using and accessing the public beach where a beach user fee is charged; however, each jurisdiction charging a beach user fee is required to provide a "free" beach, where no fees are charged. Because individuals are not required to pay beach user fees at all beaches, and such fees vary from jurisdiction to jurisdiction, a uniform cost estimate for individuals cannot be predicted.

<p> Ms. Cosper has determined that for each year of the first five years the section, as proposed, is in effect the public benefit anticipated as a result of enforcing the section will be increased flood protection for private and public property and beachfront structures; guaranteed preservation and enhancement of public beach use, recreation and access; natural resource and habitat protection; maintenance of the sediment supply to slow erosion; and establishment and maintenance of beach-related facilities and services.

<p>Comments on the proposed rule may be submitted to Ashley K. Wadick, General Land Office, Legal Services Division, 1700 North Congress Avenue, Room 630, Austin, Texas, 78701-1495, Fax:

512/463-6311. Ms. Wadick will also provide copies of any General Land Office comments referenced in <*>15.11(b) of this section upon written request.

<p>The new section is proposed under the Natural Resources Code, <*>61.011(d)(5) and <*>63.121 which provide the General Land Office with the authority to promulgate rules, respectively, for the certification of local government beach access and use plans and for the identification and protection of critical dune areas.

<*>15.11. Certification of Local Government Dune Protection and Beach Access Plans.

(a) Certification of local government plans. The following local governments have submitted plans to the General Land Office which are certified as consistent with state law:

(1) Brazoria County,

(2) Chambers County,

(3) City of Port Aransas,

(4) City of Port Arthur,

(5) Jefferson County,

(6) Matagorda County,

(7) Town of Quintana, and

(8) Village of Jamaica Beach.

(b) Conditional certification of local government plans. The following local governments have submitted plans to the General

Land Office which are conditionally certified as consistent with state law.

(1) City of Corpus Christi. This certification is valid for 180 days, during which time the City of Corpus Christi will modify its plan consistent with the General Land Office comments submitted to the City of Corpus Christi (October 14, 1993).

(2) City of Galveston. This certification is valid for 180 days, during which time the City of Galveston will modify its plan consistent with the General Land Office comments submitted to the City of Galveston (October 14, 1993).

(3) Galveston County. This certification is valid for 180 days, during which time Galveston County will modify its plan consistent with the General Land Office comments submitted to Galveston County (October 18, 1993).

(4) Kleberg County. This certification is valid for 180 days, during which time Kleberg County will modify its plan consistent with the General Land Office comments submitted to Kleberg County (October 14, 1993).

(5) Village of Surfside Beach. This certification is valid for 180 days, during which time the Village of Surfside Beach will modify its plan consistent with the General Land Office comments submitted to the Village of Surfside Beach (December 3, 1993).

(c) Implementation of conditionally certified plans. Local governments are required to implement conditionally certified

plans consistent with the Natural Resources Code, Chapters 61 and 63, and the General Land Office rules for management of the beach/dune system, <*><*>15.1-15.10 of this section.

(d) Removal of conditions of certification.

(1) Local governments shall submit their modified plans on or before the expiration of the 180 day time period. The General Land Office shall provide to the pertinent local government a determination as to the sufficiency of the modification(s) within 60 days of receipt of the plan. The General Land Office will remove all conditions of the plan's certification by amending this subsection. Such amendments will list the name of the pertinent local government in subsection (a) of this section, and delete the same from subsection (b) of this section. If the General Land Office determines that modifications of plans are insufficient, the General Land Office shall provide specific exceptions to the modifications. If those portions of the plan to which the General Land Office has noted exceptions can be addressed through further comment, plan revision and review, conditional certification will be reissued pursuant to a General Land Office amendment to this subsection, subject to further plan modification.

(2) In the event that a local government chooses not to modify its plan as requested in the General Land Office comments, the local government shall provide in writing the scientific or legal

justification as to why such modifications are not feasible. The justification shall be submitted to the General Land Office on or before the due date of the revised plan. The justification will be reviewed by the General Land Office, and a determination as to the sufficiency of the justification will be provided to the local government within 60 days of receipt by the General Land Office. Local government plans shall continue in effect under conditional certification until the sufficiency of the justification is resolved or this section is amended.

(e) Withdrawal of conditional certification. Conditional certification of a local government plan shall be withdrawn by the General Land Office after the 180-day time period if the pertinent local government does not submit to the General Land Office either a formally adopted plan which has been modified consistent with General Land Office comments or the written scientific or legal justification as to why such modification is not feasible. In any event, withdrawal of conditional certification shall only occur after the General Land Office adopts an amendment to this subsection withdrawing conditional certification, with accompanying specific reasons, and the General Land Office has given the pertinent local government written notice of the withdrawal of the conditional certification.

(f) This section does not affect the General Land Office interim certification issued to Nueces County and Cameron County on October 9, 1992 (31 TAC, Subchapter E relating to Interim Approval of Local Government Dune Protection and Beach Access Plans) which continues in effect.

ORDINANCE 99-02

AN ORDINANCE OF THE CITY OF JAMAICA BEACH, TEXAS, AMENDING THE DUNE PROTECTION AND BEACH ACCESS PLAN OF THE CITY OF JAMAICA BEACH BY ALLOWING FOR THE USE OF FOUR FEET BY FOUR FEET SECTIONS OF UNREINFORCED FIBERCRETE MATERIAL IN THE AREA BETWEEN OVER 25 FEET FROM THE NORTH TOE OF THE DUNE TO 200 FEET FROM THE LINE OF VEGETATION AND BY ASSESSING THE "FIBERCRETE MAINTENANCE FEE" OF TWO HUNDRED DOLLARS.

WHEREAS, the Dune Protection and Beach Access Plan of the City of Jamaica Beach, Texas, currently prohibits the use of concrete slabs or other impervious surfaces from 0 to 200 feet landward of the vegetation line; and

WHEREAS, developers wish to use unreinforced fibercrete in 4 feet by 4 feet sections from 25 feet to 200 feet landward of the vegetation line; and

WHEREAS, the Texas General Land Office has approved the use of fibercrete in the City of Galveston if the City of Galveston agrees to remove the fibercrete should the need arise; and

WHEREAS, the City of Jamaica Beach wishes to allow the use of unreinforced fibercrete and will institute a $200 beachfront cleanup fee to generate revenues to pay for the cleanup of fibercrete from the public beaches should the need arise by establishing a fibercrete maintenance fee;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF JAMAICA BEACH, TEXAS:

SECTION 1. Paving or altering the ground below the lowest habitable floor is prohibited in the area between the line of vegetation and 25 feet landward of the north toe of the dune.

SECTION 2. Paving used under the habitable structure and for a driveway connecting the habitable structure and the street is limited to the use of unreinforced fibercrete in 4 feet by 4 feet sections, which shall be a maximum of four inches thick with sections separated by expansion joists, or pervious materials approved by the City Building Official, in that area 25 feet landward of the north toe of the dune to 200 feet landward of the line of vegetation. The City shall assess a "Fibercrete Maintenance Fee" of $200 to be used to pay for the cleanup of fibercrete from the public beaches should the need arise. Reinforced concrete may be used in that area landward of 200 feet from the line of vegetation.

SECTION 3. The City Council of the City of Jamaica Beach, Texas, hereby specifically designates the "Fibercrete Maintenance Fee" to be used to pay for the cleanup of fibercrete from the public beaches should the need arise.

SECTION 4. The violation of any provision of this ordinance, shall be unlawful and a Misdemeanor offense punishable by a fine not exceeding two hundred dollars ($200.00).

SECTION 5. It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses and phrases of this Ordinance are severable and, if any phrase, clause, sentence, paragraph or section of this Ordinance should be declared invalid by the final judgment or decree of any court of competent jurisdiction, such invalidity shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this Ordinance.

SECTION 6. All Ordinances or parts thereof in conflict herewith are repealed to the extent of such conflict only.

SECTION 7. This Ordinance shall be and become effective from and after its adoption and publication in accordance with State Law with the approval of said Ordinance by the Attorney General and the General Land Office.

PASSED AND APPROVED this 15 day of February, 1999.

Kenneth R. Dennis, Mayor
City of Jamaica Beach

ATTEST

T.D. White, City Secretary
City of Jamaica Beach

ORDINANCE NO. 2007-6

AN ORDINANCE OF THE CITY OF JAMAICA BEACH, TEXAS, AMENDING THE DUNE PROTECTION AND BEACH ACCESS PLAN OF THE CITY OF JAMAICA BEACH BY ALLOWING FOR THE USE OF FOUR FEET BY FOUR FEET SECTIONS OF UNREINFORCED FIBERCRETE MATERIAL IN THE AREA BETWEEN OVER 25 FEET FROM THE NORTH TOE OF THE DUNE TO 200 FEET FROM THE LINE OF VEGETATION AND BY ASSESSING THE "FIBERCRETE MAINTENANCE FEE" OF TWO HUNDRED DOLLARS.

WHEREAS, the Dune Protection and Beach Access Plan of the City of Jamaica Beach, Texas, currently prohibits the use of concrete slabs or other impervious surfaces from 0 to 200 feet landward of the vegetation line; and

WHEREAS, developers wish to use unreinforced fibercrete in 4 feet by 4 feet sections from 25 feet to 200 feet landward of the vegetation line; and

WHEREAS, the Texas General Land Office has approved the use of fibercrete in the City of Galveston if the City of Galveston agrees to remove the fibercrete should the need arise; and

WHEREAS, the City of Jamaica Beach wishes to allow the use of unreinforced fibercrete and will institute a $200 beachfront cleanup fee to generate revenues to pay for the cleanup of fibercrete from the public beaches should the need arise by establishing a fibercrete maintenance fee. In the case of a hurricane, it is anticipated that federal, state and local disaster relief funds will be used prior to any use being made of the fibercrete maintenance fees: and

WHEREAS, the City of Jamaica Beach finds the following reasons justify the use of fibercrete in that area between 25 feet landward of the north toe of the dune to 200 feet landward of the line of vegetation:

1. Clean up of the fibercrete, should that be necessary, would be quicker, easier, and more economical than clean up of brick pavers (which is an approved material) since the fibercrete will not be scattered and/or sink into the sand and be covered up by the storm tides and wind. Fibercrete is an inexpensive hard surface (compared to brick pavers) which is aesthetically acceptable to both builders and those persons wishing to purchase beach houses on West Galveston Island. The fibercrete, as placed, will not impact the beach/dune system in any greater manner than will the materials currently permitted to be used under the regulations.

2. The primary responsibility for clean up of fibercrete from the public beach easement is placed upon the property owner. The property owner will be required to execute a Beachfront Construction and Dune Protection Permit, which requires the property owner to clean up any debris, including any fibercrete, deposited on the public beach. The $200.00 permit fee will assist the City in the clean up process should it become necessary for the City to perform the clean up. The money generated by this fee will be placed in a fund not to be used for anything other than the clean up of fibercrete which may end up within the public beach easement.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF JAMAICA BEACH, TEXAS:

SECTION 1. Paving or altering the ground below the lowest habitable floor is prohibited in the area between the line of vegetation and 25 feet landward of the north toe of the dune.

SECTION 2. Paving used under the habitable structure and for a driveway connecting the habitable structure and the street is limited to the use of unreinforced fibercrete in 4 feet by 4 feet sections, which shall be a maximum of four inches thick with sections separated by expansion joists, or pervious materials approved by the City Building Official and the driveway width shall be limited to no more than the width necessary to service two vehicles, in that area 25 feet landward of the north toe of the dune to 200 feet landward of the line of vegetation. The City shall assess a "Fibercrete Maintenance Fee" of $200 to be used to pay for the cleanup of fibercrete from the public beaches should the need arise. Reinforced concrete may be used under the habitable structure and for a driveway connecting the habitable structure and the street in that area landward of 200 feet from the line of vegetation.

SECTION 3. The City Council of the City of Jamaica Beach, Texas, hereby specifically designates the "Fibercrete Maintenance Fee" to be used to pay for the cleanup of fibercrete from the public beaches should the need arise.

SECTION 4. The violation of any provision of this ordinance, shall be unlawful and a Misdemeanor offense punishable by a fine not exceeding two hundred dollars ($200.00).

SECTION 5. It is hereby declared to be the intention of the City Council that the sections, paragraphs, sentences, clauses and phrases of this Ordinance are severable and, if any phrase, clause, sentence, paragraph or section of this Ordinance should be declared invalid by the final judgment or decree of any court of competent jurisdiction, such invalidity shall not affect any of the remaining phrases, clauses, sentences, paragraphs and sections of this Ordinance.

SECTION 6. All Ordinances or parts thereof in conflict herewith are repealed to the extent of such conflict only.

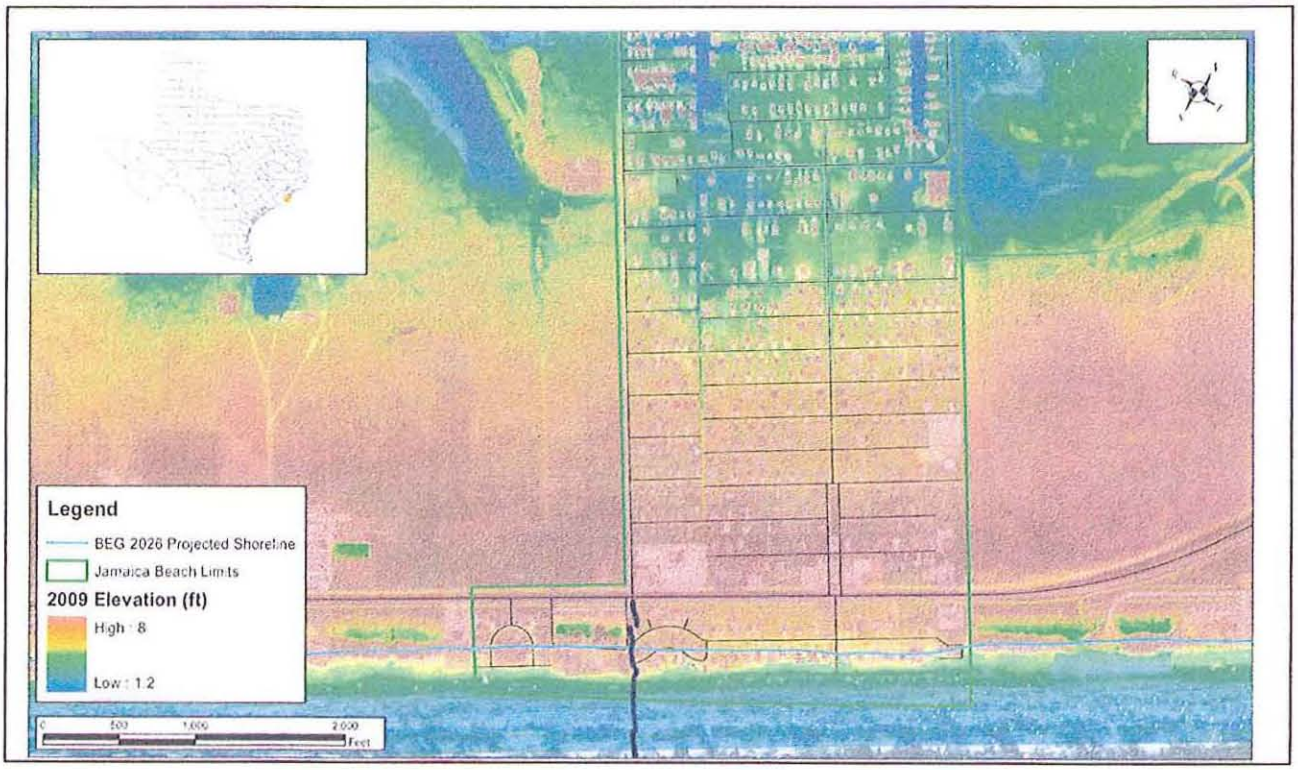
SECTION 7. This Ordinance shall be and become effective from and after its adoption and publication in accordance with State Law with the approval of said Ordinance by Texas General Land Office.

PASSED AND APPROVED this 17TH day of September, 2007.

Victor Pierson, Mayor
City of Jamaica Beach]

ATTEST

T.D. White, City Secretary



Jamaica Beach Erosion Response Plan

Submitted to the
Texas General Land Office
In Compliance with
31 TAC 15.17

Approved for Submission
July 16, 2012

Prepared by:

Peter A. Ravella, Principal
Peter A. Ravella Consulting, LLC

Bill Worsham, P.E.
LJA Engineering, Inc.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

In general terms, a strong and stable dune system is the single best strategy available to Jamaica Beach to reduce potential public expenditures caused by moderate storm and high tide events. Specifically, the City seeks to immediately implement the FEMA Dune Project as defined in Post-Hurricane Ike Project Worksheet SAS010.

Based on extensive public comments on the ERP, the City will not seek to place the FEMA Dune Project on private beachfront property without the expressed written permission from the affected landowners. The City recognizes that property owners may require the dune to be placed seaward of private property in a location more seaward than optimal from a storm-damage reduction standpoint. Such a more seaward location may require modification or reduction of the dune width and volume. The City further recognizes that the location and configuration of the FEMA Dune Project cannot be designed in the ERP. The City commits to work with the project engineer, once selected, and the landowners to ensure the dune design is workable for all involved.

The City will: (1) Install four ADA compliant public dune walkovers in conjunction with the FEMA Dune Project at (a) Beachcomber Street, (b) Buccaneer Street, (c) east end of West Beach Road, and (d) the west end of West Beach Road; and (2) Modify the two vehicular access points to elevate and stabilize the roadways to a maximum elevation of +10' NAVD-88 as the road passes through the FEMA Dune Project Dune Project. The elevated and stabilized "drive over dune" will eliminate a dune gap and path for storm surge to enter the community. Grant funds will be sought to explore the feasibility and implement improvements to access points.

To reduce damage to the beach dune system and to promote natural recovery of the shoreline, the City also intends to investigate and if appropriate further limit vehicle access on the beach itself. Substantial evidence exists in the Galveston Island State Park immediately adjacent to the City that pedestrian beaches are generally wider, have larger dunes, and are more resilient and storm resistant. The City recognizes that expanding or creating a pedestrian-only beach will prompt substantial public interest and comment and require modification of its Beach Dune Plan and certification of any change by the GLO. Among many issues, the City understands that dedicated public parking will be required (1 parking space for every 15 linear feet of pedestrian beach) if the beach or a portion thereof is closed to vehicles. The City cannot and does not propose a specific vehicle access plan in the ERP as to do so would be inappropriate and unworkable for the community. However, the City does seek to make known its intention to explore this issue in an open process with its citizens, property owners, beach users and the GLO.

The city intends to seek TWDB funds to study, design and implement a stormwater drainage modification project to redirect all drainage away from the beach and to West Bay. If successful, this modification will allow the community to complete and maintain a continuous dune complex and provide a substantial level of additional storm damage protection to the community. To be effective, the drainage modification project must be coupled with modification of the two vehicular beach access points as described herein.

The City does not propose to implement a strict setback line in this ERP or to prohibit construction seaward of the line. Rather, the City seeks to grandfather all existing structures within a defined "dune conservation area" and to require compliance with higher, more protective building standards if the structures are substantially repaired or if new or expanded structures are constructed. The Setback Line will therefore be referred to as the **Dune Conservation Area Line**.

FIRST GLO REVIEW DRAFT
JAMAICA BEACH EROSION RESPONSE PLAN

1. OVERVIEW

Recognizing the long-term benefits of effective shoreline management, the City of Jamaica Beach has elected to prepare and implement an Erosion Response Plan, pursuant to state law TNRC §33.607 and administrative rules found at 31 TAC §15.17 *et seq.*

1.1 Purpose

In accordance with state law, the City of Jamaica Beach has elected to prepare an Erosion Response Plan. In general, the purpose of this plan is to explore means and methods to reduce future public expenditures caused by damage to property and infrastructure by future shoreline change, erosion, and storms.

In 2009, the Texas Legislature passed House Bill 2571 which mandated that each coastal community develop an Erosion Response Plan (ERP). While the specific components of the plan are suggested in the General Land Office rules, cities and counties that fail to prepare an ERP that fulfils the legislative objectives are ineligible for state assistance under certain grant programs such as the Coastal Erosion Planning and Response Act. It is in the best interest of the City to develop an ERP in accordance with the statute and the regulatory requirements found in Taxes Natural Resources Code, §33.607 and Chapter 31, Texas Administrative Code, §15.17 *et. seq.*

1.2 Scope of the Plan

In this plan, the City of Jamaica Beach has elected to address erosions and storm risks within the current City boundaries. Jamaica Beach is a small city located on Galveston Island, approximately 13 miles west of the Galveston city center. The City occupies about 3,450 feet of gulf beach with 26 dwellings currently situated immediately adjacent to the Gulf of Mexico. Because of the City's short beach length, it is generally not considered cost-effective for the City, acting alone, to undertake and maintain a freestanding beach nourishment program using traditional dredging methods to acquire off-shore sand upplies. Full-scale beach nourishment projects have fixed mobilization and de-mobilization costs that can exceed $1.5 million, making impractical small-scale dredged-material nourishment projects impractical. However, the City has and can be expected to effectively implement a dune restoration and maintenance program and opportunities should be undertaken to explore new, low-cost technologies that may allow small-scale, near-shore dredging operations for beach and dune sand.

The characteristics of Jamaica Beach Gulf shoreline limit the City to three shoreline change response strategies:

1. Cooperative large-scale beach nourishment and dune restoration projects in partnership with the City of Galveston, Galveston County and the General Land Office, if and when available;

2. Aggressive dune restoration and maintenance program within the City boundaries to offset occasional dune losses, reduce potential storm damage to public and private property, and help maintain the shoreline position, and

3. Eventual relocation or removal of structures damaged by storms or persistent shoreline retreat.

1.3 ERP Requirements

The detailed requirements for local Erosion Response Plans are set forth in Chapter 31 Texas Administrative Code, §15.17. In general, the rules require that the ERP address the following elements:

- Construction setback limits
- Prohibitions on construction seaward of the setback line
- Exemptions from the setback line
- Requirements for exempt construction
- Procedures to preserve public access
- Procedures for protection and enhancement of dunes
- Criteria for voluntary acquisition or buyout
- Post-Storm recovery plans

1.4 Process for ERP Development, Adoption and Certification

The process for the development, adoption, and certification of the City's ERP is set forth in the General Land Office (GLO) rules governing the program. Local governments are charged with the responsibility to develop an ERP in draft form for submission to the state no later than July 2010. This draft is intended to fulfill that requirement.

Upon submission to the state, the GLO will review the Draft ERP and provide comments to the City. The City will then have the opportunity to undertake necessary and appropriate revisions to the Draft, leading to the submission of a Final ERP. Once in final form, the City will be required to adopt and include the Plan as an appendix to its existing Beach Access and Dune Protection Plan.

Following local adoption, the GLO will review the ERP for final certification in accordance with state procedures. To do so, the GLO is required to propose an administrative rule to either reject or certify the City's plan. The proposed certification is published in the *Texas Register* followed by a minimum of 30-day public comment period. Assuming acceptable public comments and compliance with all regulatory requirements, the GLO can then move forward with final certification

of the City's ERP in the form of a final administrative rule. The certification process may require up to 180 days to complete.

Once certified, the City is then required to move forward with amendments to its Beach Access and Dune Protection Plan and ultimately to implementation of the certified ERP, completing the adoption, approval, and certification process.

1.5 ERP Shoreline Data Sources

In developing its City's ERP, the City relied on three principle data sources on shoreline conditions and risks associated with erosion and shoreline change: (1) the University of Texas Bureau of Economic Geology (UT-BEG) Shoreline Change Atlas; (2) the Texas General Land Office Coastal Division reports, data and aerial photography; and (3) Texas A&M University at Galveston, Coastal Communities Planning Atlas for Galveston Island. The City also referred to the findings of the State of Texas Hazard Mitigation Plan, 2010-2013 (Texas Division of Emergency Management, October 10, 2010) and the Texas Erosion Response Plan (2009).

Shoreline change rates, beach profiles, and projected shoreline positions were obtained from the UT-BEG. From the GLO, the City obtained the 2009 Texas Coastwide Erosion Response Plan, which includes substantial data and information necessary for the local plan, LIDAR elevation data, and updated aerial photography of the City's shoreline. Finally, the City compiled data on previous dune restoration projects, updated shoreline profiles, and cost estimates for various shoreline management activities. No new field data was collected in ~~during~~ the course of developing this ERP.

In the final version of the Jamaica Beach ERP, the City intends to incorporate more recent aerial photography and shoreline position data, if available.

2. CURRENT SHORELINE MANAGEMENT PRACTICES

2.1. State Guidance on Beach and Dune Management. The preservation and restoration of the dune line provides many benefits to the City and its residents. Land Commissioner Jerry Patterson succulently articulated the value of dunes in the agency's *Dune Protection Manual*:

> "The Texas Coast is an environmental and economic treasure composed of interlocking, interdependent ecological systems. Coastal sand dunes are a crucial part of that system. Dunes serve not only as vital habitat for numerous native plants and animals, but an irreplaceable recreational resource upon which humans must tread lightly."

Most beachfront property owners today understand that the dune line provides an effective natural barrier to erosion, flooding, and storm damage that protects public and private property, including inland infrastructure. In addition, visitors

appreciate that the dune system provides habitat for local plants and animals. It is generally well understood that healthy dunes create a "sand savings account" for the beach itself. While a seawall or other hard structures refract wave energy and protect upland property, these structures can increase the erosion rate over time and undermine the beach. In contrast, a healthy dune system can better absorb wave energy and provide a source of sand to the beach when it is under wave attack. Sand that is stored in the dunes is beneficial to the function and stability of the beach. During storms, dune sand can be redistributed down the beach face by wave attack and erosion, where summer currents can move it back to beach face. This "sand cycle" is well described in the GLO *Dune Protection Manual*:

> "During a storm, high-energy waves flatten the beach. Waves washing against the base of the foredunes erode sand, undermining and collapsing the seaward dune face. In severe storms, the dune face commonly recedes several yards — in extreme cases as much as 100 yards — leaving a steep cliff. Sometimes dunes are completely destroyed. Retreating waves carry the eroded sand offshore and deposit it just seaward of the surf zone in large bars. This process of dune erosion and sand movement dissipates much of the energy of storm waves. Sandbars also dissipate storm wave energy by causing waves to break further offshore.
>
> If the supply of sand remains constant, the natural exchange between the beach, dunes, and offshore areas will repair and rebuild dunes to a height and width determined by local conditions. However, the loss of vegetation that traps and holds sand makes the beach and dunes more susceptible to wind and water erosion, thus inhibiting their recovery from storms. Bays, channels, marshes, and grass flats behind the weakened foredune are exposed to storm-surge flooding and to accumulation of windblown sand." (*Dune Protection Manual*, Chapter 2, page 5).

The General Land Office has adopted beachfront construction and dune protection standards intended to reduce the impact of near-shore construction on dune stability and to protect the public's historic rights to use and enjoy the beach.

The GLO Coastal Construction Handbook (2001) provides assistance and guidance to local governments working to combat coastal erosion on the Gulf of Mexico. Specifically, the Manual urges the following:

1. Designs for coastal construction should avoid any impacts to coastal sand dunes due to their importance as natural buffers to tides and waves and for their function as sources of sand to the beach while impacted by storms.
2. If however, dunes and dune vegetation are impacted by construction activities, the Dune Protection and Improvement Manual for the Texas

Gulf Coast and the Dune Protection Guide provide information on repairing and improving dunes. Both publications are available online from the Land Office.

3. The Beach/Dune Rules require that unavoidable impacts to dunes and dune vegetation be addressed in the design and the construction phases of a project. The repairing, rehabilitating or restoring process is called dune mitigation, and it requires that every scoop of dune sand and every plant that is damaged be replaced, at a minimum, to the extent that it had occurred naturally on the tract. A dune mitigation plan must be submitted along with the permit application. The local government must determine prior to issuing a permit that there will be no mater al weakening of the dunes and dune vegetation.

Through its Beach Dune Plan, the City intends to implement and comply with the GLO rules governing beachfront construction and dune protection.

2.2 Jamaica Beach Dune Restoration Project (2005 - 2006)

In 2006, the City of Jamaica Beach completed a beach and dune restoration project at a cost of more than $1 million, funded in part by the GLO CEPRA program. Unfortunately, the dune project was completely lost in Hurricane Ike in September 2008. Based on the FEMA post-storm damage assessment by Lockwood, Andrews & Newman, Inc. (November 2008), the restoration of the City's beach dune project to pre-Ike conditions was accepted for public assistance and will be replaced. No specific project date has been established at this time but FEMA, GLO and the City are committed to implementing the project.

City of Jamaica Beach Past and Planned Beach and Dune Projects

Project Date	*Sand Source*	*Project Location*	*Project Length (ft)*	*Fill Volume (cu yds)*	*Dune Plants Installed (sq. yds)*	*Total Project Cost*	*Total City Cost*
2006	Truck-Hauled Sand	Jamaica Beach	3,300	75,000	16,666.7	$1,066,667	$266,667
TBD	Truck-Haul or Hopper Dredge	Jamaica Beach	3,300	75,000	16,666.7	$2,181,120	$142,758

The foundation of the City's erosion response strategy is the restoration and on-going maintenance of the dune project, as described and funded in the FEMA post-Ike project description.

2.3 Jamaica Beach Seaweed Management Practices

In April 2011, the City has obtained a Beachfront Construction and Dune Protection Permit governing beach-cleaning services within the town (GLO ID. No. BDVJB-11-0121). The permit authorizes the city to remove seaweed and otherwise maintain the beach, provided the materials are placed landward of 200 feet from the Mean Low Tide Line to minimize reduction of the public beach easement. The GLO cautioned against excessive beach scraping, raking or cleaning and stated a preference for handpicking debris and trash rather than the use of machines.

The City is a careful steward of its beach and has an excellent track record of maintaining the beach in a manner that enhances the public's use and enjoyment of the area while avoiding actions that can damage the beach or dune system.

Goal. The goal of the City's seaweed management program is to limit damage to the beach dune system from beach cleaning and seaweed management activities and to use the cleared seaweed to promote the formation of a continuous dune system along the City's beachfront. The presence of seaweed along the beach is not detrimental to the condition of the shoreline itself but can be a nuisance to beach visitors. In general, the City will seek to limit seaweed scraping and mechanical beach manipulation to circumstances clearly warranting the removal of seaweed.

Harvesting the *Sargassum and* other seaweeds for placement on coppice mounds and dunes is a beneficial and valuable practice. *Sargassum* removal from the beach, however, will conform to the City's management and scheduling requirements. In this plan, the City seeks to better manage its beach cleaning and seaweed maintenance program to reduce adverse impacts to the beach and enhance the dune system whenever possible.

When relocating *Sargassum* from above the high-tide line, care will be taken to separate the seaweed from the sand using hay rakes or other tine-equipped tools. Doing so will allow the surface sand deposited by the surf to remain in place as a supply source for both the dunes system and nearshore berms and terraces. Driven by wind and tides, this dynamic exchange of sand between the dune system, the beach, and the nearshore sandbars can help maintain a proper sand budget across the shore-face. Over-scraping the beach when removing *Sargassum* is detrimental to the beach-dune system and can contribute to shoreline erosion.

Location & Timing of Seaweed Removal. The City will limit the location and timing of its seaweed management practices to those areas that warrant cleaning during periods of high visitor use of the beach. On an on-going basis, the City intends to utilize its Beach Dune Committee to directly oversee the beach cleaning activities of the equipment operators. Prior to each summer season and periodically during the season, the Committee will meet with the equipment operators to review the degree of *Sargassum* deposition, location and timing of areas to be cleaned, and established

appropriate deposition areas in the dune system for any sand and seaweed relocated during the beach maintenance operation.

Seaweed Coverage. The City seeks to limit seaweed removal to circumstances where seaweed coverage and deposition interfere with the public's ~~use and~~ enjoyment of the beach. This subjective decision is a matter of judgment ~~exercised to be~~ by the City Manager, with the advise of the City's Beach Dune Committee.

Management of Scraped Seaweed. In general, under the protocols established in the ERP, the City expects to clear seaweed less frequently than in the past. However, over the course of a year, the City will likely relocate hundreds of cubic yards of sand and seaweed on the beach. This material constitutes a significant resource as a dune building material. The City will maximize the benefits of its maintenance operations by effectively using the collected seaweed to rebuild and enhance the dunes.

3.0 EXISTING SHORELINE CONDITIONS

This section generally describes the existing shoreline conditions in the City of Jamaica Beach. The description is divided into three broad subject areas: (§3.1) Beach Profile, & Dynamics (§3.2) Dune System, and (§3.3) Beach Accessways.

3.1 Beach Profile and Dynamics

3.1.1 Shoreline change rates

The State of Texas has designated the University of Texas—Bureau of Economic Geology (BEG) as the official repository of statewide shoreline change information. BEG mapped historical shorelines using chart data and maps from the 1800's, aerial photography in the 1900's, and more recently LIDAR data and on-the-ground shoreline transects. Long-term average annual rates of shoreline change were determined based on comparisons of the historical and more recent shoreline positions. The determinations generally do not typically consider the physical processes causing shoreline change; rather, they are indications of past rates of such change.

Along the Texas coast, there is considerable variability in actual shoreline change rates from year to year. In Texas, a typical shoreline cycle consists of a large storm-induced retreat followed by months and sometimes years of recovery during relatively benign wave conditions. Shoreline locations also vary seasonally, typically exhibiting winter retreat and summer advance.

As seen in the figure below, BEG recently updated its long-term rates using data sets through 2007 (pre-Ike). The historic erosion rates for Jamaica Beach (shown in meters below) are less than one-foot per year. However, for the purposes of the ERP, the City has chosen to use a -1.0 ft/yr erosion rate, recognizing that significant short-term variability in shoreline positions can occur within this rather modest long-term erosion rate.

Three representative BEG beach transects for Jamaica Beach are included in the table below generally located at the southeast, middle and northeast positions on the City's shoreline (Note, BEG erosion rates have been converted from meters to feet).

Transect 1398 reflects the greatest erosion rate in Jamaica Beach at -0.15 meters per year (-0.49 feet or just about six inches per year) over a 153 year period. All the BEG erosion rates in Jamaica Beach range from -0.33 ft/yr to -0.49 ft/yr. In contrast, a typical BEG erosion rate in the Pirates Beach area is shown for Transect

Representative Jamaica Beach Shoreline Transects & Erosion Rates				Pirates Beach Transect
BEG Beach Transect No.	1410 SE end of city	1398 Middle of city	1392 NE end of city	1310 @ Buccaneer Blvd
End Point Rate (ft/yr)	-0.43	-0.49	-0.32	-1.3
Net Shoreline Movement (ft)	-68	-75	-52	-208
Data Years	160	153	158	158

1310 at Buccaneer Boulevard. Here, the erosion rate is -1.3 ft/yr with a recorded shoreline retreat of more than 200 feet over the 158-year period. The greatest erosion rates in Pirates Beach are at the northeast part of the area, reaching rates in excess of -2.5 feet per year. Jamaica Beach is fortunate to have a relatively modest erosion rate and comparatively stable shoreline position.

3.1.2 Annual sand volume losses

Data regarding the magnitude of sand deficits and surpluses at locations along the City's beachfront is useful to inform any discussion of reasonable alternative actions to address shoreline retreat and reduce future public expenditures due to erosion and storms. The BEG shoreline change rates provide a basis for a planning-level estimate of the volume of sand needed to offset the sand deficit within the City whether due to erosion or relative sea level rise -- a term that describes the combined effects of land subsidence and absolute rising sea level.

Based on the average annual erosion rate in Jamaica Beach, the City would need to place about 0.5 cubic yards of sand per linear foot of beach per year (0.5 cy/ft/yr) to offset the long-term average shoreline retreat. Based on the projected rise in relative sea level, the City would seemingly need to place an additional 2 cubic yards of sand per foot, per year (2 cy/ft/yr) to offset shoreline retreat. However, the effect of relative sea level rise is already included in the BEG long-term erosion rates. Therefore, it is clear there is a net influx of sand into the Jamaica Beach system of about 1.5 cy/ft/yr. That is, over the long-term, more sand has entered Jamaica Beach than has departed, but relative sea level rise has slightly overcome this influx causing a modest rate of shoreline retreat.

Further, BEG analysis of water level records for Galveston Island indicates that recent (since about 1990) relative sea level change rates have been among the lowest on record. If rates revert to higher historical averages, The City can expect greater shoreline retreat rates than has recently been experienced.

Knowledge of volume requirements can be used to estimate the cost of sand and shoreline management strategies. Viewed in dollar terms, these strategies can be compared to the costs of dissimilar alternative strategies such as land purchases or constraints placed upon development or post-disaster reconstruction.

While useful, it must be remembered that annual erosion and volume change rates are simplifications of complex shoreline dynamics as a uniform gain or loss of sand cannot be expected in any year or period of years. Rather, episodes of large storm-related changes are separated by potentially long periods of recovery moderated by rising relative sea level. In Jamaica Beach, the balance of these effects has been a slight landward retreat over the long term.

The expressed sand volume units of cy/ft/yr can be multiplied by a selected dollar amount per cubic yard of sand ($/cy), length of proposed project (ft), and years of average annual retreat to be addressed (yr)to arrive at a shoreline management cost ($) useful for comparison purposes.

As an example, a project to overcome a decade (10 yr) of average retreat (0.5 cy/ft/yr) for roughly the length of Jamaica Beach (4,000 ft) at the sand cost is $15/cy would be 10 x 0.5 x 4000 x 15 = $300,000 or a cost of $30,000 per year on average. This simple calculation method has been applied in the ERP below.

3.2 Dune Complex and Uplands

The Jamaica Beach dune complex and adjacent uplands occupy a strip of land less than 500 feet wide measured from the landward edge of the beach to the highway (F.M. 3005).

The storm surge associated with Hurricane Ike in 2008 flattened the dunes within the City. Direct storm damage and storm recovery buyout incentives resulted in the removal of the thirteen seaward-most front-row houses. Subsequent isolated dune restoration activities, natural processes, and beach management practices have resulted in the present location and configuration of the degraded dune complex. Working with the GLO as lead agency, the City seeks to implement the post-Ike FEMA dune project, as described in the Project Worksheet, as soon as possible.

3.2.1 Dune location, elevation, and width

The existing dune complex within the City generally occupies the zone between the dry beach and the remaining adjacent "front row" single-family residential houses. In recent decades, the dunes in this zone have typically been manmade and re-created in the aftermath of significant storms. The natural process of dune growth during periods between storms adds some volume, height, and variability to the post-storm dune projects; however, these natural processes are insufficient alone to re-establish a dune system of sufficient size to provide meaningful protection to upland property.

In 2012, less than four years after Hurricane Ike, the Jamaica Beach dune complex remains narrow, low, discontinuous, and fragile. The width varies from roughly 50 to 70 feet in discontinuous stretches separated primarily by active vehicular access points and public rights of way.

3.2.2 Dune vegetative cover

Dune vegetation within the City ranges from sparse to dense augmented in some areas by watering and stockpiling of *Sargassum*. Through seaweed maintenance activities, un-vegetated windrows of sand have been placed to fill dune gaps in sporadic locations. Common dune vegetation is typical for the region and includes railroad vine (*Ipomoea pes-caprae*), bay bean (*Canavalia rosea*), and dune sunflower (*Helianthus debilis*) on the firedune areas, sea oats (*Uniola paniculata*) and sea grape (*Coccoloba uvifera*) along the dune crest, and saw palmetto (*Serenoa repens*), cabbage palm (*Sabal palmetto*) and prickly pear cactus (*Opuntia humifusa*) on back-dune areas. Bitter panicum (*Panicum amarum*) is prevalent in all areas of the dune system and has proved to be the best species for dune stabilization on the Texas coast. Turf grasses are typical in the maintained yards landward of the landward toe of the dunes.

As described above, occasional raking and stockpiling of *Sargassum* can augment the dunes and promote stabilizing plant growth, if done delicately and with care. Active watering by some property owners helps stabilizing vegetation, as well. Overall, the

dunes and vegetation are insufficient to provide a meaningful level of protection to property with the City.

3.3 Upland Structures

The upland area landward of the dune complex and extending to F.M. 3005 is almost completely developed with single-family residential houses. In all, 26 structures currently exist on lots immediately adjacent to the beach. No buildable beachfront lots currently exist in Jamaica Beach.

Analysis of historical aerial photography indicates that the houses removed by Hurricane Ike or as part of post-Ike recovery activities were built decades ago within the dune zone existing at the time of construction, or during a brief period of atypical conditions. With these houses removed, the seaward sides of remaining front-row houses are situated roughly 200 to 250 feet from the wet-dry shoreline based on November 2011 aerial photography (using techniques similar to BEG aerial analysis).

3.4 Beach Access Points

3.4.1 Location

The City maintains two vehicular access points to the beach, one at the eastern end of the City adjacent to Galveston Island State Park and the other at the center of the City, where Buccaneer Drive intersects the beach.

In its present configuration, the street right-of-way of Beachcomber Drive (a U-shaped street which opens toward the beach) intersects the beach at two locations. Prior to Hurricane Ike, a shore parallel street and an additional row of houses separated Beachcomber Drive from the beach and no designated public access points existed in this area. Following Ike, a footpath has developed through the degraded dune complex and the new street configuration now allows for installation of additional public beach walkovers at either end of Beachcomber Drive, as recommended below.

3.4.2 Condition

The two vehicular access roads cut through the dune system perpendicular to the shore at street level and are paved to the landward edge of the beach. Buildup of deep, dry sand on the upper beach seaward of the pavement is common and can interfere with vehicle access to the beach. Windblown sand also passes through the dune cuts and deposits on the pavement and can continue landward into the subdivision and beyond. In high tide or storm conditions, the vehicular access points can allow storm surge to enter the town.

Parking is allowed on the beach near these access points at all times of the year and vehicles are allowed on other parts of the beach during off-peak seasons. During the

summer, beach areas other than the parking areas are pedestrian-only. Other than trash receptacles, no public amenities are located on the beach.

3.4.3 Vulnerability

The City, including its public infrastructure and private property, is vulnerable to the effects of beach erosion and storm events in several ways, including the following:

- Discrete events (storms)—High tides and waves can directly impact and cause damage to infrastructure and property that is not adequately separated from Gulf waters by a continuous and robust beach/dune system.
- Washover—Flooding within the City can occur as a result of natural washover conditions during significant storm events, allowing high water levels to encroach landward of the dune system.
- Sand deficit—Assuming a static building line, the modest sand deficit in Jamaica Beach can be expected to cause the landward retreat of the beach/dune system over time. Eventually the retreating dunes and beach will weaken the City's defenses against coastal storms and increase the frequency and severity of damage will impact the structures.
- Relative sea level rise—The natural response of a barrier island to progressive sea level rise is for the island to "roll over" as washover deposits raise elevations on the bayside and the Gulfside areas are submerged. This process is ongoing on Galveston Island despite the presence of development.
- Effects of built environment—The built environment primarily affects the availability of sand to the beach/dune system. The navigation channel and jetties at the northeast end of Galveston Island starve the entire island of beach sand, while beachfront development both captures sand beneath pavement and causes more wind-transported sand to be lost to landward areas.
- Vehicle impacts— while driving on the beach in Texas is a time-hoored tradition for many, it is clear that vehicles damage the beach, dune vegetation and result in a loss of dune elevation. The resulting weakened dune system is more susceptible to wave erosion and washover.

3.5 Areas of Concern

3.5.1 Drainage at Buccaneer Drive

Currently, some drainage ditches in the City seaward of FM 3005 drain to the beach. To facilitate this drainage, no dunes exist or have been restored in the outfall area and the runoff carves a channel across the beach to the Gulf. The drainage ditches are susceptible to being filled with windblown sand between rainfall events,

requiring constant maintenance, and the shallow drainage gradient to the beach causes rainwater to collect in the ditches for days after a heavy rain. The standing water interferes with access to homes, creates fetid unsightly conditions, and is an excellent breeding ground for mosquitoes. The intersection of Buccaneer Drive and Jamaica Beach Road just landward of the beach access point has been subject to flooding for years. The City recently implemented improvements to the intersection and adjacent drainage ditches to partially alleviate these conditions but the fundamental problem is that drainage of rain and stormwater through the dunes and onto the beach is unworkable and undesired.

The need to maintain a drainage path through the dunes makes it impossible to create a continuous dune system along the shoreline.

3.5.2 Drainage on Beachcomber Road

Like drainage in the Buccaneer Drive area, drainage in the Beachcomber subdivision is funneled toward the beach, where drainage pipes through the dunes discharge onto the beach. This drainage scheme is also ineffective and detrimental to the beach and dune system.

3.6 Shoreline Change Events and Circumstances

3.6.1 Federally-declared disaster (e.g., Hurricane Ike)

Hurricane Ike and other large storm events flatten dunes and cause flooding in the City. During large storms, sand is washed and blown into the City, clogging streets and drainage ditches and can be effectively lost to the beach/dune system. Sand can also be carried offshore where it typically remains in the beach/dune system if it is not lost to deep water. Similarly, sand from adjacent beaches is transported into Jamaica Beach. Typically, the beach thereafter recovers by natural processes and can return to its near pre-storm location and elevation given adequate time (meaning several years) before the next storm event.

As noted above, Jamaica Beach has a long-term net influx of sand that is slightly overtaken by the effects of relative sea level rise. The frequency and characteristics of individual storms (and intervening periods) vary widely and cannot be generalized.

3.6.2 Non-disaster chronic change (e.g., series of small storms in 1990's)

Distinct from large storm events such as Ike (2008), Rita (2005), Alicia (1983) and Carla (1961), chronic change can result from a series of smaller events such as the long-duration tropical storm events of 1996 (T.S. Josephine) and 1998 (T.S. Frances). Under these circumstances, dunes can be significantly damaged, and the shoreline can retreat. Because these events do not trigger a federal disaster, limited outside resources are available to local communities to respond and recover. T.S. Josephine was a rare federally-declared disaster even though it never reached hurricane force.

4.0 DESIRED SHORELINE CONDITIONS

This section describes the City's goals and objectives to reduce future public expenditures to respond to shoreline erosion.

4.1 Objective – Reducing Risks by Maintaining Beach Profile at its Current Location

As noted in Section 3, the City of Jamaica Beach is subject to the effects of rising relative sea level moderated somewhat by a net influx of sand into the City's beach/dune system from adjacent beaches. The City seeks to manage risks associated with shoreline retreat and storm events by undertaking an ongoing restoration and maintenance of a sustainable dune complex and healthy beach/dune system. Given the moderate sand volume loss of approximately 0.5cu/ft/yr, this strategy is a reasonable and cost-effective approach to reducing the risk of future storm damage, provided the community commits to such a program.

4.2 Maintain Beach Profile

4.2.1 Goal: Beach width & elevation

In Texas, a dry beach area generally characterizes healthy beaches and dunes approximately 200 feet in width between the wet beach and the foredune. This width is typical of the distance between: (1) the location of water's edge during usual weather and tide conditions; and (2) the location of the upper limit of wave run-up during less frequent high water/severe weather events capable of scouring away immature coppice mounds and sparse emerging vegetation, generally at about elevation four feet above sea level.

In part, the distance from the wet beach necessary to achieve an elevation adequate to support healthy dune vegetation is a function of the slope stability of beach sand in the presence of typical local forces of tides, waves, and wind. As such, any desire to change this characteristic beach width would likely require either significant additional sand to the system or changing the beach sand characteristics (for example, by importing larger average sand grain size).

Benign weather and favorable growing conditions can result in temporary seaward migration of dune plants and an apparent narrowing of the dry beach, but not over the long-term. Likewise, significant storms and associated high water and waves can leave behind a wider beach where vegetation has been destroyed and dune elevation reduced, but this condition is also usually temporary.

A healthy dune complex will be generally self-sustaining if a 200-foot wide dry beach exists seaward of the foredune. During usual weather, dunes grow seaward and higher with windblown sand becoming trapped in the vegetation. During rough weather, high water and waves pull dune sand down onto the beach. The cycle repeats.

Where the adjacent beach is narrower than 200 feet, dunes—whether natural or man-made—will likely be impacted by frequent high tides and require periodic maintenance if the desired width, height, and continuity is to persist. The narrower the dry beach, the less sustainable the dune and the more expensive the effort.

Existing beachfront houses on the eastern half of Jamaica Beach are roughly 225 feet from the wet beach on average. Farther west, the beach width to houses varies between about 200 feet along West Beach Rd to about 260 feet at the newly constituted front row in the Beachcomber subdivision.

Though intermittent, the width of the dune complex is roughly 50 to 70 feet wide in Jamaica Beach. Ideally, a continuous dune complex would be at least 75 feet wide at the base and located 200 feet landward of the mean low water line. In many areas, the existing front row houses are within the desired location of the dune complex.

The City's goal is to maintain a 200-ft wide dry beach between the wet beach and the dune complex. The 75-foot side complex should consist of (a) a dune with a base width of at least 50 feet and a minimum crest elevation of +10 NAVD-88 and (b) a 25-foot wide dune terrace at elevation +6 to +7 NAVD-88 that would serve as the foredune area.

4.2.2 Necessary Average Annual Sand Volume

As described in section 3, the long-term average annual sand volume required to offset the shoreline erosion is about 0.5 cy/ft of beach. This number is the difference between the roughly 2 cy/ft/yr required to offset relative sea level rise and the net influx of 1.5 cy/ft/yr sand from outside of Jamaica Beach. In round numbers, the sand deficit is approximately 2,000 cubic yards of sand per year for the entire length of Jamaica Beach. Given the present post-Ike condition of the dune complex, a volume adequate to restore the dunes to health must be considered in addition to this long-term average amount.

With the present group of front-row houses located within the dune complex footprint, the City would initially nourish the beach as well as restore the dunes, if a cost-effective method can be identified. This effort would move the entire beach dune system seaward, allowing for the necessary 200-foot wide distance between the wet beach and the foredune. Because the City's beach is small in scale, beach nourishment is likely to be prohibitively expensive unless undertaken in conjunction with a large- scale nourishment project sponsored by the state and/or City of Galveston. The City also recognizes that any independent beach nourishment project over some 3,000 feet of beach will likely be short-lived as normal and storm tides will straighten the beach shoreline within a matter of months.

By focusing its efforts on building and maintaining a continuous and well-vegetated dune system along the entire city beachfront, the City expects to reduce sand losses from wind transport and drainage scour.

4.2.3 Shoreline profile management methods

The average annual input of sand required to maintain shoreline equilibrium in Jamaica Beach is small, but the wide variation in annual changes relative to long-term average changes supports a management approach focused on dune restoration. If significant storm events occur, beach restoration would be beneficial if undertaken in conjunction with local and state partners or if a cost effective method can be identified.

The primary shoreline profile management effort by the City will be to document existing beach-dune profile conditions at least annually and to regularly enhance and maintain the dune system. The monitoring program will assist in this effort and ensure sufficient documentation is maintained to support future disaster assistance claims for restoration activities.

4.2.4 Sand sources: Upland truck haul vs. Nearshore sand borrow area

To complete the dune restoration project in 2006, the City took advantage of affordable sand made available by excavation of private property on Galveston Island. These sand excavation practices have since been prohibited by the City of Galveston and future projects are likely to require truck-hauled sand from off-island sources. These off-island sources are expected to cost $20 - $25/cu yd, a significant increase in cost over previous dune projects.

Alternatively, the City believes it would be prudent and appropriate to work with the GLO to investigate sand sources offshore of Jamaica Beach as a potential long-term source for dune restoration sand. Previous investigations of nearshore sand sources revealed the existence of a promising sand deposit immediately offshore of Jamaica Beach (see *GLO Texas Coastal Sediment Geodatabase*). Exploitation of this source would require up-front costs for additional exploration, sediment testing and permitting, but once available, the sand costs may be substantially less than the cost of truck-haul sand. The City recognizes that dredge mobilization costs may be prohibitive and would favor larger projects over more frequent small projects. However, if these nearshore sand sources are brought on-line as part of a post-storm disaster recovery project, the City may be able to avail itself to this less expensive sand source in the future.

4.2.5 Estimated annual cost

A City's ERP strategy must include sufficient funds for annual monitoring, dune maintenance, repair of sand fencing, installation of dune plants, and annual contributions for post-event restoration activities. If the City can gain access to the local offshore sand source with disaster assistance funds, it can quickly and cost-efficiently restore its beachfront and the economic activity that it supports.

4.3 Restore and Maintain Dune Complex

In general terms, a strong and stable dune system can be a relatively effective strategy for minor and moderate storm and tidal events. A dune complex capable of

sustaining dune vegetation, and protection in some measure of backshore property and infrastructure, exhibits the following parameters:

- Relatively high quantities of dune and beach sand, over the beach-dune cross-section, for each linear foot of beach-line
- Dune landforms that conform to mature dune types, that is, classically stable shapes that are primarily wind-carved, with wind-delivered accreting sand balancing, by and large, wind-driven sand loss
- Absence of human (foot and vehicle) disturbance in the dunes and on the beach surfaces fronting the foredune
- Minimum primary dune and inter-dune elevations of 10 feet, with some dunes in the system reaching an optimum 12 feet in elevation or greater
- Vegetation with minimum eighty-five percent coverage, or better, of dune surfaces

4.3.1 Goal: Implement FEMA Post-Ike Dune Project (Project Worksheet No. SAS010)

In general terms, a strong and stable dune system is the single best strategy available to Jamaica Beach to reduce potential public expenditures caused by moderate storm and high tide events. Specifically, the City seeks to immediately implement the FEMA Dune Project as defined in Post-Hurricane Ike Project Worksheet SAS010.

The dune project will be 3,300 feet in length and require 75,000 cubic yards of sand. The dune will be constructed to an elevation of +10 NAVD-88 with a 10-foot crest width and a base width of 50 feet. An additional foredune terrace will extend seaward approximately 25 feet conforming to the beach profile at elevation +6 to +7 NAVD-88. The total project base width is expected to be 75 feet. Native dune vegetation will be installed over an area approximately 3,000' x 50', excluding the foredune terrace, covering an area of approximately 16,667 square yards. Approximately 3,600 linear feet of dune fencing will be installed to help stabilize the new dune.

Figure 1 Schematic Showing Approximate Position of FEMA Dune Project (75-ft Base Width Shown)

In the figure above, a 75-foot wide dune restoration area is depicted seaward of the existing structure. This approximate footprint is based on the 2006 dune project and is for illustration only. The actual dune design, including its location, will be determined as part of the implementation of the post-Ike dune restoration project approved in FEMA Project Worksheet No. SAS010.

Based on extensive public comments on the ERP, the City will not seek to place the FEMA Dune Project on private beachfront property without the expressed written permission from the affected landowners. The City recognizes that property owners may require the dune to be placed seaward of private property in a location more seaward than optimal from a storm-damage reduction standpoint. Such a more seaward location may require modification or reduction of the dune width and volume. The City further recognizes that the location and configuration of the FEMA Dune Project cannot be designed in the ERP. The City commits to work with the project engineer, once selected, and the landowners to ensure the dune design is workable for all involved.

The City looks forward to working with the GLO and beachfront owners to advance the FEMA Dune Project as soon as possible.

4.3.2 Sand volume and plant sources

The FEMA Project Worksheet documented the total loss of 75,000 cy of sand that is authorized for replacement, and 16,667 square yards of dune stabilization vegetation. The worksheet assumes truck hauling from the east end of Galveston Island but also allows the use of an offshore source. With appropriate lead-time, local dune plants are expected to be available. Annual sand volumes necessary to maintain the FEMA dune once constructed are identified below.

4.3.3 Long-term dune restoration and management methods

City staff and volunteers, under the direction of a qualified contractor, will monitor dune conditions twice-annually, including profile surveys, dune volume assessment, and inspection of dune plants and sand fences. Maintenance needs will be identified and submitted for implementation within budgeted amounts, as set forth in the annual dune maintenance budget outlined herein. More significant or expensive needs will be communicated to the City Administrator for action, including seeking supplemental grant assistance through the CMP or CEPRA grant programs or other available funding sources.

The annual dune maintenance and management method will be to purchase and transport sand to dune areas in need of supplemental fill, as identified in the twice-annual surveys. Within the budget identified ~~above~~ below, dune plants and sand fence will be replaced annually on an as needed basis.

This ERP commits the City to maintain the FEMA Dune Project in the approved configuration and location. Periodically and on an as needed basis, the City will replace sand fences, dune sand and vegetation lost to persistent erosion forces.

A FEMA Project Worksheet authorizing a $2,170,898 restoration project was prepared and approved to restore Jamaica Beach dunes. In July 2010, the GLO forwarded to the City a fully executed contract for the implementation of the FEMA dune (see Contract No. 10-217-000-4119 and Amendment No.1 to Special Document No. 20040006). The contract establishes the following project costs and contributions for the FEMA dune:

Total Project Cost FEMA Dune	$2,181,120.00
GLO CEPRA Account	$75,354.00
Jamaica Beach Local Match	$142.758.00
FEMA	$1,963,008.00

This project should be advanced at first opportunity as the center point of efforts to implement this ERP.

4.3.4 Estimated annual maintenance cost

A City's financial strategy will include funding the annual dune monitoring program, dune maintenance activities such as replanting dune vegetation, filling and restoring dune gaps, replacing sand fence, as well as annual contributions into the City's post-Storm Reserve Fund.

On an annual basis, and in the absence of large storms, the annual cost of maintaining the FEMA Dune project is expected to be approximately $63,265.00. The City also expects to set aside up to $40,000 annually into a post-storm recovery

fund, which can be leveraged with state and federal assistance in post-storm conditions. Over a ten-year period, the post storm recovery fund would reach $400,000.00.

ANNUAL FEMA DUNE MAINTENANCE COST			
Item	Amount	Cost	Total
Annual Sand Input for Dune Maintenance	2,000	$20/yd	$40,000
Annual Sand Fence Replacement	100 feet of fence	$12.65/ft	$1,265
Annual Replanting	1,000 plants	$2.00/plant	$2,000
Annual Beach Surveys	2	$10,000/ea.	$20,000
Annual Post-Storm Savings Account		$40,000	$40,000
		TOTAL	$103,265

The City has established and dedicated an revenue stream sufficient to meet the costs specified above.

4.4 Create Storm Resistant Access Points

Public beach access points can be improved to reduce their negative effects on the continuity of the dune system and ensure improved access to the shoreline as the FEMA Dune Project is constructed. In particular, the City will:

1. Install four ADA compliant public dune walkovers in conjunction with the FEMA Dune Project at (a) Beachcomber Street, (b) Buccaneer Street, (c) east end of West Beach Road, and (d) the west end of West Beach Road; and

2. Modify the two vehicular access points to elevate and stabilize the roadway to a maximum elevation of +10' NAVD-88 as the road passes through the FEMA Dune Project dune ridge. The elevated and stabilized "drive over dune" will eliminate a dune gap and path for storm surge to enter the community. Grant funds will be sought to explore the feasibility and implement improvements to access points.

To reduce damage to the beach dune system and to promote natural recovery of the shoreline, the City also intends to investigate and if appropriate further limit vehicle access on the beach itself. Substantial evidence exists in the Galveston Island State Park immediately adjacent to the City that pedestrian beaches are generally wider, have larger dunes, and are more resilient and storm resistant. The City recognizes that expanding or creating a pedestrian-only beach will prompt substantial public interest and comment and require modification of its Beach Dune Plan and certification of any change by the GLO. Among many issues, the City understands that dedicated public parking will be required (1 parking space for every 15 linear

feet of pedestrian beach) if the beach or a portion thereof is closed to vehicles. The City cannot and does not propose a specific vehicle access plan in the ERP as to do so would be inappropriate and unworkable for the community. However, the City does seek to make known its intention to explore this issue in an open process with its citizens, property owners, beach users and the GLO.

4.5 Undertake Surface Water Drainage Improvements

At present, rain and stormwater seaward of FM 3005 drains through the dunes and across the beach to the Gulf of Mexico. This is detrimental to the beach dune system and increases the vulnerability of the city to storm damage and property loss. The City intends to investigate, design, and, if funds are available, construct a drainage system to redirect all rain and stormwater drainage to West Bay. The City recognizes such a modification is a significant undertaking and will require stormwater collection areas and pump or lift stations.

The city intends to seek TWDB grant funds to study, design and implement a stormwater drainage modification project to redirect all drainage away from the beach and to West Bay. If successful, this modification will allow the community to complete and maintain a continuous dune complex and provide a substantial level of additional storm damage protection to the community. To be effective, the drainage modification project must be coupled with modification of the two vehicular beach access points as described above.

5.0 SEMI-ANNUAL PRE-STORM MONITORING PROGRAM

The purpose and need of a monitoring program is to accomplish at least two goals: (1) to inform local decision makers and the community at large about the status and upcoming maintenance needs; and (2) to ensure that adequate, recent data is available to document storm losses and ensure eligibility for federal disaster assistance related to nourished beaches.

A twice-annual program consisting primarily of profile surveys augmented with other forms of data collection (e.g., photography, sand tracer studies, numerical simulations) can provide year to year comparisons as well as indications of seasonal variations to inform decision making. Previously established profile locations can be used to ensure the best use of existing data and the cost effectiveness of new data collection/analysis efforts.

In addition to periodic profile surveys, project-specific surveys of nourishment activities and the progressive movement of material from designed nourishment prisms by natural forces can allow the optimization of subsequent nourishment activities. Maintenance practices that result in movement of sand resources (and seaweed) along and across the beach can be factored into monitoring tasks and results to provide a clear picture of the program's achievements.

The deliverable products generated through monitoring can include the profile data reduced and presented graphically, comparisons to historical profiles at the same

location, trend analyses, quantity calculations, and projected maintenance needs. The information will also be available to City officials dealing with FEMA in post-storm response mode to determine federal assistance qualifications.

Estimated annual monitoring cost. A detailed scope of monitoring effort can be developed to suit the City's needs and budget. The order of magnitude cost is estimated to be $20,000 per year.

6.0 EROSION RESPONSE PLAN FOR JAMAICA BEACH

6.1 Construction Setbacks or Standards in the Dune Conservation Area

As defined by the GLO, the "setback" is the line seaward of which no new construction should occur unless appropriate exemptions and exclusions are provided in accordance with applicable statutes and rules.

The City does not propose to implement a strict setback line in this ERP or to prohibit construction seaward of the line. Rather, the City seeks to grandfather all existing structures within a defined "dune conservation area" and to require compliance with higher, more protective building standards if the structures are substantially repaired or if new or expanded structures are constructed. The Setback Line will therefore be referred to as the **Dune Conservation Area Line**.

The existence of the **Dune Conservation Area Line** is intended to improve shoreline management practices in Jamaica Beach by reducing the risks to beachfront structures from erosion, storms and waves. Currently, no statewide setback limit exists in state law, however, GLO rules specify that no construction is permitted seaward of the line of vegetation, as this has historically been within the public beach easement. In eroding areas, GLO rules and the existing City Beach Access & Dune Protection Plan impose certain construction limits and restrictions within 200 feet landlord of the line of vegetation. Subjectively, state rules also require that new construction along the Gulf beaches of the state be located "as far landlord as practicable."

In establishing the **Dune Conservation Area Line**, the state requires that the City utilize data obtained from the University of Texas Bureau at Economic Geology. The baseline from which the **Dune Conservation Area Line** is to be measured may be (a) the line of vegetation (LOV), the Mean Low Tide (MLT), the Mean High Tide (MHT) or a GLO-approved Coastal Boundary Survey. The rules further specify that the setback line cannot be further landward than the dune protection line and must protect as much of the critical dune area as practicable.

Using the MLT line as the baseline, the City has mapped the **Dune Conservation Area Line** as an indication of the approximate location of a naturally occurring dune area in the absence of development. The line and the standards governing new or

expanded construction seaward of it will be equally effective in reducing the risk of public expenditures for storm damage because:

1. All existing beachfront lots are currently developed so additional risks to new structures is not expected to occur;
2. The erosion rate in the City is less than 1 foot per year, a manageable and relatively low risk rate of chronic shoreline change;
3. The City has dedicated funding in place to restore and maintain a wide, vegetated dune system, the primary means of reducing future public expenditures for storm damage;
4. The City has in place a specific commitment to implement a twice-annual shoreline and dune monitoring program and has budgeted sufficient annual funds to react to expected shoreline erosion and dune losses;
5. The City intends to fully implement its Beach Access and Dune Protection Program for any new construction in accordance with state standards, and
6. The City is committed to addressing current drainage and vehicle access issues which interfere with establishment of a wide, vegetated dune system.

Dune Conservation Area Line: For the purposes of this erosion response plan, the City of Jamaica Beach proposes that it's **Dune Conservation Area Line** be the 100-feet landward of the "Landward Edge of the Beach," as depicted in the figure below.

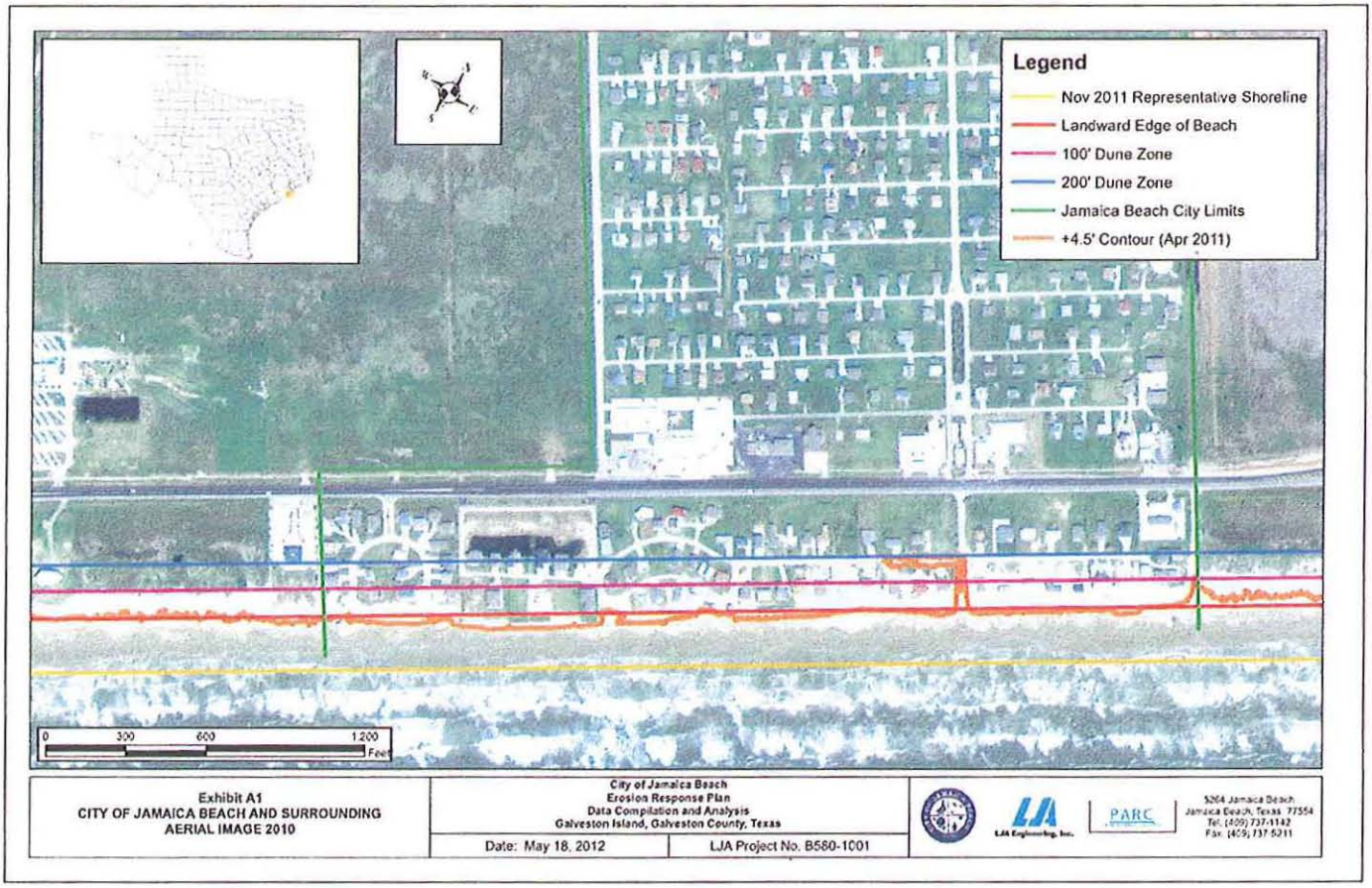
The City intends to survey the line of MLT to establish the baseline from which the setback line will be established. The "Landward Edge of the Beach" is defined as a line parallel to the MLT line but located 200' landward of MLT. This 200' area reflects the typical beach width above which a healthy dune system can be maintained. As depicted in the figure below, this line approximately corresponds to the +4.0' to +4.5' contour line.

The City then proposes that the **Dune Conservation Area Line** be located 100 feet landward of the "Landward Edge of the Beach," or 300' from the MLT line. As can be seen, most existing beachfront structures lie, at least partially, in this area 100 feet dune conservation area.

Under the FEMA Dune Project Cooperation Agreement (CEPRA Project No. 1482), the GLO is obligated to work with the City to identify the exact location of the FEMA Dune Project, contract for professional services such as beach surveys, review of historical data, obtain project permits, develop construction drawings, plans and specifications, and bid documents, and oversee construction. The City is ready and willing to confer with the GLO to undertake the FEMA Dune Project, in coordination and cooperation with affected beachfront property owners. From a project performance perspective, the City recognizes that the FEMA Dune should be located as far landward as possible on the beach profile, however, the sand dune cannot be installed on private property without the express written permission from affected

landowners. The FEMA Dune Project is the central focus of the City's efforts to implement the ERP in the near-term.

The City recognizes that to maintain the proposed **Dune Conservation Area Line** for the ERP, it is obligated to restore and maintain the dune system so that existing development is not subject to an undue risk of damage from erosion, waves and storm surge. The City's strategy to accomplish this outcome and limit public expenditures due to shoreline erosion, waves and storms is to undertake and maintain the dune restoration project identified in the FEMA Project Worksheet.



6.2 Requirements for Exempt Structures.

The City proposes that all existing habitable structures be exempt from the prohibition on structures within the 100-foot dune conservation area, represented by the pink line in the above figure, on the basis that they are consistent with existing setback lines and siting requirements in the certified City Beach Access and Dune Protection Plan. All minor repairs to existing structures are permitted without limitation seaward of the setback line so long as the footprint of the structure is not expanded. Non-habitable amenities such as walkways, dune crossovers, small decks, and other access improvements are also exempt from the construction setback limit.

To repair an existing habitable structure damaged more than 50% that is located seaward of the **Dune Conservation Area Line** or to construct a new habitable structures seaward of the **Dune Conservation Area Line**, the following requirements must also be met:

1. The landowner demonstrates that there is no practicable location for the construction to occur landward of the **Dune Conservation Area Line**;
2. The exempt new structure must be elevated to a minimum of 2 feet above the FEMA base flood elevation (BFE);
3. The foundation for the structure must conform to ASCE flood resistant standards;
4. The structure must be designed for feasible relocation;
5. Impacts to dunes and dune vegetation must be avoided if practicable and any impacts to dunes and dune vegetation that do occur must be fully mitigated;
6. The structure must be planned in a way that minimizes impact natural hydrology;
7. All enclosures below the BFE are prohibited;
8. The seaward edge of the structure must be located at least 25 feet landward of the north toe of the FEMA Dune Project; and
9. A registered professional engineer must certify that these requirements have been met.

6.3 Enhancing and Preserving Public Access.

The state requirements for erosion response plans are also intended to enhance public access to the shoreline in addition to reducing potential public expenditures for erosion and storms. With respect to access, the rules require that the City evaluate the vulnerability of access points to erosion and storm surge damage. The rules require that the City upgrade public access construction methods and designs to reduce post-storm repair costs. The City is required to create a schedule for public access design improvements and inventory existing access amenities in order to support any future FEMA post-storm funding claims. Finally, the City is required to establish post-storm beach access assessment procedures so that damages can be cataloged.

The ERP calls for installation of four ADA-compliant beach walkovers, at locations specified above. In addition, the two existing beach roads, one at Buccaneer Drive and another at Beachcomber Drive, will be modified to create an elevated, stabilized roadway at elevation +10.0 NAVD-88 so that vehicles can continue to reach the beach without allowing the free flow of storm surge or high tides into the residential areas of the community.

These improvements will be undertaken contemporaneous with the FEMA Dune Project. The project schedule will be determined in coordination with GLO, which serves as lead for the project.

6.4 Dune Protection & Enhancement

Dune protection and enhancement projects are the foundation of the City's ERP. GLO rules require that the City specify the target dune height and percent vegetative cover for its dune protection and enhancement program. Finally, the City is required to outline specific dune re-vegetation projects, identify measures to protect the landward side of the foredune ridge, and identify the goals, schedules, and funding sources to accomplish its dune protection and enhancement program.

As specified under Desired Conditions, above, the City seeks to establish, through the FEMA Dune Project, a continuous, citywide dune system approximately 3,000 feet in length with a minimum elevation of +10 NAVD-88, and 50-foot base width, plus an additional 25-foot wide foredune terrace. The dune will be vegetated over approximately 16,667 square yards using native dune plants to a minimum density of 75% coverage, with a target coverage of at 85% overall. The detailed work plan for the FEMA Dune Project is set forth in the GLO Project Cooperation Agreement (CEPRA Project No. 1482).

6.5 Criteria for Voluntary Acquisition or Buyouts.

One recognized strategy to reduce public expenditures following storms and erosion events is to purchase or buyout vulnerable properties along the shoreline. The state rules allow local governments to develop criteria governing the voluntary acquisition or buyout of beachfront parcels and structures. If such an approach is to be employed, the City was required to identify properties entirely seaward of the **Dune Conservation Area Line**, provide for voluntary acquisition, and establish procedures for prioritizing property to be acquired.

The City of Jamaica Beach has ~~also~~ elected an ERP strategy based upon maintenance of the beach and restoration and enhancement of the dune system. This approach is an alternative to the available strategy for voluntary acquisition and buyouts. The City has not elected to develop a voluntary acquisition and buyout program at this time; however, this may be re-visited in the future depending on the success of maintaining the FEMA Dune Project.

7.0 Conceptual Funding Strategy

A conceptual annual budget to support implementation of the ERP is included above at $103,265.00 annually. This budget includes funds for: (1) on-going dune maintenance; (2) annual beach and dune monitoring; and (3) replacement of sand

fence and plants loss to erosion, and (4) Post-Storm Recovery set aside at $40,000 per year.

The City also intends to seek ERP implementation support funds from a variety of state and federal assistance programs, exhaustively detailed in the Division of Emergency Management's Texas Hazard Mitigation Plan, 2010-2013. These programs include:

- Texas Department of Rural Affairs (TDRA)
- Community Development Block Grant (CDBG) Program

- Texas Division of Emergency Management
  - Emergency Management Performance Grant (EMPG)
  - Hazard Mitigation Grant Program (HMGP)
  - State of Texas Hazard Mitigation Plan (2010-2013)

- Texas General Land Office (TGLO)
  - Disaster Recovery
  - Hazard Mitigation
  - Texas Coastal Coordination Council/CMP
  - CEPRA
-
- Texas Water Development Board
  - Flood Mitigation Assistance (FMA) Program
  - Flood Mitigation Planning Program

- Federal Emergency Management Agency (FEMA)
  - All-Hazards Emergency Operational Planning (FY2009)
  - Comprehensive Planning Guide (CPG) 101
  - Comprehensive Preparedness Guide 502
  - FEMA Preparedness Cycle and Resources
  - Preparedness (Non-Disaster) Grant Program
  - Community Disaster Loan Program
  - Flood Mitigation Assistance (FMA) Program
  - Hazard Mitigation Grant Program (HMGP)
  - Map Modernization Management Support
  - Multi-Year Flood Hazard Identification Plan (MHIP)
  - National Flood Insurance Program
  - National Incident Management System
  - National Hurricane Local Grant Program
  - Pre-Disaster Mitigation (PDM) Grant Program
  - Public Assistance Grant Program
  - Regional Catastrophic Preparedness Grant program
  - Repetitive Flood Claims Program
  - Section 406 Hazard Mitigation Grant Program

- Severe Repetitive Loss Program
- Community Disaster Loans

8.0. CONCLUSION

The City looks forward to GLO review and comments on this DRAFT and additional development of the ERP.