

APPLICATION OF GEOGRAPHICAL INFORMATION SYSTEM TECHNOLOGY TO SANITARY LANDFILL SITE SELECTION

Alan C. Sandercock¹ and Randy Weathersby²

AUTHOR: ¹Georgia Geologic Survey, 19 Martin Luther King Jr. Dr., SW, Atlanta, Georgia 30334; ²Albany Dougherty Planning Commission, P.O. Box 3069, Albany, Georgia 31706.

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The Georgia Geologic Survey Branch of the Environmental Protection Division, Georgia Department of Natural Resources, in cooperation with the Georgia District of the U.S. Geological Survey, Water Resources Division, is producing a series of maps designed to help protect ground water by showing areas that are poorly suited for siting of sanitary landfills. Separate maps are being prepared for each Regional Development Center (RDC) in the State. Each one consists of a large map which is a composite of data from nine smaller source maps also included in the package prepared for the RDC. These products are currently being distributed to the RDCs at a rate of about two maps per month with completion anticipated in 1991.

Data depicted on the source maps are significant recharge, public lands, soils, slope, wetlands, urban/built-up, streams/rivers, transportation and public water supply wells. These data were derived from various computer data bases (see following section for details) and the source maps produced using a computer based geographic information system (GIS). Using GIS it is possible to conveniently plot and overlay maps at any desired scale although the source map scales range in this case from 1:63,360 to 1:500,000. The presence of significant recharge areas, public lands or airports, highly permeable soils, steep slopes, wetlands, floodplains, urban areas, and public water supply wells are all considered as potentially rendering a site unsuitable for a sanitary landfill.

These unsuitable areas were defined by the computer process of buffering (wells, airports) and reselection (unsuitable soils types, slopes over 25%, etc) followed by the general overlay process mentioned above. On the large composite maps the above geographic information is shaded red indicating unsuitability for a sanitary landfill. While locational inaccuracies cannot be precisely determined, errors are believed to be no more than one mile. This estimate is based upon the data resolution resulting from the worst case source map scale of 1:500,000 (one mile approx. an eighth of an inch). Though this level of accuracy may occasionally obscure a viable siting prospect,

most of the better suited areas should clearly be outside of the red areas. Actual site investigations, meeting rules for solid waste management, are required before any letter of site acceptability can be issued. The map is intended to help applicants focus site selection activities on areas where the prospects for successful siting are better.

SMALL SOURCE MAP DETAILS

STREAMS AND LAKES:

Digital line graph (DLG) data
Compilation 1981
Source: U.S. Geological Survey, - Earth Science Information Center
Source scale 1:100,000
Hydrography shown in blue

MAJOR HIGHWAYS, ROADS AND AIRPORTS:

Digital line graph (DLG) data
Compilation 1981
Source: U.S. Geological Survey, Earth Science Information Center
Source scale 1:100,000
Source mapping 1948 - 1979
Primary and secondary highways shown in black
Airports shown in black, including 10,000 ft buffer

MUNICIPAL WATER SUPPLIES:

State water use data system (SWUDS)
Compilation 1986
Source: Georgia Department of Natural Resources and U.S. Geological Survey
Confined wells shown in black
Unconfined wells in red, including 2 mile buffer
Surface water intakes in blue

SLOPES GREATER THAN 25 PERCENT:

Digital elevation model (DEM) data
Compilation 1981, slopes derived from DEM data

Source: U.S. Geological Survey, Earth Science
Information Center
Source scale 1:250,000
Slopes greater than 25 percent shown in red (not
applicable)

**WATER BODIES AND WETLANDS LANDUSE
CLASSIFICATIONS:**

Landuse and landcover information
Compilation 1975
Source: U.S. Geological Survey, Earth Science
Information Center
Source scale 1:250,000
Water bodies and wetlands shown in blue

URBAN AND BUILT-UP LANDS:

Landuse and landcover information
Compilation 1975
Source: U.S. Geological Survey, Earth Science
Information Center
Source scale 1:250,000
Urban areas shown in black

RECHARGE AREAS:

Hydrologic atlas no. 18, most significant ground-water
recharge areas; 1989
Source: Georgia Geologic Survey, Georgia De-
partment of Natural Resources
Source scale 1:500,000
Recharge areas shown in red

FEDERAL, STATE AND PUBLIC LANDS:

Digitized by U.S. Geological Survey 1989
Source: Georgia Department of Transportation,
County highway maps: Compilation 1988
Source scale 1:63,360 or 1:126,720
Source mapping:
Public lands shown in green

POORLY SUITED SOILS:

County soil surveys
Compilation 1974
Compiled by the Georgia Geologic Survey, Georgia
Department of Natural Resources
Source: U.S. Soil conservation service
Source scale 1:63,360
Source mapping: 1926 - 1972
Unsuitable soils shown in red