Waters of the United States: A Microeconomic Assessment

Overview

The nature of cement production involves extensive quarrying activity. This is supplemented by a large acreage footprint by each cement plant. Estimates suggest that the cement industry has a national quarry footprint of more than 118 thousand acres and this acreage includes more than 460 thousand linear feet of streams. Portland Cement Association (PCA) members must obtain and operate pursuant to the Clean Waters Act (CWA), Section 402 discharge and 404 wetland permits.

The Army Corps of Engineers (Corps) and the Environmental Protection Agency (EPA) have historically asserted broad jurisdiction over “waters of the United States” (WOTUS). For years, industry, the states, and regulators have been frustrated over uncertainty regarding the definition of waters that fall under federal jurisdiction. This uncertainty has generated lawsuits that have brought the Supreme Court into play. The current proposal offered by the EPA comes in response to Supreme Court advice, to add clarity to definitions contained in the Clean Waters Act (CWA).
In an attempt to provide more clarity, the proposed adjustments to WOTUS would establish broader definitions of existing regulatory categories, and regulate new areas that are not jurisdictional under current regulations.

The extent of federal jurisdiction over WOTUS is of extreme importance to cement producers. Roughly 97% of all cement plants in the United States could become subject to WOTUS jurisdiction under the proposed rules. This could increase costs and impact decisions by the industry to invest and expand and/or source locally. Such reactions could be repeated in other industries as well, to the detriment of economic growth and job creation.

Furthermore, cement based products are used in constructing the homes in which we live, the schools in which we learn, the buildings where we work, the roads and bridges that we travel, and virtually every segment of construction. It is possible that the proposed adjustments to the CWA could adversely impact these levels of construction activity – to the detriment of the consumption of cement based products.

As a result of the potential cost and revenue concerns, PCA’s Market Intelligence Group has been tasked to provide an estimate regarding the potential impact on the cement industry of the Environmental Protection Agency’s and the U.S. Army Corps of Engineers’ recently proposed waters of the United States (WOTUS) rule that potentially broadens the regulatory scope of waters protected under the Clean Water Act.

The Proposed Adjustments to the CWA

The CWA protects “navigable waters,” a term defined in the act to mean “the waters of the United States, including the territorial seas.” The Army Corps of Engineers and the Environmental Protection Agency have historically asserted broad jurisdiction over “waters of the United States”. Waters that are jurisdictional are subject to the multiple regulatory requirements of the CWA. Typically, jurisdictional areas require compliance costs. Non-jurisdictional waters, in contrast, do not have the federal legal protection of those requirements. Non-jurisdictional areas do not require compliance costs.

For years, industry, the states, and regulators have been frustrated over uncertainty regarding the definition of waters that fall under federal jurisdiction. Two key Supreme Court decisions point to the jurisdictional confusion.1 Much of the confusion surrounds to what degree “other waters” are jurisdictional, either by definition/rule, or as determined on a case-by-case basis to evaluate significant nexus, or waterways that “either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable or interstate waters.”

The current proposal offered by the EPA comes in response to Supreme Court advice, to add clarity to definitions contained in the Clean Waters Act (CWA). In attempting to provide more clarity, the EPA and the Corps are proposing adjustments to WOTUS. The proposed adjustments would establish broader definitions of existing regulatory categories, such as tributaries, and regulate new areas that are not jurisdictional under current regulations, such as adjacent non-wetlands. Countless ephemeral drains, ditches and other features across the countryside that may be wet only when it rains and may be miles from the nearest truly “navigable” water could come under jurisdiction.

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1 SWANCC 2001 and Rapanos 2006.
EPA: Attempts to Clarify CWA Definitions

The proposed rule allows broader aggregation of “other waters” that are similarly situated than under the existing guidance, which could result in more “other waters” being classified as jurisdictional following a significant nexus evaluation. The proposed rule does not consider metrics such as quantifiable flow rates or minimum number of functions for “other waters,” to establish a significant nexus to jurisdictional waters.

The proposed rule leaves many key concepts unclear, undefined, or subject to agency discretion. Presumably, not all these potential waters are expected to fall under the new proposal’s purview. The proposal, however, allows for broad EPA powers regarding its regulatory purview by suggesting some jurisdictional determinations will be evaluated on a “case-by-case basis” – adding uncertainty to the landowners’ compliance efforts.

Net Social Benefit Analysis: Making the Case for Expanded CWA Jurisdiction

Regulation, by its very nature, typically involves compliance and remediation costs borne by the regulated industries. Higher production costs can constrain economic activity, reduce growth and hinder job creation. Despite the inherent costs, regulation can benefit society. Regulations can provide safer working conditions, insure safe air travel, result in cleaner air to breathe, and cleaner water to drink, among others. These are benefits to society’s overall welfare. Various techniques are used to monetize these societal benefits.
Regulatory adjustments typically require net social welfare assessments. These include an analysis of full social/economic costs compared against full social/economic benefits. The United States’ social welfare is typically maximized when the social/economic benefits best exceeds social/economic costs. Where changes to regulation are introduced, the expectation is that there will be improvements to economic and welfare outcomes.

It is important to note that good regulatory policy rarely implies the complete elimination of pollution. Typically, a point is reached after pollution has been largely reduced through regulatory policy efforts, the cost attached to achieving further incremental reductions in pollution are exorbitantly high\(^2\) and the incremental gains in benefit are typically less valued.\(^3\) Optimally, according to economic theory, public policy regulation should be increased up to the point at which the marginal social benefit equates the marginal social cost – and rarely is that achieved by 100% elimination of pollution.

Some supporters of the EPA proposal cite “one-off” instances of pollution as a rational for broader jurisdictional coverage of the CWA. Expansion of jurisdiction should not be based on citing “one-off” instances such as someone that once dumps pollutants in an ephemeral drain. Such arguments imply a policy focus on complete elimination of pollution, rather than an optimal solution.

The EPA’s proposed rules could be interpreted as clarifying existing jurisdictional rules. Through its definition of waters, the new rules could also be interpreted as a means of expanding jurisdiction. Both are likely at play. Broadening jurisdiction should only be based on

\(^2\) According to economic theory, public policy regulation should be increased up to the point at which the marginal social benefit equates the marginal social cost.

\(^3\) The law of Diminishing Marginal Utility.
a weighing the marginal social benefit against the marginal social costs. **Focus should be placed on optimal national net benefit and serve as the only basis of an expansion in jurisdiction.**

**Lack of Quality Data Hinders the EPA’s Net Benefit Assessments**

There are always considerable methodological and data difficulties in achieving robust quantified evidence on potential changes in net societal benefit resulting from changes in regulatory policy. Nevertheless, good data and methodology form the starting point of good policy. The better the data and methods used to estimate the net social costs/benefits, the more likely regulatory endeavors best serve the United States and avoids the potential of doing more harm than good.

So important is the need for good, clear, and definitive ways to identify the maximization of the country’s net social welfare that the EPA employed the new Industrial Sector Integrated Solutions techniques (ISIS) to estimate the “net social welfare” when applying NESHAP regulations to the cement industry. Even though the data and estimation constructs of ISIS had disputable flaws, the EPA’s approach was an attempt to be rigorous, fair, and impartial.

The EPA and the Corps performed an assessment of the net social benefits associated with the proposed WOTUS rule changes. Due in part to the vagueness of the proposed rule, cost and benefit calculations were very difficult to estimate with any degree of confidence. The proposed ruling is so broad and could encompass a vast number of new jurisdictional waters that complete data to perform the potential impact of the proposed ruling is lacking. Given the void of good data, strong assumptions and less than desired analytical approaches were employed to comply with law requiring an analysis of net societal benefits.

Such concern is expressed in the EPA’s own economic report. Overall, they conclude that benefits would exceed costs. However, they note that “there is uncertainty and limitations associated with the results, due to data and information gaps, as well as analytic challenges. The analysis does not quantify all possible costs and benefits, and values are meant to be illustrative, not definitive”.

Net welfare analysis, as required by law, is expected to be as definitive as reasonably possible. They are not expected to be “illustrative only”. Lacking the ability to perform this analysis, the potential exists that regulatory reform will do more harm than good. The critical public policy challenge, therefore, is to ensure that the expected regulatory benefits from regulatory reforms are both achieved and outweigh any regulatory costs imposed.

Good, clear, and definitive methodologies used to maximize net social welfare were not achieved with regard to WOTUS social cost/benefit analysis. A study by Berkley economics professor, Dr. Sunding offers a detailed account of data and methodology shortcomings in the EPA analysis. To best ensure the welfare of the United States is improved as a result of the proposed regulation, better data that enables better methodology is urged before adopting the new regulations.

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6 “Review of 2014 EPA Economic Analysis of Proposed Revised Definition of Waters of the United States” Dr Sunding, Berkley University, May 2014.
Successful Regulatory Policy Requires Predictability and Certainty

Economic activity is more likely to thrive when regulatory activity is predictable and stable and reduces uncertainty surrounding business decisions. The clarity of proposed regulations and the better the data and methods used to determine the net social benefits – the more likely such endeavors can be assessed and determined if, after consideration of the pros and cons, the regulation best serves the United States. But in the absence of clarity, uncertainty is elevated, and policy failure becomes more likely.

The EPA purports that the proposed new definitions of WOTUS will add clarity, reduce business uncertainty, and as a result lead to economic benefits.\(^7\) PCA agrees with the EPA’s assessment regarding the evils that uncertainty can play on economic performance. The proposed new definitions regarding jurisdiction may add clarity in some instances. At the same time, the new definitions, however, may create new areas of uncertainty regarding the CWA. Unfortunately, the reduction in one uncertainty and the corresponding increase in another uncertainty may not be an even swap.

The EPA’s economic report claims the proposed rules will reduce uncertainty and at the same time admit that they themselves have shortcomings in trying to estimate the net social benefit to the United States. The shortcomings are largely attributed to data shortfalls and analytical conclusions based on a myriad of strong assumptions. These are not conditions that typically lead to clarity and certainty.

PCA believes the WOTUS proposal lacks clarity and may increase, not decrease, uncertainty. Under the definitions contained in the proposed rule change, ditches could now be regulated under certain circumstances. While a common sense approach could be used to interpret the rule, the proposal allows some jurisdictional determinations will be evaluated on a “case-by-case basis”. This language suggests that the application of the law could vary depending upon inspector – adding uncertainty. Ambiguities regarding the breadth of the proposed changes, and the use of case-by-case review to determine jurisdiction, could add a tremendous amount of uncertainty.

If uncertainty is increased, then in its own words, the EPA’s new definitions may lead to a reduction in businesses’ willingness to invest, delays in building roads, buildings such as schools, hospitals, and houses, and overall constrain the development of natural resources, and in other activities where CWA permits are needed. *The potential exists that the impact of regulatory uncertainty will be felt by the entire regulated community to the detriment of economic growth and job creation in many sectors of the economy.*

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\(^7\) According to the EPA’s economic report, “Land developers, the energy and transportation sectors, the agricultural community, and other businesses face uncertainty surrounding CWA jurisdiction that may lead to reduced willingness to invest in projects or lost investment when entities must alter or abandon project plans. Businesses operate best in an environment of regulatory certainty. Business professionals are equipped to plan accordingly for known factors. However, uncertainty can lead businesses to sit on capital rather than take unknown risks. The current lack of clarity in where the CWA applies can delay building roads and houses, developing natural resources, and engaging in other activities where CWA 404 permits are needed. A rule that more clearly identifies small streams and wetlands that require protection under the CWA may reduce uncertainty and the costs that go with it. Depending on how significant uncertainty-related costs are, this proposed rule might ultimately reduce net costs for people seeking CWA permits, and increase consistency, predictability, and timeliness of the permitting process.”
A WOTUS Cross Check of EPA Net Benefit Estimates.

The EPA’s economic report focuses on broad macroeconomic impacts. A key problem with the EPA’s economic analysis is that it does not take into account the proposed rules’ impact of the aggregation of isolated waters due to the lack of data and explains that collection of such data would require extensive field experience. Undeterred, the analysis extrapolates from records that do exist, then makes brave assumptions, and concludes net benefit calculations despite using data that does not mesh with the proposed new water categories.

Perhaps the EPA net benefit calculations are correct. Perhaps not. Lacking good data, no one knows for sure. Good data can only come from extensive field experience. Alternative approaches, such as a microeconomic industry case study, may shed light as to whether the EPA’s broad macroeconomic calculations are correct.

To this end, PCA performed a survey of plant managers at cement plants. The survey addressed the industry’s footprint in terms of acreage, linear feet of stream, section 402 and 404 permitting activity and costs, mitigation and other compliance costs, as well as other structural details. Using this survey data, in combination with other data and assessments, PCA performed cost estimates with respect to the proposed new WOTUS rules. PCA did not perform social benefit analysis. The intent of this report is not to estimate net social benefit. Rather, the report seeks to arrive at industry cost impacts which can then be used as a very rough cross-check against the EPA’s broad macroeconomic cost estimates.

Cement Industry CWA Profile

The United States cement industry is comprised of 98 clinker producing plants, including 7 that are currently furloughed, nearly all with their own quarry. To generate the industry profile, all PCA member plant managers were surveyed and roughly 40% responded. Plants not reporting information were populated based on industry averages from the survey and then adjusted for plant size measured by kiln capacity.

Based on the plant manager survey, PCA estimates the cement industry’s quarry footprint at 118,000 acres. Of this, nearly 20,000 acres, or nearly 17%, are currently under CWA jurisdiction. In addition, the industry currently has approximately 460,000 linear feet of quarry related streams. Of this, nearly 175,000 linear feet are covered by CWA permit, or roughly 38%.

Additionally, each plant was evaluated based on their location relative to flood zones and categorized by flood risk defined by FEMA. PCA estimates that 27% of plants carry minimal flood risk, 71% have some form of elevated risk, and 2% are undetermined.

The cement industry is largely impacted by sections 402 and 404 under the CWA.

- Section 402 – establishes a program to address the discharge of most pollutants (called the National Pollutant Discharge Elimination System, or NPDES, permit program).

- Section 404 - establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands.
Total Estimated Current Industry Acreage Quarry & Plant Footprints

118,075 Total Acres
- 19,942 Acres Covered By Permits (16.8% of Total Acreage)
- 98,133 Acres Not Covered By Permits (83.2% of Total Acreage)

35 Permits
Implied Permit Compliance Rate = 570 Acres per permit

Total Estimated Quarry Related Linear Feet of Streams Currently Covered by Permit VS Not Currently Covered

460,105 Total Linear Feet of Streams
- 174,533 Linear Feet Covered By Permits (37.9% of Total Linear Feet)
- 285,572 Linear Feet Not Covered By Permits (61.1% of Total Linear Feet)
Cement Industry Compliance Cost Estimates

The cement industry is largely impacted by sections 402 and 404 of the CWA. Section 402 establishes a program to address the discharge of most pollutants (called the National Pollutant Discharge Elimination System, or NPDES, permit program). Section 404 establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. Typically, permits last five years. PCA’s analysis is constrained to compliance of only these sections of the CWA.

PCA’s compliance cost estimates are separated into four key areas including: permitting costs, mitigation costs, testing and administrative costs, and opportunity costs. Information on the first three cost areas was garnered from the plant-by-plant survey of plant managers. Opportunity costs were estimated in-part from industry survey responses and other data. It is important to note while the EPA’s economic report mentions the potential of significant opportunity costs associated with the proposed new rules, it does not, however, include any estimates for these costs.

While the cement industry holds a large footprint in term of acreage and linear feet of streams, not all these lands will be subject to the CWA even under broader EPA jurisdictional power. PCA assumes that section 402 and 404 permitting and compliance costs are triggered only when land is disturbed. Based on the survey results, 2% of a quarry’s footprint is harvested annually. While the harvest rate can change significantly due to cyclical production levels, the 2% rate is applied to the total industry acreage footprint of 118,000 acres – yielding a maximum annual potential exposure of roughly 2,362 acres.

Section 404 Cement Compliance Acreage Estimates

<table>
<thead>
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<th>Current Acreage</th>
<th>Annual Increase in Acreage</th>
<th>Five Year Total</th>
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<tbody>
<tr>
<td>118,075</td>
<td>2,362</td>
<td>11,808</td>
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Survey: 2% of Quarry Harvested Annually

Section 402 Cost Estimates

Section 402 of the CWA establishes a program to address the discharge of most pollutants (called the National Pollutant Discharge Elimination System, or NPDES, permit program). Discharge sites typically require permits. The cement industry currently has an estimated 707
discharge sites, or roughly one per 167 acres, all of which fall under section 402 jurisdiction. Permits typically remain in effect for five years and on average each cost the industry an estimated $11,132 per permit.

A key problem with the EPA’s economic analysis is that it does not take into account the proposed rules’ impact of the aggregation of isolated waters due to the lack of data and explains that collection of such data would require extensive field experience. While not EPA environmental inspectors, cement plant managers serve as a proxy for “extensive field experience.”

According to PCA’s survey of plant managers, the proposed changes in EPA’s jurisdiction, coupled with expected quarry harvest rates could result in an additional 436 discharge sites that would fall under CWA’s section 402 jurisdiction if the entire site were to fall under CWA jurisdiction today. This reflects a 61% increase in section 402 permitting and a corresponding permitting cost increase to roughly $970,000 annually and $4.9 million during a five year cycle.

Based on the plant manager survey, 22.6% of discharge sites require additional mitigation and treatment costs. Based on the increase in discharge sites anticipated under the proposed new rules, 22.6% are assumed to require additional mitigation and treatment expenditures to comply with the CWA, or roughly 98 discharge sites. Based on the plant manager survey, the average mitigation and treatment cost is $30,022 per discharge site requiring mitigation and treatment. This translates into nearly $3 million in mitigation and treatment costs assumed to occur during the five year cycle.

Discharge sites under the jurisdiction of section 402 of the CWA require testing, monitoring and other administrative costs. Based on information from the plant manager survey, this is estimated at nearly $2,500 per discharge site. Based on estimates for new discharge sites
under the new rules, this translates into slightly more than $3.1 million in testing, monitoring and other administration costs and $2.3 million in other recurring costs assumed to occur during the five year cycle.

**Section 404 Cost Estimates**

Section 404 regulates the discharge of dredged and fill material into waters of the United States, including wetlands. The cement industry currently has 35 individual section 404 permits, or roughly one permit per 570 acres. Permits typically remain in effect for five years and on average each cost nearly $575,000 per permit according to the plant manager survey. The industry also has several general permits. These costs have been reviewed and are considered rather small and are excluded from our estimates.

Based on assumed harvest rates of 2% annually, 2,362 acres are harvested annually by the cement industry, or roughly 11,808 acres during a five year cycle. Given the annual acreage estimate of quarry harvest, and combining it with the average permits per acreage translates into the need for an additional 21 section 404 permits during a five year cycle. Applying the average cost per permit of $575,000 translates into a total of $11.9 million. These estimates, however, reflect current jurisdictional definitions.

Although the definition of "waters of the United States" proposed by the new rules may impose no direct costs, more activities will require CWA permits because of the expansion of jurisdiction. In part to the vagueness of the proposed rule, it is very difficult to estimate the expansion of permitting activity with any degree of confidence. In essence, PCA’s efforts in estimating potential cost impacts relating to section 404 compliance are not immune to the same data issues that plagued the EPA’s economic report.

PCA’s survey of plant managers suggests that under current rules, one section 404 permit is typically required every 570 acres. This reflects the permitting and enforcement activity for the prevailing jurisdictional scope. The scope will widen. At issue is how much the scope will

**Kansas’ Potential WOTUS Extension**

1 Permit per 570 Acres.  
1 Permit per 143 to 285 Acres.

Currently Designated WOTUS

Proposed New WOTUS

Source: Waters Advocacy Council
widen. As suggested by the EPA, extensive field work is required to obtain a definitive answer to this question. In lieu of field work data, several analyses have been undertaken with this regard and may provide a proxy alternative.

The Water Advocacy Council, for example, has estimated if ephemeral streams are included, as proposed, CWA’s jurisdictional coverage in Kansas would increase from 32,000 miles to 134,000 miles of streams, or roughly a four-fold increase. If the prevailing permitting and enforcement activity remains constant, but the jurisdiction increases four-fold, the cement industry could require one permit for every 143 acres.

Analysis performed by the National Pork Producers Council (NPPC), together with other agricultural groups, concludes that land likely to be regulated under the Waters of the United States rule proposed by the EPA and the Corps would more than double under the proposed rule in most of the 17 states studied. If the prevailing permitting and enforcement activity remains constant, but the jurisdiction doubles, the cement industry could require one permit for every 285 acres.

More definitive data would add to the precision of the estimates. The implication of these two studies, however, is that the number of permits required by the cement industry will increase significantly. These studies imply that the EPA’s economic estimate of a 2.7% increase in permitting activity significantly understates the magnitude of the compliance costs attached to the proposed WOTUS rules.

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8 Ten years ago, EPA approved Kansas’ withdrawal of designated uses....” is referencing the Kansas Department of Health & Environment’s nutrient reduction plan submitted to the EPA in December 2004. As part of the proposal, they are required to perform “use attainability analysis” (UAA’s) which assigns designated uses to different stream/water-body cohorts. As part of this plan, certain ephemeral streams previously covered were withdrawn.

9 National Pork Producers Council, September 8, 2014
Based on assumed harvest rates of 2% annually, 2,362 acres are harvested annually by the cement industry, or roughly 11,808 acres during a five year cycle. PCA assumes in its estimates the NPPC’s less intrusive estimate of the EPA’s jurisdictional expansion under the new rules. The rational is based on broader coverage of its analysis. In doing so it is recognized the potential of upside risk to the resulting cost estimates.

Accordingly, PCA assumes one section 404 permit is required per 285 acres. Permits typically remain in effect for five years and on average each cost nearly $575,000 per permit according to the plant manager survey. This implies 42 new permits during the next five years and represents an incremental increase of 21 new permits compared to current jurisdictional definitions. The incremental increase in section 404 permits during a five year period is estimated at $11.9 million.

Based on the plant manager survey, additional mitigation and treatment costs are significant and average nearly $500,000 per permit. Given the net increase in permitting under the new rule (21), this adds roughly $10.5 million to compliance costs. Finally, based on the plant manager survey, the incremental administrative and monitoring costs are estimated at $2.3 million and other recurring costs at $4.8 million over a five year time horizon.

Opportunity Costs Associated with Regulatory Compliance

Regulation, by its very nature, constrains economic activity and can hinder economic growth through the increase of costs (such as permit application fees and mitigation expenses). It is important to note that regulations can hinder economic growth through the increase of visible costs (such as permit application fees and mitigation expenses) and “opportunity” costs.

Opportunity costs include the time and expense spent complying with regulations that could otherwise be spent on other projects. If a developer, for example is forced to spend time and money to secure the necessary permits to begin a project, then that is time and money that cannot be dedicated to another project that could expand business and create jobs – to the detriment of economic growth.

According to various research studies, the opportunity costs associated with acquiring permits to comply with regulatory adjustments can be significant. Indeed, the real damage to economic growth may not be in the additional processing fees developers have to pay, or in the additional headaches the new rules create, but in the projects that never happen and the profits that are never generated, and the jobs that are never created.10

With the broadening of the definition of waters covered under the CWA, permitting will increase. Time is involved to prepare a permit and receive a decision from the Corps. According to the Corps, it takes between 16 to 127 days for a decision on permits, depending on the type and complexity of the permit. Research that has been conducted to validate these estimates indicates the permitting process is considerably longer.11 Based on surveys of permitting

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10 An Analysis of the USEPA’s Economic Analysis of Proposed Revised Definition of Waters of the United States, Marc Seelinger, Jr.

applicants, it takes an average between 405 to 788 days from the time they began preparing the application to the time they received a permit, depending on type and complexity of the permit.

The main reason for the discrepancy is that the Corps only counts the time from the date that it deems an application to be complete until it reaches a decision. This accounting ignores the time needed to prepare the application, which comprises the majority of the total permitting time required for both nationwide and individual permits.

Based on the plant manager survey, the cement industry averages 480 days from the start to completion of the permit process. From an applicants’ perspective, the survey results seem more appropriate for a rough estimation in opportunity costs associated with the WOTUS proposal. Since some of the time-in-process does not actively include the applicants work time, PCA assumes that only half of the time in process includes applicant work time. Furthermore, applicant work time will likely include junior and senior level staff time. PCA assumes that one third of the total staff time is comprised of junior level staff time and two thirds of senior level staff time. Finally, PCA applies daily wage rates to each level of staff time. The wage rates are taken from the Federal Government’s annual GS pay scale using a GS-10 for junior staff and a GS-15 for senior staff. Conversion to a daily rate was achieved by dividing the annual salary by 232 days per year (365 days per year, less 104 weekend days, less 15 vacation days, less 13 holiday days, less 2 roaming holidays). Benefits are added at a ratio of one third wages. This crude method results in an opportunity cost estimate for the permit requester of slightly more than $64,000 for a section 402 permit and nearly $94,000 for a section 404 permit. Clearly, the assumptions used can be tinkered with and adjusted – yielding somewhat different results. PCA believes it has used somewhat conservative estimates. Section 402 compliance under the proposed rule is expected to require an additional 436 permits, each with an opportunity cost estimated at $64,000 and totaling $27.9 million over a five year time horizon.
Similarly, section 404 compliance under the proposed rule is expected to require a net 21 additional permits, each with an opportunity cost estimated at $94,000 and totaling nearly $2 million over a five year time horizon. Opportunity costs that may materialize at the government level are not calculated into these estimates.

Keep in mind, as more projects become subject to the federal Clean Water Act, more of them will also have to submit to consultation with other federal agencies to ensure compliance with the Endangered Species Act and the National Historic Preservation Act. The regulatory compliance efforts, as a result, could be multiplied. In the end, more projects will become subject to regulation and many could become subject to additional regulation - prolonging compliance time and expense and adding to opportunity cost estimates. PCA has not included the possibility of these compliance efforts into its opportunity cost estimates.

The critical point that is being made is that opportunity costs are an important, and significant, cost associated with regulation. While the EPA’s economic report recognizes the existence of opportunity costs, it fails to include these costs in its social welfare analysis. Without incorporating these significant costs, the economic social benefit assessment is compromised. Interestingly, the EPA’s economic report includes “opportunity benefits” into its estimates of social welfare.

**Microeconomic Cross Check of EPA’s Net Welfare Assessments**

Data, or the lack thereof, lies at the root of criticism regarding the EPA’s economic assessment of net social benefit associated with WOTUS. The dearth of good data forces the EPA into a methodological estimation approach that rests on strong assumptions and problematic methodology – raising concerns of the EPA’s net social benefit assessments.

The EPA suggests that extensive field testing is required to collect the necessary data in order to provide a more definitive estimate regarding the net social benefits associated with the proposed WOTUS changes. The structure of the cement industry provides a unique opportunity to conduct a survey based microeconomic cross-check of the EPA’s general macroeconomic cost estimates. For surveying purposes, the cement industry has a manageable number of plants (98), a relatively large acreage footprint, significant exposure to the CWA’s section 402 and 404, and finally seasoned plant managers that are familiar with each inch of their facility. While the plant managers are not EPA environmental inspectors, cement plant managers serve as a proxy for “extensive field experience” that the EPA suggests is needed for better social welfare analysis.

Using this unique information, PCA estimates that the proposed WOTUS rules could add nearly $73 million in compliance costs over a five-year horizon. Based on reasonable changes in assumptions, PCA believes the costs could range from a low of $55 million to a high of $103 million.

This microeconomic approach used to generate compliance costs are compared against the economic wide estimates provided by the EPA and the Corps of $163 million to $279 million.

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12 The Agencies (EPA and the Corp) recognize the time and impact avoidance and minimization costs can be significant for some share of permit applicants. However, because there is not a defensible, ready basis for estimating these costs, the agencies did not estimate these compliance costs as part of this economic analysis.” Economic Analysis of Proposed Revised Definition of the Waters of the United States, USEPA & Army Corp of Engineers, March 2014
both research is correct, the cement industry would account for a range of 33% to 37% of total national compliance costs. Keep in mind, the cement industry is a $14 billion industry in the context of a $16 trillion economy, or accounting for less than one-tenth of one percent.

How can an industry so small account for such a large part of the EPA estimates? Perhaps PCA’s cost estimates are off ten-fold. Then, the cement industry, accounting for less than one-tenth of one percent of overall economic activity would account for 3% to 4% of EPA’s national WOTUS cost estimates. In reality, even this result is unlikely and may point to the EPA’s and Corps’ dramatic underestimation of costs to the United States economy.

Other Costs: Economic Growth and Jobs.

Regulation, by its very nature, typically involves compliance and remediation costs borne by the regulated industry. These direct costs to industry multiply, industry after industry, and under the weight of higher production costs can constrain broader economic activity, reduce growth and inevitably net job creation. A recent study estimates that federal regulations have reduced economic growth by about 2 percent per year between 1949 and 2005. They find that if federal regulations were still at levels seen in the year 1949, current GDP would be $38.8 trillion higher. While that number seems extraordinarily high, a number of other studies have similarly concluded that regulatory accumulation slows down economic growth\textsuperscript{13}. Neither PCA nor the EPA included these impacts into assessments. Nevertheless, such impacts are very real and should be included in net benefit social welfare assessment.

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 & Section 402 & Section 404 \\
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Initial Permit Costs & $4.9 & $11.9 \\
Mitigation Costs & $2.9 & $10.5 \\
Administration Costs & $3.1 & $2.3 \\
Recurring Costs & $2.3 & $4.8 \\
Opportunity Costs & $27.9 & $2.0 \\
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Total & $41.1 & $31.5 \\
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\textsuperscript{13} A study in the June issue of the "Journal of Economic Growth" – authored by John Dawson of Appalachian State University and John Seater of North Carolina State University