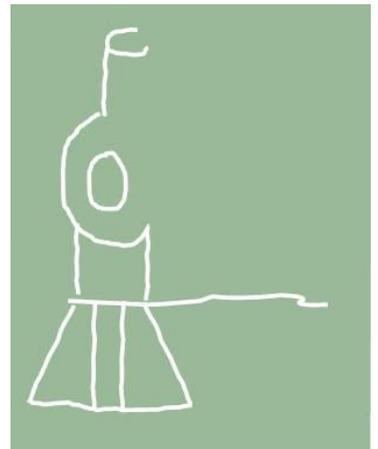


Chapter 6: The Natural Environment



All Aboard!

The Natural Environment

Overview

The first settlers to establish the Twin Forks settlement were drawn by the lush virgin forests covered in Longleaf pines. The area, formerly Choctaw Indian territory, was rich in commodities needed to support the settlers and, later, to build a town.

The confluence of the Bouie and Leaf Rivers provided a major transportation corridor within the Pascagoula River Basin. Gordon's Creek and Gillis Creek provided fresh water tributaries for the settlers' water supply. The rise of the natural topography granted dry building sites less than one-half mile from the river. The push for development into the South around the mid to late 1800s brought continued growth in population and the timber market.

Today, the residents of Hattiesburg and the surrounding region enjoy many benefits from our natural environment and geographic location. Below are some of the area's attributes:

- › There is an abundant water supply available to residents of the region. The wells are located in the Lower Catahoula sand strata, protected from contaminants by a significant depth of red clay which lies under the topsoil.¹
- › Residents of the region enjoy mild mean temperatures. The average temperature in January is 48 degrees and the average temperature in June is 80 degrees.
- › There are many beautiful, enjoyable natural features that increase the quality of life for residents, including the Bouie and Leaf rivers, Duncan Lake, majestic stands of Longleaf pine trees, and a well-maintained and protected urban forest.



Photo: Gordon's Creek at Walnut Street.

Floodplains and Waterways

The Leaf River is a part of Mississippi's Pascagoula River Basin and is the last unregulated major river system in the lower forty-eight states. The Leaf River at Hattiesburg is known as the "Pine Belt" portion of the basin.²

Geographically, Hattiesburg's northern and eastern city limit boundaries are the Bouie and Leaf Rivers.

Hattiesburg's first settlement, appropriately named Twin Forks, occurred at the confluence of the two stream systems. Below is a description of the origins and paths of the Leaf River and the major creeks found in the city.

Leaf River

The Leaf River originates in the southeast quadrant of Scott County, collecting minor tributaries namely Ichusa Creek, West Tallahala Creek, and Fisher Creek in Smith County; Oakohay Creek in Covington County; and Big Creek in Jones County. In Forrest County, the Leaf River receives the Bouie River at Hattiesburg. Bouie Creek originates in the south portion of Simpson County and the Okatoma Creek originates in Smith County at Magee. The two converge into the Bouie River at the northwest corner of Forrest County.

The Leaf River continues through Forrest, Perry and Greene Counties. In the northwest corner of George County, the Chickasawhay River, originating in Clarke County, meets the Leaf River to form the Pascagoula River and continues on through George County and Hancock County to the Gulf of Mexico at Pascagoula.

Gordon's Creek

Gordon's Creek begins near the intersection of Interstate 59 and Lincoln Road to the east, crossing U.S. Highway 49 at the south end of the interchange. The creek flows north, crossing Hardy Street at 19th Avenue, and continues in an east-northeasterly direction through Downtown Hattiesburg and into the Leaf River.

Burkett's Creek

Burkett's Creek begins in the Richburg Road area flowing in a southeasterly direction. The creek changes course to the northeast before crossing U.S. Highway 11, Bonhomie Road, and U.S. Highway 49 (near Pearl River Community College). The creek continues northeast across Edwards Street at County Drive, travels northeast across James Street to the sewer lagoon, and follows around the lagoon to the river.

Priest's Creek

Priest's Creek originates near Interstate 59 (south exit) between U.S. Highway 11 and Bonhomie Road. The creek flows in an easterly direction across U.S. Highway 49, through the Forrest County Industrial



Figure 16. What is a floodway?

“A ‘Regulatory Floodway’ means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. For streams and other watercourses where FEMA has provided Base Flood Elevations (BFEs), but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that increases in water surface elevations do not occur, or identify the need to adopt a floodway if adequate information is available.”

Source: <http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/floodway.shtm>.

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Park/Hattiesburg Bobby L. Chain Municipal Airport. Priest's Creek crosses James Street below the J.M. Tatum Industrial Drive and flows into the Leaf River.

Mixon's Creek

Mixon's Creek begins in Lamar County at Lake Thoreau near Gravel Pit Road north of U.S. Highway 98. The creek travels in an easterly direction and parallels the south side of West 4th Street to Interstate 59. Mixon's Creek turns north, crossing Interstate 59 and U.S. Highway 49 into the Lake Terrace Convention Center property and flowing easterly on to the Bouie River at Glendale. For more information, refer to the Floodplain and Waterways map in Appendix C.

Floodplain Management

For many years, the City has worked to stabilize Hattiesburg's creeks with gabions, loose rip-rap and grouted rip-rap to control erosion. A priority project is the completion of bank stabilization along Gordon's Creek from East Hardy Street to Interstate 59.¹ Another near-term need is the stabilization of sections of Mixon's Creek. Because of development to the west, water volumes and erosion along the creek have increased.¹

The Vision Advisory Team discussed environmental issues related to stormwater and floodplain management and strongly advocated a policy of returning, as much as possible, the city's creeks and streams to their natural states. The banks of many creeks have been "hardened" with concrete or other impervious stabilization methods to prevent the erosion.

In recent years, alternative "best management practices" have been identified that prevent erosion and reduce sedimentation and yet allow waterways to remain in a more natural state. There are many environmental advantages to these best management practices, including fostering a better habitat for plant and animal species, recharging groundwater through the infiltration of stormwater, reducing thermal pollution of waterways, and improving the appearance of Hattiesburg's creeks and streams. Hattiesburg should employ these methods in all future projects and, where possible, return the hardened waterways to a more natural state.

Soils and Topography

Hattiesburg Soils

This section provides a snapshot of the many types of soils found within Forrest and Lamar counties. Of the many soil characteristics provided in the county soil surveys, only two common attributes are described herein: 1) drainage and 2) slope. More detailed information about area soils is available from the USDA Soil Conservation Service office in Hattiesburg.

A map showing the soil types found in Hattiesburg is shown on page 76. The map highlights six areas of the city for soil identification:

Area 1 – Hattiesburg Proper (Forrest County)

Area 2 – Palmer’s Crossing (Forrest County)

Area 3 – Timberton (Forrest County)

Area 4 – Classic Drive (Forrest County)

Area 5 – U.S. Highway 98 West (Lamar County)

Area 6 – Lincoln Road Extension (Lamar County)

The Table of Soil Types on page 77 reflects only the most predominant occurrences of soil types within each area. The following is a brief overview of information observed by using the map and table together; this is provided as an example to use in interpreting the soil characteristics in Areas 2 through 6.

Area 1-Forrest County Soil Classifications - Hattiesburg proper.

Soil Type BcA (Blue): The right hand side of Area 1, lying adjacent to the Bouie and Leaf Rivers, shows that a majority of the properties east of Main Street are classified as an area that is occasionally flooded. This soil pattern also coincides with the AE zone found on the Floodplain map in Appendix C. The AE zone—a flood hazard zone based on a 100 year flood event—has strict development guidelines and requires flood insurance for all structures within this zone.

Soil Type Ur (Green): This soil type appears in the following areas: Downtown Hattiesburg; the area between 4th and 7th Streets; the Hercules site on 7th Street; and the Broadway Drive/West Pine Street area. This soil type is described as “Urban Land –

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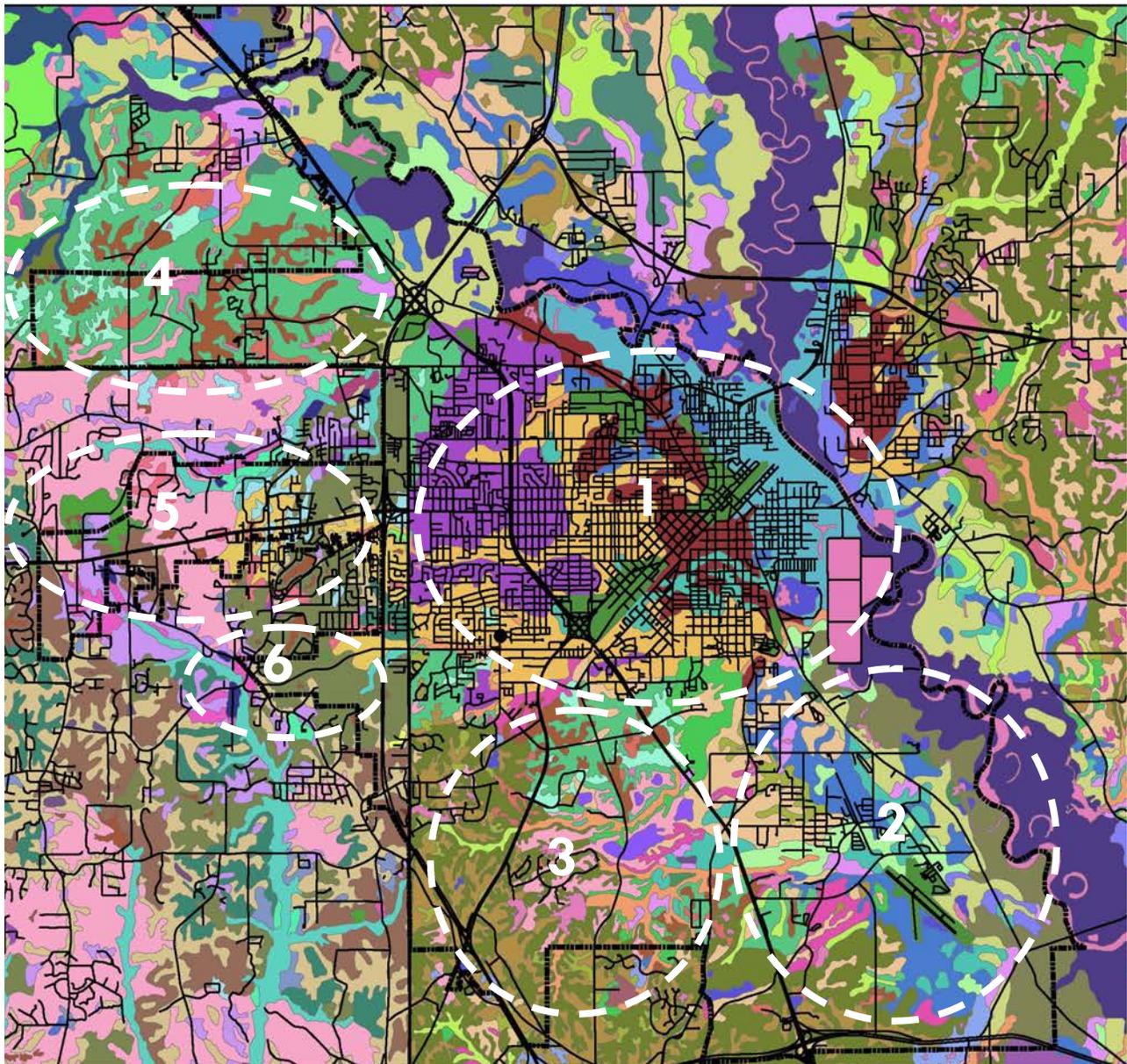
Soils and Topography



Photo: Hattiesburg Tree Nursery.

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Map 1. Hattiesburg Soils



City of Hattiesburg— Predominant Soil Classifications

Soil Classification Areas:

1. Hattiesburg Proper
2. Palmer's Crossing
3. Timberton
4. Classic Drive
5. U.S. Highway 98 West
6. Lincoln Road Extension

Methodology:

The city was divided into six areas due to the overall varying degrees of Forrest and Lamar Counties soil classifications. The area soil classifications were selected by choosing the most predominant occurrences in each area. Each classification also provides general attributes of the soil type. This report is for planning purposes only and not intended for any other applications.

Source: Soil Map Data: from www.GISCouncil.ms.gov.

Table of Soil Types

Area 1—Forrest County

| | | |
|--|-----|--|
| | BbA | Bassfield-Urban land complex (0-2% slopes) Well drained soils |
| | BcA | Bassfield-Urban land complex, (Occasionally flooded) |
| | FsB | Falkner-Susquehanna-Urban land complex, (2-5% slopes) Poorly drained soils |
| | Ur | Urban land, (heavy development has altered/obscured soil; no longer can be identified within the soil series). |
| | Pu | Prentiss-Urban land complex, (Moderately well-drained) |

Area 2—Forrest County

| | | |
|--|-----|--|
| | JN | Jena-Nugent association, (Frequently flooded) |
| | LT | Latonia-Trebloc association, (Occasionally flooded) |
| | PtB | Prentiss loam, (2-5% slopes) Moderately well drained soils |
| | Tb | Trebloc silt loam, (Poorly drained soils) |

Area 3—Forrest County

| | | |
|--|-----|--|
| | BeB | Benndale fine sandy loam, (2-5% slopes) Well drained soils |
| | HeE | Heidel sandy loam, (12-30% slopes) Well drained soils |
| | MbB | McLaurin loamy sand, (2-5% slopes) Well drained soils |
| | PtA | Prentiss loam, (0-2% slopes) Moderately well drained soils |
| | SuD | Susquehanna silt loam, (5-12% slopes) Poorly drained |

Area 4—Forrest County

| | | |
|--|-----|---|
| | HeE | Heidel sandy loam, (12-30% slopes) Well drained soils |
| | SuB | Susquehanna silt loam, (2-5% slopes) |
| | SuD | Susquehanna silt loam, (5-12% slopes) |

Area 5—Lamar County

| | | |
|--|-----|---|
| | FmC | Freestone-McLaurin-Susquehanna association (rolling) poor to moderate drained soils |
| | MIC | McLaurin-Lucy association (Rolling) Well drained soils on uplands |
| | FsD | Freestone, Susquehanna, and Prentiss soils, (5-12% slopes) Poor to moderate drained soils |

Area 6—Lamar County

| | | |
|--|-----|---|
| | FsD | Freestone, Susquehanna, and Prentiss soils, (5-12% slopes) Poor to moderate drained soils |
| | MIC | McLaurin-Lucy association (Rolling) Well drained soils on uplands |
| | SuC | Susquehanna silt loam, (5-12% slopes) Poorly drained |

Source: Soil Classifications: Soil Survey of Forrest County, Mississippi, Soil Survey of Lamar County, Mississippi; U.S. Department of Agriculture, Soil Conservation Service and Forest Service in cooperation with Mississippi Agricultural and Forestry Experiment Station.

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heavy development has altered/obscured the soil; no longer can be identified within the soil classification series.”

Soil Type BbA (Brown): Most all of the brown areas are residential, surrounding the downtown district on the west side of Main Street and also along both sides of North Main Street. This soil type is considered “well drained” with a relatively flat topography and ideal for residential development.

Soil Type Pu (Gold): This soil type represents a partial mix of Urban Land complex and provides a moderately well-drained classification. The soil type is found in the following areas: north and south of the central portion of Hardy Street; the Forrest General Hospital site; a portion of West 7th Street at U. S. Highway 49, Lincoln Road west of U. S. Highway 49, and the William Carey University/Helveston Road area.

Soil Type FsB (Purple): This soil type occurs north and south along U. S. Highway 49 between the Interstate 59/U.S. Highway 49 and the U.S. Highway 49/ Highway 11 interchanges. The land use is mostly residential with commercial corridors and the University of Southern Mississippi campus. The attributes of the areas are poor-draining soil and moderately-sloping topography.

The map of soils uses some of the same colors in Forrest and Lamar Counties. Even though the colors may be the same, the soils and scientific names are different. When using the Table of Soil Types to identify soils depicted in the map, it is important to refer to the correct county.

Topography

Elevations in Hattiesburg range from 140 feet above sea level to 343 feet above sea level. The lowest point occurs along the Leaf River and highest point is around the Sullivan/Killrain Crossing at the intersections of US Highway 11 and Interstate 59.¹

The Urban Forest

With its history rooted in the timber industry, Hattiesburg has made the management and preservation of its urban forest a priority. Prior to Hurricane Katrina (August 29, 2005), many of the city’s

streets were shaded by mature oaks and pine trees. An estimated 30% of the city's tree canopy was lost or heavily damaged during the hurricane, and even more trees were removed in the months that followed. Falling trees caused widespread property damage and prompted many wary property owners to remove additional trees as a precaution.³

Much of Hattiesburg's tree cover is over-mature water oaks. To protect the safety and welfare of the citizens of Hattiesburg, the City's forestry crews remove 200 to 300 hazard trees annually. These trees pose a public safety risk along streets, public rights-of-way, and city properties. Purchasing 250 trees each year to replace the trees being removed requires an investment of \$17,000 to \$20,000.³

City Tree Nursery

To meet the need for a reliable and cost-efficient source of new trees, the City established its own tree nursery in 2003.³ Half of the cost to establish the nursery was provided by the Mississippi Forestry Commission under its Urban and Community Forestry Assistance Grant program. The half-acre nursery is now capable of producing 200 trees annually, thus saving the City thousands of dollars.³

The nursery's first trees were potted in February 2003. The trees are grown in the nursery for 3 to 4 years before being planted.³ Most of the species grown in the nursery are large shade tree species such as Live oak, Willow oak and Nuttall oak. Other tree species being grown include Green Ash and Red Maple.³

The City currently has between 700 and 800 trees in the nursery at different stages of growth. Within the last two years, approximately 100 nursery trees have been planted in Hattiesburg. The City anticipates having between 200 and 300 trees of a size appropriate for planting in 2008.³ In the nursery there is a continuous cycle of tree planting, transferring younger trees to larger pots, and planting the next generation of new seedlings.³

Having a City-owned and operated nursery allows significantly more trees to be planted at the same costs currently spent on tree planting, and allows for the flexibility of growing other species as the need arises.

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Urban Forestry Programs

The department focuses on three key areas of urban forestry: preventive maintenance, hazardous tree recognition, and new tree planting.³

- › *Preventive maintenance:*
City workers routinely inspect every street in the city once a month and trim or remove any elements that could pose future concerns.
- › *Hazard tree recognition:*
Workers remove any hazard on City-owned property or public rights-of-way and make private property owners aware of tree safety issues by working with code enforcement officers to address private tree hazards.
- › *New tree planting:*
The only way to restore the city's urban forest is by planting new trees. Through the urban forestry department's annual tree planting program and by requiring developers to provide green space and trees, the City hopes to improve and restore the city's tree canopy.³

Additionally, Hattiesburg's Code of Ordinances is designed to protect and preserve an important natural resource. The department finds that, to appropriately oversee and enforce the city's tree protection ordinances, penalties and fines must be put into place to effectively deal with non-permitted tree removal, clear-cutting, and unapproved land clearing.⁵

Water Oak Replacement and Tree Hazards

There are still many older water oaks located throughout the city. The urban forestry department continues to perform regular maintenance to these trees, such as deadwooding (removal of diseased, broken or weak branches), trimming and tree assessments, until removal is the only option. In 2007, City workers removed eight water oaks in the Oaks District and replaced them with Willow Oaks.³ A large section of the water oaks in this area are past maturity and will be removed when the trees are no longer sustainable.³

Another primary concern of the urban forestry department is hazard trees on private property. By working with code enforcement officers, the City is able to require property owners to remove trees due to

safety hazards. Other challenges to maintaining a healthy urban forest include illegal or inappropriate land clearing methods and a resistance on the part of developers to invest in landscaping for new or existing developments.³

Hattiesburg Tree Board

The Hattiesburg Tree Board—inactive between January 2006 and October 2007—has been reappointed and began meeting in January 2008. The Tree Board is a group of concerned citizen volunteers appointed by the Mayor to work with the Urban Forestry division in developing and administering a comprehensive urban forestry management program. The board is focused on the development and implementation of public education and training programs to promote conservation and improve urban forestry.⁴

Tree City USA

Additionally, Hattiesburg has participated in the Arbor Day Foundation's Tree City USA program since 1992.³ The recognition from the Arbor Day Foundation brings credibility and a positive influence to the Urban Forestry Program. It is a benchmark that reflects the city's commitment to tree planting and improving its urban forest.³

Implementation Actions

- › Continue and strengthen successful urban forestry programs.
- › Strengthen ordinances and enforce landscaping and tree planting requirements.
- › Prohibit clear-cutting—removing all trees and vegetation from a lot—prior to marketing or construction. Instead, require appropriate site planning and design to protect and preserve mature trees.
- › Employ adequate staff to perform inspections and enforce penalties for violating land clearing ordinances.
- › Provide information, such as brochures, to residents and business-owners on land development and land clearing ordinances. Educate residents and land developers on the importance of protecting natural features and the environment's natural systems.
- › Provide educational programs and materials to citizens for tree and landscape care.

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- › Initiate awards programs such as “Developer of the Year” to recognize special efforts.
- › Create neighborhood and pocket parks in residential areas that do not have access to parks and open spaces.
- › Consider how tree protection and the health of the urban forest can be improved through amendments to the tree ordinance or improvements in administration and enforcement.
- › Require site development plans to include an analysis of existing mature trees and adopt policies for tree protection, preservation and maintenance.

Short-Term Facilities, Equipment and Program Needs

- › Replace existing bucket truck. Estimated cost: \$128,000.
- › Provide additional training for the City’s tree crew to stay up-to-date with safe work practices, new techniques and other related fields.

Brownfields and Environmental Issues

As in many communities, Hattiesburg’s citizens are concerned about the existence of contamination at current and former industrial sites. There are a number of sites in Hattiesburg that have been determined to be contaminated or have a possibility of being contaminated.⁷ Below is a description of those sites and any current or needed actions to restore the health of the environment and protect nearby residents.

- › *Former Gulf States Creosote site (West Pine Street).*

The Mississippi Department of Environmental Quality (MDEQ) and the U.S. Environmental Protection Agency (EPA) have determined that this former wood treatment site was contaminated with creosote. As it did not meet the requirements to be classified a Superfund site, MDEQ exercised jurisdiction over the remediation process.⁷ In 1996, Kerr McGee, owner of the property, and MDEQ entered into an “Agreed Order” to remediate the site.⁷ Tronox, a spin-off corporation of Kerr McGee, is the current landowner. The City acts as a conduit for information between MDEQ and area residents. Under the terms of the Agreed Order, if additional contamination is found at any time that

exceeds acceptable levels determined by either EPA or MDEQ, Tronox will be responsible for clean-up.^{6,7}

The City will continue to be a resource to individual residents and environmental citizen groups to ensure that the public is informed about the current status of the site.⁶

› *James Street Landfill.*

This site on James Street was used as a landfill for organic material, such as wood chips. Phase 1 clean-up and a portion of Phase 2 clean-up has been completed, including the drilling of test wells to determine if there is contamination.⁶

This landfill site was closed in the 1980s. Prior to the 1980s, there were no federal regulations that covered this type of operation. At this time, testing has revealed that no contamination has been found that exceeds the allowed levels.⁶

› *Mississippi Central Railroad site (17 ac.) near Shemper and Son's on Bouie Street.*

The City of Hattiesburg is working with the Mississippi Department of Transportation (MDOT) and hopes to purchase this property. MDOT will not assume title of the property until they are assured that no environmental issues exist.⁶

Shemper's—a scrap metal recycling business—had been storing vehicles on the site for 50 years. If acquired, this land will be incorporated into Chain Park at Twin Forks (see description on page 169). Engineering work on the park site should be completed in 2008; park construction is scheduled to begin in late 2008 or early 2009.⁶

Environmental testing on the Mississippi Central Railroad site will be performed by the Army Corps of Engineers. The property is proposed to be used as a passive recreational site adjacent to Chain Park at Twin Forks.⁶

› *Former Forrest County Co-op and Meridian Fertilizer Plant, Jackson and 4th Streets (Mobile-Bouie area).* Phase 1 has been completed. MS Department of Environmental Quality will authorize the engineers to begin Phase 2 in the near term. Phase 2 involves drilling soil samples for testing

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purposes.⁶

- › *Former Davis Timber site, Jackson Road.*
The former Davis Timber site, located in the Hattiesburg Country Club area, was on the superfund list. The City of Hattiesburg has not been involved in any part of the testing and remediation of this site.⁶

City officials are continuously seeking grant opportunities for additional identification and assessment programs. The City should continue to be proactive in seeking outside funding sources for identification, assessment and remediation.

In addition, the City should continue to pursue safe uses for these properties that have real or perceived contamination. The Mississippi Central Railroad property, described above, is a successful example of how contaminated properties can be put to use to enhance the quality of life for surrounding property owners and area residents.

Hazard Mitigation

Hattiesburg, in partnership with Forrest County and the City of Petal, recently adopted a Multi-Jurisdictional Hazard Mitigation Plan for the purpose of eliminating, mitigating and minimizing the impacts of disasters on city and county residents. The following are the primary types of hazards identified in the plan that could potentially impact Hattiesburg: hurricanes and coastal storms, thunderstorms and tornadoes, flooding and potential flood events, wildfires, and manmade hazards such as hazardous material spills. The plan also contains a list of goals, objectives and strategies that will minimize the impacts of these hazards to local residents.

Sources

1. Bennie Sellers, PE, Director of Public Services. Personal interview. March 7, 2008.
2. Pascagoula River Basin. <http://www.deq.state.ms.us/OpenDocument>. Website accessed April 26, 2008.
3. Andy Parker, City Arborist. Personal correspondence. January 3, 2008.
4. Andy Parker, City Arborist. Personal correspondence. March 17, 2008.
5. Andy Parker, City Arborist. Comments submitted July 8,

2008.

6. Bennie Sellers, PE, Director of Public Services. Presentation to the Vision Advisory Team. May 10, 2007.
7. Franklin Tate, Department of Public Services. Comments submitted July 18, 2008.



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Hazard Mitigation

