

HOUSTON COUNTY



Solid Waste Disposal Facility

Awards

Outstanding Landfill Operation

Houston County Solid Waste
Disposal Facility
Georgia Chapter SWANA
November 16, 2006

Landfill Management Silver Excellence Award Winner

Houston County Solid Waste
Disposal Facility
SWANA - WASTECON
October 18, 2007

Landfill Management Excellence Award

Houston County Solid Waste
Disposal Facility
Georgia Chapter - SWANA
October 10, 2012

Landfill Management Silver Excellence Award

Houston County Solid Waste
Disposal Facility
SWANA - WASTECON
September 17, 2013

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— RECOGNITION —

A. **Houston County Board of Commissioners**

Tommy Stalnaker - Chairman
H. Jay Walker, III
Gail Robinson
Larry Thomson
Tom McMichael

B. **Houston County Public Works**

Robbie Dunbar - Director of Operations
Brian Jones - County Engineer
Terry Dietsch - Solid Waste Superintendent
Larry Arnold - Landfill Operator
Craig Duke - Landfill Operator
Staff - Solid Waste Disposal Facility

C. **Engineers**

Atlantic Coast Consulting, Inc. (July 2006 - present)
Hodges, Harbin, Newberry & Tribble (1990 - June 2006)

Contractors

Phase II Cells 1 & 2 Peed Brothers Construction Co. of Butler, GA
 Cells 3 & 4 ERC Contracting, Winter Garden, FL
 Cell 5, Specialized Services of Dublin, GA
 Cells 6 & 7 Middle GA Road Builders of Dublin, GA
Phase III Cells 1, 2 & 3 Peed Brothers Construction Co. of Butler, GA
 Cells 4, 5, 6 & 7 CBP Inc. of Statham, GA
Phase IV Cells 1 & 2 Middle GA Road Builders of Dublin, GA
 Cells 3, 4 & 5 Peed Brothers Construction Co. of Butler, GA
Phase V Cells 1 & 2 Peed Brothers Construction Co. of Butler, GA
Construction & Demolition C&D
 Cell 1 RE Industrial Services of Perry, GA
 Cells 2 & 3 Houston County forces
 Cell 4 Houston County forces
 Cells 5 & 6 Houston County forces

- **Special Recognition to our valued customers that utilize the Solid Waste Disposal Facility. Thank You for your business!!**

Houston County Solid Waste Disposal Facility - (478) 987-0089
Address: 2080 Hwy 247, Kathleen, GA 31047 (physical)
P.O. Box 10, Kathleen, GA 31047 (mailing)

PROPERTY and Subtitle “D” Phase II, Phase III and Phase IV

On October 19, 1993, Houston County placed the first load of waste in the new Subtitle “D” technology landfill located at 2080 Hwy. 247 South, Kathleen, Georgia. This new landfill ushers in new technology in environmental protection for the disposal of municipal solid waste. The initial opening of landfill (Phase I) was in October, 1987. It was closed in October, 1993. Phase I was a synthetically unlined disposal site.

Property:

- A. Houston County owns 2,588 acres of land set aside for solid waste disposal (SWD).
- B. 200 Acres permitted December 1, 1986 for landfilling of municipal solid waste (MSW).
- C. 200 Acres are set aside for waste reduction technologies and additional landfilling, of which 50 acres are permitted for landfilling of construction and demolition waste (C & D).
- D. 2,031 Acres permitted December 16, 2015 for future municipal solid waste (MSW) expansion.
- E. Original 200 acres purchased 1986.
- F. Purchased 200 acres June 1990.
- G. Purchased 200 acres May 1999.
- H. Purchased 1,355 acres August 25, 2003.
- I. Purchased 65 acres October, 2003.
- J. Purchased 368 acres September 9, 2005.
- K. Purchased 200 acres November 17, 2009.
- L. Phase I (unlined) opened October 1987 - closed October 1993.
- M. Phase II opened October 19, 1993.
- N. C & D Landfill opened April 20, 1999.
- O. Phase III opened April 10, 2006.
- P. The landfill has adequate MSW and C&D capacity permitted and planned to handle the county’s waste for the foreseeable future.
- Q. Phase IV opened on March 21, 2011
- R. Phase V opened on December 15, 2014



Leachate Tank



Phase IV Cells 3, 4 & 5 Construction

SUBTITLE “D” PHASE II, PHASE III AND PHASE IV.

- A. Phases II, III, IV and V utilizes a subtitle “D” liner system.
- B. Liner system includes a compacted subbase, 24 inches thick clay liner, 60 mil high density polyethylene liner and 24 inches thick protective cover.
- C. Liner system includes leachate collection lines with pump stations to carry it to a tank for storage.
- D. Leachate created in the landfill will be managed by a combination of on-site and off-site treatment systems. These will include leachate recirculation for anaerobic digestion and transport to nearby wastewater treatment facilities for biological treatment.
- E. Leachate tank is a 365,000 gallon glass lined storage tank.

HISTORY OF SUBTITLE “D”

- A. Phase II, cells 1 & 2 construction required 11 months for completion and are 13 acres. Over 350,000 cubic yards of soil were excavated during construction. Cost was approximately \$2,250,000.00. The County performed approximately \$250,000.00 of work with County forces.
- B. Many of the components constructed in the first two cells of Phase II will serve phases II, III, and IV (example: roads, leachate tank, collection lines, and sediment pond).
- C. Bids were taken in April 1995 and contracts signed on May 22, 1995 to begin construction of cells 3 & 4 in Phase II. Bid amount was \$1,746,695.00 and construction was completed in December 1995. Cells 3 & 4 are 16 acres and waste was placed in cell 3 January 26, 1996 and cell 4 beginning on October 15, 1996.
- D. Construction began on November 4, 1997 for Cell 5 Phase II and was completed on July 1, 1998. Cost was \$951,118.00. Cell 5 is 6½ acres.
- E. Bids were taken in July 2000 for construction of cells 6 & 7 of Phase II. Construction began August 14, 2000 and was completed in early 2001. Cost was \$1,081,134.00. Cells 6 & 7 are 9½ acres.
- F. Bids were taken in August 2004 and construction began in October 2004 for construction of cells 1, 2 & 3 of Phase III. Completed in April 2005, 10.9 acres, cost was \$2.6 million.
- G. Bids were taken in May 2007 and construction began in June 2007 for cells 4, 5, 6 & 7 of Phase III. Cells are 14½ acres and cost was \$3 million. Completion was November 2007.
- H. Bids were taken in April 2010 and construction began in May 2010 for cells 1 and 2 of Phase IV. Cells are 8 acres and cost was \$1,900,000.00
- I. Bids were taken in March 2012 and construction began in May 2012 for cells 3, 4 and 5 of phase IV. Cells are 11 acres and cost was \$1,300,000.
- J. Bids were taken in March 2014 and construction began in April 2014 for cells 1 and 2 of phase V. Cells were about 3 acres and cost was \$1,300,000.



Subtitle “D” Liner



Installing Clay

CONSTRUCTION & DEMOLITION LANDFILL (C & D)

- A. Unlined landfill for building materials or other materials that do not have the potential to contaminate the groundwater.
- B. Construction for Cell I and sediment pond IV started in September 1998 and was completed in April 1999.
- C. First load of waste was dumped on April 20, 1999.
- D. Cost of construction of Cell I was approximately \$426,265.00
- E. C & D landfill saves space in the lined landfill and offers a reduced tipping fee to our customers.
- F. Cell 2 opened 7/13/01, construction was completed by county employees.
- G. Cell 3 opened 6/14/04, construction was completed by county employees.
- H. Cell 4 opened 10/15/07, construction was completed by county employees.
- I. Cells 5 & 6 opened 5/4/15, construction was completed by county employees.

FINANCES

- A. The landfill is operated as an enterprise fund without tax monies, bond issues, special assessments, grants or loans. Strictly user fee funded.
- B. Houston County has **NO** debt on the landfill or its equipment.
- C. Closure and post closure is being and has been funded since October 1987 and is currently fully funded with cash.
- D. Tipping fees are on the lower end of the subtitle "D" fees in the state.
- E. Rate Structure:
 - \$20.50 per ton garbage and trash
 - \$15.00 per ton segregated yard waste and white goods.
 - \$35.50 per ton sludge or grease.
 - \$23.50 per ton sludge Perry and Warner Robins Waste Water Plants.
 - \$90.00 per ton tires.
 - \$35.50 per ton asbestos
 - \$15.50 per ton Construction and Demolition Material (C & D).
 - (\$.75 fee is collected for E.P.D. - Fee is included in Tipping Fee).
- F. \$2.00 per ton additional Host Fee for out of county customers.

TECHNICAL EQUIPMENT

- A. Computerized scales, billing, revenue, tonnage, budget and equipment maintenance.
- B. Technologically advanced heavy equipment for disposal of waste.
- C. 275,000 gallons per hour pumping capacity for stormwater removal from cells.

LANDFILL GAS TO ENERGY PLANT

On January 5, 2011 Houston County, Flint Energies and Power Secure started the landfill gas to power generation plant. Landfill gas is generated and is a by-product from the disposal of solid waste.

HISTORY OF PROJECT

- A. In November 2003, Houston County installed a gas collection system and flare station to serve Phase I of the landfill.
- B. In April 2008, Houston County solicited proposals for landfill gas to energy partners.
- C. Eleven proposals were received that identified at least six potential end users of the energy from landfill gas.
- D. Proposal by Flint Energies, in partnership with Power Secure, was determined to be in the best interest of the County.
- E. In November 2009, Houston County installed a second gas collection system to serve Phase II of the landfill.
- F. In December 2009, Houston County signed final contract with Flint Energies.
- G. In April 2010, Power Secure broke ground to build the waste to energy plant.



H. In October 2011, Houston County installed a third gas collection system to serve Phase III of the landfill.

I. Gas collection from Houston County is producing about 1,200 standard cubic feet a minute.

J. Landfill gas to power generation plant is producing 3,200 KW of power and this is enough electricity to service 1,680 homes annually on average.

K. Houston County will be compensated \$2.00 per MMBTU for gas consumed by generation plant.

L. Sales of landfill gas could generate \$250,000 to \$500,000 in revenues annually to the County depending on gas flow rates.

M. Recovering the energy instead of flaring it is projected to reduce emissions.

N. Recovering the energy will also save fuels such as oil and coal that typically provide fuel for electricity generation.

O. Recovering of the landfill gas is another way to recycle from the waste stream and is beneficial to our customers and the environment.



TUB GRINDER

1. Yard waste products are stockpiled on the landfill and once a quarter a portable tub grinding machine is brought in to grind all the material.
2. Beginning April 20, 1999 a lower tipping fee of \$15.00 was established for segregated yard waste compared to the \$20.50 garbage and trash fee. Customers are urged to segregate their yard waste before coming to the landfill to take advantage of the lower fee.
3. Estimates are for a reduction of the waste stream of approximately 17% by removing the yard waste from the landfill.
4. The grinder is one means to reach the 25% state reduction goal as well as separating metals, tires and white goods for recycling.
5. Mulch is used at the landfill, public buildings and by the road department.



ENVIRONMENTAL MONITORING

- A. 43 Methane monitoring wells.
- B. 34 Groundwater monitoring wells.
- C. 8 Surface water monitoring points.
- D. Surface emission testing
- E. 115 Methane gas extraction wells feeding flare.
- F. Both the “MSW” and “C&D” landfills are monitored quarterly for methane gas, groundwater contamination and surface water is tested on site.
- G. Groundwater and surface water is tested both upgradient and downgradient.
- H. Active gas extraction system on Phases I, II, and III of the landfill with a flare station installed.
- I. Active landfill gas to energy plant.
- J. Stormwater Pollution Prevention Plan.
- K. Leachate is monitored daily and tested quarterly.
- L. Leachate prevention system.



BECKHAM-WHITE BUILDING

ARCHITECT: Sides and Pope, P.C.
(Mike Parker)

CONTRACTOR: Bullock Construction
(George & Scott Bullock)

ENGINEERS: Hodges, Harbin, Newberry &
Tribble Inc.

COMPLETED: March 1996

COST: \$185,405.00 (No debt -
paid in full)



General Information: The Beckham-White Building is named after Milton Beckham, County Engineer from 1983-1993 and Arthur A. White, Jr., County Commissioner from 1983-1986. These men were pioneers in establishing the Houston County Solid Waste Disposal Facility. The building contains the administrative offices and scale room for the Houston County Municipal Solid Waste Landfill. In addition to the day-to-day administrative functions of the landfill, this building is used for employee training and records storage.



The original building, constructed of salvaged materials, had to be demolished due to the infiltration of explosive methane gas. This new building, designed for positive gas removal, provides a safe working environment.

Features: (A) 2,560 sq. ft.; (B) Suspended concrete slab floor; (C) Concrete floor for crawl space; (D) Power ventilators to extract air beneath the suspended floor; (E) Surveillance camera and monitors for examining waste loads and view activity on landfill; (F) Fire and burglar alarm; (G) Sprinkler system in mechanical and storage room; (H) Computers for storing data for billing and reports; (I) Teller Window; (J) Central A/C and heat; (K) Completely handicapped accessible; (L) Low maintenance materials of construction.

Rooms: (A) Scale Room; (B) Offices (3); (C) Conference/Training Room; (D) Lobby; (E) Restrooms; (F) Kitchen, Storage Room; (H) Mechanical Room.

MAINTENANCE FACILITY

Architect - Sides and Pope: Contractor - International City Builders: Engineers - Hodges, Harbin, Newberry & Tribble: Completed - March 2003: Cost - \$310,000

Features: (a) 60' x 176' - 4 enclosed bays and 3 open bays (b) Climate controlled storage (c) Break Room and Restroom Facilities (d) Maintenance Pit for Servicing (e) Fuel and oil storage with lubrication system (f) Security System

STAFF AND OPERATIONS

- A. Three (3) certified operators including Solid Waste Superintendent.
The Landfill has 22 employees.

(Staff and Operations Continued)

- B. Staff has been through training in the operation of subtitle “D” facilities. Training in both classroom and field.
- C. Hours of operation: Monday - Saturday 7:00 A.M. - 5:00 P.M.

TONNAGE (fiscal year July - June)

2015-16: 187,634 Tons (51,819 out of county)	2004-05: 212,971 Tons (50,659 out of county)
2014-15: 171,031 Tons (51,750 out of county)	2003-04: 207,478 Tons (46,897 out of county)
2013-14: 174,175 Tons (51,103 out of county)	2002-03: 200,732 Tons (49,256 out of county)
2012-13: 201,730 Tons (50,908 out of county)	2001-02: 182,531 Tons (45,226 out of county)
2011-12: 195,921 Tons (42,930 out of county)	2000-01: 141,253 Tons (33,294 out of county)
2010-11: 196,900 Tons (37,232 out of county)	99-2000: 108,137 Tons (27,128 out of county)
2009-10: 196,779 Tons (49,605 out of county)	98-99: 120,480 Tons (24,707 out of county)
2008-09: 194,859 Tons (42,892 out of county)	97-98: 147,214 Tons (18,508 out of county)
2007-08: 220,057 Tons (46,225 out of county)	96-97: 133,666 Tons (14,842 out of county)
2006-07: 211,903 Tons (43,820 out of county)	95-96: 120,084 Tons (12,216 out of county)
2005-06: 206,106 Tons (48,610 out of county)	94-95: 121,632 Tons (14,096 out of county)

- A. In April 1994 additional out of county governments began disposing of their waste at the Houston County Solid Waste Disposal Facility including: Bleckley County, Cochran, Hawkinsville, Pulaski County, Dooly County and Dodge County.
- B. Waste generated is approximately one (1) ton per capita per year in Houston County.
- C. Cost is approximately \$20.50 per person per year for waste disposal, approximately one (1) cent per pound per person for waste disposal for Houston County residents.

WASTE REDUCTION STRATEGY

1. Reduce the amount of yard trimmings going into the landfill for disposal by 100 percent. This is being accomplished by an ordinance requiring yard trimmings to either be mulched at the home, composted at home, or delivered to mulching centers in the County. This mulch material will be provided to residents of the County free of charge for use in landscaping and land reclamation projects. This reduction strategy will yield a 17 percent per person reduction of solid waste.
2. Reduce the white goods going into the landfill by 100 percent. This strategy will call for all white goods to be separated from the waste stream and stored for reclamation. This reduction strategy is expected to lead to a 4 percent per person reduction of solid waste.
3. Reduce the miscellaneous metals going into the landfill by 75 percent. This strategy will call for a majority of all metals to be segregated from the waste stream and stored for reclamation. This reduction strategy will lead to a 2 percent per person reduction of solid waste.
4. Reduce the tires going to the landfill by 100 percent. This strategy will call for tires to be separated prior to disposal. This reduction will lead to a .05 percent per person reduction of solid waste.

(Waste Reduction Strategy Continued)

5. Promote volunteer efforts in the County for recycling of materials. This reduction strategy will lead to a 2 percent per person reduction of solid waste.
6. Promote commercial efforts in the County for recycling of materials. This reduction strategy will lead to a one percent per person reduction of solid waste.
7. Develop a comprehensive public information program to promote source reduction throughout the county. This program will include the schools, civic organizations, and regular media releases. This reduction strategy will lead to a 1.5 percent per person reduction of solid waste.



Phase III Cells

Together, these strategies will lead to a 28 percent reduction of solid waste in Houston County. This program will also result in similar reductions for the cities since their waste is taken to the landfill.

WEIGHT SCALES

Two state of the art computerized scales to weigh customers inbound and outbound. Installed fall of 2006.

Engineers - Atlantic Coast Consulting, Inc.

Contractor - Albany Scale Company

Manufacturer - Rice Lake Weighing Systems

Cost - \$172,000.00

Features - (A) Special designed computer program to operate scales and track customer base.

(B) 100,000 pound weighing capacity each scale.

(C) 35' x 50' canopy covering scales to protect customers.

(D) Stop and go light.

(E) Communication system.

(F) Camera System to look at loads coming in.



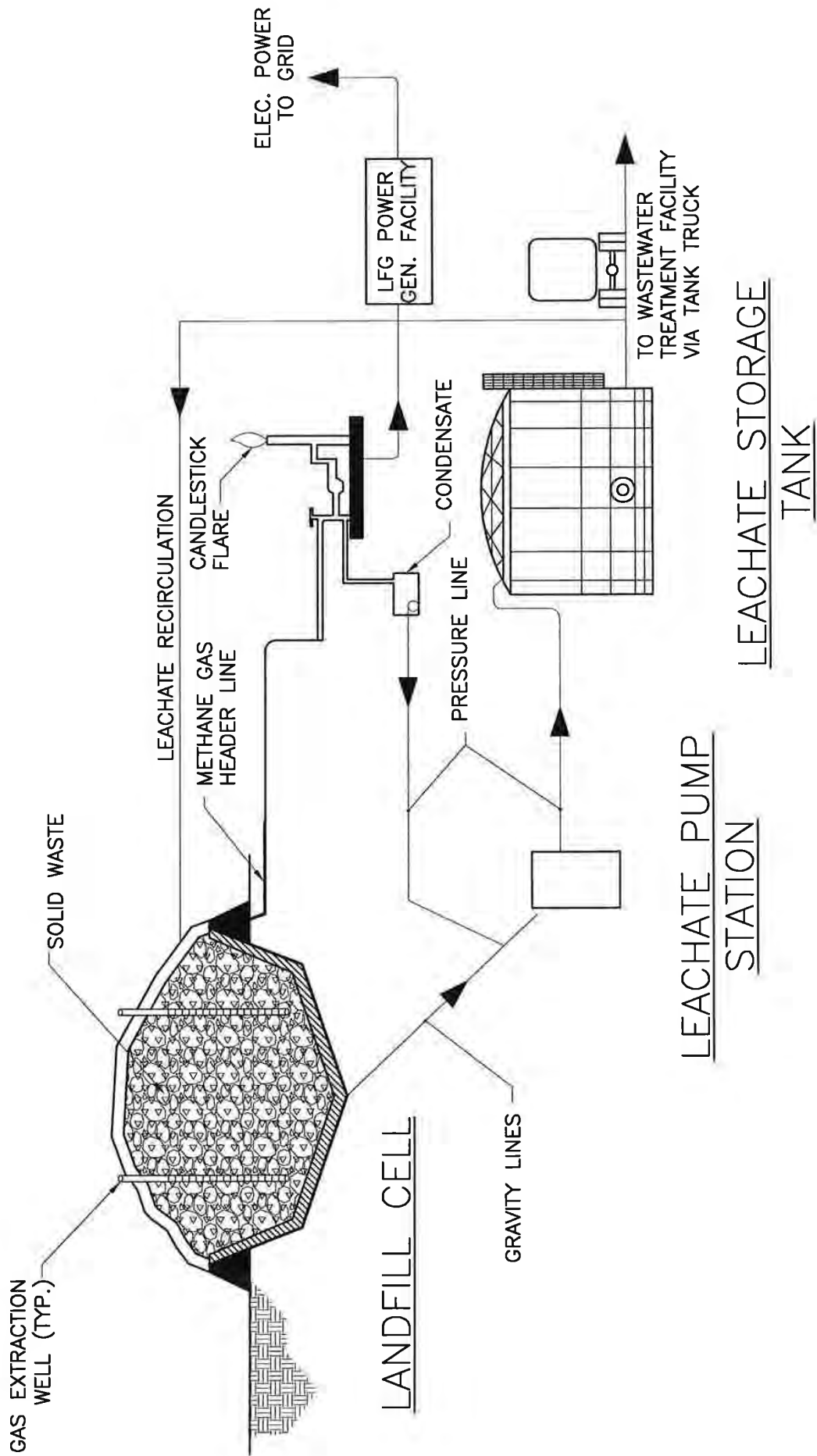
Scales



Camera System

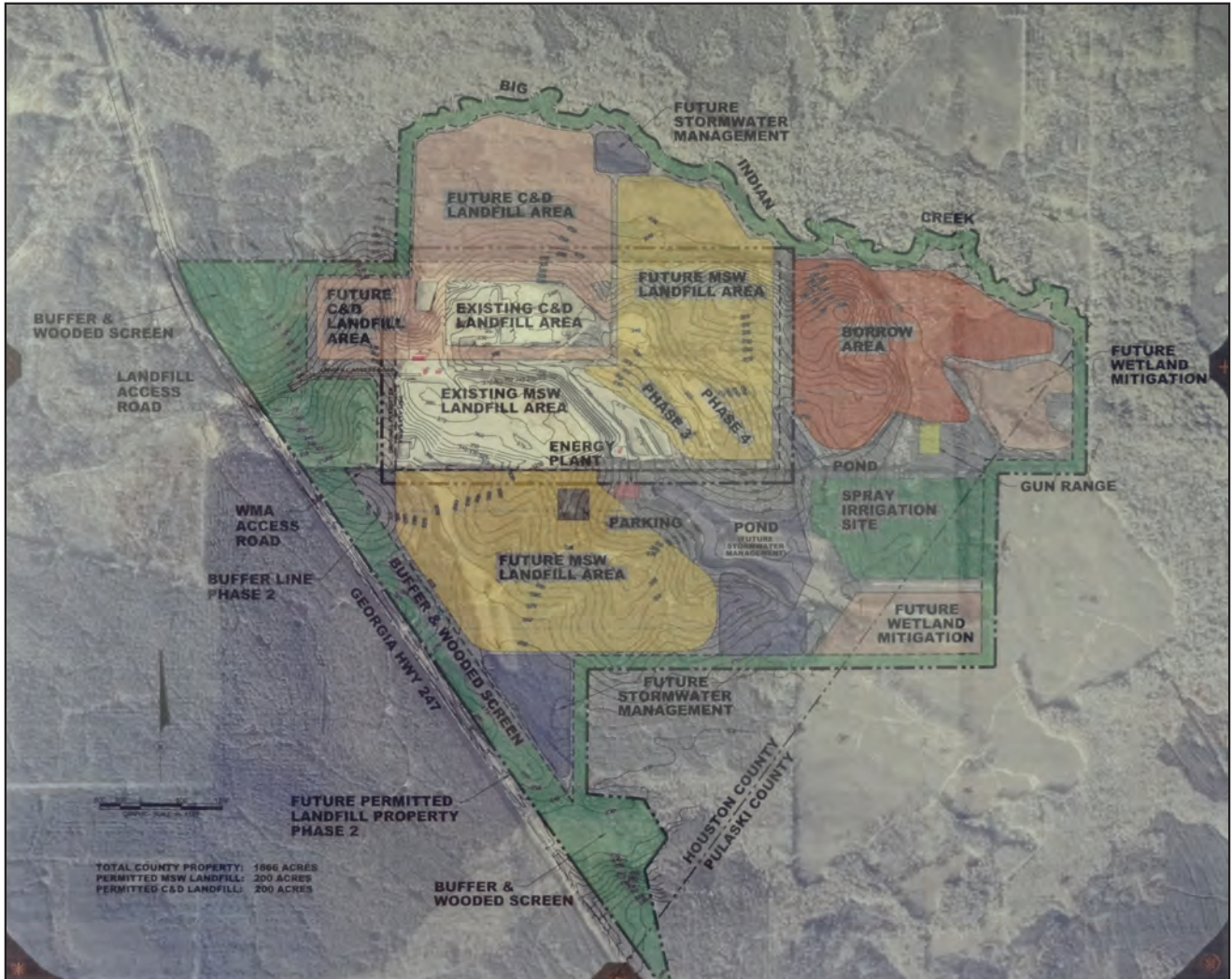


Aerial 2012



LEACHATE AND GAS MANAGEMENT SYSTEM

N.T.S.



HOUSTON COUNTY LANDFILL MASTER PLAN
 FOR
HOUSTON COUNTY BOARD OF COMMISSIONERS



Scale House



Leachate Tank



Lubrication Service Center



Maintenance Facility



Methane Flare Station



Methane Monitoring Well



Working Face



Applying Water To Clay Liner



Scale Operator



Waste Being Covered Daily



Compactor - Compacting Waste



Compactor Working Waste



Detention Pond



Detention Pond Phase I



Liner Being Installed



Beginning Stage of Cells



Scales



Office Generator



Street Sweeper



Processing Soil For Clay Liner



Off-Road Trucks Used To Hall Cover



ATV



Substation



Placing Protective Cover



Protect Our Environment



Information Sign



C&D Cell I



Well Field Phase II



Overlook North County from Phase II



Mulch Pile



Limestone Rock



Limestone Rock Geology



Entrance Drive



Exiting the Landfill



“Thanks for Your Business”



Entrance