Economic Impact Analysis of the Clay Ceramics Manufacturing NESHAP

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

SECTION 1
INTRODUCTION

The Environmental Protection Agency (EPA) promulgated Maximum Achievable Control Technology (MACT) standards for hazardous air pollutants emitted by clay ceramics manufacturing companies in 2003. These standards were vacated by the D.C. Circuit Court of Appeals in 2007. The Agency is now aiming to sign proposed standards to replace the vacated rule by August 28, 2014 and a final rule for promulgation by June 30, 2015.

1.1 Executive Summary

The purpose of this report is to evaluate the economic impacts of pollution control requirements on ceramic wall and floor tile and sanitary ware manufacturing businesses to help the Agency develop updated MACT standards for these businesses. The key results of the Economic Impact Analysis (EIA) are as follows:

- **Engineering Costs:** Kohler Co., a Sanitary Ware company, is a major source and will incur costs as a result of the rule. EPA estimates that the total annualized costs as a result of this rule for Kohler Co. will be $92,358 (2011$).

- **Economic Impacts:** The economic impact of compliance costs is less than 0.002% of sales for Kohler Co. Hence, the economic impact for compliance is minimal.

1.2 Organization of the Report

The report is organized as follows: Section 2 provides a profile of the industry, which includes a description of the supply and demand of clay ceramic products. This section also presents information on industry organization and available market data and trends in the industry. Market data on manufacturers' shipments, foreign trade, and apparent consumption for ceramic wall and floor tiles is included in Appendix A. Section 3 describes the company-level costs that businesses will face to comply with the updated rule. Section 4 explains the economic impacts of complying with this rule and Section 5 provides conclusions.

SECTION 2
PROFILE OF THE AFFECTED INDUSTRY

Ceramic wall and floor tiles and sanitary wares are inputs to build different types of structures, including homes, buildings, and office facilities (U.S. EPA, 2003). Floor and wall tile serve a decorative purpose and are used to add character to homes and buildings; sanitary ware and bathroom accessories are products installed in bathrooms (or kitchens, when it comes to sinks) and are primarily used for cleansing (U.S. EPA, 2003). Ceramic Tile's end use break down in 2010 was 56.4% in residential sales dollars and 43.6% in commercial sales dollars (Ceramic Tile and Stone Consultants, 2013).

To provide a general overview of current conditions in the affected industry, we used the U.S. government's official measures reported in the Annual Survey of Manufacturers (ASM), County Business Patterns, and Current Industrial Reports. Because the latest year of data (2010) differs from historical industry trends, it is unclear whether the industry without the proposed rule would be similar to the industry today. As a result, the profile provides information on a range of factors that may influence how the ceramic floor and wall tile and sanitary ware markets may evolve.

Federal statistical agencies classify business establishments in this industry using two North American Industry Classification System (NAICS) codes:[1]

- 327111 Vitreous china plumbing fixture and china and earthenware bathroom accessories manufacturing
- 327122 Ceramic wall and floor tile manufacturing

In the rest of the industry profile section, we use the term "sanitary ware" to refer to products produced by the NAICS 327111 industry, and the term "ceramic wall and floor tile" to refer to products produced by the NAICS 327122 industry. We also use the term "ceramic products" to refer to both ceramic floor and wall tile and sanitary ware products.

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[1] In 2012, the sanitary ware industry (327111) was classified under NAICS 327110 Pottery, Ceramics, and Plumbing Fixture Manufacturing. See http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=327110&search=2012. In 2012, the ceramic tile industry (327122) was classified under NAICS 327120 Clay Building Material and Refractories Manufacturing. See http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=327120&search=2012.

In 2011, the value of products shipped in the two industries was approximately $1.1 billion (U.S. Census Bureau, 2013f). The value from NAICS 327122 was about twice of that from NAICS 327111. The ASM and the County Business Patterns reported that 151 establishments (24 in 327111 and 127 in NAICS 327122) employed 5,980 people with a total annual payroll of about $243 million in 2011. (U.S. Census Bureau, 2013a, b).

During 2010, approximately 700 million square feet of tiles were produced by the ceramic wall and floor tile industry (U.S. Department of Commerce, Census Bureau, 2011). Federal Reserve data suggest the capacity utilization rate for the industries under the broad 327 NAICS is close to 56% (Board of Governors of the Federal Reserve System, 2013) (see Figure 2-1).

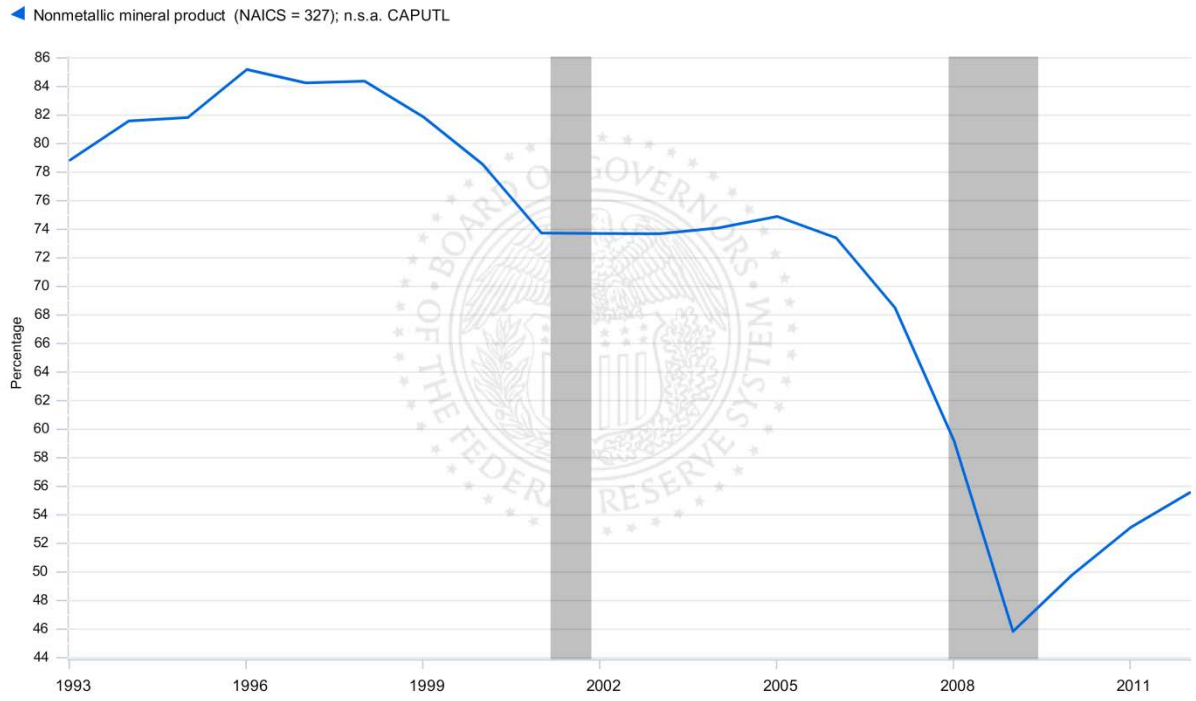

Figure 2-1. Capacity Utilization for Nonmetallic Mineral Products (NAICS 327)

Source: Federal Reserve Board. 2013. Industrial Production and Capacity Utilization—G.17. http://www.federalreserve.gov/datadownload/Chart.aspx?rel=G17&series=a0ccc54490f3f114f44928eb9cb9ec98&lastObs=20&from=&to=&filetype=spreadsheetml&label=include&layout=seriescolumn&pp=Download (December 20, 2013).

The current observed conditions are influenced by the recent steep declines in the residential construction market. For example, 2011 new privately owned housing starts (608,800) units are well below levels observed in 2000 (1.6 million) and 1990 (1.2 million) (U.S. Census Bureau, 2013c). Since 2010, new residential housing starts have begun to grow again, but levels

are still much lower than the previous two decades. New privately owned housing starts in July 2013 were at a seasonally adjusted annual rate of 852,000 (U.S. Census Bureau, 2013d).

2.1 Supply

To better understand the markets for affected products, we consider the group of sellers that provide goods to the market and common factors that influence supply (e.g., input prices) and quantity of goods supplied (e.g., output prices).

2.1.1 What Types of Products Does the Industry Provide?

Table 2-1 lists categories of sanitary ware (NAICS 327111) and ceramic wall and floor tile (NAICS 327122) products.

2.1.2 What Factors Influence Market Supply?

The general process steps used in the production of ceramics include raw material processing, mixing, forming, shape drying, glazing, firing, and finishing (U.S. EPA, 2003; U.S. EPA, 1996). Census data for NAICS 327122 ceramic wall and floor tile manufacturing and for NAICS 327111 sanitary ware manufacturing suggest that in both industries around 70% of the product's value is associated with value-added activities (i.e., labor and capital earnings and energy costs) (U.S. Census Bureau 2013 (a)). During the last 5 years, labor costs have remained flat in the nonmetallic mineral products sector. The U.S. Bureau of Labor Statistics reports that average annual hourly earnings (adjusted for inflation) of all employees was about $20 per hour (U.S. Bureau of Labor Statistics, 2013a, b).

The value of intermediate goods used in these processes (i.e., raw materials including clays and other minerals mined from natural deposits, and high purity powders prepared by chemical synthesis [U.S. EPA, 2003; U.S. EPA, 1996]) make up the remaining 30% of the ceramics' total product value. Intermediate production costs can be influenced by changes in raw clay material prices, but the prices of these materials have not fluctuated recently. Ball clay prices primarily used in floor and wall tile, (consuming 38% of ball clay production in 2011) and sanitary ware (consuming 20% of ball clay production in 2011) were $45 per metric ton in 2010 and $46 per metric ton in 2011; the average free alongside ship value for exported ball clay and the average customs value for imported ball clay were, respectively, $59 per metric ton and $318 per metric ton (U.S. Geological Survey [USGS], 2013).

Table 2-1. Types of Products by the Ceramics Manufacturing Industry

2007 NAICS	2012 NAICS	Product
327111	327110	Bathroom accessories, vitreous china and earthenware, manufacturing
327111	327110	Bidets, vitreous china, manufacturing
327111	327110	Drinking fountains, vitreous china, non-refrigerated, manufacturing
327111	327110	Faucet handles, vitreous china and earthenware, manufacturing
327111	327110	Handles, faucet, vitreous china and earthenware, manufacturing
327111	327110	Lavatories, vitreous china, manufacturing
327111	327110	Plumbing fixtures, vitreous china, manufacturing
327111	327110	Sinks, vitreous china, manufacturing
327111	327110	Soap dishes, vitreous china and earthenware, manufacturing
327111	327110	Tanks, flush, vitreous china, manufacturing
327111	327110	Toilet fixtures, vitreous china, manufacturing
327111	327110	Towel bar holders, vitreous china and earthenware, manufacturing
327111	327110	Urinals, vitreous china, manufacturing
327111	327110	Water closet bowls, vitreous china, manufacturing
327122	327120	Ceramic tiles, floor and wall, manufacturing
327122	327120	Floor tile, ceramic, manufacturing
327122	327120	Mosaic tile, ceramic, manufacturing
327122	327120	Quarry tiles, clay, manufacturing
327122	327120	Tile, ceramic wall and floor, manufacturing
327122	327120	Wall tile, ceramic, manufacturing

Source: U.S. Census Bureau 2013. 2012 NAICS definition, 327110 Pottery, Ceramics, and Plumbing Fixture Manufacturing. http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=327110&search=2012%20NAICS%20Search

2.1.3 What Factors Influence the Relationship Between Output Prices and the Quantity Supplied?

All other things equal, wall and floor tile and sanitary ware manufacturers are likely to offer to sell more when the prices of wall and floor tile and sanitary ware rise. The price elasticity of supply measures how much the quantity of wall and floor tile/sanitary ware supplied responds to changes in its price.[2] If manufacturers have a significant amount of flexibility to change the amount they produce when the price rises, the supply is elastic. In contrast, if the

[2] The measure is computed as the percentage change in quantity supplied divided by the percentage change in price.

quantity produced and supplied only changes by small amounts when the price rises, the supply is inelastic. A key determinant of the price elasticity of supply is the length of the time period over which the product choices can be made. During shorter periods, it is more difficult for the firm to adjust inputs and increase production, because quantities of some factors are fixed in the short run.

2.2 Demand

Ceramic wall and floor tiles and sanitary wares are inputs to build different types of structures, including homes, buildings, and office facilities, and are influenced by overall macroeconomic trends and conditions in the residential housing industry.

2.2.1 Who Uses Ceramic Products?

Sanitary ware and ceramic floor and wall tile are used in the construction of homes, buildings, and structures: floor and wall tile serve a decorative purpose and are used to add character to homes and buildings. Sanitary wares (and bathroom accessories) are products installed in bathrooms and are primarily used for cleansing (U.S. EPA, 2003). In the case of sinks, sanitary wares are also installed in kitchens (U.S. EPA, 2003). These products are purchased by construction companies to be used as inputs for the production of homes, buildings, and office facilities. Once these structures are built, consumers then purchase these structures from the construction companies. However, if consumers build homes or make improvements to existing structures themselves, they may directly purchase and install sanitary ware (bathroom accessories,) and ceramic tiles (U.S. EPA, 2003).

2.2.2 What Factors Influence the Market Demand?

Ceramics are designed for specific commercial or industrial applications to withstand high temperatures and electrical voltage, or to resist chemical attack, fatigue failure, or rapid wear (Midwest Research Institute, 1999).

2.2.2.1 Price of Related Goods

There are similar-use products made from materials other than clay. Below we discuss sanitary ware and ceramic wall and floor tile separately.

2.2.2.1.1 Sanitary Ware

As EPA (2003) mentions:

“Bathroom accessories such as soap dishes, towel racks, toothbrush holders, and faucet fixtures come in an array of materials, including plastic, brushed or polished metal, and glass.

Consumers usually base their choice of bathroom accessories on their specific tastes and the type of look they want to create as they decorate the bathroom. Generally plastic accessories are relatively inexpensive, though when higher quality plastics are used, producers can charge prices in the same range as those for bathroom accessories made from glass, ceramics, or metal."

"Clay is the most common material used for the manufacture of sanitary ware, but sinks and toilets can also be made out of stainless or enameled steel, fiberglass, or enameled cast iron. These materials all possess similar characteristics to ceramic sanitary ware, but to differing degrees. For example, steel may be less subject to cracking than ceramic material; however it is not as heat resistant. Another material used to produce sanitary ware is marble, which is one of the most expensive materials available for sanitary ware production."

2.2.2.1.2 Ceramic Wall and Floor Tile

The substitutes for ceramic floor tile are other floor covering materials including laminate, hardwood, stone, vinyl sheet & floor tile, carpet & area rug, and other resilient flooring (Floor Covering Weekly, 2013). In 2012, Ceramic wall and floor tile accounted for 12.5% of U.S. Floor Covering Sales, on the same level with hardwood (10.4%) and vinyl sheet & floor tile (12.6%) but far less than carpet & area rug (52.1%) (Floor Covering Weekly, 2013). Among these different types of materials, natural stone is the most expensive, having an average value of around $4 per square foot during the years between 2008 and 2012. Hardwood has an average price of around $2. All other types, including ceramic tile, have a price of around $1 per square foot, except vinyl sheet & floor tile that has a price of around $0.7 per square foot (Floor Covering Weekly, 2013).

2.2.3 What Factors Influence the Relationship Between Prices and the Quantity Demanded?

All other things equal, consumers will likely buy fewer ceramic products when the price of the product rises. The price elasticity of demand measures the size of the price response.[3] Several factors influence how sensitive consumers are to price changes. If consumers can easily switch from one product to another because there are many close substitutes, demand tends to be more elastic. This is particularly true for more narrow market definitions (mosaic versus quarry tile) and over longer time horizons for the consumption decision (months versus years).

[3] The measure is computed as the percentage change in quantity demanded divided by the percentage change in price.

2.3 Firm Behavior and Organization of Industry

2.3.1 Market Definition

Market definition boundaries are commonly defined in two dimensions: product substitution and geography. Based on product substitution characteristics and available data, we rely on the Census definitions to define two groups of markets in which buyers are more likely to view products as substitutes:

- Sanitary ware
- Ceramic wall and floor tile

We found that international trade represented a large fraction of economic activity for ceramic wall and floor tile (see Section 2.4).

2.3.2 Firm Pricing Behavior

Economists have developed a system for grouping markets that helps describe the pricing behavior of firms. At one end of the spectrum, firms have little control over pricing for their products. Put another way, firms are price takers, and price is determined by supply and demand conditions. This basic model is more likely to hold when the industry has a large number of sellers, goods are identical, and barriers for entry and exit (laws, high capital requirements, or patents) are low. At the other end of the spectrum, there is a single firm that searches for the price-output combination that maximizes its profit. This basic model is more likely to hold when there are significant barriers to entry (industries with economies of scale or ownership of a patent).

When markets have a small number of firms selling identical products, firms may not necessarily be price takers; instead, they may be able to determine their price while considering how competitors respond to their own decisions. To assess the extent to which affected markets may be concentrated among a small number of sellers we compiled and estimated Table 2-2.

The latest 5-year Census statistics describing U.S. concentration at the 6-digit NAICS code level, found that the ceramic wall and floor tile manufacturing industry has a Herfindahl index level (a measurement of concentration) that government agencies consider moderately concentrated (U.S. Census Bureau, 2013e; U.S. Department of Justice and the Federal Trade Commission, 1997). This index is not available for the sanitary ware industry. However, the data suggest that the sanitary ware industry is even more concentrated. The 4 largest ceramic wall and floor tile manufacturing companies account for 59.8% of the industry's total shipment value,

while the 4 largest sanitary ware manufacturing companies account for 87.2% of the industry's shipment (U.S. Census Bureau, 2013e).

Table 2-2. Number of Establishments by Census Region

Census Region	Number of Establishments, NAICS 327111	Number of Establishments, NAICS 327122
East North Central	6	18
East South Central	1	15
Mid-Atlantic	4	11
Mountain	1	13
New England	0	5
Pacific	5	33
South Atlantic	3	16
West North Central	1	9
West South Central	3	7

Note: In County Business Pattern, an "establishment" is defined as follows –

"An establishment is a single physical location at which business is conducted or services or industrial operations are performed. It is not necessarily identical with a company or enterprise, which may consist of one or more establishments. When two or more activities are carried on at a single location under a single ownership, all activities generally are grouped together as a single establishment. The entire establishment is classified on the basis of its major activity and all data are included in that classification."

Sources: U.S. Census Bureau. 2013; Geography Area Series: County Business Patterns: 2011; http://censtats.census.gov/cgi-bin/cbpnaic/cbpcomp.pl (17 Dec 2013);

U.S. Census Bureau. 2013; Geography Area Series: County Business Patterns: 2011: Definitions; http://www.census.gov/econ/cbp/definitions.htm

U.S. Census Bureau (undated), Census Regions and Divisions of the United States, http://www.census.gov/geo/maps-data/maps/pdfs/reference/us_regdiv.pdf

2.3.3 Affected Facilities and Ultimate Parent Companies

RTI has identified the major source facilities that are expected to be covered by the rule in Table 2-3. One company owns three facilities in the east north central, south atlantic and west south central regions. Since 2014, all major source wall and floor tile manufacturers have become synthetic minor sources and thus are not financially impacted by this rule

Table 2-3. Affected Production Facilities by Census Region: Sanitary Ware

Company - Sanitary Ware	Facility Location	Region
Kohler Co.	Kohler, WI	East North Central
Kohler Co.	Spartanburg, SC	South Atlantic
Kohler Co.	Brownwood, TX	West South Central

2.3.3.1 Small Businesses

The Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) requires federal departments and agencies to evaluate if and/or how their regulations affect small business entities. Specifically, the Agency must determine if a regulation is expected to have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions. The business is defined as the owner company, rather than the facility; the size of the owner company determines the resources it has available to comply with the rule. The Small Business Administration website specifies the criteria for a company to be considered a small business. The size standards for NAICS 327111 (which in 2012 was changed to NAICS 327110) and NAICS 327122 (which in 2012 was changed to NAICS 327120) is any company with 750 or fewer employees. Thus, as shown in Table 2-4, the affected owner-company is not a small entity.

Table 2-4. Parent Company Size Information

Parent Company	Sales (million $)	Employment*	Small
Kohler Co.	4,680*	30,000	No

*2011 data
Sources: Kohler: Forbes.com
http://www.forbes.com/companies/kohler

2.4 Market Data and Trends

This section presents historical market data for Ceramic wall and floor tiles and sanitary ware. Historical market data include U.S. volumes for manufacturers' shipments,[4] foreign trade,

[4] The source reports list both shipment and production quantities. Here we have chosen shipment quantities over production quantities, even though these do not differ by much in each year nor show different trends over time. The reason to choose shipment numbers over production numbers is that shipment quantity is the number that is

and apparent consumption. Data for ceramic wall and floor tile, obtained from various years of *Current Industrial Reports* published by the U.S. Census Bureau, are shown in Appendix A.

These data reveal that the clay floor and wall tile market has two characteristics. First, the historical shipment levels have been stable with mild fluctuations. Second, imports account for much larger proportion of the apparent consumption than do shipments. Imports of wall and floor tiles experienced declines starting in 2007, the year the recent economic crisis set in, and continued to decline post-crisis. The shipments also experienced a decline in 2007, although it was mild compared to the drastic drop of imports. The level of shipments has come back to its pre-2007 levels as of 2010. The decline in imports since 2007 is due to the decreased demand resulting from the 2007–2008 recession rather than to structural changes within the industry. We expect both overall demand and imports to come back to prerecession levels in the future. This projection is also supported by the recent annual report of a large company producing these products. The annual report of Mohawk Industries shows the company recovering after exhibiting declines during the recession.

Kohler Co. manufactures sanitary ware, in addition to other products. There is evidence that the sanitary ware industry will see rising domestic production in the coming years. Toilets are one of the major sanitary ware products. According to an article from the Wall Street Journal by James R. Hagerty, Kohler Co. is the biggest toilet supplier in the U.S., with an estimated 24% of the U.S. market. The article mentions that making toilets requires lots of manual labor and for this reason most production moved over the past two decades to lower-cost countries, mostly China and Mexico. It was estimated that three quarters of the 10.6 million residential and commercial toilets sold in the U.S. in the year 2012 were imports; there are just 7 toilet plants in the U.S. now, compared with 48 in the late 1970s. However, because of high shipping costs and increasing wages in China and Mexico, U.S. manufacturing of toilets is making a comeback (Hagerty, 2013).

Kohler Co. has four toilet plants, three in the U.S. and one in Mexico. Its revenues rose from $4.68 billion in 2011 (Forbes, 2011) to $5 billion in 2012 (Forbes, 2013). David Kohler, the president of Kohler Co., says in an interview that “the economy definitely is on stronger footing and national and regional businesses are doing better” (Kirchen, 2013). The likely increase in

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relevant for final consumption. In fact, when the data source reports calculate “apparent consumption,” they use shipment numbers, not production numbers.

residential building during the economy's recovery should lead to an increased demand for sanitary ware.

The above company-specific information supports the recovery since 2007 we see in the Current Industrial Reports' information for the ceramic tile industry. The Current Industrial Reports do not provide data for the sanitary ware industry. However, based on the above company-specific information and the fact that sanitary ware is demanded by residential and commercial building, we believe that the sanitary ware industry, similar to the ceramic tile industry, will recover as the building and construction industry revives. In addition, our prediction that the ceramic tile industry is only experiencing a temporary setback and will come back to prerecession levels also is supported by recent reports for the clay and shale industry, which is upstream of the ceramic products industry. One of the most common types of clays used to produce ceramic products is common clay and shale (U.S. EPA, 2003). A recent advance report published in 2013 by U.S. Department of the Interior, U.S. Geological Service, suggests that once statistical data become available, the country may see a moderate growth in common clay sales in 2012 (U.S. Department of the Interior, 2013). In their analysis, the factors supporting the growth are increases in housing starts and construction spending for commercial buildings, which are the sources of demand for ceramic tile and sanitary ware.

2.4.1 Market Prices

In 2010, the average price of clay floor and wall tile was approximately $1.30 per square foot (U.S. Department of Commerce, Census Bureau, 2011). Since 2005, the average nominal price for clay floor and wall tile has remained flat, while the price for sanitary ware has risen moderately (Figure 2-2).

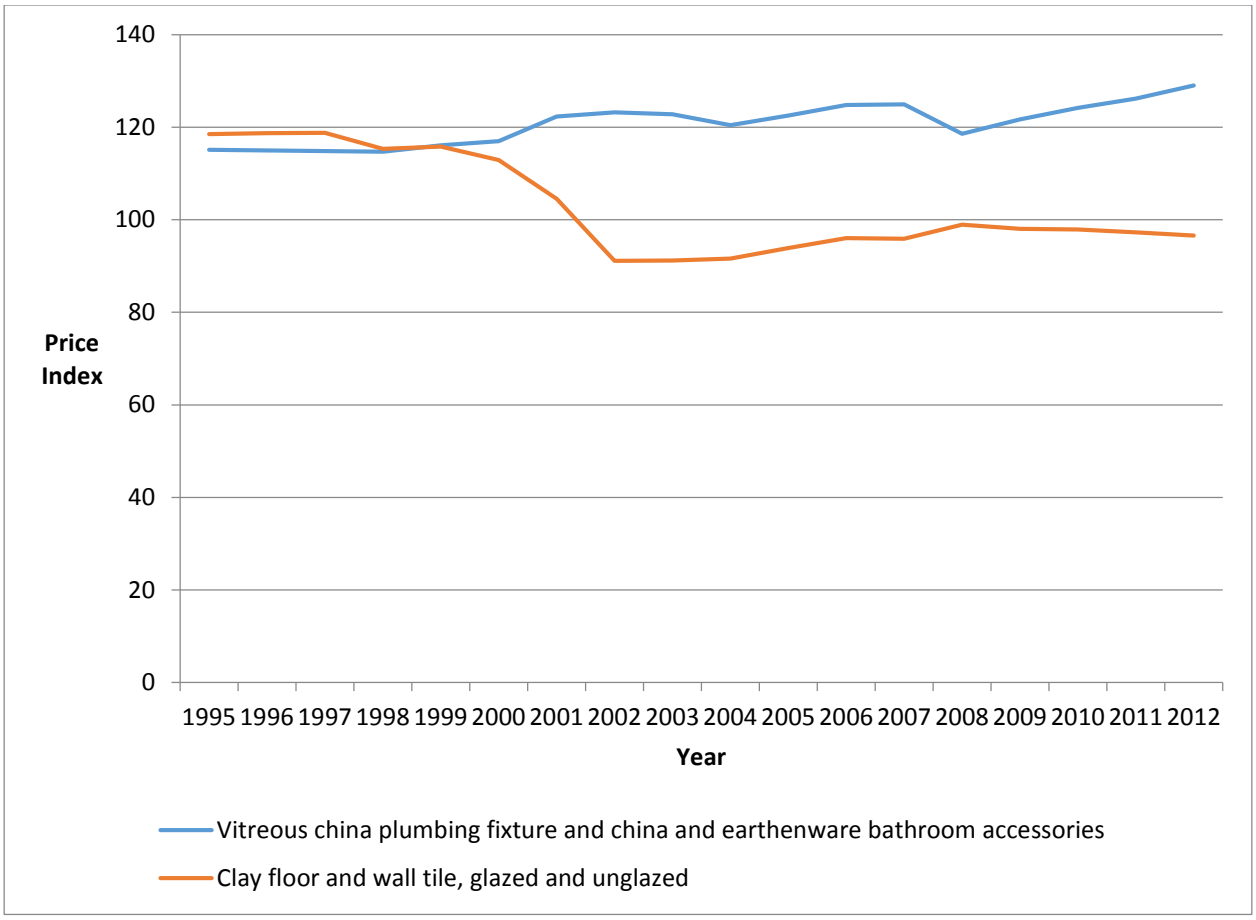

Figure 2-2. Real Price Trends for Ceramic Products

Sources:

U.S. Bureau of Labor Statistics. 2013. Employment, Hours, and Earnings from the Current Employment Statistics survey (National) Series ID: CEU3132700003.

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SECTION 3
COSTS OF THE AFFECTED INDUSTRY

RTI has identified the major source facilities that are expected to be covered by the rule in Section 2, Table 2-3. There is one company that owns three facilities. Kohler Co., a sanitary ware company, is a major source and will incur costs as a result of the rule. However, the company will not incur any control costs, only emissions testing and monitoring costs. Table 3-1 shows the costs for this company. As shown in Table 3-1 the costs for this company are extremely low, so economic impacts are expected to be small.

Table 3-1. Summary of Testing and Monitoring Costs

Company	Annualized Testing Cost (thousand 2011 $) $)	Annual Monitoring Cost (thousand 2011 $)	Total Annualized Compliance Costs (thousand 2011 $)
Sanitary Ware Company			
Kohler-Spartanburg Plant	35.0	17.9	52.9
Kohler-Brownwood Plant	13.2	3.0	16.2
Kohler-Wisconsin Plant	17.3	6.0	23.3
Kohler - All Plants Combined	65.5	26.9	92.4

Source: Annual Testing and Monitoring Cost for Kohler Co., 2011 $, RTI International

SECTION 4
ECONOMIC IMPACT ANALYSIS

4.1 Description of Entities Affected

As stated in Section 3, there is only one major source. This is the company that has not installed controls, thus incurring compliance costs: Kohler Co., a sanitary ware company.

4.2 Economic Screening Analysis

In order to determine the effects of the regulatory program on the company, we compared pollution control costs to total sales for the ultimate parent company of this business. We calculated the cost-to-sales ratio, by dividing the ultimate parent company's total annual compliance cost by its reported revenue:

$$\text{CSR} = \sum_{i}^{n} TACCi_i/TR\text{j}$$

where

CSR = cost-to-sales ratio,

$TACC_i$ = total annualized compliance costs,

i = index of the number of affected plants owned by company j,

n = number of affected plants, and

TRj = total revenue from all operations of ultimate parent company j.

Table 4-1. Summary Statistics for Economic Impact Analysis

Company	Parent Company	CSR (Cost-to-Sales Ratio, %)
Company - Sanitary Ware		
Kohler - All Plants Combined	Kohler Co.	<0.002%

Sources: http://www.forbes.com/companies/kohler

Annual Testing and Monitoring Cost for Kohler Co., 2011 $, RTI International

Forbes database was used to obtain the total revenue for Kohler Company, which is privately held. Forbes.com was founded in 1996 and is part of Forbes Digital, a division of Forbes Media LLC. Forbes is a leading source for reliable business news and financial information.

The results of the screening analysis in Table 4-1 show that the economic impact of compliance costs is less than 0.002% of sales for Kohler Co. Hence, the economic impact for compliance is minimal. Also, as noted in Section 2, Kohler Co. is not a small business. Because no small firms face significant control costs, there is no significant impact on small entities. Thus this regulation is not expected to have significant impact on a substantial number of small entities.

SECTION 5
CONCLUSION

The Agency has considered the economic impacts of this rule on companies and found that this rule will have minimal economic impact on the entity affected by the rule. The rule will impact one ultimate parent company of a sanitary ware manufacturing company. Kohler Co. would have annualized cost of less than .002% of sales associated with meeting the requirements. Hence, the burden of this rule on this business is very small.

SECTION 6
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APPENDIX A
HISTORICAL DATA FOR CERAMIC WALL AND FLOOR TILE MANUFACTURING

Table A-1. Historical Data for Ceramic Wall and Floor Tile Manufacturing (thousands of square feet): 1993–2010

Year	Shipments of Clay Floor and Wall Tile	Exports[a]	Imports[a]	Apparent Consumption[b]
1993	558,700	43,307[c]	641,615	1,157,008
1994	604,408	40,107[c]	711,193	1,275,494
1995	568,094	42,649[c]	774,571	1,300,016
1996	580,392	41,789[c]	884,051	1,422,655
1997	618,978	42,442	1,022,852	1,599,388
1998	636,805	41,635	1,232,974	1,828,144
1999	636,242	30,731	1,494,031	2,099,542
2000	650,483	36,188	1,669,677	2,283,972
2001	591,080	33,304	1,716,360	2,274,137
2002	649,480	41,699	2,034,617	2,642,397
2003	614,850	28,933	2,231,166	2,817,082
2004	695,386	34,854	2,488,165	3,148,698
2005	658,198	37,017	2,638,332	3,259,513
2006	629,672	45,101	2,732,194	3,316,765
2007	544,988	47,469	1,191,974	1,689,494
2008	484,956	50,515	1,685,532	2,119,973
2009	571,255	42,428[c]	1,221,085[d]	1,749,911
2010	649,057	36,982[c]	1,293,726[d]	1,905,801
Average Annual Growth Rates				
1993–2008[e]	−0.64%	2.33%	9.35%	5.85%
1997–2008[e]	−1.87%	3.32%	8.24%	4.89%
1997–2010[e]	0.83%	0.59%	5.31%	3.48%
1993–2010[e]	1.28%	0.36%	6.98%	4.66%

Note: Table 2-6 presents data for clay floor and wall tile, which, by 2007 NAICS definition, is associated with NAICS 327122, Ceramic Wall and Floor Tile Manufacturing.

Calculation rules used when computing numbers from the Industrial reports for this table are 1 thousand of square feet = 0.092903 thousand of square meters and 1 million square feet = 1,000 thousand square feet

[a] The export quantities for 1993–1996 are not available in the source reports (marked as (X)). The export and import quantities for 2009 and 2010 are not available in the source report; only the export and import values are given.

[b] Apparent Consumption = Shipments of Clay Floor and Wall Tile − Exports + Imports

(continued)

Table A-1. Historical Data for Clay Floor and Wall Tile (thousands of square feet): 1993–2010 (continued)

[c] Because the export quantity data for clay floor and wall tile are not available for 1993–1996, and 2009 and 2010, the numbers for 1993–1996 and 2009 and 2010 are estimates for clay floor and wall tile exports. The export numbers for clay floor and wall tile seem to be significantly and negatively correlated to shipment numbers. So we have estimated the numbers for 1993–1996 and 2009 and 2010 based on the regression *exports = a + b*shipments*, using 1997 to 2008 data. The estimate for *b* is significant at the 5% level.

[d] Because import quantity data for clay floor and wall tile are not available for 2009 and 2010, the numbers here are based on estimates. (Only import values are available.) The import quantities exhibit a steady increasing pattern between 1993 and 2006, a drastic drop in 2007, and a significant increase in 2008. So estimating 2009 and 2010 levels builds on the basic judgment of whether the 2009 and 2010 levels remained at the 2007 and 2008 low or rose quickly toward the 2006 level after the increase in 2008. Numbers of import values suggest that the former case is more likely to be true. Specifically, the import values also experienced a similar drastic drop in 2007 and a significant increase in 2008. But the import values in 2009 and 2010 are between 2007 and 2008 values and closer to the 2007 value. The import values suggest that the import quantities in 2009 and 2010 remained at the 2007 and 2008 low instead of coming back. Further, the yearly average price, computed as the import value divided by the import quantity in a year, remained stable and at about $10 per square meter (Specifically, the import quantities in 2005, 2006, 2007, and 2008 are, respectively, 245109, 253829, 110738, and 156591, all in thousand sq. meters, and the import values in 2005, 2006, 2007, and 2008 are, respectively, 2257926, 2365930, 1074328, and 1624960, all in thousands of dollars. Dividing values by quantities yield the four yearly prices as $9.2, $9.3, $9.7, and $10.4), suggesting that it is indeed safe to infer the rise and fall in quantities with values. Finally, to estimate, we computed the average of the average prices in 2007 and 2008 to be $10.04 per square meter and used this estimated price and reported 2009 and 2010 import values to obtain the estimated 2009 and 2010 import quantities.

[e] The growth rates have been computed for 1993–2008, 1997–2008, 1997–2010, and 1993–2010, because import data for 2009 and 2010 are estimates and export quantities for 1993–1996, 2009, and 2010 are also estimates.

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