



Indian River County 2030 Comprehensive Plan

Chapter 3C

Solid Waste Sub-Element

Indian River County Community Development Department
Adopted: 2010

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INTRODUCTION

In Indian River County, residents and commercial/industrial establishments produce an average of 2.4 tons per capita per year of solid waste (Duncan & Associates, 2007). In addition, the County generates hazardous waste. Some is considered household hazardous waste, but the bulk comes from businesses and industry.

This sub-element will identify and analyze Indian River County's existing solid and hazardous waste management practices and facilities, project future waste generation levels, assess the adequacy of current facilities, and establish goals, objectives, and policies.

DEFINITIONS

Average Annual Per Capita Landfill Capacity Consumption Rate: A consumption rate based on 2.5 cubic yards per person per year.

Commercial waste: Waste generated by commercial and institutional entities. These wastes have physical characteristics similar to residential wastes, consisting largely of combustible and degradable materials such as paper and food waste.

Customer Convenience Center (CCC): A drop-off facility for solid waste, recyclables, and household hazardous waste delivered by County residents for transportation to the County's landfill site for ultimate disposition.

Hazardous waste: Waste which, because of its characteristics, has the potential to cause or significantly contribute to injury, illness or death and which could present a potential danger to human health if improperly transported, stored, treated, disposed of or otherwise managed.

Industrial waste: Solid waste generated from industrial sites, excluding hazardous wastes. These can include general industrial housekeeping and support activity wastes.

Landfill: The final disposal (burial) site of solid waste which has not been or cannot be recycled.

Per Capita Waste Generation Rate: Average quantity of total solid waste generated annually by each resident. This is equal to 2.4 tons (Impact Fee Update, Solid Waste, Duncan & Associates, 2007).

Recycling: Any process by which materials otherwise considered to be solid waste are collected, separated, processed and reused or changed into raw materials or new products.

Residential waste: Mixed household solid wastes, including yard trash.

Resource recovery: The process of recovering usable materials and/or energy from the municipal solid waste stream.

Solid Waste: Garbage, refuse, yard trash, land-clearing debris, ash, sludge and other discarded material resulting from domestic, industrial, commercial, mining, agricultural or governmental operations.

Special waste: Construction and demolition debris, yard trash, white goods, and waste tires.

Waste Generation Unit: A weight unit equivalent to 1 ton (2000 pounds) of solid waste.

BACKGROUND

Prior to 1977, small landfill operations existed in six locations throughout the County. The old dump (landfill) sites are as follows:

- Roseland Landfill (east of Roseland Road): This landfill is currently closed with a portion used as a Customer Convenience Center (CCC).
- Wabasso Landfill (west of 58th Avenue and south of 85th Street): This landfill is currently closed.
- Winter Beach Landfill (south of 65th Street and west of Old Dixie Highway): This landfill is currently closed with a portion used as a CCC.
- Gifford Landfill (south of 41st Street and west of 43rd Avenue): This landfill is currently closed with a portion used as a CCC.
- Oslo Road Landfill (Old Dixie Highway and 1st Place): This landfill is currently closed with a portion used as a CCC.
- Dodger Pines Landfill site (north of 26th Street and west of 43rd Avenue). This landfill is currently closed.

Of the six former dump sites referenced above, all except the one at Dodger Pines were maintained by the County. The Dodger Pines site was a city of Vero Beach dump site.

In 1977, the Indian River County Board of County Commissioners (Board) established a centralized county landfill at the current landfill site south of Oslo Road and west of 74th Avenue. The first constructed landfill, Segment I, was unlined (it was not required to be lined at the time) and operated until 1989. It was then closed, and the lined Segment II, the current operating landfill, was opened.

Solid Waste Master Plan

In order to determine future solid waste needs, the County, in 1985, commissioned a solid waste study. The result of that study was the Indian River County Solid Waste Management Master Plan (Solid Waste Master Plan). As recommended by that plan, the County then established a Solid Waste Disposal District (SWDD). The SWDD is structured as a dependent special district.

Since 1985, the Solid Waste Master Plan has been updated several times. According to the adopted plan, the specific programs, projects, policies, and direction of the solid waste management system are to undergo periodic review and update. The focus of such reviews is expected to include the following:

- * Update of waste stream and capacity forecasts;

- * Evaluation of how the useful life of the existing landfill has been extended or can be extended through source reduction, recycling, and landfill development; and
- * Review of disposal charges, bonding requirements and the role and effectiveness of the SWDD.

Overall, the Solid Waste Master Plan provides specific guidance for solid waste management within the County. Many of the policies of the Solid Waste Master Plan are similar to the policies of the solid waste sub-element of the comprehensive plan.

EXISTING SOLID WASTE MANAGEMENT SYSTEM

To varying degrees, all land uses produce solid waste. This waste then must be handled in one of several ways. Most commonly, solid waste is disposed of in a landfill. As more land is needed for disposal, the threat of groundwater pollution increases, and the cost for construction and operation of the landfill also increases. For those reasons, recycling and other alternatives to disposal have recently come under serious consideration.

Currently, Indian River County maintains the County landfill facility for the disposal of solid waste produced in the County. The solid waste system, however, involves more than just the disposal of solid waste; it also involves the generation and collection of such waste. This section addresses these three components.

Presently, the county's solid waste system consists of franchised solid waste collectors; five customer convenience centers (Figure 3.C.1 shows the location of solid waste facilities in Indian River County); a disposal system (Figure 3.C.2 shows the locations of the county's solid waste management facility); a hazardous waste management program; and a recycling program. In the incorporated areas of the County, solid waste collection is the responsibility of the respective municipalities. In the unincorporated area, the SWDD Board has the legal authority to award franchises to private haulers. Currently, two franchised haulers, Treasure Coast Refuse and Waste Management Inc. of Florida, provide curbside collection services in the county's unincorporated area.

Generation, collection, and processing/disposal are the three elements of municipal solid waste management. Each must be considered when assessing a municipal solid waste (MSW) system.

Generation

Given the solid waste tonnage produced by residential, commercial, industrial, and special waste generators, Indian River County's unit contribution rate of solid waste averages 2.4 tons per capita/per year for the County's permanent population plus weighted seasonal population. The solid waste industry weight standard is the short ton. A short ton equals 2,000 pounds.

Based on this unit contribution rate, the annual per capita solid waste generation is estimated to be 4,800 pounds (lbs), of which approximately one third is recycled and the remaining two thirds is landfilled. According to SWDD records, the average annual per capita landfill capacity consumption rate is approximately 2.5 cubic yards (Solid Waste Management Master Plan, 2007 update). The

landfill volume is the principal factor in projecting landfill needs and in creating level-of-service standards.

At present, the County has 275 acres of land for solid waste disposal. As of 2005 approximately 1.09 million cubic yards of solid waste mass had been accumulated at the landfill site. Based upon the average compaction densities achieved by the SWDD from 1996 through 2006, the annual landfill capacity required by the County is approximately 2.5 cubic yards per capita. According to projections for the year 2030, the landfill facility will require additional capacity of 9.6 million cubic yards for solid waste disposal (Solid Waste Management Master Plan, 2007 Update).

Although there are slight variations in the seasonal generation of solid waste, the spring months continue to have the highest generation rates, with lower generation rates occurring in the fall and winter months.

Funding

For Fiscal Year 2007/2008, the operation costs of the SWDD were \$11,356,000, while revenues were \$12,489,000. To fund orderly expansion and operation of the solid waste facilities, the County uses non-advalorem assessment programs and user fees.

Collection

In this plan, collection refers to the system by which solid waste is transferred from the point of generation to processing or disposal facilities. This also involves a transfer/storage component. The transfer/storage component is an intermediate step between collection and disposal. Transfer/storage has been employed to maximize cost efficiencies in the transportation of solid waste from the point of generation to the point of disposal. In Indian River County, the transfer/storage system supplements the curbside and door-to-door collection services.

Overall, the solid waste collection system involves transporting waste from individual land uses or points of generation to the county landfill. Presently, there are three primary methods of solid waste collection. These are as follows:

- door-to-door collection by the City of Vero Beach;
- curbside collection in the unincorporated County and the other municipalities by private haulers; and
- individual transportation of solid waste to County CCCs or the landfill.

Figure 3.C.1
 Location of Solid Waste Facilities
 County Landfill and Customer Convenience Centers
 Indian River County

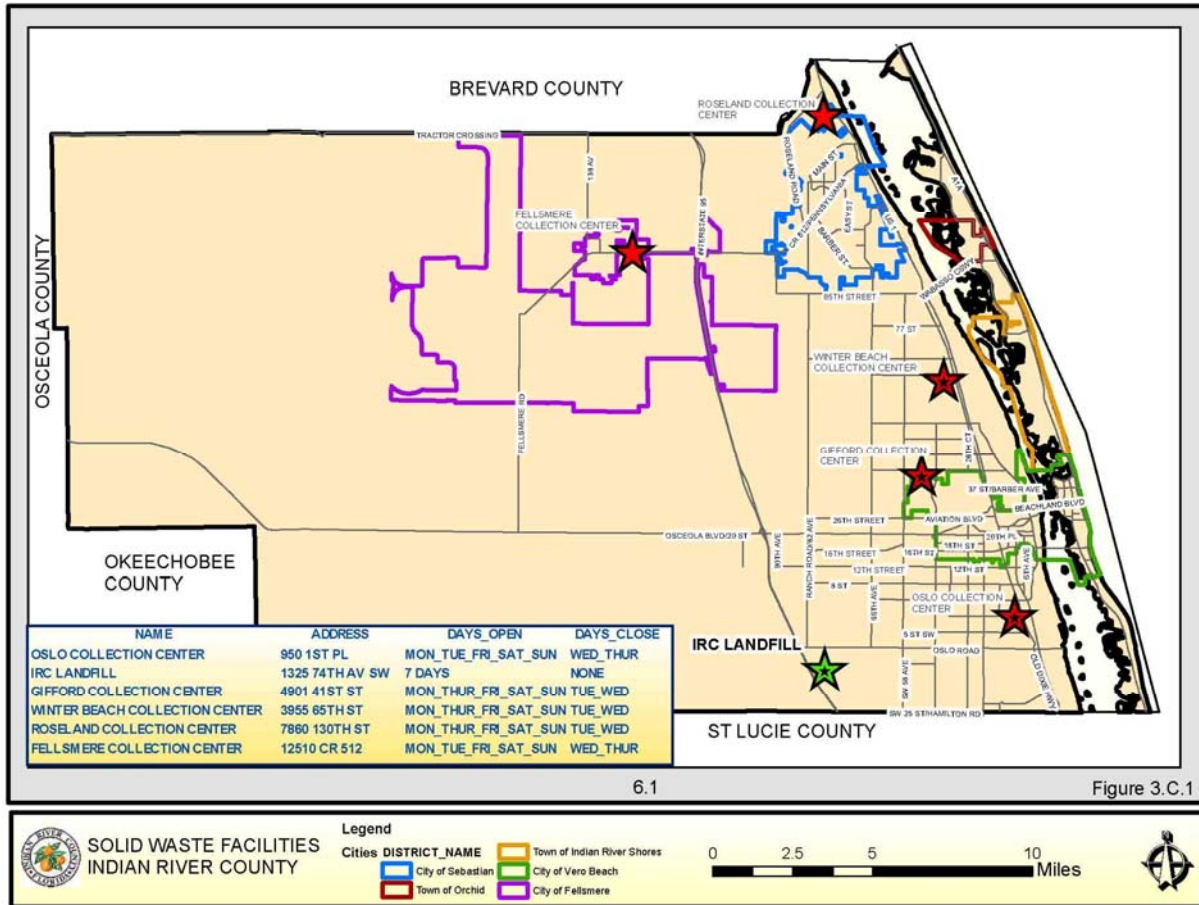
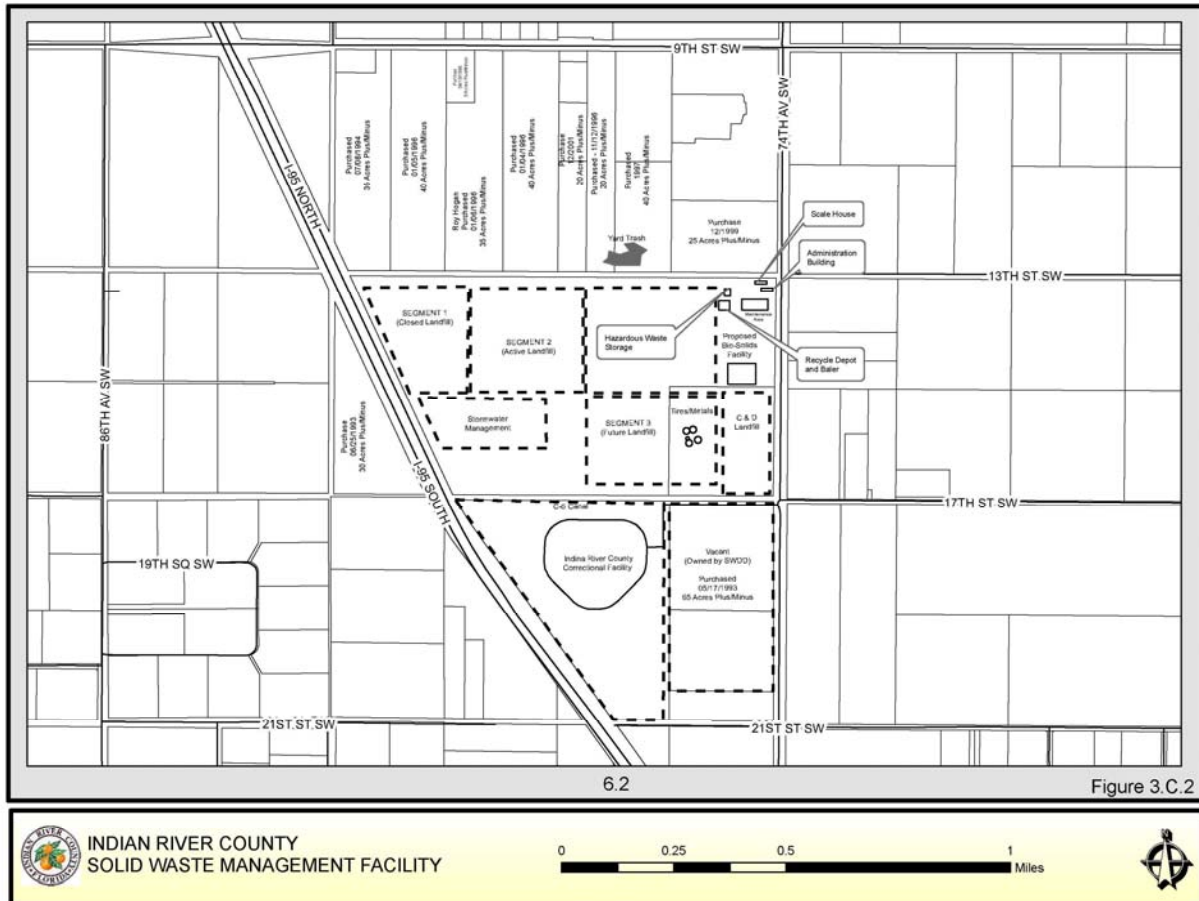


Figure 3.C.2
Solid Waste Management Facility (County Landfill)
Indian River County



- **Residential Collection**

Within the County, residential solid wastes are collected in one of the following ways:

- **Drop-off**

In addition to the landfill, five CCCs operate throughout the County. At any of the five CCCs and the landfill site, County residents can at no charge drop off solid waste, waste that is to be recycled, and household hazardous waste. In Fiscal Year 2007/2008, less than ten percent (10%) of the County's residential solid waste was processed through the five CCCs. The cost for operation and maintenance of the five CCCs and transportation of the waste material to the landfill site is about \$2 million per year.

The five CCCs are open and manned five days a week from 7:00 a.m. to 6:00 p.m., while the landfill site is open 7 days a week from 7:00 a.m. to 5:00 p.m. All CCCs are closed on Wednesdays, but three of the CCCs are also closed on Tuesdays, with the other two CCCs closed on Thursdays. Each CCC has 40-yard roll-off containers designated for household waste and yard waste, segregated containers for recyclables, and designated areas for various other materials such as bulky materials, tires, batteries, etc. The Oslo, Fellsmere and Winter Beach CCCs also use transfer trailers equipped with walking floors for transportation of household waste. Materials collected at the CCCs are then transported by the SWDD to the landfill for disposal or for processing and transportation to recycling markets.

Recently, the SWDD completed the expansion of the Fellsmere CCC, increasing its size by four acres to 5.36 acres and remodeling the facility at a cost of \$2,000,000. The facility uses 135-cubic yard transfer trailers equipped with walking floors, instead of 40 cubic yard-rolloff containers to transfer MSW to the landfill site. This mode of transportation reduces the number of trips necessary to transport the waste to the landfill site in comparison with the 40-cubic yard containers, and thus offers significant savings to the SWDD. The SWDD also plans to expand the Oslo CCC and build a new facility at the site. Because solid waste collection remains voluntary by subscription only, the CCCs continue to allow County residents to drop-off solid waste and recyclable materials without a fee.

- **Residential Curbside Collection**

Under current franchise agreements, the County is split into two service areas for residential solid waste and recycling collection. While Waste Management Inc. serves the northern part of the County, Treasure Coast Refuse serves the southern part of the County. Currently, the cost of collection is about \$14.32 per month for residential customers. Residential waste collection also includes separate collection of yard and garden trash. All County residents, regardless of whether or not they subscribe to a trash collection service, receive curbside or neighborhood recycling collection service. Through inter-local agreements, residents in all municipalities within the county also receive SWDD recycling collection service.

decided to discontinue the separate disposal of C&D debris in an unlined landfill, because of the potential danger of groundwater contamination from accidental release of contaminated leachate, and switched to codisposal, whereby the C&D debris is landfilled in a lined Class I landfill commingled with MSW.

On the landfill site, the following improvements exist:

- * A scale house for weighing materials entering the landfill;
- * An administration building housing SWDD administrative offices;
- * A yard trash site for processing yard trash such as bushes, trees, etc.;
- * A recycling operation for processing recyclable materials;
- * A household hazardous waste storage facility to store hazardous waste before the wastes are sent to processing facilities;
- * An Active Class I landfill cell for disposal of solid waste entering the landfill;
- * An Inactive C&D debris landfill;
- * A stormwater pond for treatment and on-site storage of clean stormwater run off;
- * A landfill gas management system; and
- * A biosolids dewatering facility (estimated construction completion March 2010).

Currently, SWDD's 5-acre yard waste area encompasses both disposal and recycling activities. This area is manned seven days a week by a contractor who is responsible for grinding all vegetative debris received. In 2008, approximately 54,000 tons of yard waste were received and processed. Of this tonnage, the SWDD used approximately 12,000 tons of ground vegetative debris on site for daily cover at the Class I landfill. The contractor transports the balance off site.

Recently, the plans for future Segments 3, 4, and 5 of the Class I landfill were changed to establish one new segment, Segment 3, with four phases of development. Also, the County decided in 2007 to abandon plans to develop a new cell (Cell 2) for C&D debris disposal, and decided instead to commingle C&D debris with MSW in a lined Class I landfill.

As of 2005, approximately 1.09 million cubic yards of solid waste mass had been accumulated at the landfill site. In order to accommodate the amount of solid waste projected through the year 2030, the landfill facility will require an additional 9.6 million cubic yards of disposal capacity for Class I solid waste and C&D debris. With the current available capacity plus the scheduled addition of the vertical expansion and proposed Segment 3, the landfill's design capacity is estimated at 13.5 million cubic yards.

At present, the processing of solid waste remains the same as it was in 1995, with solid wastes separated by type. As in the past, the processing of waste differs according to the various waste types, and separation continues to occur at the source of production, at the CCCs, and at the landfill site. To ensure safe processing and disposal of the County's solid waste and to minimize environmental impact by following Federal and State standards and regulations, the SWDD continues to monitor the landfill site.

For volume reduction at the landfill site, the County contracts for tire removal and for yard waste grinding services. While tires are hauled off-site, a portion of the ground yard waste is used for

coverage on the Class I landfill, and the remaining yard waste is hauled off-site.

Currently, sludge, screenings and grit from the County’s wastewater treatment plants are dewatered and disposed of at the County landfill. Recently, the SWDD obtained Florida Department of Environmental Protection (FDEP) permits for construction and operation of a sludge dewatering facility at the landfill site. This facility is presently under construction and is scheduled to be complete by March 2010. Septage is also currently disposed of at the County landfill.

- Recycling

In response to the Florida Solid Waste Management Act of 1988, Indian River County established a recycling program. Since May 1997, this program has included curbside or neighborhood residential recycling collection available to every residence in the County, both single-family and multi-family. In addition, residents may bring their recyclables to any of the five CCCs in the County or to the landfill site.

As structured, the countywide recycling program includes curbside collection services for single-family homes and either pick-up or drop-off service for businesses and multiple family developments. To avoid concentrating recycling activities on only one or two materials, the State of Florida does not allow everything that is recycled to count toward a community’s recycling goals. Consequently, the SWDD applies only a portion of the ground yard waste used for daily coverage of the landfill toward the County’s recycling goal. Additionally, the SWDD contracts with a private company to remove all tires from the landfill for recycling into fuel and road base material.

During Fiscal Year 2007/2008, approximately 54,000 tons of recycled solid waste were collected. This amount represents 23% of the total solid waste stream in the County. During Fiscal Year 2007/2008, the County recycled the following amounts of materials (Table 3.C.1):

**TABLE 3.C.1
2008 RECYCLED MATERIALS**

MATERIAL	TONS RECYCLED
Glass	1,489
Aluminum Cans	141
Plastic	707
Clean C&D	11,038
Yard Trash	32,996
Tires	463
Scrap Metals	871
Corrugated	858
Newspaper	4,788
Steel Cans	180
Mixed Recyclables	58
TOTAL	53,589

Until late 2008, the County recycled seven items. These were plastic #1 and #2, steel cans, aluminum cans, clear glass, brown glass, green glass, and newspapers. At that time, waste haulers had to collect these items, separate them at the curb, and place them in one of the recycling truck’s seven separate compartments. If one of the seven compartments was full, then the driver had to travel to the landfill to empty the recycled materials before he could collect more. Since the recycling trucks had only seven compartments, there was no room to add additional materials to be recycled.

Presently, the County collects all non-newspaper recyclables together and sends them to regional facilities for separation. This procedure was instituted after the SWDD decided that it would be beneficial to collect newspapers separately and collect other recyclables combined. By collecting all non-newspaper recyclables together, many other items, such as plastic #3 through #7, corrugated cardboard, phone books, and magazines, can be recycled. This, in turn, further reduces the quantities of material that are sent for landfill disposal.

- **Waste to Energy Conversion Facility**

Another new method for reducing the amount of solid waste requiring landfill disposal is waste-to-energy (WTE) conversion. With this method, solid waste is converted to energy. This is a new technology that requires an in depth analysis to determine if it could work for the County. Among other factors, a WTE feasibility study (FS) considers whether there is a sufficient waste stream to support such a facility, a facility’s effect on air quality, and the probability of obtaining a permit for a facility. If feasible, the County then must choose a private firm to obtain all necessary permits as well as build and operate the facility.

Even though a WTE FS has not formally been conducted by the County, the SWDD Board, on March 24, 2009, authorized SWDD staff to start negotiations with INEOUS New Planet BioEnergy LLC (INPB) to implement the first phase of a WTE conversion facility that would, by 2011, utilize yard and other vegetative waste to produce approximately 8 million gallons per year of ethanol. Subsequent phases of the project will utilize other wastes disposed at the County landfill as feedstock for the WTE conversion facility. If this project is successful, future phases of the project will definitely reduce the quantity of solid waste requiring landfill disposal. With this technology, only residues will likely require landfill disposal.

- **Illegal Dumping**

Indian River County requires that County residents properly dispose of all solid waste materials within the County. The majority of these materials are then transported to the County’s landfill for disposal. Not all such materials, however, arrive at the County’s landfill facility. Occasionally, there are incidents of solid waste materials being discarded along County roadways, on private property, and in other areas of the County. The improper disposal of solid waste materials constitutes illegal dumping.

Illegal dumping remains a problem in the County. While improper disposal of solid waste continues to occur along roadways and on private property, the improper use of the five CCCs has significantly

dropped. For Fiscal Year 2007/2008, the County’s Code Enforcement Division reported 428 “junk, trash & debris” code cases throughout the County. The referenced code enforcement cases, however, represent only a small portion of total illegal dumping of solid waste.

According to the Indian River County Code Enforcement office, illegally dumped solid waste along County roadways and on private property usually falls into one of the following categories:

- Materials, such as tires or hazardous waste such as batteries, oil filters, used oil, etc., which the owner does not transfer to the landfill or CCCs; or
- Heavy and bulky materials such as refrigerators, stoves, and others, which are inconvenient and costly to transfer to the landfill or to the CCCs. There is no charge for disposal of these materials at the landfill or at the CCCs; however, there are transfer costs; or
- Trash disposed of outside the gates of CCCs when transfer stations are closed; or
- Trash disposed of along County roadways or on vacant properties

While illegal dumping outside of the CCC gates rarely occurs now, illegal dumping along roadways and on private properties remains a concern of the SWDD. As the population has increased, the number of “junk, trash & debris” code enforcement cases has also increased. According to the Code Enforcement Division, only a small number of concerned citizens are willing to report acts of improper disposal. In recent years, the County’s emphasis on informing residents of the service hours and fees of the landfill and the customer convenience centers, as well as the County’s policies on enforcement of illegal solid waste disposal and illegal dumping, has resulted in a reduction of the problem.

It is expected that, if the County established a countywide mandatory door-to-door collection service, there would be less incentive for illegal dumping, and the amount of illegal dumping could be reduced even further. Since collection services would be available and would be paid for, there would be no reason for residents to illegally dump solid waste. Mandatory door-to-door solid waste collection would also reduce the costs associated with the operation of the CCCs.

Household Hazardous Waste

To manage all hazardous materials and to operate the household hazardous waste (HHW) program, the SWDD has hired a private contractor, licensed by the State. This contractor replaced the environmental chemist who supervised the HHW program in the past.

Although the amount of household hazardous waste collected and processed increased by sixty percent (60%) between 1995 and 2008, this increase can be attributed to the County’s growth during that period. During Fiscal Year 2007/2008, the household hazardous waste program collected and processed 62,200 pounds of household hazardous material. In 2008, there were no cases of improperly managed or illegally disposed of hazardous waste in the County.

According to the State Health Department, only three events involving the mismanagement of hazardous waste occurred in the County between the Fiscal Years of 1995/1996 and 2007/2008. The Environmental Health Department attributes the awareness of the dangers of HHW and the convenience of the HHW storage facility for the minimal occurrences of illegal HHW disposal by County residents.

Water-Quality Monitoring

Groundwater, surface water and leachate monitoring take place in accordance with the current Segment II FDEP Operations Permit. Presently, the SWDD has 60 monitoring wells, including 24 shallow-zone wells, 21 intermediate-zone wells, and 15 deep-zone wells. The SWDD contracts with a laboratory for chemical analysis.

REGULATORY FRAMEWORK

Currently, the federal government, the state, and the county are all involved in the regulation and management of solid waste disposal facilities. Table 3.C.2 provides a summary of the landfill site operating permits and a list of issuing agencies.

- Federal

The potential environmental impact of solid waste facilities has led to the development of an extensive network of permitting requirements. For air and water quality, impacts are reviewed by the U.S. Environmental Protection Agency (USEPA) and the FDEP. Where dredging or filling might occur, impacts are reviewed by the U.S. Army Corps of Engineers (USACOE).

With passage of the Federal Resource and Conservation Recovery Act (RCRA), the USEPA was directed to develop a program to regulate and manage solid and hazardous wastes and provide incentives for states to adopt consistent programs. Through the Federal Comprehensive Emergency Response and Compensation Liability Act (CERCLA), USEPA was given the authority and funding to respond to incidents requiring site clean-up and emergency mitigation; this act is commonly known as the USEPA "Superfund" Act. As part of the program to implement this act, the USEPA developed and created a National Priority List (NPL) to include sites that, due to the extent of contamination and exposure, pose significant threat to human health and the environment and, as such, need clean-up.

- State

In 1980, the Legislature passed the Florida Resource Recovery and Management Act. This act adopted the federal guidelines and directed FDEP to develop and implement a hazardous waste management program. Amendments to this act in 1983 provided direction and funding to establish a cooperative hazardous waste management program among local, regional, and state agencies. In 1988, the Legislature passed the Solid Waste Management Act, with an initial overall goal of reducing the volume of solid waste going into Florida landfills by 30 percent by 1994. Since then, amendments to the act have continued to encourage county recycling programs. Basic components of

the Act include requiring counties to initiate recycling programs; to separate newspaper, glass bottles, cans, and plastic bottles from the solid waste stream; and to prohibit lead acid batteries, whole tires, and yard waste from landfill disposal. The regional water management district provides state-level review for water quality and quantity impacts.

- Local

The Indian River County SWDD is responsible for the planning and management of solid waste operations serving the County, ensuring that such facilities conform to all permit requirements and are in compliance with water quality regulations.

- **SWDD Assessments**

In Indian River County, residents are assessed an annual disposal fee per waste generation unit (WGU). A WGU is defined as a basic unit of waste generation equivalent to 1 ton of solid waste. In Fiscal Year 2007/2008, the annual assessment per WGU was \$44.04 for residential customers and \$29.86 for commercial customers. The County Tax Collector is responsible for collecting and distributing all assessments, using the same procedures employed to collect ad valorem taxes. For Fiscal Year 2007/2008, \$7,601,412.38 was collected from solid waste assessments.

- **Tipping Fees**

Currently, the SWDD has a schedule of tipping fees for various materials entering the landfill. Table 3.C.3 shows current rates for various materials brought in. When materials are brought to the landfill, tipping fees must be paid before leaving unless there is an established account with the SWDD. Tipping fee revenue varies from year to year, since the SWDD does not have control over the amount of solid waste entering the landfill each year.

ANALYSIS

In evaluating the County’s solid waste system, several functional components must be considered. These components include: (1) solid waste generation and cost; (2) solid waste collection, storage, and transfer; (3) solid waste processing and disposal; and (4) projection of future demand and landfill capacity.

Solid Waste Generation and Cost

Since 1998, Indian River County has experienced over a 30% population increase. Thus, the amount of land area needed for landfill disposal of solid waste has increased. To address this need, the SWDD in recent years acquired an additional 300 acres of land, increasing the landfill site by approximately one hundred and ten percent (110%). In 2006, however, the SWDD Board decided not to develop the additional area for landfill expansion, but instead to limit all future capacity additions to the current area of the landfill site. To satisfy the need for water storage and canal modification as a result of the future abandonment of the C-5 canal that bisects the landfill property, the SWDD Board, in 2009, purchased 80.94 acres adjacent to an existing SWDD owned 30 acres on the West side of I-95.

From 1995/96 to 2007/08, the total cubic yards of solid waste mass accumulated at the landfill site more than doubled, but because the SWDD currently compacts its solid waste at a greater density rate than in the past, the rate at which the landfill approaches capacity is slower.

Currently, the County’s level of service standard for solid waste is set at 2.2 tons per capita per year, an amount which is based on the annual per capita waste generation rate of 2.4 tons. Of the 2.4 tons per capita, 0.2 ton is attributable to commercial sources.

Population Projections

For population growth, the Introductory Element of the County’s Comprehensive Plan provides information. Since the landfill site serves both the unincorporated and the incorporated areas of the County, the total County population must be used to project solid waste demand.

Overall, the projected population determinates future needs for solid waste services. Using a population projection that is too low is likely to result in the failure to adequately provide for the County’s needs. Conversely, using a population projection that is too high will result in identifying needs that will not occur in the forecasted time period. Therefore, an accurate forecast of the future population is essential in planning for solid waste demand.

Section 9J-5.005 of the Florida Administrative Code (FAC) states that communities should utilize the University of Florida's Bureau of Economic and Business Research (BE BR) mid-range projections when planning for future service needs. Consistent with Florida Administrative Code, the county has adopted BE BR’s mid-range population projections. The following table identifies the County’s population projections through 2030:

TABLE 3.C.4
POPULATION PROJECTIONS

POPULATION PROJECTIONS INDIAN RIVER COUNTY					
	2010	2015	2020	2025	2030
BEBR	142,300	155,000	169,300	183,400	196,900

Source: University of Florida, BEBR, Mid-Range Projections 2009

Solid Waste Generation Rates

Based on population projections and the average annual per capita landfill capacity consumption rate developed from landfill disposal records, the 2007 update of the Solid Waste Master Plan projected that SWDD facility needs will be 5.3 million cy for Class I solid waste and 4.3 million cy for C&D debris, for a combined total of 9.6 million cubic yards, from 2009 through the year 2030 (Neel Schaeffer, 2007).

Needs and Cost

According to the Solid Waste Master Plan (Neel-Schaeffer, 2007), approximately 9.6 million cubic yards of solid waste capacity will be required by the year 2030. With the current landfill segments, the scheduled vertical expansion of the Class I landfill and the proposed Segment III expansion, the design capacity of the landfill site for 2030 is 13,500,000 cubic yards. This design capacity, along with current SWDD practices, provides sufficient land area for solid waste management needs through 2030 and beyond. Consequently, there is no need to expand the landfill site’s area through 2030. For the County to be able to continue landfill operations at this site, however, the county will need to implement buffer control measures to screen the landfill from I-95 which abuts the landfill to the west.

Between Fiscal Years 1995/1996 and 2007/2008, the yearly operational costs for SWDD facilities increased by 99% from \$5,700,000 to \$11,356,000. During the same time period, the yearly revenues increased by 63% from \$7,662,540 to \$12,489,000. Even though costs increased faster than revenue between Fiscal Years 1995/1996 and 2007/2008, revenue received annually continues to exceed the yearly operational costs of maintaining the SWDD facilities. For that reason, there is no need to increase the SWDD non-ad valorem assessment rate at this time.

Solid Waste Processing and Disposal

At present, the processing of solid waste at the County’s landfill meets Federal and State standards and regulations, ensures safety, and minimizes environmental impacts.

To reduce solid waste volume, the County has contractors that provide for tire removal and for yard waste grinding and removal services. While tires are hauled off-site, a portion of the ground yard waste is used for daily cover on the Class I landfill, and the remaining yard waste is hauled off-site. According to FDEP solid waste reports, Indian River County and its adjacent counties have seen slight, but steady, increases in the per capita tonage of solid waste disposed of each year. The average tons/capita/year for the State of Florida is nearly double that of the County's.

In order to further reduce the amount of solid waste being disposed of at the landfill, there are two principal options. First, the County can expand its existing recycling system, disposing the remainder of solid waste in the landfill. Second, the County can contract with a regional landfill to transfer solid waste to that disposal site.

Another option for reducing the amount of solid waste requiring landfill disposal is Waste to Energy (WTE) conversion. WTE converts solid waste to energy. This is a new technology that requires an in depth study to determine if it could work for the County. With the proposed INEOS New Planet Bio project, the SWDD has initiated the process of establishing a WTE facility to convert solid waste to energy and ethanol. In the future, the county should assess the performance of that facility and should support the project if the assessment shows that the project is successful.

Projection of Future Demand and Landfill Capacity

Since the time horizon of this Comprehensive Plan update is 2030, future solid waste demand must be projected to that year. For solid waste, demand projection is based on two components: population growth and solid waste generation rates.

Landfill Capacity

One of the County's principal responsibilities is to ensure that sufficient landfill capacity is available for disposal of processed or raw waste. According to the Solid Waste Master Plan, the County must maintain a disposal capacity of at least three years to allow for sufficient time to permit and construct a new active landfill segment, when necessary.

Currently, the SWDD utilizes two approaches to ensure that there is adequate landfill capacity. These are: (1) developing new landfill capacity, and (2) implementing programs to reduce the demand for landfill disposal. To increase the disposal capacity for Class I waste and C&D debris, the SWDD has optimized the design of the Class I landfill between Segments I and II. Also, the SWDD recently obtained permits for additional C&D disposal on the side slopes of Segment I to increase the C&D disposal capacity. To increase the disposal capacity of the landfill footprint area, the SWDD obtained permits for a vertical expansion of the Class I landfill to elevation 185 feet National Geodetic Vertical Datum (NGVD). Construction of the vertical expansion began in May 2009 and was completed in October 2009.

Besides those initiatives, a 70-acre Segment III Class I cell is being designed and permitted for future construction. This cell will accommodate another 8.4 million cubic yards of Class I waste and C&D debris. SWDD has also obtained permits for a 33-acre component of the Segment III landfill

landfill through the five CCCs. This is a significant drop from the more than thirty percent (30%) in 1998. Even with this reduced activity level, however, the County must coordinate and maintain the five CCCs at a cost of about \$2 million per year, an amount that accounts for more than fifteen percent (15%) of the yearly SWDD operation costs.

Another problem associated with the existing collection and transfer system is illegal dumping. This problem has two parts. One part is the improper disposal of solid waste along County roadways and on private property. The other part is improper use of the five CCCs. With the existing system, the service area for each transfer station is about 5 miles, and the CCCs are not open 7 days a week. This causes some inconvenience and results in illegal dumping.

In response to illegal dumping problems, the County adopted Chapter 973, Public Nuisance, of the Indian River County Code of Laws and Ordinances. According to Chapter 973, an accumulation of debris, garbage, junk, trash, weeds, unserviceable vehicles, dead trees posing a health or safety hazard, or other noxious materials may be declared a public nuisance. Pursuant to the provisions of Chapter 973, the county may abate public nuisances if property owners fail to take action. The Environmental Planning and Code Enforcement Section of the Indian River County Planning Department administers this ordinance. Also, Chapter 204, Solid Waste Disposal, of the County code has specific sections regarding littering and use of CCCs and the landfill within the County.

In the future, the County has three options for modifying the County's existing collection system. The County could: (i) keep the CCCs open seven days a week with longer operational hours; (ii) build more CCCs; or (iii) establish a countywide mandatory solid waste collection system. To have CCCs open seven days a week or build additional centers, the county would incur additional costs that, according to the SWDD, are not justifiable. For example, it would cost an additional \$400,000.00 per year to operate another CCC that could be open 5 days a week. The SWDD estimates that it would cost another \$300,000 per year to keep the existing CCCs open seven days a week.

If a mandatory door-to-door solid waste collection system is initiated, the need for the CCCs would be greatly reduced. Overall, mandatory solid waste collection could eliminate the costs associated with maintaining the CCCs and reduce illegal dumping. With mandatory door-to-door solid waste collection, illegal dumping would decline because it would be more convenient for residents to have their solid waste removed by curbside collection than by illegally dumping solid waste. From a cost perspective, closing the CCCs could reduce SWDD operational expenses by \$2,000,000 a year. Also, the CCC properties could be sold or used for other purposes.

If all types of solid waste were collected at the place of generation and transferred directly to the landfill site, there would be less need for coordination, and the County would have better control of the solid waste stream entering the landfill site. Such a mandatory door-to-door solid waste collection system would provide for better control of the solid waste stream entering the landfill site. Consequently, the County's policy should be to evaluate the feasibility of establishing a mandatory collection system in the future.

Processing/Disposal

Processing of waste that arrives at the landfill is an important part of the entire system. At the processing site, the various waste types are separated and treated accordingly. Then, each type of waste needs a different method of processing in order to sufficiently reduce the total waste volume and ensure that the waste will receive the appropriate treatment. The prerequisite for ensuring proper processing is appropriate separation of the solid waste.

Overall, materials collected and shipped to processing centers for recycling must be free of contamination. Contaminated materials are returned to the landfill. While separation of different types of solid waste is costly, time consuming and in some cases requires special equipment, the existing County system is generally adequate to handle various types of solid waste.

An important part of the solid waste processing system is the availability of equipment to handle all materials appropriately. In the future, there may be a need for additional equipment to facilitate the separation of materials entering the landfill. As technology improves, the County should acquire new equipment to handle all materials appropriately. There may also be a need for equipment to reduce the amount of waste and to recycle some of the waste stream. Because the County is sending several types of solid waste materials to processing centers for recycling, the County does not need any additional recycling equipment at the landfill at this time. For general landfill operations, however, the County must maintain its heavy machinery such as bulldozers, loaders, compactors, and scrapers. Even though the County is currently under contract with Waste Management, Inc. to operate the Class I Landfill, the county must still maintain a suite of equipment for emergency use. For such emergencies, the County has entered into a rental agreement with a local equipment supplier.

The final part of a processing/disposal system is the disposal of processed or raw waste in the landfill. In disposing of waste, the county must ensure that the disposed material does not have an adverse impact on the environment and that sufficient landfill capacity is available for disposal of the processed or raw waste. With Segment II of the landfill designed according to federal and state standards and being monitored regularly, the County ensures that there will be no adverse environmental effects from the landfill. Consistent with the Solid Waste Master Plan, the County maintains at least three years of landfill disposal capacity at all times, thereby allowing sufficient time for permitting and construction of a new active segment.

With respect to disposal, the County has three options. First, the County can continue to recycle as much solid waste as possible and dispose of the remainder in the landfill. Second, the County can contract with a regional landfill, such as the Okeechobee Landfill in Okeechobee County or the JED Landfill in Holopaw, Osceola County, and transfer solid waste to that disposal site. Third, the County can pursue development of a waste-to-energy (WTE) facility, if that technology is determined to be feasible for the County.

At present, option one seems to be the most workable for the County. Although the County recently initiated negotiations with INPB for a WTE conversion project for ethanol production in the County, it is still necessary for the SWDD to conduct a feasibility study and a cost/benefit analysis of all three options and utilize any combination of options as appropriate. With options two and three, however, the County would need to continue to maintain the landfill for backup and for disposal of some solid waste as well as for disposal of residue from a WTE facility.

Special Waste Handling and Disposal

To accommodate household hazardous waste materials, the SWDD has built a temporary storage facility at the landfill for residentially generated hazardous waste. This facility, however, will not accept such waste from small quantity commercial or industrial generators. Instead, small quantity generators must individually contract with licensed hazardous waste haulers for the disposal of their hazardous waste materials. In the future, the County intends to expand this facility at the landfill to temporarily store hazardous waste materials from residences and provide a receiving and coordination center between transporters and local small quantity generators.

GOALS, OBJECTIVES AND POLICIES

Goal

It is the goal of Indian River County shall ~~to~~ have an efficient and environmentally sound solid and hazardous waste management system to prevent spread of disease, to promote orderly growth within the County, and to meet existing and projected demands for the management and disposal of waste.

OBJECTIVE 1 Service Concurrent with Development

~~During the 1998-2000 period, the active segment of the landfill will always have a minimum of 0.486 million cubic yards capacity (three years of disposal capacity) available for disposal.~~

Through the time horizon of the plan, the active segment of the landfill will always have sufficient a capacity to accommodate demand.

POLICY 1.1: Design for additional disposal segments of the landfill shall be completed before the active segment of the landfill is at 70% of its capacity, and construction of additional segments shall begin when the active segment is at 75% of its capacity in order to ensure that the established level of service will be maintained.

POLICY 1.2: New development within the Indian River County SWDD service area shall continue to be approved only when capacity is available at the active segment of the landfill. If the active segment of the landfill is at 90% of its capacity and a new segment is not ready, additional development shall not be permitted.

POLICY 1.3: The following level of service standards are hereby adopted, and shall be used as the basis for determining the availability of facility capacity and the demand generated by new development:

~~Countywide 2.4 tons are generated per capita for permanent population plus weighted seasonal population per year or 4 cubic yards per permanent population plus weighted seasonal population per year~~

~~2.5 cubic yards of landfill capacity is used annually per capita~~

POLICY 1.4: The County shall maintain its concurrency management system to update its solid waste facility demand and capacity information as development orders or permits are issued.

POLICY 1.5: The SWDD shall maintain a comprehensive solid waste management master plan and shall prepare annual summaries of demand and capacity information for the active segment of the landfill.

POLICY 1.6: The SWDD shall maintain at least 3 years of disposal capacity available at all times.

POLICY 1.7: The County shall continue to provide countywide solid waste services to all of the County's municipalities and the unincorporated portion of the County by providing landfill capacity

POLICY 2.6: The County shall perform water quality tests in accordance with the landfill permit requirements to ensure that the Class I landfill is not contaminating the surrounding groundwater and surface water bodies.

POLICY 2.7: The County shall close its existing C&D debris landfill cell and switch to co-disposal operation whereby C&D debris is disposed of in a lined Class I landfill commingled with MSW.

POLICY 2.8: The County shall encourage the County Environmental Health Department to continue to perform regular inspections of small quantity hazardous waste generators.

POLICY 2.9: The County shall cooperate with the FDEP and USEPA to continue to perform regular inspections of private licensed waste handlers to ensure that bio-hazardous waste, generated by medical establishments and handled by private firms, is properly managed. When improper management of bio-hazardous waste is found during an inspection, the FDEP and USEPA will take enforcement action. The County shall continue to inspect for the bio-hazardous waste from the solid waste that enters the landfill.

~~**Policy 2.10:** The county shall encourage the Department of Environmental Protection to continue to perform regular inspections of large quantity hazardous waste generators and private licensed waste handlers to ensure that bio-hazardous waste, generated by medical establishments and handled by private firms, is properly managed. When improper management of bio-hazardous waste is found during an inspection, the private waste handler (the violator) will be prosecuted and fined by the Environmental Control Board. The county shall continue to inspect the bio-hazardous waste which enters the landfill.~~

OBJECTIVE 3 Capital Improvements

Through the time horizon of the plan, the County will have maximized the use of existing facilities and discouraged urban sprawl by having completed all needed solid waste capital improvements as outlined in the Capital Improvements Element of the County Comprehensive Plan.

POLICY 3.1: The County shall maintain a ~~seven~~ five year schedule of capital improvements for the landfill and shall update this schedule annually in conformance with the review process for the Capital Improvements Element of this plan.

POLICY 3.2: Proposed capital improvement projects shall be evaluated and ranked according to the following priority level guidelines:

- Level One - whether the project is needed to protect public health and safety, to fulfill the County's legal commitment to provide solid waste facilities and services, or to preserve or achieve full use of existing facilities; and
- Level Two - whether the project increases efficiency of use of existing facilities or prevents or reduces future improvement costs.
- Level Three – whether the project increases the amount of solid waste being recycled.

or through special events, shall provide general public education on the importance and benefit of the recycling program.

POLICY 4.6: By ~~1999~~ 2012, the SWDD shall arrange for completed studies to determine the feasibility of the maximum recovery of recyclables from the County garbage stream and their conversion to useful products.

POLICY 4.7: By ~~1999~~ 2012, the SWDD shall arrange for completed studies to determine the feasibility of transferring the County's solid waste to another regional facility for disposal of solid waste.

POLICY #	TYPE OF ACTION	RESPONSIBILITY	TIMING	CAPITAL EXPENDITURE
2.8	Monitoring	Public Health Unit	Ongoing	No
2.9	Monitoring	FDEP	Ongoing	No
3.1	CIP Maintenance/Evaluation	Finance Dept./SWDD	Ongoing	No
3.2	CIP Evaluation and Prioritization	Finance Dept./SWDD	Ongoing	No
3.3	Financing Method	SWDD/Finance Dept.	Ongoing	No
3.4	Funding Mechanism	SWDD/Finance Dept.	Ongoing	No
3.5	Funding Mechanism	SWDD/Finance Dept.	Ongoing	No
3.6	Landfill and Facility Expansion	SWDD	Ongoing	Yes
3.7	Charge Mechanism	SWDD	Ongoing	No
4.1	Recycling Program	SWDD/Municipalities	Ongoing	No
4.2	Feasibility study of establishing a mandatory door-to-door solid waste collection system	SWDD	2012	No
4.3	Coordination/Public Education	SWDD/School Board	Ongoing	No
4.4	Maintaining Recycling Program	SWDD	Ongoing	No
4.5	Public Education	SWDD	Ongoing	No
4.6	Feasibility studies for development of Waste Conservation Industrial Park and waste to energy facility	SWDD/BCC	2012	Yes
4.7	Feasibility study of transferring solid waste to another regional facility	SWDD/BCC	2012	Yes

PS = Planning Staff SWDD = Solid Waste Disposal District

EVALUATION & MONITORING PROCEDURES

To be effective, a plan must not only provide a means for implementation; it must also provide a mechanism for assessing the plan's effectiveness. Generally a plan's effectiveness can be judged by the degree to which the plan's objectives have been met. Since objectives are structured, as much as possible, to be measurable and to have specific timeframes, the plan's objectives are the benchmarks used as a basis to evaluate the plan.

Table 3.C.6 identifies each of the objectives of the Solid Waste Sub-Element. It also identifies the measures to be used to evaluate progress in achieving these objectives. Most of these measures are quantitative, such as additional capacity provided, decrease in the amount of improperly managed waste, reduction of waste disposed in the landfill, and others. Besides providing evaluation measures, Table 3.C.6 also identifies timeframes associated with meeting the objectives.

The Solid Waste Disposal District staff will be responsible for monitoring and evaluating the Solid Waste Sub-Element. This will involve collection of data and compilation of information regarding facility capacity, landfill expansion, and new development permitted. The monitoring and evaluation will be done on a regular basis. As part of the County's concurrency management system, the Solid Waste Disposal District will continually monitor facility capacity to ensure that solid waste level-of-service standards will be maintained.

While monitoring will occur on a continual basis, formal evaluation of the Solid Waste Sub-Element will occur every five years in conjunction with the formal evaluation and appraisal of the entire Comprehensive Plan. Besides assessing progress, the evaluation and appraisal process will also be used to determine whether the Solid Waste Sub-Element objectives should be modified or expanded. In this way, the monitoring and evaluation of the Solid Waste Sub-Element will not only provide a means of determining the degree of success of the plan's implementation; it will also provide a mechanism for evaluating needed changes to the plan element.

**TABLE 3.C.6
SOLID WASTE SUB-ELEMENT
EVALUATION MATRIX**

OBJECTIVE #	MEASURE	TIMEFRAME
1	Cubic yards of available capacity in active segment of the landfill	Through the time horizon of the plan
2	Number of cases of illegal hazardous waste disposal	Through the time horizon of the plan
3	Completed improvement as identified in the sub-element	Through the time horizon of the plan
4	Volume of solid waste recycled	2020

Comparison of Expenditures to Revenue						
	FY 2009/10	FY 2010/11	FY 2011/12	FY 2012/13	FY 2013/14	Total
Total Revenue	\$ 3,279,600	\$ 3,312,300	\$ 3,345,300	\$ 3,378,900	\$ 4,192,900	\$17,509,000
Total Expenditures	\$ 6,882,000	\$ 380,000	\$ 1,480,000	\$ 2,045,000	\$ 6,722,000	\$17,509,000
Annual Balance	\$ -3,602,400	\$ 2,932,300	\$ 1,865,300	\$ 1,333,900	\$-2,529,100	\$0

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