

Outer Continental Shelf

Gulf of Mexico OCS Oil and Gas Scenario Examination: Onshore Waste Disposal

Outer Continental Shelf

**Gulf of Mexico OCS Oil and Gas Scenario
Examination: Onshore Waste Disposal**

Authors

David E. Dismukes
Michelle Barnett
Derek Vitrano
Kristen Strellec

Published by

**U.S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region**

**New Orleans
August 2007**

GULF OF MEXICO OCS OIL AND GAS SCENARIO EXAMINATION: ONSHORE WASTE DISPOSAL

A variety of different types of wastes are generated through oil and gas exploration and production (E&P) activities in the offshore Gulf of Mexico (GOM) region. Some wastes are common to any operation (e.g., garbage, sanitary waste (toilets) and domestic waste (sinks, showers)), while others are unique to the oil and gas exploration and production industry (e.g., drill fluids and produced water). The generated wastes include both the solid and liquid forms. This report focuses solely on solid wastes that must be transferred to shore-based facilities for storage and disposal: municipal solid waste, nonhazardous E&P waste, and hazardous waste. The purpose of this research is to examine both the solid-waste disposal needs of the GOM offshore industry and the onshore solid-waste disposal infrastructure (in terms of available capacity) given both current and forecasted drilling and production activities in the GOM.

The literature and resources examined during the course of this research are provided in the references section of this report. Due to concerns raised by the State of Louisiana, special emphasis was placed on examining the capacities of onshore facilities located in Louisiana. The authors directly consulted with State environmental and natural resources staff at the Louisiana Department of Environmental Quality (DEQ) and Louisiana Department of Natural Resources (DNR), as well as with industry representatives. None of the Louisiana State agency experts and industry representatives consulted indicated any concern about the adequacy of solid-waste disposal infrastructure to meet disposal needs now or in the future (i.e., given current or projected Federal offshore activities).

Since the enactment of the National Environmental Policy Act in 1969, the Minerals Management Service (MMS) has prepared environmental impact statements (EIS's) and environmental assessments (EA's) to analyze the potential impacts of proposed lease sales on the marine, coastal, and human environments. In order to describe the level of activity that could reasonably result from a proposed lease sale, MMS develops exploration and development (E&D) scenarios, including forecasts of new coastal infrastructure such as solid-waste facilities. These scenarios provide a framework for detailed analyses of potential environmental and socioeconomic impacts of a proposed lease sale. The analyses of coastal infrastructure presented in previous EIS's and EA's concluded that no new solid-waste facilities would be built as a result of single lease sale in the Western or Central Planning Areas (WPA or CPA) or as a result of the Outer Continental Shelf (OCS) Program.

Municipal Solid Wastes

There is little difference in handling between domestic activity waste and most common offshore oil-field solid waste. Waste from offshore activities can include boards, pallets, paper, plastics, and other types of items that can also be commonly found at a typical onshore facility. This waste must be shipped to shore where it is transferred to a municipal waste facility. There are significant fuel-related costs in shipping these wastes from offshore structures to onshore locations, and operators will attempt to reduce these costs wherever possible. This provides economic incentives for operators to minimize waste generation and recycle wherever possible. The limited space on a platform or drillship further encourages operators to limit waste derived from consumables. Food wastes produced from offshore activities is ground up and discharged on site and not transported to land.

To reduce the amount of waste that is landfilled, a number of offshore operators and drilling contractors participate in the Recycle the Gulf program, which has reclaimed about 2 million pounds of materials from offshore operations since its inception in 2002 (Rach, 2007). The recyclable commodities are donated to the Association of Retarded Citizens (ARC) in New Iberia, Louisiana, which processes and resells the materials to a recycling plant.

The MMS recently funded a study addressing the waste streams associated with the decommissioning and removal of OCS structures (Kaiser and Pulsipher, 2007). When structures are decommissioned and removed, the basic idea is to maximize the value of the waste stream by reducing the structure according to a generally accepted disposal hierarchy: refurbish and reuse, scrap and recycle, and dispose in designated landfills. Virtually no steel (with the exception of some pilings and conductors cased in cement) is typically landfilled. A small amount of obsolete equipment that cannot be brokered and sold may ultimately be disposed in a landfill.

Industry and Louisiana DEQ officials indicated that oil-field contributions to overall municipal waste levels were minimal, and prior MMS-funded studies on the matter found that, under the most aggressive scenario, these wastes may comprise 5 percent of total landfill waste in selected areas near offshore oil and gas supply facilities (The Louis Berger Group Inc., 2004). Based on operator data provided in filed plans, MMS estimates that there is an average of 2,000 cubic feet of trash and debris generated per exploration well drilled, 102 cubic feet of trash and debris generated per development well drilled, and 1,000 cubic feet of trash and debris generated per year per manned platform over its 25-year life. Combining these estimates with the E&D scenarios used in 2007-2012 Multisale EIS¹ and converting this to tons² results in the following total estimates of trash and debris projected to be generated and disposed onshore as a result of a typical lease sale: WPA³ proposed action, 10,000-29,500 tons and CPA³ proposed action, 19,000-58,500 tons. Estimates for the OCS Program are 415,500-993,500 tons for the WPA³ and 1,095,500-2,549,500 tons for the CPA³. As illustrated below, this represents only a very small percentage (less than 1%) of the total current permitted landfill capacity in the GOM economic impact area (EIA).

Over the past decade, landfills have experienced an increase in capacity due to new technology. For example, Texas landfills have increased useful life by 19 years from the mid-1990's to 2005, mainly due to technological improvements of how waste is compacted before placed in the landfill. Landfills in Louisiana, Mississippi, and Alabama have also benefited from this improved technology in compacting.

Table 1 illustrates the estimated capacity and useful life for landfills in Louisiana, Texas, Mississippi, and Alabama in the MMS-defined EIA of the GOM. These landfills have an estimated remaining permitted capacity of 386,545,904 tons and an average useful life of 32 years. Landfills with useful lives greater than 40 years have a remaining capacity of 170,058,951 tons, which represents 44 percent of the total capacity for the GOM region.

¹ There were 42-66 exploration wells, 155-221 development wells, and 10-15 manned platforms projected as a result of a proposed lease sale in the WPA; 155-221 exploration wells, 330-468 development wells, and 10-20 manned platforms were projected as a result of a proposed lease sale in the CPA; 2,325-2,864 exploration wells; 8,160-9,662 development wells, and 218-262 manned platforms were projected as a result of the OCS Program in the WPA; and 5,010-6,569 exploration wells; 23,181-26,243 development wells; and 517-607 manned platforms were projected as a result of the OCS Program in the CPA (USDOJ, MMS, 2007).

² Compacted trash weighs 800-1,600 pounds per cubic yard (Duffy, 2007).

³ This paper refers to the newly configured planning area boundaries that became effective with the 2007-2012 5-Year Program.

Table 1

Landfill Capacity and Reported Tons Deposited

State	Economic Impact Area	Market	County/ Parish	Remaining Capacity (tons)	Remaining Capacity (life over 40 years)	Useful Life (years)
Alabama	AL-1	Mobile	Mobile		31,500,000	90
Mississippi	MS-1	Biloxi-Gulfport	Harrison	280,768		15
			Jackson	1,333,333		22
			Pearl River	2,487,938		11
Louisiana	LA-1	Lake Charles	Jefferson Davis	3,525,999		12
	LA-2	Lafayette	Acadia		4,420,870	55
			St. Landry	2,701,700		37
			Vermilion	839,639		7
	LA-3	Baton Rouge	Ascension	6,741,169		13
			East Baton Rouge	22,806,804		30
			Livingston	28,474,250		36
			Tangipahoa	910,728		7
			St. Mary	3,775,972		3
	LA-4	New Orleans	Jefferson	51,043,758		24
			Plaquemines	362,266		11
			Washington	1,026,000		21
Texas	TX-1	Brownsville	Cameron		16,025,673	80
			Hidalgo	10,660,663		10
			Starr			47
		Corpus Christi	Brooks	56,755	88,882	33
			Duval	2,680		1
			Jim Wells	1,044,101		19
			Kleberg		1,589,702	65
	Nueces		11,695,023	27		
	TX-2	Brazoria Victoria	Brazoria	26,500,611		28
			Colorado	3,243		0
			Victoria	4,119,498		31
	TX-3	Beaumont- Port Arthur	Hardin		1,360	42
			Jefferson		24,000,178	41
			Newton		27,853,479	130
			Polk		6,059,782	64
Houston- Chambers		Chambers	8,414,117		21	
		Galveston	16,335,996		14	
		Harris		58,519,025	53	
		Montgomery	11,343,942		29	
Total Capacity with Less than 40 Years of Useful Life				216,486,953		
Total Capacity with More than 40 Years of Useful Life					170,058,951	
Total Capacity of the Gulf of Mexico Region						386,545,904
Average Useful Life						32

Sources: Louisiana DEQ, 2007; Texas Commission on Environmental Quality, Waste Permits Division, 2006; and Mississippi Development Authority, 2007.

Landfill capacities do not appear to be a constraint in any fashion to the ongoing or future development of offshore oil and gas activities. Existing facilities have ample capacity, and environmental regulators in the region, particularly in Louisiana, foresee no future constraints. Should any location-specific constraints arise in the distant future, there are no physical or legal reasons why municipal solid waste generated offshore could not be exported to other areas outside the EIA. Municipal solid-waste disposal is a competitive business that is engaged in interstate commerce, and it is subject to numerous substitutes and alternatives.

Nonhazardous E&P Solid Wastes

Drilling muds and wastewater streams (including produced sand⁴) that have been solidified may often serve as daily cover for a landfill. Use of this type of material often improves a site's soil balance, meaning the volume of soil required over the life of the landfill for its construction and operation will be less than if these materials were not available and other soils had to be hauled in at a cost. Up to a point, these materials consume no usable space (i.e., have no impact on landfill capacity) since they are merely displacing soils that would be used for cover in any event. For this reason, landfills will often accept these materials at a reduced price, or even at no charge (The Louis Berger Group Inc., 2004).

Some of these solidified waste streams (such as those containing oil-based drilling fluids) may require some preliminary treatment before they can be used. In this case, "pits" are loaded and then treated for approximately 2 years, after which the remaining material can be removed and reused. While the intent was to reuse this material offsite, from a practical purpose, it has rarely been done due to transportation costs versus other soil procurement options. The material is usually reused onsite for projects, such as constructing or maintaining levees. Because this waste material is ultimately completely recycled, it does not face any disposal capacity constraints.

The only wastes that must be specifically handled separate from traditional solid wastes are those that have some potential chemical contaminants such as paint cans, oily rags, oil-stained clothing, etc. The storage and disposal of these wastes are governed by a variety of State and Federal statutes, rules, and regulations. Offshore wastes that are required to be stored or disposed of into special facilities or impoundments must be collected from offshore areas and transported to onshore oil-field waste facilities. These wastes are basically handled in the same manner as similar industrial wastes generated onshore.

Hazardous Solid Wastes

The occurrence of hazardous offshore, oil-field waste is minimal and infrequent; industry representatives contacted indicated that the need for such storage could occur as infrequently as once in 5 years for a typical offshore facility with drilling and production activities. Industry experts consulted noted that estimating the impact that oil-field activities had on hazardous waste facilities would be too small to measure and would not affect disposal capacities.

Conclusion

The analyses of coastal infrastructure presented in previous EIS's and EA's concluded that no new solid-waste facilities would be built as a result of single lease sale (in the WPA or CPA) or as a result of the OCS Program. This research further supports these past conclusions that existing solid-waste disposal infrastructure is adequate to support both existing and projected offshore oil and gas drilling and production needs.

References

- Argonne National Laboratories. 2007. Drilling waste information management system. Internet website: <http://web.ead.anl.gov/dwm/>. Accessed August 3, 2007.
- CHWMEG, Inc. 2007. Facility status report. Internet website: <http://www.chwmeg.org/asp/search/detail.asp?ID=152>.
- Duffy, D.P. 2007. Landfill operations: getting the most from your equipment. Official Journal of the Solid Waste Association of North America. July/August 2007. Internet website: http://www.gradingandexcavation.com/mw_0707_operations.html.
- Hahn, M. 2007. Personal communication. Louisiana Department of Environmental Quality (DEQ), Office of Hazardous Wastes, Baton Rouge, LA. June 6, 2007.

⁴ The quantity of produced sand and gravel generated is minimal; industry contacts estimate levels generated are, at most, a few 55-gallon drums per typical platform per year.

- Kaiser, M.J. and A.G. Pulsipher. 2007. Idle iron in the Gulf of Mexico. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2007-031. 197 pp.
- Louisiana Department of Environmental (DEQ). 2007. Quality solid waste generation and disposal capacity report. Internet website: <http://www.deq.louisiana.gov/portal/tabid/259/Default.aspx>. Accessed August 13, 2007.
- Metcalf, R. 2007. Personal communication. Health Safety and Environmental Affairs Coordinator, Louisiana Mid-Continent Oil and Gas Association. Baton Rouge, LA. June 6, 2007.
- Mississippi Development Authority. 2007. Small scale producers - renewable and bioenergy database in Mississippi, active municipal solid waste landfills. Internet website: <http://www.mississippi.org/energycd/landfill/active.htm>. Accessed August 13, 2007.
- Pennington, S. 2007. Personal communication. Environmental Impact Specialist, Louisiana Department of Natural Resources (DNR), Office of Conservation, Injection and Mining Division, Baton Rouge, LA. June 4-6, 2007.
- Rach, N. 2007. Gulf of Mexico recycling. *Oil and Gas Journal*. January 1, 2007.
- Rogers, J. 2007. Personal communication. Environmental Scientist, Louisiana Department of Environmental Quality (DEQ), Office of Solid Wastes, Waste Permits Division, Baton Rouge, LA. June 6, 2007.
- Sharafkhani, B. 2007. Personal communication. Administrator, Louisiana Department of Environmental Quality (DEQ), Office of Environmental Services, Waste Permits Division, Baton Rouge, LA. June 6, 2007.
- Snellgrove, G. 2007. Personal communication. Environmental Consultant, Louisiana Department of Natural Resources (DNR), Office of Conservation, Injection and Mining Division, Baton Rouge, LA. June 4-6, 2007.
- Texas Commission on Environmental Quality. Waste Permits Division. 2006. Municipal solid waste in Texas: A year in review. Texas Commission on Environmental Quality, Waste Permits Division, Austin, TX. June 2006, AS-187/06. Pp. 20-26. Internet website: http://www.tceq.state.tx.us/assets/public/comm_exec/pubs/as/187_06.pdf.
- The Louis Berger Group, Inc. 2004. OCS-related infrastructure in the Gulf of Mexico fact book. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study MMS 2004-027. 234 pp.
- U.S. Dept. of the Interior. Minerals Management Service. 1999. Notice to Lessees and Operators (NTL 99-G22). Internet website: <http://www.gomr.mms.gov/homepg/regulate/regs/ntls/ntl99-g22.html>.
- U.S. Dept. of the Interior. Minerals Management Service. 2007. Gulf of Mexico OCS oil and gas lease sales: 2007-2012; Western Planning Area Sales 204, 207, 210, 215, and 218; Central Planning Area Sales 205, 206, 208, 213, 216, and 222—final environmental impact statement. U.S. Dept. of the Interior, Minerals Management Service, Gulf of Mexico OCS Region, New Orleans, LA. OCS EIS/EA MMS 2007-018. 2 vols.
- U.S. Environmental Protection Agency. 2002. Exemption of oil and gas exploration and production wastes from Federal hazardous waste regulations. Internet website: <http://www.epa.gov/epaoswer/other/oil/oil-gas.pdf>.
- Watson, A. 2007. Personal communication. Environmental Impact Specialist, Louisiana Department of Natural Resources (DNR), Office of Conservation, Injection and Mining Division, Baton Rouge, LA. June 4-6, 2007.



The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.