Waste Management and Remediation Services Turnover/Output Measures in the US

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1. Definition of the Services being collected

The definition of waste management and remediation from NAICS United States covers a wide range of activities that are associated with the collection, treatment, and disposal of waste as well as specified activities related to the remediation of contamination in the environment. NAICS includes the following description:

"Industries in the Waste Management and Remediation Services subsector group establishments engaged in the collection, treatment, and disposal of waste materials. This includes establishments engaged in local hauling of waste materials; operating materials recovery facilities (i.e., those that sort recyclable materials from the trash stream); providing remediation services (i.e., those that provide for the cleanup of contaminated buildings, mine sites, soil, or ground water); and providing septic pumping and other miscellaneous waste management services. There are three industry groups within the subsector that separate these activities into waste collection, waste treatment and disposal, and remediation and other waste management. Excluded from this subsector are establishments primarily engaged in collecting, treating, and disposing waste through sewer systems or sewage treatment facilities that are classified in Industry 22132, Sewage Treatment Facilities and establishments primarily engaged in long-distance hauling of waste materials that are classified in Industry 48423, Specialized Freight (except Used Goods) Trucking, Long-Distance. Also, there are some activities that appear to be related to waste management, but that are not included in this subsector. For example, establishments primarily engaged in providing waste management consulting services are classified in Industry 54162, Environmental Consulting Services."1

NAICS classifies the activities of ISIC 3700, Sewerage in the utilities sector. For the purposes of this mini-presentation, sewerage will be included in the discussion of waste management. Many of the market issues that relate to waste management are shared by sewerage service providers.

2. Unit of Measure collected

Surveys and Censuses covering waste management output collect the dollar value of sales, shipments, receipts or revenue for the collection, treatment, and disposal of waste and/or the dollar value of remediation services provided. Collection of waste management services revenue for services provided by governments often requires using expenses or other variables as a proxy for the market value of services provided.

3. Surveys measuring waste management and remediation output

The Census Bureau has a number of censuses and surveys that collect output information for the waste management and remediation services industries. Most of the censuses and surveys collect output data from private employers. There are additional surveys of non-employers and government or municipal waste management activities. Each of the surveys and coverage is detailed in the following paragraphs.

The Economic Census, conducted every five years, collects the most detailed information and provides benchmark data for the periodic sample surveys. The Economic Census questionnaires are sent to privately owned single- and multi-unit employers. The Economic Census output information is also used by the Producer Price Index program at the Bureau of Labor Statistics to weight price indexes. In 2007, there were over 22,200 private employer establishments with almost \$77 billion in revenue in the waster management and remediation industries according to the Economic Census.

The Service Annual Survey targets employer companies and provides estimates of the output of the waste management industries based on a sample of providers. This survey provides estimates at the NAICS six digit industry level.

The Quarterly Services Survey targets employer companies provides estimates at the three-digit level (total waste management and remediation less sewerage). The series began in 2003 and provides estimates of total revenue.

Non-employer statistics provide information on the number of establishments and receipts based primarily on administrative records annually.

A final series of interest comes from the Census of Government Employment. This Census is performed coincidently with the Economic Census and provides information on the local government employment, payroll and full time equivalents (FTE) for the sewerage and waste management industries.

In addition to the output data series, there are related surveys of capital expenditures and financial results at the enterprise level that can provide additional insight to the operation of waste management and remediation entities.

A comprehensive overview of waste management and remediation services including private, government, and non-employer businesses is available by comparing and/or combining data from a the different programs listed above.

4. Market conditions and constraints

Waste Management and Remediation (including sewerage)

Private employer establishments: 22,202 Employees in private establishments: 393,179 Receipts/revenue from private employers: $$76,924,944,000^{2}$

Nonemployer establishments: 20,886 Receipts/revenue from nonemployer estabs: \$ 1,677,620,000³

Local government employees in waste management: 249,8474

The providers of waste management and remediation services in the United States are fragmented. There are a wide variety of public and private activities included. While most remediation is performed by private companies, the collection and treatment of waste is a mix of public and private businesses. For example, in many cases local municipalities perform residential waste collection and disposal through public works or other units of local government. In other cases, there is a mixture of municipal and private service for residences within a municipality. Multifamily housing developments such as apartments or condominiums generally contract with private waste management providers and almost all commercial waste management services are provided by private enterprises.⁵ This combination creates considerable problems for developing total waste management services output.

Sewerage services are dominated by government establishments and are often regional in scope. The Economic Census does not include government owned sewage treatment plants. The 2007 Economic Census identified 689 private sewage treatment facilities with 6,974 employees and revenue/receipts of \$1,309,142. Local governments had 133,301 employees involved in sewerage.

Identification of "revenue" from government entities is not always straight forward. In general, sewerage activities are separately billed to customers based on metered usage or imputed from a water usage figure. Solid waste collection is often included within the general services provided by a municipality and not separately invoiced. The capital and labor used to collect solid waste is often used for other activities when needed, such as snow removal.

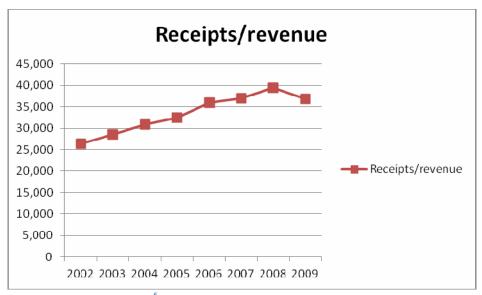


Figure 1: Nominal Revenue Growth 562⁶

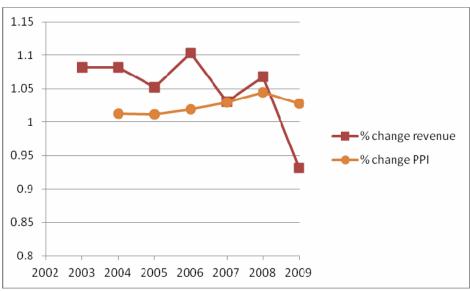


Figure 2: Solid Waste Collection⁷

There are a wide range of practices and they can vary by municipality. In recent years, local governments have moved toward privatization to reduce costs. The dynamic nature of service provision requires a review across both private and public establishments over time when making comparisons. This might form part of the explanation of continued growth of private waste management in real terms. Figure 2 shows that real output is consistently increasing (with the exception of the recessionary period in 2008/2009).

Increasingly, the source point is required to separate waste from recyclable materials into separate streams. It is common to have separate containers for waste and recyclable materials. It is not uncommon for separate providers to handle refuse and recyclable materials. Once again, the combination of municipal and private providers is common.

The waste management and remediation industries are highly regulated in the United States. There are federal requirements from the Environmental Protection Agency (EPA) as well as state and local licensing requirements for haulers, collectors, transfer facilities, and disposal facilities. These regulations address the distinction between hazardous and non-hazardous waste but also include requirements for landfills such as liner systems, leachate collection systems, landfill gas collection systems, and capping or closure requirements. ⁸

There are a wide variety of federal requirements that classify different types of waste and regulate collection, treatment, and disposal. Items from chemicals, bio-hazardous materials, radioactive materials all the way to tires are the subject of regulation. However, at this time, there is no federal requirement to recycle electronics. Even when electronics such as CRTs contain hazardous materials such as lead or mercury, they are not treated as hazardous unless they broken and are stored for less than a year or if broken are transported in containers to limit releases. CRTs are

considered hazardous for export purposes and their export must be reported to the EPA. Similar exceptions for printed circuit boards and other electronics are intended to increase the ease of recycling electronics.⁹

5. Standard Classification structure and product details/levels

NAICS United States 2007

- 22132 Sewage Treatment Facilities
- 221320 Sewage Treatment Facilities
- Waste Management and Remediation Services
- 5621 Waste Collection
- 56211 Waste Collection
- 562111 Solid Waste Collection
- 562112 Hazardous Waste Collection
- 562119 Other Waste Collection
- 5622 Waste Treatment and Disposal
- 56221 Waste Treatment and Disposal
- 562211 Hazardous Waste Treatment and Disposal
- 562212 Solid Waste Landfill
- 562213 Solid Waste Combustors and Incinerators
- 562219 Other Nonhazardous Waste Treatment and Disposal
- 5629 Remediation and Other Waste Management Services
- 56291 Remediation Services
- 562910 Remediation Services
- 56292 Materials Recovery Facilities
- 562920 Materials Recovery Facilities
- 56299 All Other Waste Management Services
- 562991 Septic Tank and Related Services
- 562998 All Other Miscellaneous Waste Management Services

NAPCS United States (provisional) – aggregate levels, full list in appendix 1.

- 1 Non-hazardous waste management services
- 1.1 Collection services for non-hazardous waste and recyclable material
- 1.2 Consolidation, storage, and preparation services for non-hazardous waste and recyclable material
- 1.3 Transportation of non-hazardous waste and recyclable material by road
- 1.4 Disposal services for non-hazardous waste

- 1.5 Operation, maintenance and closure services for non-hazardous waste disposal facilities
- 1.9 Non-hazardous waste management services, nec.
- 1.10 Products related to non-hazardous waste management
- 2 Hazardous waste management services
- 2.1 Collection services for hazardous waste
- 2.2 Consolidation, storage, and preparation services for hazardous waste and recyclable material
- 2.3 Transportation of hazardous waste by road
- 2.4 Treatment services for hazardous waste
- 2.5 Disposal services for hazardous waste
- 2.6 Operation, maintenance and closure services for hazardous waste disposal facilities
- 2.9 Hazardous waste management services, nec.
- 2.10 Products related to hazardous waste management
- 3 Remediation services
- 3.1 Site remediation services
- 3.2 Building remediation services
- 3.3 Environmental emergency response services
- 3.9 Remediation services, nec.
- 3.10 Products related to remediation

Provisional NAPCS products have not been developed for sewerage services.

6. Evaluation of standard vs. definition and market conditions

The standard classifications adequately distinguish between the various services provided in the waste management and remediation industries in most cases. Industries separate out activities based on the production function of the facilities and products include important distinctions for residential and commercial, as well as various types of waste being managed. Products are defined appropriately for output reporting identifying different measures such as collection fees, tipping fees, and similar variables included in company records.

One area of concern that is not adequately addressed in the classifications is the recycling of electronics. While other countries have mandated recycling and appropriate handling of electronics, there are no mandatory recycling requirements at the federal level. Management regulations for end-of-life electronics are generally handled at the state level. According the to US EPA, over 20 states have enacted legislation related to eCycling (recycling electronics) as of March 2011. Differences in definitions and regulations across the 50 states combined with the lack of adequate distinction in the product classification structure make good estimates of the total eCycling output hard to measure.

7. National accounts concepts and measurement issues for waste management and remediation

The national accounts allocate the waste management and remediation services to both intermediate consumption and personal consumption expenditures. The NAPCS details included in attachment 1 differentiate between residential and nonresidential waste collection services to facilitate national accounts practices. In addition, the Economic Census questionnaires request a breakdown of class of customer data from waste management and remediation services providers. Respondents are asked to provide a percentage breakdown to businesses and farms, not-for-profit institutions, federal government, state and local government, and individuals.

The benchmark Input/output tables reflect the consumption of waste management services expected based on market information. The four largest consumers of waste management services, in order, are state and local governments, real estate lessors, households, and waste management enterprises. However, because the consumption of waste management services is allocated across almost all industries, a comprehensive estimate of total product output is important to the national accounts.

The make table also shows that the two primary providers of waste management services are waste management enterprises and state and local governments.

Quarterly, annual and benchmark turnover data is available for national accounts use from the Census Bureau. It should be noted that the turnover in these programs are for private, employer establishments and companies. Government activities are excluded from these data sources.

8. Turnover/output data method(s)

The various data program sources listed in section 3, above, use different methods of collecting data. The most comprehensive from a coverage and a detailed product standpoint is the Economic Census conducted every five years. This data program directly surveys producing establishments above a mail cutoff level. Administrative tax records are used for small, non-mail cases.

Quarterly and annual sample survey data is company based. A sample of employer establishments is surveyed at the appropriate periodicity. The quarterly data are benchmarked the annual and the annual data are benchmarked to the Economic Census every five years.

Nonemployer data is based on administrative records.

9. Evaluation of comparability of turnover/output data with price practices

Solid waste collection is the only area within waste management and remediation activities that has both turnover and output data currently in the US. The PPI does not include government activities and therefore the weighting information from the Economic Census is an appropriate match in content. Solid waste collection revenue represents almost 48% of the total waste management and remediation revenue total.

The next largest single component of waste management and remediation is included in NAICS 562910, Remediation Services accounting for almost 16.5 % of revenue/receipts. There is no comparable PPI available to use as a deflator for remediation services.

Finally, waste disposal (including combustors and landfills) accounts for almost 15% of the revenue for the subsector. There is little reason to suspect that the pricing and markets for the services are similar and therefore a single deflator may not be appropriate for the entire subsector. The addition of two or three additional price indexes would increase deflator coverage from 48% of revenue to approximately 80% of revenue/receipts.

10. Summary

Private sector turnover data for waste management and remediation services are relatively comprehensive and are collected in the five year economic census, in the annual programs and in the quarterly programs. Price data are only available for private solid waste collection. There are gaps in the provision of waste management and remediation services from government providers because of the fact that services are often not directly invoiced to customers and because the resources used are often shared with other municipal tasks. The wide variation in locality practices complicates the collection of waste management and remediation services from localities. Remediation services however appear to be more private enterprise oriented and the development of a remediation services price index would allow for the development of real output estimates for that important area.

¹ North American Industry Classification System, United States 2007, United States Office of Management and Budget, 2007, ISBN 978-1-59888-082-3, pages 789-790

² 2007 Economic Census, US Census Bureau (data for subsector 562 plus sewerage from sector 22)

³ 2008 Nonemployer statistics, US Census Bureau

⁴ 2007 Census of Government Employment, US Census Bureau

⁵ Privatization: Saving Money, Maximizing Efficiency & Achieving Other Benefits in Solid Waste Collection, Disposal, Recycling, National Solid Waste Management Association Privatization Research Bulleting, April 2011. http://www.environmentalistseveryday.org/solid-waste-management/privatization-saving-money-maximizingefficiency/index.php

⁶ Service Annual Survey, Subsector 562, US Census Bureau

⁷ Service Annual Survey estimates for solid waste collection, US Census Bureau, PPI PCU5621, Solid Waste Collection, US Bureau of Labor Statistics

⁸ http://americanlandfill.wm.com/facility-information/permits.jsp (accessed 6.7.2011)

⁹ US EPA, Easier Recycling of Cathode Ray Tubes, May 2006 EPA530-F-06-012.

¹⁰ US EPA website http://www.epa.gov/epawaste/conserve/materials/ecycling/index.htm accessed 6/7/2011.

NAPCS United States (provisional)

1 Non-hazardous waste management services

1.1	Collect	ion services for non-hazardous waste and recyclable material
1.1.1		Subcontracted collection services for non-hazardous waste and recyclable
		material
1.1.2		Residential collection services for non-hazardous waste and recyclable material
1.1.2.1		Residential collection services for non-hazardous waste
1.1.2.2		Residential collection services for non-hazardous recyclable material
1.1.2.3		Residential collection services for pre-sorted, non-hazardous waste and recyclable material
1.1.3		Non-residential collection services for non-hazardous waste and recyclable material
1.1.3.1		Non-residential collection services for non-hazardous waste
1.1.3.1	.1	Non-residential collection services for non-hazardous waste, industrial locations
1.1.3.1	.2	Non-residential collection services for non-hazardous waste, non-industrial locations
1.1.3.2		Non-residential collection services for non-hazardous recyclable material
1.1.3.2	.1	Non-residential collection services for non-hazardous recyclable material,
4 4 0 0	•	industrial locations
1.1.3.2	.2	Non-residential collection services for non-hazardous recyclable material, non-industrial locations
1.1.3.3		Non-residential collection services for presorted, non-hazardous waste and recyclable material
1.1.3.3	.1	Non-residential collection services for pre-sorted, non-hazardous waste and recyclable material, industrial locations
1.1.3.3	.2	Non-residential collection services for pre-sorted, non-hazardous waste and recyclable material, non-industrial locations
1.1.4		Collection services for non-hazardous construction and demolition waste
1.1.5		Destruction services for non-hazardous waste
1.1.5.1		Destruction services for documents or files
1.1.5.2		Destruction services for expired and other unmarketable non-hazardous
		products
1.1.9		Other collection services for non-hazardous waste
1.1.9.1		Non-hazardous waste management services for parks, recreational areas, and
		special event venues

1.1.9.2	Pumping and cleaning services for non-hazardous waste holding and drain facilities
1.1.9.3	Pumping and cleaning services for septic tanks, portable toilets, and cesspools
1.1.9.4	
1.1.9.9	•
1.1.3.3	Other collection services for horr-mazardous waste, nec.
1.2	Consolidation, storage, and preparation services for non-hazardous waste and recyclable material
1.2.1	Transfer facility services for non-hazardous waste
1.2.2	Recovery and preparation services for non-hazardous recyclable material
1.3	Transportation of non-hazardous waste and recyclable material by road
1.3.1	Transportation of non-hazardous waste by road
1.3.2	Transportation of non-hazardous recyclable material by road
1.4	Disposal services for non-hazardous waste
1.4.1	Landfilling services for non-hazardous waste
1.4.1.1	Landfill disposal services for non-hazardous waste
1.4.1.2	Sanitary landfill disposal services for non-hazardous waste
1.4.2	Incineration disposal services for non-hazardous waste
1.4.3	Other disposal services for non-hazardous waste
1.5	Operation, maintenance and closure services for non-hazardous waste disposal
	facilities
1.5.1	Operation and maintenance services for non-hazardous waste disposal facilities
1.5.1.1	Operation and maintenance services for an open non-hazardous waste disposal
	facility
1.5.1.2	Maintenance services for a closed non-hazardous waste disposal facility
1.5.2	Closure services for a non-hazardous waste disposal facility
1.9	Non-hazardous waste management services, nec.
1 10	Dradusts related to non-harardous waste management
1.10 1.10.1	Products related to non-hazardous waste management
1.10.1	Non-hazardous vaste brokerage services
_	Non-hazardous recyclable material brokerage services
1.10.3	Rental of non-hazardous waste management equipment
1.10.4	Reselling services for non-hazardous waste, retail and wholesale
1.10.5	Energy generation from non-hazardous waste

1.10.6	Recovered methane gas
1.10.7	Compost
1.10.8	Recyclable material recovered from a non-hazardous waste stream
1.10.9	New non-hazardous waste management equipment
1.10.10	Reselling services for new non-hazardous waste management equipment, retail
	and wholesale
1.10.11	Reselling services for used non-hazardous waste management equipment, retail and wholesale
1.10.12	Non-hazardous waste management consulting services
1.10.13	Road cleaning services
1.10.19	Products related to non-hazardous waste management, nec.
2 H	azardous waste management services
2.1 Co	ollection services for hazardous waste
2.1.1	Subcontracted collection services for hazardous waste
2.1.2	Residential collection services for hazardous waste
2.1.3	Non-residential collection services for hazardous waste
2.1.3.1	Non-residential collection services for hazardous waste (organic solvents,
	solutions, and still bottoms).
2.1.3.2	Non-residential collection services for hazardous waste (oils and greases, oily mixtures, and residues)
2.1.3.3	Non-residential collection services for hazardous waste (heavy metal solutions, sludges, and residues)
2.1.3.4	Non-residential collection services for hazardous waste (inorganic sludges, solutions, and residues, except heavy metal)
2.1.3.5	Non-residential collection services for hazardous waste (pesticide, herbicide, and fungicide wastes)
2.1.3.6	Non-residential collection services for hazardous waste (polychlorinated biphenyls (PCB), wastes)
2.1.3.7	Non-residential collection services for hazardous waste (biological-infectious waste)
2.1.3.8	Non-residential collection services for hazardous waste (radioactive waste)
2.1.3.8.1	Non-residential collection services for hazardous waste (low-level radioactive waste)
2.1.3.8.2	Non-residential collection services for hazardous waste (high-level radioactive waste)
2.1.3.9	Non-residential collection services for hazardous waste (used tires)
2.1.3.10	Non-residential collection services for hazardous waste (used batteries)

2.1.4	Cleaning and removal services for hazardous waste holding facilities
2.2	Consolidation, storage, and preparation services for hazardous waste and recyclable material
2.2.1	Transfer facility services for hazardous waste
2.2.2	Recovery and preparation services for hazardous waste recyclable material
2.3	Transportation of hazardous waste by road
2.4	Treatment services for hazardous waste
2.4.1	Treatment services for hazardous waste (organic solvents, solutions, and still bottoms)
2.4.2	Treatment services for hazardous waste (oils and greases, oily mixtures, and residues)
2.4.3	Treatment services for hazardous waste (heavy metal solutions, sludges, and residues)
2.4.4	Treatment services for hazardous waste (inorganic sludges, solutions and residues, excluding heavy metals)
2.4.5	Treatment services for hazardous waste (pesticide, herbicide, and fungicide wastes)
2.4.6	Treatment services for hazardous waste (polychlorinated biphenyls (PCB) wastes)
2.4.7	Treatment services for hazardous waste (biological-infectious waste)
2.4.8	Treatment services for hazardous waste (radioactive waste)
2.4.8.1	Treatment services for hazardous waste (low-level radioactive waste)
2.4.8.2	Treatment services for hazardous waste (high-level radioactive waste)
2.4.9	Treatment services for hazardous waste (used tires)
2.4.10	Treatment services for hazardous waste (used batteries)
2.4.19	Treatment services for other hazardous waste (excluding waste water)
2.5	Disposal services for hazardous waste
2.5.1	Disposal services for hazardous waste, by confinement
2.5.1.1	Disposal services for hazardous waste, by controlled confinement by landfilling
2.5.1.2	Disposal services for hazardous waste, by controlled confinement other than landfilling
2.5.9	Other disposal services for hazardous waste

Nonresidential collection services for other hazardous waste

2.1.3.19

2.6	Operation	, maintenance	and closure	services for	r hazardous waste	disposal facilities

2.6.1 O	peration and	d maintenance	services for	hazardous	waste disposal	facilities

- 2.6.1.1 Operation and maintenance services for an open hazardous waste disposal facility
- 2.6.1.2 Maintenance services for a closed hazardous waste disposal facility
- 2.6.2 Closure services for a hazardous waste disposal facility

2.9 Hazardous waste management services, nec.

2.10 Products related to hazardous waste management

2.10.1	Hazardous was	ste brokerage	services
2.10.1	TIUZUI UUUS WU.	occ brokerage	JCI VICCS

- 2.10.2 Rental of hazardous waste management equipment
- 2.10.3 Reselling services for hazardous waste, retail and wholesale
- 2.10.4 Energy generation from hazardous waste
- 2.10.5 Recyclable material recovered from a hazardous waste stream
- 2.10.6 Processed and/or treated recyclable material recovered from a hazardous waste
- 2.10.7 New hazardous waste management equipment
- 2.10.8 Reselling services for new hazardous waste management equipment, retail and wholesale
- 2.10.9 Reselling services for used hazardous waste management equipment, retail and wholesale
- 2.10.10 Hazardous waste management consulting services
- 2.10.11 Products related to hazardous waste management, nec.

3 Remediation services

3.1 Site remediation services

- 3.1.1 Site assessment services
- 3.1.1.1 Site assessment services, air
- 3.1.1.2 Site assessment services, water
- 3.1.1.2.1 Site assessment services, water, on-site
- 3.1.1.2.2 Site assessment services, water, off-site
- 3.1.1.3 Site assessment services, soil
- 3.1.1.3.1 Site assessment services, soil, on-site
- 3.1.1.3.2 Site assessment services, soil, off-site
- 3.1.1.9 Site assessment services, nec.
- 3.1.2 Site remediation planning services
- 3.1.2.1 Site remediation planning services, air

3.1.2.2	Site remediation planning services, water
3.1.2.3	Site remediation planning services, soil
3.1.2.9	Site remediation planning services, nec.
3.1.3	Site remediation clean-up services
3.1.3.1	Site remediation clean-up services, air
3.1.3.2	Site remediation clean-up services, water
3.1.3.2.	Site remediation clean-up services, water, in-situ
3.1.3.2.	2 Site remediation clean-up services, water, ex-situ
3.1.3.3	Site remediation clean-up services, soil
3.1.3.3	1 Site remediation clean-up services, soil in-situ
3.1.3.3.	2 Site remediation clean-up services, soil, ex-situ
3.1.3.9	Site remediation clean-up services, nec.
3.1.4	Control, containment, and monitoring services for site remediation
3.1.4.1	Control and containment services for site remediation, air
3.1.4.2	Monitoring services for site remediation, air
3.1.4.3	Control and containment services for site remediation, water
3.1.4.4	Monitoring services for site remediation, water
3.1.4.5	Control and containment services for site remediation, soil
3.1.4.6	Monitoring services for site remediation, soil
3.1.4.9	Control, containment, and monitoring services for site remediation, nec.
3.1.9	Site remediation services, nec.
3.2	Building remediation services
3.2.1	Building remediation services, asbestos contamination
3.2.2	Building remediation services, lead paint contamination
3.2.3	Building remediation services, radon contamination
3.2.9	Building remediation services, other contamination
3.3	Environmental emergency response services
3.3.1	Environmental emergency response planning services
3.3.2	Environmental emergency response services, petroleum and oil-based spills
3.3.3	Environmental emergency response services, mine spills
3.3.9	Environmental emergency response services, nec.
3.9	Remediation services, nec.

3.10 Products related to remediation

3.10.1 Recyclable material recovered from remediation activities

3.10.2	Rental of remediation equipment
3.10.3	Reselling services for new and used remediation equipment, retail and wholesale
3.10.4	Decommissioning services
3.10.9	Products related to remediation, nec.