



CITY OF MELBOURNE
COMPREHENSIVE PLAN
CHAPTER VII
CONSERVATION ELEMENT

Data and Analysis

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DRAFT

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Conservation Element Data and Analysis

The City of Melbourne is located in southern Brevard County along Florida's Space Coast. The goals, objectives, and policies contained within this element are intended to form the basis for sensible decision making regarding the appropriate use of the City's natural resources as well as the identification and conservation of irreplaceable ecological features. As the City experiences growth, its urban area will expand to the north and to the west, approaching the natural resources of the St. Johns River floodplain. This region is characterized by its extensive wetland and floodplain areas. The City recognizes this issue and has developed a map that displays the existing environmental features west of I-95 (please see Map VII-4).

The Conservation Element is intended to prevent the degradation of water bodies, upland habitat, shoreline areas, wetlands, and air quality, while allowing for responsible development opportunities. The City recognizes the valuable contribution these resources provide to the quality of life for both residents and visitors alike.

Another important issue addressed by this element pertains to water and energy conservation. Policies within this element encourage effluent reuse, the installation of water saving devices, the planting of drought resistant vegetation, the use of sustainable building rating and certification systems, and the use of hybrid technology.

B. STANDARDS.

The data and analyses for this element have been provided for the entire Melbourne Planning Area as mapped in the Future Land Use Element. This has been done to provide a broader picture of conditions that exist beyond the current city limits, so as to provide a sound basis for future decisions and actions within the city.

As defined by Chapter 9J-5, Florida Administrative Code (FAC), conservation uses are "...activities within land areas designated for the purpose of conserving or protecting natural resources or environmental quality, including areas designated for such purposes as flood control, protection of quality or quantity of groundwater or surface water, flood-plain management, fisheries management, or protection of vegetative communities or wildlife habitats."

C. EXISTING CONDITIONS.

1. Natural Resources.

Existing natural resources have been identified and analyzed to determine needed policies and actions for their conservation, as described later in this element.

a. Surface water.

Rivers/coastal creeks. The only water body named as a river within the Planning Area is the Eau Gallie River. While not within the Planning Area, the St. Johns River to the west has an impact on Melbourne's water resources, since it feeds Lake Washington-the city's main source of potable water.

The Eau Gallie River is classified as a wide coastal creek, and flows into the Indian River Lagoon. It is navigable for some distance upstream, and has two marinas located near its confluence with the Indian River Lagoon.

Crane Creek is significant to the Melbourne area, having been the original focal point for the creation of the original settlements in the area. Indian canoe traffic was replaced much later with barge traffic as Crane Creek served as a major harbor. The natural drainage basin of Crane Creek was expanded greatly in the 1920's when extensive canals were created in the area. Like the Eau Gallie River, Crane Creek is navigable for some distance upstream, and has a marina located near its confluence with the Indian River Lagoon.

Other coastal creeks in the Planning Area are: Otter Creek, Elbow Creek, and Horse Creek, all of which flow into the Indian River Lagoon. All of the creeks identified have non-point source pollution.

Estuaries. The Indian River Lagoon is a large body of brackish water which separates the barrier island from the mainland and provides the Melbourne area with commercial fishing, recreation and water transportation. The Indian River Lagoon Comprehensive Conservation & Management Plan (IRLCCMP) was published in May of 1996. The SJRWMD is currently in the process of updating the IRLCCMP. The study encompasses the 156 mile lagoonal system from Ponce De Leon Inlet south to Palm Beach County.

The lagoon continues to experience some pollution problems from stormwater runoff but all sewage treatment plant effluent discharges from the city's treatment plants were ceased in July of 1988. The city has established a stormwater utility to retrofit existing stormwater facilities and to strengthen stormwater management regulations in order to help protect the water quality of the river and creeks.

In 1999, City Council established a Stormwater Utility Fund. The program generates about \$750,000 per year for projects to prevent localized flooding and to address environmental issues related to stormwater runoff as mandated by the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System Phase II Program (NPDES).

In addition, the City of Melbourne began a storm drain marking program in 2003. Under this program storm drain markers are installed on storm drain inlets throughout the City to remind citizens that what goes down the storm drain flows to the Indian River Lagoon.

Lakes. Lake Washington, which is part of the St Johns River system, is located on the extreme western edge of the planning area. Lake Washington is the main source of potable water for the City of Melbourne. It is classified by the Florida Department of Environmental Protection (FDEP) as a Class I water body. The lake has experienced some variation in water quality, but has never been polluted. Detailed studies and reports prepared by the city, the St. Johns River Water Management District (SJRWMD), and the Florida Game and Freshwater Fish Commission have all cited the importance of Lake Washington, and have indicated that stormwater management practices must be monitored and

controlled to ensure that Lake Washington is able to continue as a potable water source.

WetLands/marshes. General wetland areas, as mapped by SJRWMD and in the National Wetlands Inventory are shown on Map VII-1. These areas are periodically flooded, and tend to be isolated pockets. This aspect might be due to an under-lying impervious clay layer which is creating a “perched” water condition. The wetland areas are vegetated mostly with marsh grass, but also contain maple swamps and cypress domes.

Wetlands play an important role in the natural filtration of stormwater drainage and runoff before it is discharged to surface water bodies or recharged to the aquifer. Wetlands are also important components because they often serve as spawning, nursery and feeding habitats for many species of fish and wildlife and because they often provide important flood storage, nutrient cycling, detrital production and recreational functions. The SJRWMD is the main regulatory agency overseeing the protection of wetlands.

- b. *Floodplains.* Eight types of floodplains have been identified within the Planning Area and are shown on Map VII-2.

Zone A	Special flood hazard area inundated by 100 year flood without base flood elevations determined
Zone AE	Special flood hazard area inundated by 100 year flood with base flood elevations determined.
Floodway (FW)	Channel of river or other water course and the adjacent land areas that must be reserved.
Zone AO	Special flood hazard area inundated by 100 year flood with average depths of 1 to 3 feet.
Zone VE	Special flood hazard area inundated by 100 year flood-coastal flood with velocity hazard.
Zone X5	Area inundated by 500 year flood; areas of 100 year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile and areas protected by levees from 100 year flood.
Zone X	Area outside the 500 year flood.
Zone D	Area in which flood hazards may exist but are undetermined.

The 100-year floodplains are areas that have a one percent chance of being flooded in any given year. Some types of floodplains are subject to the Federal Flood Insurance Program.

- c. *Air quality.* Air quality can generally be defined by the presence of specific pollutants in certain concentrations. The pollutants and concentrations can be measured and compared with the statewide Ambient Air Quality Standards established by the Florida DEP to determine the extent of air pollution in any given location.

Florida DEP
 Ambient Air Quality Standards
 (micrograms per cubic meter) Average

<i>Pollutant</i>	<i>Average Annual Allowable</i>	<i>Maximum Concentration</i>	<i>24-Hour Maximum</i>
Particulates	60	None Given	150
Sulfur Dioxide	60	1,300 – Three Hour Maximum	260
Nitrogen Dioxide	100	None Given	None Given
Carbon Monoxide	None Given	40 – One Hour Maximum	None Given
		10 – Eight Hour Maximum	
Ozone	None Given	235 – One Hour Maximum	None Given

These standards cannot be exceeded more than once per year.

FDEP monitors air quality throughout the state and identified areas that have not met standards as “non-attainment areas”. According to FDEP’s latest assessment, no areas within the Central Florida area have been classified as “non-attainment” areas. Motor vehicles and the Melbourne International Airport are the most significant sources of air pollution in Melbourne.

- d. *Minerals.* There are no known sources of commercially valuable minerals in the Planning Area. Although minerals certainly exist, none have been identified in sufficient quantities to make commercial mining worthwhile. Sand mines did previously exist, but are no longer permitted. Below is a summary of the mineral deposits known to exist at the surface and in the four major rock formations below the surface.

Surface deposits. Mixtures of sand, clay and shells including dunes.

Hawthorne formation. Varying proportions of quartz sand, clay, phosphorite, phosphatic limestone, and sandstone.

Ocala group. Primarily dolomitic limestone.

Avon Park limestone. Granular and porous limestone in the upper portion; dense, crystalline dolomite in the lower portion.

Lake City limestone. Alternating layers of hard, porous to dense, crystalline dolomite, and soft, fossiliferous limestone.

Coquina rock. There are substantial areas of coquina rock extending along the west shore of the Indian River Lagoon.

- e. *Soil erosion.* No areas of significant inland soil erosion have been identified. However, several areas along the rivers, coastal creeks and drainage canals have banks of sufficient slope conducive to erosion under certain weather conditions. Therefore, vegetation on these banks must be maintained and preserved, as must the wetlands on coastal streams.

The area where erosion is most prevalent is along the Atlantic coast, which experiences continual advances and retreats in the shoreline. The sea level of the Atlantic Ocean has been rising, causing slight increases in the level of some coastal creeks.

- f. *Vegetation, fish and wildlife.*

Vegetation. Much of the Melbourne area is classified as urban in which the natural vegetation has been preserved in some manner, or additional varieties have been planted. Map VII-3 identifies the land cover within the City. Some areas on the barrier island and in the northern and southern sections of the city still maintain a large proportion of the natural vegetation.

Natural vegetation communities occurring within the planning area include:

- Sea grass beds
- Sand pine scrub
- Hammock (Xeric, Mesic and Hydric).
- Pine flatwoods (longleaf, slash and pond).
- Coastal strand.
- Mangrove shores.

Vegetation within the area is well-varied with the following plants being of special concern:

- Giant leather fern.
- Curtiss milkweed.
- Large-flowered rosemary.
- Spring coralroot; Wister's coralroot.
- Butterfly orchid.
- False coco.
- Rein orchid.
- Carolina holly; sand holly.
- Catesby lily.
- Fall-flowering pleat-leaf; celestial lily.
- Florida beargrass.
- Hand adder's tongue fern.
- Twistspine prickly pear.
- Goldenpolypody.
- Elliot's sticky ground cherry.
- Rose pogonia.
- Big yellow milkwort.
- Polypody fern.

- Whisk fern; fork fern.
- Selaginella arenicola.
- Spiranthes vernalis.
- Aspidium fern.
- Common wild pine; airplant.
- Giant wild pine; giant air plant.
- Tampa vervain.
- Shoestring fern.
- Netted chain fern.

Natural vegetation serves several important functions in coastal areas. Among these are:

- Reduction of salt-water intrusion.
- Bird and animal habitats.
- Air purification.
- Noise reduction.
- Retardation of runoff and retention of soil moisture.
- Prevention of shoreline erosion.
- Buffering of storm surges.
- Prevention of wind erosion.
- Utilization of excess nutrients.
- Filtration of sediments and pollutants which may endanger water quality in adjacent areas.
- Temperature buffering.

Fish. The proximity of the city to the ocean, Indian River Lagoon and the St. Johns River make it a suitable center for commercial and sports fishing and shellfish harvesting. The most prevalent types of fish caught in the area include mullet, red snapper, sea trout, whiting, king mackerel, grouper, snook, and bass. Shellfish include Florida lobster, shrimp, scallops, blue crabs, stone crabs, oysters, and clams.

Wildlife. A list of wildlife species that were known to be present, or suspected to be present, in the area is found in Table C-2 of this Element.

Of the various species listed as threatened or endangered, the manatee is of special interest. The manatee has been designated as the official mammal of the city, and several programs have been initiated which provide greater protection. Brevard County completed a Manatee Protection Plan in 2000 to protect the manatees throughout the County. This plan includes boat speed zone regulations, educational efforts, habitat protection, a marina siting plan, and law enforcement recommendations.

Another species of special interest to the area is the Florida Scrub Jay. Brevard County has undertaken the process of developing a Scrub Conservation and Development Plan. This Plan, which has not been adopted by the Brevard County Commission, is a habitat conservation plan for scrub and scrub jays in Brevard County. In addition, the County's Environmentally

Endangered Lands Program has established various sanctuaries and conservation areas that preserve scrub habitat. These areas are located throughout the County.

Table C-2
 Conservation Element
 Data and Analysis
 Wildlife Species Representative of the Planning Area

A. Species known to be present.

Amphibians	Eastern spadefoot toad	Pine woods treefrog
	Greenhouse frog	Squirrel treefrog
	Southern toad	Little grass frog
	Oak toad	Southern chorus frog
	Cricket frog	Southern leopard frog
Reptiles	Snapping turtle	Southeastern five-lined skink
	Florida box turtle	Glass lizard
	Florida cooter	Eastern garter snake
	Gopher tortoise	Eastern hognose snake
	Green anole	Southern black racer
	Six-lines racerunner	Eastern Diamond-backed rattlesnake
Birds*	Red-throated Loon	Common Loon
	Pied-billed Grebe	Horned Grebe
	Cory's Shearwater (OS)	Greater Shearwater (OS)
	Sooty Shearwater (OS)	Audubon's Shearwater (OS)
	Wilson's Storm-Petrel (OS)	White-tailed Tropicbird (OS)
	Masked Booby (OS)	Brown Booby (OS)
	Northern Gannet (OS)	American White Pelican
	Brown Pelican	Double-crested Cormorant
	Anhinga	Magnificent Frigatebird
	American Bittern	Least Bittern
	Great Blue Heron	Great Egret
	Snowy Egret	Little Blue Heron
	Tri-colored Heron	Reddish Egret
	Cattle Egret	Green-backed heron
	Black-crowned Night-Heron	Yellow-crowned Night-Heron
	White Ibis	Glossy Ibis
	Roseate Spoonbill	Wood Stork
	Greater Flamingo	Fulvous Whistling-Duck
	Snow Goose	Brant
	Canada Goose	Wood Duck
	Green-winged Teal	American Black Duck
	Mottled Duck	Mallard
	Northern Pintail	Blue-winged Teal
	Southern Shoveler	Gadwall
	American Pigeon	Canvasback
		Ring-necked Duck

Table C-2 (Continued)

Wildlife Species Representative of the Planning Area

A. Species known to be present.

	Greater Scaup	Lesser Scaup
	Oldsquaw	Black Scoter
	Surf Scoter	White-winged Scoter
	Common Goldeneye	Buffelhead
	Hooded Merganser	Red-breasted Merganser
	Ruddy Duck	Black Vulture
	Turkey Vulture	Osprey
	American Swallow-tailed Kite	Bald Eagle
	Northern Harrier	Sharp-shinned Hawk
	Cooper's Hawk	Red-shouldered Hawk
	Broad-winged Hawk	Swainson's Hawk
	Red-tailed Hawk	Crested Caracara
	American Ketrel	Merlin
	Peregrine Falcon	Wild Turkey
	Northern Bobwhite	Blackrail
	Clapper Rail	King Rail
	Virginia Rail	Sora
	Purple Gallinule	Common Moorhen
	American Coot	Limpkin
	Sandhill Crane	Black-bellied Plover
	Lesser Golden Plover	Wilson's Plover
	Semipalmated Plover	Piping Plover
	Kildeer	American Oystercatcher
	Black-necked stilt	American Avocet
	Greater Yellowlegs	Lesser Yellowlegs
	Solitary Sandpiper	Villet
	Spotted Sandpiper	Upland Sandpiper
	Whimbrel	Long-billed Curlew
	Marbled Godwit	Ruddy Turnstone
	Red Knot	Sanderling
	Semipalmted Sandpiper	Western Sandpiper
	Least Sandpiper	White-rumped Sandpiper
	Pectoral Sandpiper	Purple Sandpiper
	Dunlin	Stilt Sandpiper
	Short-Billed Dowitcher	Long-billed Dowitcher
	Common Snipe	American Woodcock

Table C-2 (Continued)
 Wildlife Species Representative of the Planning Area

A. Species known to be present.

	Wilson’s Phalarope	Red-necked Phalarope (OS)
	Red Phalarope (OS)	Pomarine Jaeger (OS)
	Parasitic Jaeter (OS)	Laughing Gull
	Bonaparte’s Gull	Ring-billed Gull
	Herring Gull	Glaucous Gull
	Great Black-backed Gull	Black-legged Kittiwake
	Gull-billed Tern	Caspian Tern
	Royal Tern	Sandwick Tern (OS)
	Toseate Tern	Common Tern (OS)
	Forster’s Tern	Least Tern
	Bridled Tern (OS)	Sooty Tern (OS)
	Black Tern	Black Skimmer
	Rock Dove	White-winged Dove
	Mourning Dove	Common Ground Dove
	Black-billed Cuckoo	Yellow-billed Cuckoo
	Smooth-billed Ani	Common Barn Owl
	Eastern Screech Owl	Great Horned Owl
	Burrowing Owl	Barred Owl
	Short-eared Owl	Common Nighthawk
	Chuck-will’s widow	Whip-poor-will
	Chimney Swift	Ruby-throated Hummingbird
	Rufous Hummingbird	Belted Kingfisher
	Red-headed woodpecker	Red-bellied Woodpecker
	Yellow-bellied Sapsucker	Downy Woodpecker
	Hairy Woodpecker	Red-cockaded Woodpecker
	Northern Flicker	Pileated Woodpecker
	Eastern Wood Pewee	Acadian Flycatcher
	Eastern Phoebe	Eastern Kingbird
	Western Phoebe	Nor. Rough-winged Swallow
	Gray Kingbird	Cliff Swallow
	Tree Swallow	Blue Jay
	Bank Swallow	American Crow
	Barn Swallow	Carolina Chickadee
	Scrub Jay	Brown-headed Nuthatch
	Fish Crow	

Table C-2 (Continued)
 Wildlife Species Representative of the Planning Area

A. Species known to be present.

	Tufted Titmouse	House Wren
	Caroline Wren	Marsh Wren
	Sedge Wren	Blue-gray Gnatcatcher
	Ruby-crowned Kinglet	Veery
	Eastern Bluebird	Swainson's Thrush
	Gray-cheeked Thrush	Wood Thrush
	Hermit Thrush	Gray Catbird
	American Robin	Brown Thrasher
	Northern Mockingbird	Cedar Waxwing
	Water Pipit	European Starling
	Loggerhead Shrike	Solitary Vireo
	White-eyed Vireo	Warbling Vireo
	Yellow-throated Vireo	Red-wyed vireo
	Philadelphia Vireo	Blue-winged warbler
	Black-whiskered Vireo	Orange-crowned Warbler
	Tennessee Warbler	Northern Parula
	Nashville Warbler	Chestnut-sided Warbler
	Yellow Warbler	Cap May Warbler
	Magnolia Warbler	Blackburnian Warbler
	Black-throated Green Warbler	Pine Warbler
	Yellow-throated Warbler	Palm Warbler
	Prairie Warbler	Blackpoll Warbler
	Bay-breasted Warbler	American Redstart
	Black-and-white Warbler	Worm-eating Warbler
	Prothonotary Warbler	Ovenbird
	Swainson's Warbler	Louisiana Waterthrush
	Northern Waterthrush	Connecticut Warbler
	Kentucky Warbler	Hooded Warbler
	Common Yellowthroat	Yellow-breasted Chat
	Wilson's Warbler	Scarlet Tanager
	Summer Tanager	Northern Cardinal
	Western Tanager	Blue Brosbeak
	Rose-breasted Grosbeak	Painted Bunting
	Indigo Bunting	Rufous-sided Towhee
	Dickcissel	Chipping Sparrow
	Bachman's Sparrow	Field Sparrow
	Clay-colored sparrow	Lark Sparrow
	Vesper Sparrow	Grasshopper Sparrow
	Savannah Sparrow	Sharp-tailed Sparrow
	Henslow's Sparrow	Fox Sparrow
	Seaside Sparrow	Lincoln's Sparrow
	Song Sparrow	White-throated Sparrow

Table C-2 (Continued)
 Wildlife Species Representative of the Planning Area

A. Species known to be present.

	Swamp Sparrow	Bobolink
	White-crowned Sparrow	Eastern Meadowlark
	Red-winged Blackbird	Rusty Blackbird
	Yellow-headed Blackbird	Boat-tailed Grackle
	Brewer's Blackbird	Brown-headed Cowbird
	Common Grackle	Northern Oriole
	Orchard Oriole	Pine Siskin
	Purple Finch	House Sparrow
	American Goldfinch	Cotton Rat
Mammals	Opossum	Raccoon
	Least Shrew	Sea Otters
	Eastern Mole	Spotted Skunk
	Nine-banded Armadillo	Striped Skunk
	Eastern Cottontail	Gray Fox
	Florida or Gopher Mouse	Bobcat
	Florida Deer	

B. Species Suspected to be present.

Amphibians	Eastern Narrow-mouthed toad	Gopher Frog
Reptiles	Red-tailed Skink	Scarlet Kingsnake
	Southern Hognose Snake	Scarlet Snake
	Eastern Indigo Snake	Southeastern Crowned Snake
	Florida Pine Snake	Eastern Coral Snake
Mammals	Short-tailed Shrew	Gray Fox
	Cotton Mouse	Florida Panther

*List of birds compiled by Johnie Johnson based upon observations during the period from 1951 through 1982.
 Source: University of Central Florida, Ecology Impact Statement prepared as part of an Aircraft Noise Abatement Policy Study, 1971.

Data and Analysis
 Table C-3.
 Threatened and Endangered Species
 Within the Melbourne Area

	<i>Species of Special Concern</i>	<i>Threatened Species</i>	<i>Endangered Species</i>
Amphibians and Reptiles	American Alligator	Gopher Tortoise	Atlantic Green Sea Turtle
	Red Rat Snake	Atlantic Loggerhead Sea Turtle	Leatherback Sea Turtle
	Barbor's Map Turtle	Indigo Snake	
	Georgia Blind Salamander	Atlantic Salt Marsh Snake	
	Florida Pine Snake		
	Gopher Frog		
	Bog Frog		

Birds	Roseate Spoonbill	Southeastern American Kestrel	Wood Stork
	Wakulla Seaside Sparrow	Crested Caracara	Everglades Snail Kite
	Scott's Seaside Sparrow	Florida Sandhill Crane	Peregrine Falcon
	Limpkin	Least Tern	
	Worthington's Marsh Wren	Florida Scrub Jay	
	Little Blue Heron		
	Reddish Egret		
	Snowy Egret		
	Tricolored Heron		
	Brown Pelican		
	Florida Burrowing Owl		
	American Oystercatcher		
	Red-cockaded Woodpecker		
	Osprey		
Mammals	Florida Mouse	Florida Black Bear	Florida Panther
	Sherman's Short-tailed Shrew		Florida Manatee
	Duke's Saltmarsh Vole		
	Florida Mouse		
	Sherman's Fox Squirrel		
	Eastern Chipmunk		
Fish	Harlequin Darter		
	Southern Tessellated Darter		
	Saltmarsh Topminnow		
	Shoal Bass		
	Rivulus		
	Key Blenny		

Source: St. Johns River Water Management District, Phase 1 Water Resources Plan and East Central Florida Regional Planning Council, Regional Policy Plan, Florida Natural Areas Inventory, Florida Fish and Wildlife Conservation Commission, Florida's Endangered Species, Threatened Species and Species of Special Concern.

Several species of sea turtles including the Atlantic Green Turtle, the Atlantic Loggerhead Turtle, and the Leatherback Turtle nest on Brevard County beaches. These three species are designated either as endangered or threatened. Because artificial lighting and various human activities can disturb the turtles, the City will consider adopting an ordinance that protects the nesting area of these species.

- g. *Groundwater recharge areas.* These are areas suited for capture and infiltration of precipitation and surface flow into underground limestone formations which replenish groundwater resources. There are two basic types of recharge:
- (1) Primary, which generally contain well-drained, sandy soils; a thick, unsaturated zone having a low water table; little or no confining layers to impede filtration; and adequate storage capacity available in the artesian system.
 - (2) Surficial, which are capable of groundwater recharge but, with hydrologic modifications, can be induced to perform more efficiently.

Primary recharge areas in the coastal zone are limited to coastal ridges. These Atlantic ridges do not supply large quantities of water, but function importantly by preventing lateral saltwater intrusion into inland groundwater reservoirs. Both primary and surficial recharge areas should be protected from practices which would destroy their function.

- g. *Stormwater management.* The historical practice of collecting and discharging stormwater runoff to surface water bodies and channelizing natural drainage corridors to remove excess rainfall has created severe environmental problems. These problems include, but are not limited to:

- Saltwater intrusion.
- Diminished water quality.
- Flooding.
- Loss of valuable recharge to groundwater supplies.
- Erosion of topsoil.
- Sedimentation of receiving water bodies.
- Lowering of the water table.

Multipurpose management objectives and policies designed to alleviate these problems are contained in Section E. . The City's stormwater ordinance requires all projects to submit a stormwater management plan and to have a SJRWMD permit. An erosion and sedimentation control permit is required for any land disturbing activities with a plan for sedimentation control. The city continues to install sediment traps to provide retention time and settling of sediment from stormwater prior to entering the Indian River Lagoon. The city also maintains a program to pave and provide drainage for unimproved streets.

The City has completed the following stormwater management projects:

Garfield Street Drainage: Construction of two detention ponds providing treatment of neighborhood stormwater runoff in an area where direct discharge to Eau Gallie River previously existed.

Dove Street Pond: Construction of a 2.5 acre dual-stage stormwater detention facility providing flood control and water quality benefits.

Baffle Boxes – Installation at Yacht Basin & Stewart: Water quality improvement through sediment reduction.

Wickham Park Pond Construction: City contributed to county project. Creation of two ponds. Water quality project treating water from the Parkway and Croton systems. Some flood control is also being provided to these areas.

South Melbourne & Crane Creek Drainage Basin Flooding/Water Quality Study: Analyzed existing system's ability to convey stormwater by computer simulation. Identified problem areas and recommended flood reduction improvements. Pollutant loading computer model identified potential water

quality improvements. Detailed analysis of the cost effectiveness of each recommended improvement project.

2. Known Pollution Problems.

Known pollution sources in the planning area are, but not limited to: Marinas, traffic, improper construction practices, and the airport. Stormwater runoff contributes to pollution in Crane Creek, the Eau Gallie River, and other local tributaries

3. Potable Water.

The source for all information presented in this section is the City of Melbourne Comprehensive Plan Infrastructure Element.

a. *Current and projected water needs and sources.* In the 10-Year Water Supply Facilities Work Plan, the City has examined the sources of water that can be utilized to serve both existing and future demand. The Plan also addresses the facility improvements needed to meet future potable water needs.

b. *Industrial and hazardous wastes.* Industrial and hazardous wastes have not been a problem to date in the Melbourne area. The city has in place an ordinance requiring pretreatment of all industrial wastes prior to discharge into the sanitary sewer system.

Hazardous wastes, as deemed in Rule 9J-5, are fairly limited in quantity in the Melbourne Planning Area, and consist primarily of hospital x-ray wastes and household items such as paint thinners, paint, oils, and pesticides., A permanent site for the drop-off of household hazardous materials has been established in Melbourne at the Sarno landfill and is open three days per week.

c. *Water quality, and conservation/protection of resources.* Refer to information provided in the Infrastructure Element.

d. *Water use conservation.* The city has an active and effective water conservation program. The program includes the following initiatives ~~controls~~ and programs:

- An aggressive capital improvement program for continually improving the water and wastewater treatment systems
- A large reclaimed water program that seeks to displace potable water irrigation
- A process water recycling procedure at the surface water treatment plant
- A high recovery operation at the reverse osmosis water treatment plant
- A commitment to individually metered water services
- A strong cross-connection control program
- An aggressive water distribution system leak detection and repair program
- A nationally recognized industrial pretreatment program supported by a full-time pre-treatment coordinator
- A nationally recognized water conservation program supported by full-time staff; and,
- A strong commitment to customer education and retrofit programs.

4. Existing Controls.

a. *Regulations.* Current regulations and permitting processes that directly or indirectly affect the conservation of natural resources in the city are fairly extensive. They include:

- Vegetation Ordinance.
- Zoning Ordinance.
- Building Permit.
- Subdivision Regulations.
- Septic Tank Permits.
- Well Construction Permits (in reuse zones).
- Manatee Protection Plan.
- Water Conservation Ordinance.
- Stormwater Ordinance.

In addition, permitting programs administered by the Department of Environmental Protection, the Army Corps of Engineers, the Game and Freshwater Fish Commission, the U.S. Fish & Wildlife Service, and the St. Johns River Water Management District all play major roles in protecting various resources. No current regulatory deficiencies have been identified.

b. *Support activities.* Melbourne is also fortunate to have several knowledgeable groups which strongly pursue activities that contribute to the conservation and preservation of natural resources. Included among these groups are the Marine Resources Council of East Florida, the Indian River Lagoon Estuary Program, Keep Brevard Beautiful, Native Plant Society, Turtle Coast Sierra Club, the Chamber of Commerce and its various committees, numerous garden clubs and other groups.

D. FUTURE CONDITIONS.

1. Natural Resources.

Development will continue to create the potential for destruction of or damage to wetlands, floodplains and recharge areas. Development regulations will continue to be enforced which will eliminate, mitigate or minimize the potential for destruction of wetlands, floodplains and aquifer recharge areas. Development should only be allowed when adequate mitigation measures can be provided, to ensure that no loss of natural functions occurs.

Air quality is expected to be impacted by automobile exhaust emissions, which will likely intensify as growth continues. Adequate highway facilities, as outlined in the Transportation Element, must be provided to keep traffic congestion to a minimum.

Soil erosion caused by future development is not expected to be a problem, as proper site planning and construction techniques should prevent any adverse impacts. Variation of

the coastal shoreline including coastal creeks is expected to continue and should be monitored, as is done now, to provide early identification of any critical trends. Coordination with Brevard County and other agencies will continue to be essential for the protection of this area. Sea grasses and natural shoreline vegetation must be preserved for erosion control, water quality and habitat prevention.

Wildlife will likely diminish in the Planning Area as new development occurs. Some mitigation can be realized through requirements for preservation of natural vegetation and provision of open space. Government acquisition and preservation of key habitats is an ongoing occurrence and should be promoted to help reduce the need for wildlife to flee to other areas. Additionally, ongoing educational programs should be provided to encourage public awareness of the needs of the wildlife in the area.

2. **Pollution.**

Future development must continue to be required to provide stormwater management systems that are increasingly sensitive to natural resources and functions. Every effort should be made to use natural wetlands as part of stormwater management systems. The use of on-site retention and treatment is required for new projects in order to preserve wetlands, flood-prone areas, and recharge areas. This will reduce not only adverse environmental impacts, but also the impact of new growth on the existing drainage systems.

The City has the following projects underway or planned to address the treatment of stormwater:

Improvements Underway:

Sarno Road/Bell Street Drainage Improvements: The scope of work includes the removal of approximately 400 linear feet (l.f.) of deteriorated 48" diameter metal storm drain and replacement of same with reinforced concrete pipe. Additionally, 125 l.f. of metal storm drain pipe under Sarno Road will be rehabilitated by the insertion of a cure-in-place polyethylene liner. The resulting work will reduce street flooding conditions within the Ixora Park Subdivision.

Swift Street Stormwater Improvements: Provide flood control by enhancing drainage existing system, includes pipe replacement and lining.

Stormwater Master Plan Master : A stormwater master plan for the entire Crane Creek drainage basin, including the Hickory Ditch sub-basin, has been completed to address flood control and water quality issues in this area of District 5. This study was jointly funded by St. John's River Water Management District (SJRWMD), City of Melbourne and Brevard County. This area in South Brevard County includes the cities of Melbourne and West Melbourne as well as unincorporated Brevard County. The master plan is being used to identify local flooding areas and possible solutions, identify possible best management practices (BMPs) to improve water quality into the Indian River Lagoon and identify possibilities available to increase recharge to the superficial aquifer underlying the watershed.

Upcoming Improvements

Eber Road Widening & Babcock Street Realignment: Retrofit roadway and nearby development for stormwater drainage and treatment improvements.

Charles Drive: Upgrade of stormwater outfalls along Charles Drive/Almar Subdivision. When complete, will provide flood control and treatment by replacing existing pipe system and construction of detention pond.

Sherwood Drive Replacement Stormwater Pipe: When complete, reduction of ditch erosion.

Stabilize Hickory Ditch: Water quality project to stabilize ditch resulting in reduced erosion to Crane Creek and Indian River Lagoon including stormwater pipe replacement.

Tallwood Subdivision Drainage: Study to define solution to street flooding problems.

Front Street/New Haven Drainage Study: To define solution to street and property flooding problems.

3. Potable Water.

As described in the Infrastructure Element, the city will continue to provide sufficient potable water to meet the demands of future growth. The city and Brevard County must ensure appropriate protection of Lake Washington. Future Conditions are described within the Infrastructure Element.

4. Needed Incentives.

Current regulations of the city, state and federal governments are effective in providing protection for natural resources. As development pressures increase to develop lands of greater environmental sensitivity, additional controls will likely be needed. Expected needs are described as policies in the Goals, Objectives and Policies section of this element.

Green development methods can increase energy efficiency. These methods can also reduce impacts to the on the natural environment. Such practices are integral to sustainable building and development which can be characterized as balancing the need for development (housing construction) and growth (population increase) with the need to protect the natural and built environment. The City recognizes the value of green building practices and will encourage the construction of such development.