

11.15.2010

Virginia Coal and Energy Commission

Request for Proposals #1: Socioeconomic Study of Impact of Uranium Mining

With the growing international demand for uranium ore and its associated 'clean energy' generation, the significant deposits of uranium in Coles Hill, Virginia have become a heightened matter of legislative importance. The Virginia Coal and Energy Commission is seeking a socioeconomic impact study to provide clarity around the major issues of safety, regulatory policy, public health and toxicity, overall quality of life, and the economic and fiscal impacts from uranium mining and milling on the Commonwealth. Chmura Economics & Analytics has assembled a premier team of experts to address the energy opportunities and related quality of life issues that influence the current moratorium on uranium mining. The Chmura report will define the geographical reach of the socioeconomic impacts within the Commonwealth and surrounding Coles Hill site of uranium mining and milling operations.

Prepared
for

Virginia Coal and Energy Commission
c/o Ellen Porter, Division of
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November 15, 2010

Virginia Coal and Energy Commission
Ellen Porter, Division of Legislative Services
910 Capitol Street, 2nd Floor
Richmond, Virginia 23219

Dear Ms. Porter,

Chmura Economics & Analytics (Chmura) is pleased to offer this proposal and statement of work to provide the socioeconomic impact from the mining and milling of uranium in the Commonwealth of Virginia. Chmura is partnering with Issues Management Group (IMG) and Glenn Pfennigwerth (with Y-12 National Security Complex) to provide the Commonwealth with a team whose expertise on the request for proposal (RFP) topics will provide value that exceeds the budget of this proposal. This document details the deliverables, planned methodology, and firm qualifications for the project.

The Chmura Team will complete this analysis by December 1, 2011 in accordance with the RFP document after receipt of a signed proposal.

Please call me at 804-649-1107 if you have any questions.

Sincerely,

Leslie Peterson
Partner and Director of Operations



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Purpose

The Virginia Coal and Energy Commission (the “Commission”) is requesting a study on the socioeconomic impacts from uranium mining and milling operations for the communities surrounding Coles Hill in Pittsylvania County, Virginia. The request for proposal (RFP) document indicates these impacts need to be both quantitative and qualitative and address both the economic and fiscal benefits from mining the uranium deposits and the corresponding social impacts on the populations living in the defined geographical radius. The Chmura report will quantify and qualify both the economics from the ore and the benefits to the Commonwealth and the localities. It will also model the costs and benefits to the state and the regions to mine the ore with the most current technologies to preserve the quality of life for the region and localities surrounding the Coles Hill site. The RFP is seeking a response that, at a minimum, addresses the following four major components that will drive the conversation and decision-making process within the Commission:

1. Economic impacts
2. Government services and regulatory impacts
3. Public health and environmental impacts
4. Societal impacts

The Chmura report will deliver the economic, fiscal, and social benefits and impacts, the revenues generated and the costs (economic, societal, and environmental) to remove the ore. The costs to shut down the operations at the end of the milling and mining cycle will also be estimated.

Background

From the RFP document, Chmura and their subcontractors, Issues Management Group and Glenn Pfennigwerth (with Y-12 National Security Complex), understand the role of the Commission is largely a legislative one; they are charged with the study and evaluation of coal and other energy resources for the Commonwealth of Virginia. Their history with uranium legislation began in the early 1980s when a significant deposit of uranium (the current estimate for the deposit is 110 million pounds) was found outside the town of Chatham, Virginia, which is located in Pittsylvania County. The renewed interest in nuclear power has renewed the interest in lifting the legislative moratorium on uranium excavation for the state.

In 2008, the Commission created the Uranium Mining Subcommittee (the “Subcommittee”) whose efforts are aligned with the Virginia Center for Coal and Energy Research (VCCER) to oversee a technical study of uranium mining and milling operations by the National Academy of Sciences (NAS). NAS has been empowered to deliver other studies that support the full Commission in the area of policy development and uranium mining.

Uranium mining¹ is estimated to be a \$15,481,592.00 (total annual wages) industry in the nation employing 914 people (based on the latest available data for the last 4 quarters²) workers that are paid an average of nearly \$70,000 a year. The nature of mining uranium is controversial from a regulatory, toxicity, safety, environmental, and socioeconomic perspective. The goal of the Commission is to determine the current ‘state of the

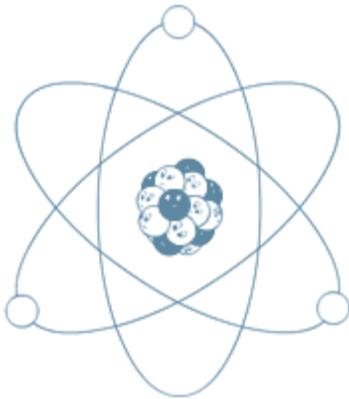
¹ “Uranium-radium-vanadium ore mining” is the official name of the industry based on the North American Industry Classification System (NAICS) 212291. It is defined as comprising “establishments primarily engaged in developing the mine site, mining, and/or beneficiating (i.e., preparing) uranium-radium-vanadium ores according to the U.S. Census.

² JobsEQ.com

socioeconomic impact' from mining and milling of uranium and what that scenario will look like on the Virginia economy and residential footprint from the start-up of the operations phase, throughout the operations phase, and eventually, during the shut-down of operations phase. The socioeconomic impact study will take a parallel path with a number of related studies. The significance of these related studies, particularly the technical study from the National Research Council (NRC) will investigate the

*scientific, technical, environmental, human health and safety, and regulatory aspects of uranium mining and milling across the Commonwealth. The results of the technical study are expected December 1, 2011. This request for proposals is the initiation of the socioeconomic study, which is intended to provide a complementary analysis to the technical study.*³

About Uranium

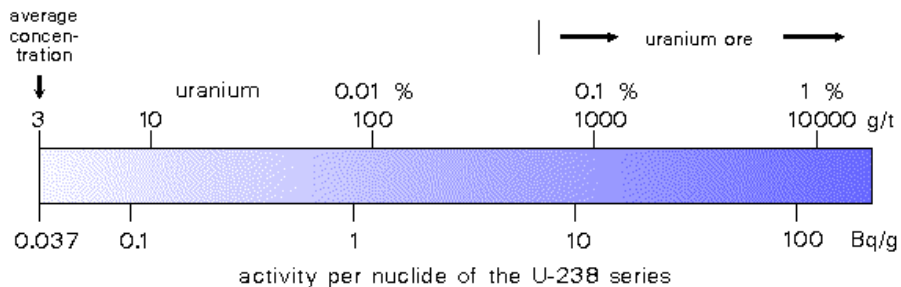


Uranium is a naturally occurring element. It is found in very small amounts in nature in the form of minerals. Rocks, soil, surface and underground water, air, plants, and animals all contain varying amounts of uranium. Its naturally occurring isotopes are uranium 234, uranium 235, and uranium 238. All three isotopes behave the same chemically, so any combination of the three would have the same chemical effect on the body. However, the three isotopes have different radioactive properties. The industrial process called enrichment is used to increase the amount of uranium 234 and uranium 235 and decrease the amount of uranium 238 in natural uranium. The product of this process is called enriched uranium, and the leftover uranium 238 is called depleted uranium. Enriched

uranium is more radioactive than natural uranium, and natural uranium is more radioactive than depleted uranium.⁴

Waste rock is produced during open pit mining when overburden is removed, and during underground mining when driving tunnels through non-ore zones. Piles of so-called waste rock often contain elevated concentrations of radioisotopes compared to normal rock. Other waste piles consist of ore with too low a grade for processing. The transition between waste rock and ore depends on technical and economic feasibility.

Uranium Concentrations in Rock



Source: <http://www.wise-uranium.org/uwai.html>

³ Virginia Coal and Energy Commission: Request for proposals #1: Socioeconomic Study of Impact of Uranium Mining

⁴ http://www.atsdr.cdc.gov/HAC/oakridge/pdf/orr_y12_brief.pdf

Statement of Needs

In accordance with the RFP document, the study we be completed before December 1, 2011, and will address the items detailed below in addition to recommendations from Chmura that are not part of the RFP language.

I. Economic Development

a. The number and types of jobs created directly by the mining and milling operation and the associated payrolls.

Estimating the direct economic impact of an industry that does not yet exist in a region requires a case study approach. Based on U.S. Bureau of Labor Statistics data, 47 uranium mines existed in the fourth quarter of 2009. The operations of some of those uranium mines will be reviewed along with international mines to estimate the potential number of jobs that will be created at the mine in Chatham, Virginia.⁵ The type of jobs (occupations and skills) created by the uranium mining operation will be obtained from Chmura's proprietary JobsEQ[®] software.⁶ Uranium milling employment will be estimated in a similar manner.

The Chmura report will estimate the economic and fiscal impacts from uranium mining and milling in the following three phases:

- 1) Construction of the mine and milling plant
- 2) On-going operations of the mine and milling plant
- 3) Cessation of active mining and milling operations

As noted above, the start-up phase will have a construction-intensive economic impact component. During this phase, local government revenue may be less than during the on-going operations of the mine and milling operations, which may put pressure on local governments that are providing services to more people if special skills are needed for the construction that cannot be found in the local labor market shed. At the conclusion of the construction phase, some of these workers may be used in the second phase (on-going operations of the mine) if skills are transferable.

Although Virginia does not have uranium mining now, the national wage for the industry is \$67,000—much higher than the average \$48,000 for all workers in Virginia. The closest related industry in Virginia is *other metal mining*, which has an annual average wage of \$58,000. The Chmura report will provide the numbers and types of jobs created by North American Industry Classification System (NAICS) code 212291, uranium-radium-vanadium ore mining, and NAICS 331419 for uranium refining beginning in 2012 (assuming the moratorium is lifted in the 2012 legislative session). The size of the operations will impact total payroll.

The cessation of active mining and milling operations will be estimated as the third phase and is addressed more fully in response to 'h' below.

⁵ If employment and sales data have already been estimated by a reliable public source, it will be used in the study.

⁶ JobsEQ[®] is Copyright © 2010, Chmura Economics & Analytics. All Rights Reserved. JobsEQ is protected by U.S. Patent 7,480,659; and patents pending.

Experience: Chmura creates between fourteen to twenty economic impact reports a year; these assessments include mining-related evaluations for companies such as Alpha Natural Resources in southwest Virginia. Some of the data from a select group of Chmura's Alpha Natural Resources studies have been released to the public in Chmura's *Virginia Economic Trends* publication.⁷

b. The number, types, and geographic locations of jobs created indirectly by the mining and milling operation in all sectors including retail and wholesale trades, the construction industry, and government.

The Chmura report will deliver an analysis of the indirect jobs created as a result of the start-up and ongoing operations from the mining and milling operations in Pittsylvania County. IMPLAN Pro model,⁸ which is most preferred by economists for impact studies, will be utilized in this analysis. In addition to indirect jobs (those created when the mine or mill purchases supplies from firms in the region), induced jobs will be estimated (those created when employees from the mine, milling operation, or suppliers spend their income in the region). Employment will be identified by industry (retail, doctor's offices, residential construction, etc.) as well as by geographic region. Since uranium mines and milling operations do not yet exist in Virginia, it is possible that some supplies will initially be purchased outside the region or state but will later be purchased nearby as suppliers choose to expand into the region. This scenario will be explored through the case-study approach.

Chmura will determine the scope of the impacts and jobs based on the geographic reach of the project (labor market shed) in terms of jobs that will be indirectly needed to support the operations.⁹ In addition to the Chatham labor market shed, Chmura recommends that economic impacts be performed for the entire Commonwealth. Chmura understands that the type of mining site process may be surface mining or below the surface excavation. Chmura mining advisors will provide the types of mining scenarios most likely to be deployed at the site. Chmura can prepare an analysis that includes both types of mining operations for start-up and operations through the life cycle of the mine and its eventual shut-down of operations.

Experience: Chmura has delivered numerous economic impact studies throughout the Commonwealth of Virginia. Other locations utilizing Chmura economic impact studies have been the state of West Virginia's need to have the economic impact on the state from the Interstate 77 expansion into that state; currently Chmura is providing a similar analysis for that interstate's expansion into Myrtle Beach, South Carolina.

c. The number and types of all such jobs likely to be filled by current residents and those likely to be filled by outside workers.

The Chmura Team will provide the current inventory of labor to supply the workforce needed to sustain the mining operations. JobsEQ, which provides the number of workers by occupation in a region, is summarized in Appendix A. This inventory of the labor assets will be evaluated along with the supply capacity from the region's education and training facilities to support the pipeline of workers needed in 2012 and beyond. These forecasts will allow the region to think about any gaps in supply capacity that will be introduced as a result of the uranium mining

⁷ "Coal and Virginia's Energy Future," fourth quarter 2006,

http://www.chmuraecon.com/file_dl.aspx?name=-/pdfs/trends/06q4_feature.pdf&id=f87c1563-9fba-4395-a340-de5b36b7f4e2.

⁸ IMPLAN Pro was created by Minnesota IMPLAN Group, Inc. (MIG). It uses classic input-output analysis along with regional specific social accounting matrices and multiplier models.

⁹ The Chmura Team will use Census commuting pattern data to define the labor market shed along with input from the steering team.

operations. For example, truck drivers will be needed to support the uranium mine, and there are over 150 truck drivers working in Pittsylvania County. In contrast, “continuous mining machine operators” will likely be needed at the mine but there are none currently working in the county. However, other occupations exist in the county (such as “paving, surfacing, and tamping equipment operators”) that can be trained to perform the continuous mining machine operators.

Experience: Chmura has performed an abundance of labor market analyses over the past eleven years that include identifying gaps in occupations between the supply and demand for occupations and skills. Chmura completed a comprehensive community audit for the coal-intensive Southwest Virginia Workforce Investment Area (WIA) as well as the formerly textile-reliant West Piedmont WIA which includes Pittsylvania County. Chmura’s workforce tools and analysis have been deployed in Alabama, Colorado, Florida, Kentucky, Iowa, New York, Ohio, South Carolina, Tennessee, and Virginia. Furthermore, Chmura has a confidential and contractual relationship with Virginia and Ohio that includes the purchase of firm-specific data to further support our clients in workforce and economic development. Our firm’s handling of confidential data is trusted and our work is credible and reputable.

d. The number and types of jobs that might be lost due to contraction or closure of existing businesses.

The economic impact of any businesses that close due to the opening of the uranium mining and milling operation will be estimated based on the process previously identified in this response to proposal. Specifically, the occupations of the firms will be estimated based on the industry type; Chmura will apply JobsEQ® to this phase of the evaluation. The Chmura report will identify those occupations from businesses that close that are transferable to the mining and milling operations. The multiplier impact of any jobs lost due to this project will be estimated using the IMPLAN Pro model. Potential revenue losses will be measured based on the type of taxes assessed in the county.

e. Revenue generated from spending and capital investment made directly and indirectly by the uranium mining and milling operation.

Revenue generated will be estimated from the IMPLAN Pro model as well as case studies of mining and milling operations. It is further anticipated that the ‘Company’ owners will provide revenue projections based on their internal forecasts—Chmura can work with prior research and compare these projections to our internal analysis.

Experience: The estimation of revenues is a typical outcome of an economic impact study. Chmura has extensive experience providing private-sector firms with sales forecasts and the analysis of their confidential and historical sales data.

f. The impact on local and state tax revenues.

The economic impact will estimate the local and state taxes based on taxes levied. Local taxes typically include the one percent portion of the sales tax; personal property; machine tool taxes; and business, professional, occupational licenses (BPOL). State taxes include the state portion of the sales tax as well as personal and corporate income taxes. In addition to estimating the tax revenue, costs will be estimated relative to the infrastructure needs for the localities impacted by the new jobs in terms of the propensity of the localities to absorb the project. Some examples include police and fire protection, capacity for schools to absorb new students in the K-16 pipeline, and available housing. (This is addressed further in Sections II-Government Services and Regulation and IV-Social Impacts.)

Experience: The estimation of fiscal revenues and costs is a typical outcome of an economic impact study.

g. The impact on real estate values, land use potential, the housing market, and the construction industry, including any loss of value to those properties downstream or downwind from the mining operation.

A literature review will determine whether previous studies have measured real estate-related impacts from mining operations. In the absence of sufficient prior studies, case studies will be used to identify the impact of the uranium mining and milling operation on real estate and related issues. Specifically, before-and-after scenarios for real estate values and housing activity will be measured in similarly affected areas in the nation.

Experience: Chmura has addressed the potential impact on real estate values in economic impact studies from both a positive side (conversion of a rail-to-trail) and negative side (creation of a race track).

h. The impact on both direct and indirect employment levels and revenue generation after the cessation of active mining and milling operations.

Consistent with the process presented in this response to proposal, the economic impact of the cessation of active milling operations will be addressed by first reviewing prior studies that address how the mine and mill will be shut down and/or whether they can be converted to another use. In the absence of credible prior studies, case studies will be performed to estimate plausible scenarios for the Chatham facilities. Once scenarios are created, IMPLAN Pro will be used to identify the direct and indirect impact on employment in the region. Revenue generation will be assessed relative to taxes levied.

Experience: The cessations of activities or renovations are sometimes considered in economic impact studies. The Chmura report will consider the expenses and environmental costs to cease the operations of the uranium mine. Depending on the final geological constraints for the uranium deposit, the cost to shut down operations may be dependent on the configuration of the ore relative to the land and land ownership. The Chmura study will determine if two start-up phases are needed and two-cessation scenarios should the deposit require a "shut-down and move to another site" requirement. The costs for cessation will be compared for the short-term and longer-term environmental burden.

II. Government Service and Regulation

In keeping with the research methodology, our team will work closely with state and federal government regulatory and operating agencies including, for example, the Nuclear Regulatory Commission (NRC), the Federal Energy Regulatory Commission (FERC), and the U.S. Navy to gather data on actual experiences related to all phases of the socioeconomic study. We will also network with private sector contractors to federal agencies.

For example, the U.S. Navy has the longest nuclear operating experience of any organization in the country; utilizing their experiences as case studies will provide our team with excellent data and feedback. The first nuclear submarine, the Nautilus, was constructed by General Dynamics/Electric Boat in Groton, Connecticut and launched in 1954. Decommissioned in 1980, the sub is now moored in New London, Connecticut. The important point is that the U.S. Navy has nuclear experience of over 56 years. And, unfortunately, the public is unaware of the exemplary performance and safety records of nuclear reactors aboard ships and subs because of national security issues (perceived).

The results of this study are all about informing the public in a documented and unbiased manner. Virginia has a proud history (albeit largely unknown) and strong connection with the nuclear industry through the Navy: nuclear subs and aircraft carriers have been built in the Newport News shipyards for many years and Norfolk is the largest naval base in the world, where most of the Navy's nuclear aircraft carriers are based.

The Trident nuclear subs, the largest in the Navy fleet, of which there are currently 18 in commission, were first constructed in 1976; the first one was commissioned in 1981. Noteworthy is the fact that the anticipated decommissioning date for the first Trident sub is 2029, providing nearly 50 years of service, which is extraordinary. The Trident subs are based in Bangor, Washington and in King's Bay, Georgia due to deep water and special facility base requirements. This geographic distribution provides us with the opportunity to obtain geographically diverse data across a broad spectrum of subjects related to the socioeconomic effects of uranium mining/milling and handling.

The first nuclear aircraft carrier, the Enterprise, was launched September 24, 1960 and is still in service today. It, and 5 Nimitz-class nuclear carriers, is based in Norfolk, in close proximity to where every single one of the U.S. Navy nuclear aircraft carriers was built, again providing a very close relationship between nuclear research, manufacturing, and naval operations in Virginia.

In addition, Lynchburg has been a major player in nuclear operations for many years as home to the Babcock & Wilcox Nuclear Operations Group. With facilities and operations all over the world, Lynchburg remains a major player in the company's nuclear energy, nuclear operations (headquarters), and technical services (headquarters) programs. Lynchburg is only 42 miles northeast of Chatham and we expect Lynchburg to be included in certain geographic study issues in our overall research. We believe the proximity between Lynchburg and Chatham to be a potentially significant factor; for example, although we plan to utilize real examples across the country and the world, the extent of nuclear components manufacturing and handling right in Lynchburg is probably not well understood by the general public.

Our technical consultant is employed as a contractor to the Navy – through a Babcock & Wilcox subsidiary in Oak Ridge, Tennessee; we anticipate having ready access to important data and additional knowledgeable individuals that can inform the technical aspects of the socioeconomic issues of our study.

a. The local and state government costs for regulation and monitoring of mining, milling, tailings management, closure and aftercare, and any associated liabilities.

We will project the costs of local and state regulatory and monitoring requirements of the entire spectrum of the uranium mining process. While we will utilize historical data from existing uranium mining operations, it is anticipated that we will also need to create a unique model for projecting compliance costs because the recent energy-related disasters would predictably lead to increased regulation and increased costs, although unknown at the time of the study.

b. The impact of increased use and costs for any infrastructure and services upgrade.

Through the team's extensive network of mining professionals and knowledge of the mining industry, we will identify infrastructure and services uniquely required for the uranium mining process. We will also identify the projected increase of existing community infrastructure and services that would require upgrades. One of the team members has followed the mining industry, particularly coal, as an avocation for over 50 years. His level of expertise and, in particular, his ability to communicate the complex issues in easy-to-understand, almost story-like fashion, is an important component of our final work product. Our team has a close working relationship with the Bluefield State College of Engineering, renowned for its experiential-based mining engineering program, and we see direct parallels between the rural nature of Bluefield's southern West Virginia student base and that of the student base in Southside. Although previously mentioned, one of the great strengths of our team-based approach in studying these complex issues is the ability to reach out to a diverse group of professionals and get unbiased feedback. Said another way, the relationships that our team has earned over the years will enable the final work

product to be produced at a far lower cost, which is in keeping with the limited budget announced by the Commission.

c. The impact on public schools including funding and educational opportunities.

Given that increased employment and population would naturally accompany the mining operation and spin-offs, we will project the impact on existing public schools in the region. These projections will be natural extensions of the data from Part I. We are aware of the presence of a number of private schools in the region and will seek their input to pertinent quality of life and socioeconomic issues. Also, we will project the additional (newly required and not currently existing) educational needs and opportunities that the mining industry would require, much of which we believe will be in areas of workforce training, certifications, licensing, and ongoing higher education. As with most industries, technology advances have increased the education and skill sets required for jobs in the mining industry. Virginia Tech has a renowned coal institute and an existing presence in the Chatham area via the Institute for Advanced Learning and Research located in Danville. We would study the existing uranium competencies at Virginia Tech and would project increased areas of education based on our existing case studies methodology. Our team has an unusually strong background in workforce training, particularly in Virginia, where numerous studies have been completed by various team members, one has served as the chair of a regional workforce board, and another has served as a contracted executive director.

d. The local and state government costs for contingency planning and disaster preparedness.

We will project local and state costs for contingency planning and disaster preparedness. Again, we will be mindful that the current energy-related regulations are likely to increase substantially at the federal level. The necessary steps required to complete this component of the work scope will have the added benefit of also determining existing local and state contingency planning and disaster preparedness. We expect this to be a substantive endeavor; for example, it is widely accepted by VDOT that the current highway evacuation plan for the eastern shore would not accommodate the traffic exodus associated with a major hurricane at the Virginia coast. Conversely, the BP oil spill has taught us that it is unacceptable to conclude that a worst-case scenario cannot occur. We will work with our team of experts to determine a realistic worst-case scenario.

e. A review of the potential costs to upstream and downstream localities resulting from the mining and milling operation.

The potential upstream and downstream costs associated with the mining operation will be reviewed. Integral to this review is the determination of the affected watershed. (See Attachment for our initial thoughts on determining the size and scope of the watershed to be included in this study.) We will want to seek approval of the steering committee of the watershed we recommend before we conduct any analysis. We are aware that the watershed safety issues are potentially the most volatile issue involved in the mining process. This is an excellent example of the importance of our actual case study approach to the research and recommendations. Because water is required in the mining and milling processes – totally separate and apart from the existing domestic and process water needs of the region – the potential of contamination of the overall watershed deserves considerable study. In addition, although not specifically mentioned in the RFP, we recognize the similarities and differences between the mining and milling processes; importantly, the issue of dust control is second only to water in significance.

f. A review of the potential costs and determination of the parties responsible for remediating any potential environmental damage.

We will review the potential costs and determine the potential responsible parties expected to remediate any potential environmental damage. The deliverables on this item are directly related to item e above. Given the timeliness of this study, it is possible that our thoughts and suggestions can be of assistance in the ongoing dialogue at the federal level regarding the potential increase in regulation for all mining industries. Our team expects to have access to federal agency and committee staffers and to tap their expertise on key issues of the study. We do not expect the recent political changes in Congress to negatively affect our access to information; we will be working with senior, tenured staffers.

g. A review of potential sources of funding to offset the costs identified above.

Our team will review potential sources of funding to offset the costs of all items included in this section. We recognize there is a wide variation in the confidence level for these projections. For example, potential sources of funding for new public schools are well established in history; however, potential sources for mining disasters are still being determined. We already know that fines are not a satisfactory deterrent to unsafe mining practices and we know that potential worst-case disasters are requiring assets available only at the military level. Our review will include international case studies on this issue as well, because the United States cannot continue to subsidize the costs of large (and growing) energy issues in numerous sectors, not just uranium mining. Our team is aware that national security issues are at stake in the various energy sectors and, arguably, none more important than the nuclear sector (as evidenced by the ongoing security practices currently in place by the military and its contractors).

III. Public Health and Environment

We recognize the issues of public health and the environment are of great importance to our findings in this study. Following the Massey Coal mining disaster in West Virginia, the BP oil spill in the Gulf of Mexico, and the dramatic rescue operation of gold miners in Chile, the entire world is now focused on the negative impacts of energy- and mining-related issues, particularly those that involve mining and its potential impacts on the health and environment. Public perception has risen to the level of outrage and has been measured by a number of credible organizations; we will make appropriate use of already collected data that has sought to measure subjective thought among the residents of our nation.

In keeping with the case study approach to our research, there are, for example, active and closed uranium mining and/or milling operations in New Mexico, Colorado, Utah, Arizona, and Wyoming. These (and others) will be included in our scope of work.

a. The costs of health care and illness due to potential negative impacts from the uranium mining and milling operation.

- A. **Experience:** Members of the Chmura Team (Issues Management Group) has worked with the Kellogg Foundation, Robert Wood Johnson Foundation, the National Association of City and County Health Officials (NACCHO), the Virginia Hospital Association (VHA), and the Virginia Department of Health (VDH). This expertise provides us with knowledgeable contacts and access to health data pertinent to this project. Our team led a regional project in the Roanoke and New River Valleys, in partnership with VDH and VHA, to develop a proactive health plan for the western Virginia region. Our project was one of only 43 funded in the nation and the only one that was regional in scope. We see direct parallels with the uranium study; the geographic area studied must be regional, not just restricted Chatham or Pittsylvania County. We are experienced in determining appropriate geographical regions of study.

Our initial research indicates that there is substantial data that will inform the study of costs in health care and illness due to potential negative impacts from uranium mining and milling operations. For example, the Navaho Indian Tribe has been affected by numerous uranium mining operations in the New Mexico and Arizona regions dating back to the early 1940s. Our case study and comparative analysis approach will enable us to evaluate the causes and effects of health issues relative to mining and milling operations from the 1940s through the 1980s (historically the most concentrated uranium mining and milling time period, which was driven by the demands and requirements of nuclear issues related to the Cold War). We will compare the historical data to the mining and milling techniques currently in use or available today. This approach will enable a broad spectrum of analysis and will acknowledge any health issues associated with early mining techniques, will contrast health issues associated with current mining techniques, and report the outcomes. Taking full advantage of a full 70-year spectrum of data will enable us to present an accurate picture of potential negative impacts and documented improvements.

Chmura has experience in modeling hospital-specific economic impact data as well as regional health care impacts. Chmura has worked closely with the Greater Richmond Region to analyze firm-specific, confidential health-related cost and infrastructure-related expenses and benefits from health care on the overall economic base for health care across the Commonwealth. Given the availability, credibility, publically-available and timely nature of any data we utilize from the case studies, Chmura and Issues Management, together, will provide solid and validated data from the costs impacts on health care from the uranium mining and milling operations case studies. Further, Chmura will work with Issues Management to review any health projections available from research universities on this subject matter.

b. A review of the quality of life impacts from health risks attributable to the mining and milling operation for employees and residents.

Our quality of life review will include determinations of ancillary health care systems improvements in uranium communities. In addition to identifying the health risks attributable to uranium mining and milling, we will also determine the growth of the health care industry in uranium mining/milling communities that could potentially improve overall quality of life for employees and residents. For example, black lung disease in the coal mining industry led directly to the expansion of hospital services in economically deprived areas of southwest Virginia and southern West Virginia, which was a positive outcome from a very negative consequence. We need to study and quantify these types of issues as they relate to the uranium industry.

c. The impact on quality of life from detrimental environmental consequences.

We will research and identify specific detrimental environmental consequences to flora and fauna using actual case studies and correlate that data to quality of life determinations, both in the objective (direct) sense and the subjective (indirect or perceptive) sense. This is a good example of the diversity of our team: available data will be obtained, relationships with health organizations will enable specific feedback to be obtained, connectivity with a myriad of environmental organizations will derive their perspective, and our experience in multi-faceted economic development initiatives will enable a thorough review. As the method of mining (underground, open pit, or in situ) has a great deal to do with the specificity of particular environmental concerns, the consequences of each method will need to be examined.

d. The impact on natural landscapes, scenic appeal, recreation, and tourism including wildlife and hunting, fishing, boating, and places of historical interest.

Members of our team have spent many years, both personally and professionally, in Southwest and Southside Virginia and are very aware of the importance of preserving and enhancing natural landscapes, recreation, and tourism – ranging from wildlife to historic preservation. Coles Hill is located “upstream” of Kerr Reservoir and Lake Gaston, favorite recreation areas for residents and tourists in Southside Virginia and adjacent areas of North Carolina. There are pertinent parallels with Grand Junction, Colorado; Barnwell, South Carolina; the Tri-Cities area of Washington State; as well as Moab, Utah. These localities will be useful in determining a number of impacts under the scope of this RFP. For example, such data as migratory fowl flyways, soil types, weather patterns and trends, flood history and potential, etc., will be examined as part of our study.

e. A review of any environmental justice impacts.

The issue of ‘environmental justice’ is significant and members of our team are personally invested. We are experienced disaster relief volunteers, have served on numerous social service boards in various communities, and have project management experience in local, state, federal, and private foundation-funded programs to improve the quality of life of economically disadvantaged citizens. Our combined years of experience/service would easily exceed two hundred. Our research will draw upon data and experiences from coal mining communities in southwest Virginia and southern West Virginia and our contacts in those areas are numerous and longstanding. Additionally, much data is available to our team regarding uranium mining/milling impacts on indigenous populations and others in the American southwest over the last seven decades. We are experienced with the complexities of the psychological aspects of the economically disadvantaged, job sustainability, corporate profitability, union-management conflict resolution, operational safety, and a myriad of multiplier and spin-off effects related to the interpersonal and intangible aspects of environmental justice. Our study will incorporate all of these experiences to present an objective look at these critical issues, which we clearly understand will be a major driver in the ultimate political decision facing the General Assembly.

f. A review of post-closure procedures to ensure public health and safety.

Our case study approach will enable us to accurately review the actual socioeconomic impacts of known mining and milling closure procedures. The review will identify both problems and best practices to provide a balanced look at the post-closure process. Given that uranium mining has occurred in this country for decades, we will also utilize the data to provide a historical perspective that will indicate how new technologies have improved the measurable outcomes of post-closure procedures. We are interested in researching, studying, and determining the potential for new and useful post-closure sites (landfills, biomass acreage, ball fields) that go well beyond the typical reclamation practices.

IV. Social Impacts

a. The effects on internal and external image of the region, i.e., belief that area remains a safe place to live, work, and invest.

The Chmura Team will investigate the internal and external forces impacting the social impacts for the regions’ populace. A SWOT (strength, weakness, opportunities, and threats) analysis will be used as a template for capturing these components and compartmentalizing their relative importance to the sustained quality of life for the

populations living in and visiting the uranium mining and milling region. The region-specific SWOT will be compared and contrasted to case-study SWOTs from the uranium mines, such as those found in Wyoming and/or Colorado. The case studies will have the advantage of studying regions where residents dealt with their subjective views of the impact of the mine on the region and have had the opportunity to change that view once the mine was put in operation.

The value of the SWOT is the interconnectivity between the 'real' and the 'perceived' views of the issues associated with uranium mining from the 'societal' side of the economics of the project. Some of these societal threats may include short-term spikes in the costs for police and safety during the construction phase due to the nature of the transitory workers. At the same time, the short-term economics from the construction phase may have a significant windfall on wages and tax benefits to the localities and to the state. The Chmura report will compartmentalize the key issues in a manner that allows the legislators to see the significant relationships that can shape and refresh the thinking from the residents regarding the lasting impacts to the region from uranium mining.

Experience: An example of a SWOT analysis developed from focus groups (primary data) and Chmura proprietary databases (secondary data) is provided below for the Tobacco Indemnification and Community Revitalization Commission region under the project umbrella for Longwood University, Virginia Tech and the University of Virginia: The final project was entitled "Charting the Course: the Strategic Compass for Virginia Southside Region."

	Strengths	Weaknesses	Opportunities	Threats
South Central Southside VA				
<i>industry mix</i>		<ul style="list-style-type: none"> • Relatively large percentage in manufacturing • Relatively high percentage in low paying leisure sector • Leisure sector added the most jobs over the last few years 		<ul style="list-style-type: none"> • Manufacturing jobs in decline and pays one of the highest wages
<i>highways</i>	<ul style="list-style-type: none"> • I-85 connections north and south 	<ul style="list-style-type: none"> • Route 58 traverses mainly rural areas 		
<i>utilities</i>	<ul style="list-style-type: none"> • Fiber Optic Regional Backbone 	<ul style="list-style-type: none"> • NC has better water/sewer utilities 		
<i>tourism</i>	<ul style="list-style-type: none"> • Southern Virginia Tourism Region • Buggs Island Lake • Southern Virginia on the Move • South Boston Speedway • The Dominion 2006 World Inboard Championships 		<ul style="list-style-type: none"> • Identity not well known 	
<i>quality of life</i>	<ul style="list-style-type: none"> • Proximity to Raleigh Durham labor 		<ul style="list-style-type: none"> • Lower cost of living 	<ul style="list-style-type: none"> • Lose labor to North Carolina firms
<i>education K-12</i>	<ul style="list-style-type: none"> • Better than in most rural areas • Largest dual enrollment in state 		<ul style="list-style-type: none"> • Can be improved 	
<i>higher education</i>	<ul style="list-style-type: none"> • Southside Business Technology Center 		<ul style="list-style-type: none"> • Lake Country Advanced Technology Center (LCATC) • Lake Country Enrichment and Education Center • Southside Virginia Workforce Development Center • Southside Virginia Community College 	
<i>research & entrepreneurial</i>		<ul style="list-style-type: none"> • Low rate of startups 		
<i>economic and workforce development initiatives</i>	<ul style="list-style-type: none"> • Southside Tobacco Forgiveness Loan program 			
<i>workforce</i>	<ul style="list-style-type: none"> • CNC welders • Pneumatic welders • Applied technology 			<ul style="list-style-type: none"> • NC high precision development center • Skewed toward low skill jobs, many not easily transferable skills

b. Public confidence in the company to control adverse effects and the ability of government to properly regulate such effects.

Chmura will work with the Commission to better understand the legal composition of “the company” in terms of its management, commitment to product stewardship, environmental excellence expertise, health and safety focus, and its overarching business model and how that model impacts the flow of revenue throughout the communities and the Commonwealth. Chmura will validate the commitment to the health, safety and environmental protection by a combination of the following criteria:

1. The quality and precision of the company’s quality assurance process
2. The quality and accuracy of the company’s environmental, health, and safety standards and best practices and the identification of the company’s planned ‘green’ construction best practices
3. The strength of the company’s “Right-to-Know” training and implementation
4. The value the company places on the input of the ‘public’s’ regarding the aesthetics of the mine and its operations
5. The company’s vision, mission, and business values will be reviewed against the broader business plan and goals for the organizations successful extraction of the available uranium deposits.

Case studies will provide historical public confidence profiles and provide a ‘life-cycle’ view of the best practices and potential unforeseen threats.

Experience: Chmura has 15 years experience in the chemical manufacturing industry with, product stewardship, quality assurance, employee right-to-know laws, environmental excellence, and employee and public health monitoring and control, ISO 2001/9000 quality certification, performance management (PM) and business process improvement (BPI). Chmura’s projects have required the application of various identification and validation methodologies to provide a ‘weighted’ approach toward evaluating socioeconomic impacts. Chmura has eleven years experience in delivering primary data to supplement secondary datasets; these primary data are in the form of surveys, focus groups, and interviews. The Chmura team has a combined 40+ years in providing professional consulting services throughout the Commonwealth of Virginia and beyond in the U.S. and in Europe.

c. The impacts on private schools and local institutions.

The socioeconomic impacts on private schools and local educational institutions will be assessed in the Chmura report from two perspectives. First, it will consider the perceived impact of the mine on enrollment and will use case studies to compare those perceptions to peer regions.

Second, part of the economic impact phase of the project (Section I, part d) will provide the baseline analysis from uranium mining and milling on the capacity and fiscal condition for the education and training providers in the defined geographical-reach of the economic impact study area. From the baseline economics and workforce supply and demand profiles will emerge the impacts from this project on the supply-side of the workforce pipeline.

The Chmura report will model the impacts on the education and training providers from an asset mapping perspective. Gaps in the training and curriculum will be identified based on the successful start-up of operations in 2012. The crossover skills for textile workers to transition into uranium mining construction and operations (mining and milling) will be investigated. Chmura will work closely with the training and education suppliers in the region to provide demand occupation and skills profiles anticipated by the project’s launch as well as an assessment of green skills.

The Chmura report will provide estimates for the workforce by demographic and other longitudinal dimensions. Chmura's proprietary time series and panel data sets will be used in this part of the education pipeline analysis. Where relevant and meaningful, Chmura will provide both time series and cross-sectional data to shape the analysis. The regional stakeholder groups will be given insights into the role of the broader national economy on the labor economic trends in the region overlaid with the impacts from uranium mining in the short/mid/long-term forecasts for occupations and skills considered to be in-demand. From this analysis, the Chmura report will provide a view of the what, how, and why the state of the workforce is currently performing relative to the desired equilibrium between supply of talent and demand for the uranium mining and uranium milling¹⁰ skills typically required. The Chmura report will clearly communicate the current state of the workforce and analyze the 'state' of the supply chain for opportunities to bring the process into a 'steady state' based on the projections for occupation-demands in the supply chain into mining and milling-type industries and the anticipated expansions in the supply chain supporting this industry within the study region.

The geographic location of the uranium mining workforce will be mapped for critical occupations. In addition, surveys will be utilized to identify age demographics for critical occupations.¹¹ The private schools represented by the geographical footprint from the uranium mining operations will be included in the asset mapping for the regional educational pipeline. All participants in education and training will be part of an education and business-led focus group session planned for the region. The focus group will be conducted against a backdrop of socioeconomic background data as well as a summary of the case studies-to-date. Participants will be afforded the opportunity to see some of the project's technical, environmental, economic, and workforce potential for the region. From this larger session, led by Christine Chmura, PhD, break-out sessions will be formed to discuss the following:

1. Safety and public health concerns
2. Environmental and toxicology concerns
3. Education concerns
4. Tourism and environmental concerns
5. Regulatory issues
6. Economic and workforce issues

Experience: Chmura has several years experience in providing services to the education pipeline both in Virginia and in other states. Some examples of our work within education include:

1. Creation of the Virginia Education WIZARD
2. Workforce Investment Board (WIB) staff in southwest Virginia for 3.5 years
3. Strategic planning for Longwood University, Virginia Tech, and the University of Virginia
4. Career pathway planning for the Williamsburg Historic Triangle
5. Strategic planning in West Piedmont, Hampton Roads, the Crater workforce area, central Virginia, southwest Virginia, and WIA 2 in southwestern Virginia
6. Demand for occupations analysis in southwest Virginia, Southside Virginia, the Petersburg and Crater areas of Virginia, the Hampton Roads area, the Tompkins County, New York area, the Greater Dayton Ohio area, workforce areas in Tennessee, South Carolina, and Alabama, Wyoming and Iowa.

¹⁰ Uranium milling is assumed to resemble an advanced manufacturing chemical plant.

¹¹ A demographic analysis of all aerospace occupations will not be performed via survey due to the due date of the study.

d. The impact on aesthetics and overall quality of life issues.

Case studies once again will provide a catalogue of the evolution of the technologies and product stewardship characterizing the 'state of the uranium' mining and milling operations. These case studies will incorporate impacts on the overall quality of life for the populations living and visiting the uranium-mining communities surrounding the mine locations. Where available, the case studies will incorporate any quality of life factors revealed from prior surveys, tourism trends, economic and overall prosperity indicators, health and safety factors, environmental aesthetics and the advances in green construction and design that have had a positive effect for the uranium-mining industries included in the case studies. If a particularly significant case study is addressing the major socioeconomic impacts needed for the Virginia study, and no survey instrument results are available, Chmura may determine that the population should be surveyed as part of the Virginia study. For the purposes of the project plan and the stated assumptions, this survey will be considered 'optional.'

Also, where possible and legally permissible, Chmura will provide live interview and video content from the interviewees and product-spokespersons into the case study components of the Chmura report. The proposed interviews with subject matter experts (SME) and industry experts (business and community leaders) will be provided to the residents and populations living and traveling to the study region. The interview content will be shared in the planned focus-group session in Chatham, Virginia.

Experience: Chmura has many years of experience analyzing economies for societal impacts that are part of the overall quality of life for communities. Our experiences extend from the rural coal-mining communities of southwest Virginia and Upstate Wyoming to the urban areas of Northern Virginia, Hampton Roads, and Richmond in Virginia; Chmura has multi-state level experience with analyzing regional prosperity indicators. An example of a prosperity index is provided in the Appendix of this document.

Contact Information

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Chmura History, Background & Experience

Chmura Economics & Analytics (Chmura) was founded by Christine Chmura in 1999. The firm is a women and minority owned small business¹² with headquarters in Richmond, Virginia. Chmura currently has ten professional staff members plus temporary support staff. A branch office was opened in Cleveland, Ohio in 2005. The firm specializes in applied economic consulting, quantitative research, and software solutions requiring the integration of advanced economic analysis. Work has included workforce and economic development, site selection, and impact

¹² SWAM number S-9700.

analysis. Chmura publishes Virginia Economic Trends, now in its tenth year, electronic publications and forecasts available via chmuraecon.com, and custom publications. Software products include JobsEQ®, currently in widespread use by economic development agencies throughout Virginia and the nation.

Chmura's multi-state client base includes economic developers, workforce practitioners, education reformers, firms seeking information and data to make sound decisions, governors and secretariats, chambers of commerce, lobbyists, developers, target marketers, counties and localities, firms and corporations seeking fiscal analysis for project and incentive-based discussions, as well as many other public and private entities with needs for credible information on a timely basis. Chmura served over 200 clients during the past two years with projects and services spanning a multitude of public and private entities. Furthermore, Chmura's online products currently serve over 9,000 international users and subscribers across the nation receive Chmura's weekly and quarterly publications.

Chmura Economics & Analytics is committed to achieving 100% customer satisfaction in all project engagements. Our philosophy is that when our customer succeeds, we have been successful. We exist because our customers exist. Therefore, we strive to create an atmosphere of 'shared risk' with our clients. By providing excellence and thoroughness in work and management, we are confident that the deliverables noted in this proposal will be achieved successfully. Our approach is built on performance management and the Malcolm Baldrige principles.

Issues Management History, Background & Experience

Founded in 1995, The Issues Management Group (IMG) is committed to assisting clients with action-oriented issues that affect their future.

The firm was created to provide clients with an opportunity to outsource complex projects and problems to a 'best in class' consulting team assembled for the specific issue. The firm has built its reputation by addressing challenging issues that others do not want to undertake. Assembling information on complex issues, identifying realistic and implementable solutions, and communicating data into understandable information is the hallmark of the firm.

The discipline of issues management enables preferred outcomes to be developed by anticipating issues, developing action plans, and placing ideas into action. Issues management, by design, is a considerably more proactive approach than crisis or problem management. Issues management provides a competitive advantage by anticipating problems before they occur. This philosophy is particularly applicable in controversial public policy decision-making processes.

Issues facing organizations today are typically complex and require a broad range of disciplines to be solved effectively and efficiently. The members assembled for the IMG Team on the uranium project have been selected because they offer the diversity of experience and the various skill sets required to address the issue.

IMG is a proactive, hands-on, project management firm. IMG distinguishes itself from traditional consulting firms through its ability to implement powerful ideas and strategies, its hands-on project management, and its long-term client relationships.

IMG is dedicated to working with government, business, and citizen leaders on issues that affect public policy and issues of lasting community interest. IMG has significant experience in public-private policy-making decisions and has been involved in facilitation and community leadership positions for over thirty years in the Southwestern Virginia Region. Members of the IMG team have served in leadership positions for dozens of community organizations in Southwest Virginia and these experiences provide the IMG team with a strong and unique insight into a broad array of contemporary issues facing the community and its citizens.

IMG believes strongly in the citizen input process. Its experience shows that citizens and local government leaders can work effectively together and can develop mutual respect. Indeed, citizens will actively participate if they believe the project is of value and the process is fair, open, and transparent. IMG is committed to new and unique strategies that result in furthering citizen participation.

Examples

See Appendix A for samples.

References

Chmura

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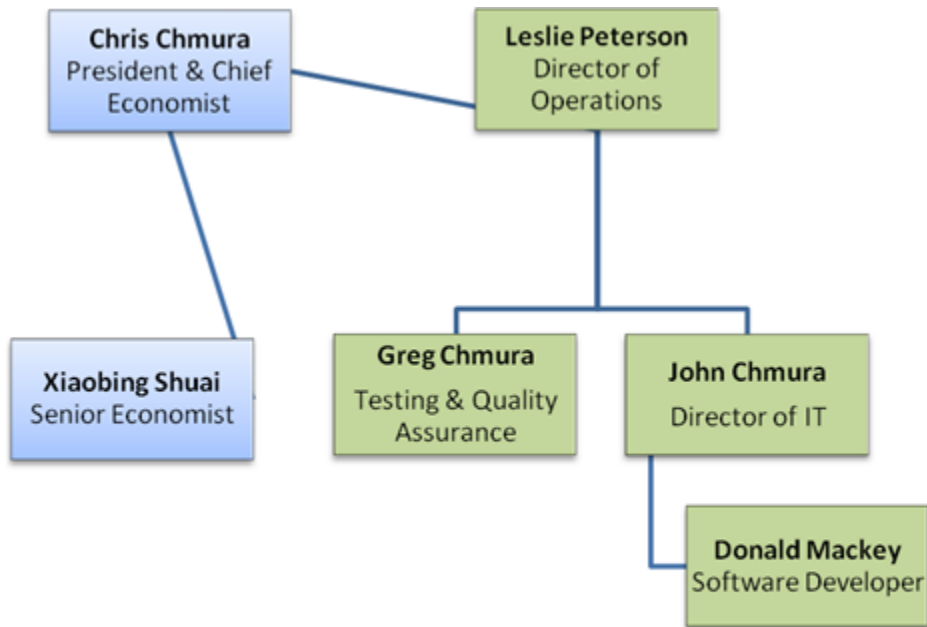
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Personnel

Chmura Economics & Analytics is a limited liability organization.



Project Manager: Christine Chmura, PhD, President

Prior to founding Chmura Economics & Analytics, Chris was the Chief Economist at Crestar Financial Corporation and prior to that an Associate Economist at the Federal Reserve Bank of Richmond. She received her Ph.D. in Business with a major in Finance and a minor in Economics from Virginia Commonwealth University in Richmond, Virginia.

Chris currently serves on the Governor's Economic Advisory Board of the Commonwealth of Virginia. She is a former member of Governor McDonald's Commission on Economic Development & Job Creation, the Virginia Commonwealth University Foundation Board of Trustees, the Board of the National Association of Business Economics, and the Governor Kaine's Commission on Climate Change. She's been described by Virginia Newswire as "a regular on the Virginia speaking circuit, [she] has built a following around the Old Dominion as one of the few non-academic economists with in-depth knowledge of the state." (Workforce Wizardry, April, 2004).

Chmura's Work Experience Related to Virginia's Energy Economies

Dr. Chmura has been analyzing the Virginia economy for nearly thirty years. Her analysis includes many industries including mining and milling economic impact analysis for the southwest Virginia local and regional economies. Moreover, she and has performed extensive research in the arena of economic development over the last eleven years.

Leslie Peterson

Partner, Director of Operations, Project Manager - Leslie has a passion for rural economic development, a disciplined scientific approach to research and applications, a heightened sense of customer care, and a sharpened desire for straightforward communication. Leslie is currently working toward a Certificate in International Economic Development with Georgia Institute of Technology. Prior to joining Chmura, Leslie worked in the chemical industry, including ten years at EASTMAN Chemical Company where she served as a world-wide sales coordinator, holds a commercially viable patent, and worked on the team that brought Eastman the coveted Malcolm Baldrige Award. Leslie is a LEAD VIRGINIA 2007 alumna and serves on The Governor's Commission on Higher Education Reform, Innovation, and Investment. Her professional memberships include the International Economic Development Council (IEDC), the National Association of Workforce Boards (NAWB) and the Virginia Association of Economic Developers.

Xiaobing Shuai

PhD, Senior Economist - Dr. Shuai conducts model building and regional and macroeconomic trend forecasting. His interest rate forecasts are published in the "Blue Chip Financial Forecasts." A prior senior analyst with Capital One Financial Corporation, he studied at the University of Wisconsin-Madison and obtained an M.A. in Agricultural Economics and a Ph.D. in Economics. Xiaobing won the NABE 2005 Contributed Paper Award, published in Business Economics; this paper investigated the economic relationship between Virginia's center cities and their suburbs.

John Chmura

Director of Information Technology - John Chmura created and maintained Chmura Economics & Analytics original information systems between 2000 and 2003. He temporarily left the firm between 2003 and 2005 to pursue his Master's in Computer Science from the School of Engineering at Case Western Reserve University with a specialization in Web and Data Mining. His expertise includes development and implementation of enterprise web and client/server systems, large relational databases systems, and data mining. John is a graduate of Kent State University in Kent, Ohio with a Bachelor's degree in Computer Information Systems. In December 2005, a paper written by John was published in the International Conference on Asian Digital Libraries meeting in Bangkok, Thailand.

Greg Chmura

Senior Statistician & Executive Editor - Greg directs Chmura's survey research which includes design, implementation, and analysis of business and consumer surveys. Greg is editor of our publications which include the quarterlies *Virginia Economic Trends* and *Ohio Economic Trends*. Further, Greg works with our IT department in software design and testing, documentation, and training. He earned Bachelor's of Science degrees in Mathematics and Physics from Cleveland State University. In further studies he earned a Certificate of Secondary Education. Greg was previously a professor at Cuyahoga Community College and has also worked in actuarial science.

Donald Mackey

Software Developer - Donald joined Chmura Economics & Analytics in 2008. Donald is a Graduate from DeVry University in Columbus, Ohio with a Bachelor's degree in Computer Information Systems. His experience includes

database development and management as well as web and application development. Donald also has a background in the hospitality industry.

Resumes for Assigned Personnel

Christine Chmura

Academic Background

Institution	Degree	Specialization	Date
Virginia Commonwealth University, Richmond, Virginia	Ph.D.	Finance Economics	1993
Dissertation: "An Investigation of Bank Lending Practices to Test Portfolio Theory and the Theories of Credit Rationing and Customer Relationships"			
Clemson University, Clemson, South Carolina	M.A.	Economics	1983
Thesis: "A Financial Market Analysis of Airline Deregulation"			
Clemson University, Clemson, South Carolina	B.S.	Business Administration	1981

Professional Portfolio

President and Chief Economist Chmura Economics & Analytics

(March 1999-present)

- Founder of a consulting firm that provides economic consulting ranging from firm-specific forecasting to workforce development. A 100-plus equation structural macroeconomic model serves as the central point of their forecasting of interest rates, national indicators, regional indicators, and firm-specific variables. They also provide commentary on economic and financial trends as well as regional and industry analysis. On the economic development side, they work with counties and regions to provide insight into industry and workforce trends.

Chief Economist and Senior Vice President of Quantitative Research and Economics Crestar Financial Corporation

(March 1993-March 1999)

- Expanded quantitative economic research capabilities beyond macroeconomic and interest rate forecasting to include forecasting consumer delinquencies and loan growth as well as estimating deposit elasticity.
- Strategic intent and risk management services were major focus areas for senior management consulting and included market area research for potential expansion.
- Additional contributions included writing the Weekly Economic Monitor which analyzes national economic and financial market trends as well constructing the monthly Virginia Leading which predicts changes in

economic activity.

**Economist and Vice President
Crestar Financial Corporation**
(May 1990-March 1993)

- Economic research and analysis of Virginia and the GWR, D.C., metropolitan area resulting in the identification of strategic opportunities for product-specific growth.
- Created a business cycle/loan portfolio assessment tool which enabled the corporation to assess the contribution of specific industry risk to the bank's overall loan portfolio.
- Research emphasis included real estate and defense which was used to direct industry and region-specific loan portfolio growth.

Newspaper Columnist

- (1999-present): Author monthly columns about the Virginia and national economy for the Richmond Times Dispatch.
- (1992-1994): Authored columns about the Virginia and national economy in the Capitol Forum newspaper and a column about the Richmond metropolitan area economy for the Richmond Business magazine.

Advisory Councils and Professional Service

- Governor Mark Warner, Finance Transition Team (2001)
- Virginia Commonwealth University Foundation Board of Trustees (2000-present)
- National Association of Business Economics Board of Directors (1999-2003)
- Harvard Discussion Group of Industrial Economists (1997-1999)
- American Bankers' Association Economic Advisory Board (1996-1999)
- Governor's Advisory Board of Economists (GABE) (1992-present)
- Blue Chip Financial Forecasts Contributor (1994-present)
- National Association of Business Economists Financial Advisory Board, (Chair 1996-1998; Officer 1994-1995)
- Governor's Commission on Defense Conversion and Economic Adjustment (GABE Liaison) (1992)
- Virginia Association of Economists, President (1992); Officer (1985-1991)
- Virginia Employment Commission Trust Fund Advisory Board (1991-present)
- Washington, D.C., Production Index Advisory Council, Board Member (1989-1990)
- Washington MSA Coincident/Leading Indexes Advisory Council, Greater Washington Research Center (1990-1994)
- Senate Committee on Commerce, Science, and Transportation; "The Impact of Defense Cuts on the Hampton Roads Economy," April 16, 1993.

Publications

- "A Loan Pricing Case Study," The Journal of Commercial Lending (December 1995).
- "The International Competitiveness of U.S. Banking," Proceedings of the 1991 Annual Symposium of the Institute for International Competitiveness, Co-authors Dan M. Bechter and R. Craig Carlock (March 1991).

- "An Assessment of Construction Activity in the Greater Washington Region," (Richmond: Crestar Financial Corporation, 1991).
- "The Exporter and the Nonexporter: A Profile of Exporting and Nonexporting Firms in the Southeast," Proceedings of the 1990 Annual Symposium of the Institute for International Competitiveness, Co-authors Dan M. Bechter and R. Craig Carlock (March 1990).
- "The Competitiveness of Rural County Manufacturing During a Period of Dollar Appreciation," Regional Science Perspectives, Co-author Dan M. Bechter (Winter 1989).
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- "Local Government Revenue and Expenditure Projections," in The Future of the Capital Area 2000/2010, Volume II (Richmond: William Byrd Press, 1988).
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- "Bibliography for Colleges and Universities of Materials on Economics, Monetary Policy, Money and Banking, and Financial Markets," Co-author James F. Tucker (Federal Reserve Bank of Richmond, 1986).
- "The Effects of Airline Regulation," The Freeman (August 1984).

Leslie Peterson**Academic Background**

Institution	Degree	Specialization	Date
Clemson University, Clemson, South Carolina		Business Administration	2000
CIMBA International Study Abroad Program, Asolo, Italy. Two semesters studies in Finance and Marketing.			
The University of Virginia, Wise, Wise, Virginia	B.S.	Biology/Chemistry	1982

Professional Portfolio

Director of Operations, Partner
Chmura Economics & Analytics
 (2002-present)

- 2003-current Georgia Tech Atlanta, GA
- Pursuing international certification in Economic Development
- Leads economic and workforce development-related projects.
- Specializing in technology-led economic development.
- Emphasis on rural development.
- Leads quality management endeavors.
- Strategy development.
- *Editor-in-Chief for the Virginia Economic Trends.*
- Contributor to eRural publication financed by U.S. Economic Development Authority.

EASTMAN Chemical Company
 (1990-1999)

- World Wide Chemicals Sales Coordinator
 - Completed sales training program for Eastman Chemical Company's regional sales managers.
 - Business Management Curriculum.
 - Malcolm Baldrige award team participant
 - ISO Best Practices
- Technical Representative
 - Increased sales from \$2.8 million to \$3.5 million for AQUASTAB® aqueous delivery systems for polyolefin stabilization and for detackifying high VA -containing ethylene vinyl acetate copolymers.
 - Proposed price-for-resale strategy resulting in reduced manufacturing costs for niche-market product lines gaining market access to lower cost rubber markets while utilizing capacity resulting in \$700,000 annual sales with 20% increase in earning from operations.
- Technology Coordinator
 - Hold patent for waterborne sulfopolyester hybrid latex resulting in strategic technology invention and a 7% increase in sales volume.

- Technical expert in coatings, inks, and adhesives products: i.e., Cellulose Acetate Butyrate and Propionate, EASTEK® waterbased resins, plasticizers and coalescents, resin intermediates such as CHDM Glycol, 5-SSIPPA and PIA and NPG Glycol, and Specialty Products such as Chlorinated Polyolefins, Sucrose Acetate Isobutyrate, and EPOLENE® Polymers.

Laboratory Manager**SICPA Druckfarben**

(1985-1990)

- Increased earnings 12% by implementing toll conversion strategies for commodity lacquers, varnishes, and primers.
- Served as in-plant technical representative at International Playing Cards, INC. in Rogersville, TN.
- Brand Identity Representative for Philip Morris, RJR, and Brown and Williams labels and folding cartons.
- Served as technical consultant to Philip Morris, RJR, Reynolds Metals, Kraft, and General Mills, to implement environmentally improved product lines for the food and cigarette manufacturing industries.
- Staff assistant to CEO - developed competitive reformulation strategies to increase earnings from operations by applying activity based costing systems.
- Specialize education and training in Aarberg, Switzerland, 1986--1989

Xiaobing Shuai**Academic Background**

Institution	Degree	Specialization	Date
University of Wisconsin-Madison, Madison, Wisconsin	Ph.D.	Economics	1999
Dissertation: "Foreign Direct Investment in Developing Countries: Motives, Structures, and Impacts"			
University of Wisconsin-Madison, Madison, Wisconsin	M.A.	Agricultural Economics	1997
Fudan University, Shanghai, China	B.S.	International Economics	1992
Graduated with honors.			

Professional Portfolio

Senior Economist**Chmura Economics & Analytics**

(2004-present)

- Develop macro economic model to forecast macro indicators and interest rates using RATS. Results published in Survey of Professional Forecasters by Philly Fed, and Virginia Economic Trend.
- Develop Virginia regional economic models to forecast regional economic growth and employment trends using RATS. Forecast published at Virginia Economic Trend.
- Developed Interest Rate forecast model. Forecast published at Blue Chip Financial Forecast. Housing index and mortgage rate forecast published at Housing Market Report.
- Research on rural and regional development, including target marketing study, and industry cluster analysis.
- Research workforce development issues, including occupation cluster analysis, labor market supply and demand forecast.
- Conduct economic impact studies using IMPLAN.
- Develop models to project education demand and supply.

Senior Analyst**Capital One Financial Corp**

(1999-2004)

- Researched on portfolio and industry level financial risk, making recommendations on corporate wide policy and standard regarding credit risk management.
- Developed statistical models (using SAS) to predict response to direct mail campaign, attrition, credit risks, and customer behaviors related to Small Business Segments.
- Conducted market research and segmentation studies.

Research and Teaching Assistant
University of Wisconsin-Madison
 (1994-1999)

- Researched on the land use and environmental issues for Philippines watersheds, co-authored several research papers.
- Taught Economic Statistics class (ECON310) with excellent evaluation

Accountant
Baosteel International Trade Corp (Shanghai, China)
 (1992-1994)

- Certified Accountant on export finance for a large trade company.
- Managed accounts of trade partners worldwide.

Publications

- Are center cities the engines of growth for their suburbs?—Evidences from Virginia's metropolitan areas, *Business Economics*, 40(4): 22-31, October 2005.
- Testing the income convergence among Virginia's cities and counties, *Forthcoming, Virginia Economic Journal*, Volume 10, 2005.
- Development policies, resource constraints, and agricultural expansion on the Philippine land frontier, with Ian Coxhead and Gerald Shively, *Environment and Development Economics*, 7(2):341-363, May 2002.
- Multinationals, information update and product adaptation, *International Economic Journal*, 14(2):41-66, Summer 2000.
- Agricultural development policies and land expansion in a southern Philippine watershed, with Ian Coxhead and Gerald Shively, in A. Angelsen and D. Kaimowitz (eds.) *Agricultural Technologies and Tropical Deforestation*, 347-365, London: CAB International, 2000.

Conference Presentations

- "Are center cities the engines of growth for their suburbs?—Evidences from Virginia's metropolitan areas", presented at the National Association for Business Economics 47th Annual Meeting, September 26th, 2005, Chicago.
- "Modeling the Fed action and the interest rates of the United States", presented at the 32th Annual Meeting of Virginia Association of Economists, March, 11th, 2005, Richmond, VA.
- "U.S. Economy in 2003 and its 2004 outlook", presented at 31th Annual Meeting of Virginia Association of Economists, March 18th, 2004, Richmond, VA.

Awards

- NABE Contributed Paper Award-2005, National Association for Business Economics
 - Henry Taylor Doctoral Dissertation Award—2000, University of Wisconsin-Madison.
-

Professional Affiliations

- Member of National Association for Business Economics
- Member of Richmond Association for Business Economics
- Member of Virginia Association of Economists
- Panel Member of Housing Market Report
- Panel Member of Blue Chip Financial Forecasters
- Panel Member of Philadelphia Fed Survey of Professional Forecasters

Robert W. Glenn, Jr.**Experienced CEO**

- Leader. Facilitator
- Mediator
- Project Manager
- Innovator
- Critical Thinker
- Change Agent
- Communicator.
- Technical Writer
- Think-Tank Leader
- Economic Development; Workforce Training; and Ethics, Governance, and Accountability.

PROFESSIONAL EXPERIENCE

The Issues Management Group LLC (IMG)

Roanoke, Virginia

Founder and Managing Member

6/95 to present

*A 'hands-on' consulting firm specializing in project management for complex client issues***The ONE O₂ Institute**

Roanoke, Virginia

Founder and Facilitator

2010 to present

*An 'umbrella' organization and 'think tank' including IMG and the following entities:***The Center for Ethics, Governance, and Accountability, Inc. (CEGA)**

Roanoke, Virginia – Internet-Based Corporation

Incorporator, Founder, President, and Treasurer

11/07 to present

*Promoting ethics as a competitive advantage to grant funding for the non-profit sector***TEC Solutions LLC (TEC)**

Roanoke, Virginia – SWaM-Certified Firm

Founder and Founding Managing Member

5/08 to present

*Providing non-traditional economic development strategies for small communities***The Sustainable Communities Partnership, Inc. (SCP)**

Roanoke, Virginia – 501 c(3) Charitable Non-Profit Organization

Incorporator, Preparer of IRS Application, Founding Executive Director

6/08 to present

Funding and managing collaborative community demonstration projects

Roanoke Gas Company

Roanoke, Virginia
Vice President
3/91 to 6/95
Natural Gas and Propane Public Utility Company

Appalachian Power Company

Roanoke, Virginia
Department Manager
6/79 to 3/91
Electric Power Public Utility Company

Anderson & Associates

Blacksburg, Virginia
Corporate Director
6/98 to present
Employee-Owned Engineering and Surveying Firm

Academic Background

Bachelor of Science in Electrical Engineering (BSEE)
North Carolina State University; Raleigh, NC
June, 1979.

Master of Business Administration (MBA)
Lynchburg College; Lynchburg, VA
May, 1989.

Management Development Program
Ohio State University; Columbus, Ohio.
May, 1990.

Management Development Program
Stone & Webster Engineering Consultants; NY.
May, 1993.

COMMUNITY LEADERSHIP - Present Involvement

Mr. Glenn has more than 30 years of community service experience in top leadership positions on the boards of key community organizations throughout the region. He retired from active service on community boards effective June 30, 2005 in order to: (1) renovate an historic building in Downtown Roanoke and (2) create The ONE O₂ Institute.

He remains passionate about the recruitment and mentoring of young professionals, workforce training for skills-based careers, the critical need for developing leadership in local communities, and non-traditional economic

development and job creation strategies for small and rural communities. He continues to engage in community projects when requested.

COMMUNITY LEADERSHIP - Previous Involvement

Chair

Roanoke Regional Chamber of Commerce
Board of Directors, 1991 to 1997.
Chair, 1996 to 1997.

Downtown Roanoke Incorporated
Board of Directors, 1992 to 1999.
Chair, 1997 to 1998.

Roanoke Redevelopment & Housing Authority
Board of Commissioners, 1988 to 1996
Chair, 1991 to 1993.

The Western Virginia Workforce Development Board
Board of Directors, 2001 to 2004
Chair, 2004 to 2005.

Virginia Museum of Transportation
Board of Directors, 1984 to 1992.
Chair, 1989 to 1991.

Roanoke Jaycees
President, 1984 to 1985; Chair, 1985 to 1986.

Executive Committee

United Way of Roanoke Valley (UWRV)
Executive Committee, Board of Directors
Chair of Fund Distribution Committee
1990 to 1996.

The Roanoke Valley Economic Development Partnership (RVEDP)
Executive Committee, Board of Directors
2000 to 2005.

The New Century Technology Council (NCTC)
Founding Director
1995 to 1998.

The Center for Innovative Leadership (CIL)
Founder, Founding Secretary/Treasurer; Executive Committee Member
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1998 to 2005.

The New Century Council (NCC)
Executive Committee, Board of Directors
1996 to 1999.

The Corridor Foundation, Inc. (I-73)
Board of Directors, Secretary/Treasurer, Founder
1999 to 2002.

Roanoke Community Development Corporation (RCDC)
Charter Director
1991 to 1994.

The Foundation for Regional Excellence (FRE)
Founder, 1997
Board of Directors, 1997 to 2007
President, 1997 to 2007.

Member of the Board of Directors

- Roanoke Foundation for Downtown Incorporated, Board of Directors, 1999 to 2003.
- Roanoke Valley Development Corporation, Board of Directors, 1997 to 2003.
- Blue Ridge Public Television, Board of Directors, 1993 to 1996.
- Roanoke Regional Homebuilders Association, Board of Directors, 1988 to 1990.
- Junior Achievement of Roanoke Valley, Board of Directors, 1984 to 1985.
- Lutheran Family Services, Board of Directors, 2002 to 2003
- ARC-Roanoke/CHD Industries, Board of Directors, 1986 to 1990.
- Lewis Gale Hospital Department of Psychological Medicine, Advisory Board, 1999 to 2003.
- Camp Virginia Jaycees, Board of Directors, 1984 to 1986.
- Plantation Village Homeowners Association, Board of Directors, President, 1980 to 1982.
- Highland Pointe Homeowners Association, Board of Directors, President, 1997 to 1998.
- St. Paul Lutheran Church, Church Council, Chair, 1985 to 1987.

Other Community Leadership – Committees, Task Forces, Political, Fraternal

- Boy Scouts of America, Assistant Scoutmaster, 1980 to 1982
- Governor Allen's Workforce Development Task Force, Member, 1995.
- Ferrum College, Career Advisory Board, Member, 1997 to 2002.
- Henry Street Revival Committee, City of Roanoke, 1986 to 1996.
- Total Action Against Poverty, Poverty Task Force, 1991 to 1992.
- The Economic Development Partnership, Developers Committee, 1990 to 1995.
- Virginia Western Community College, Advisory Committee, 1991 to 1993.
- Roanoke College Center for Community Research, Advisory Board, 1993 to 1995.
- Rotary Club of Roanoke Valley, Member, 1987 to 1991.
- Rotary Club of Roanoke, Member, 1991 to 1994.

- Fitzpatrick for City Council, Chairman, 1988
- Action '94, Joint Founder, 1993 to 1994.
- Alpha Phi Omega (National Service Fraternity), Member, 1978 to 1979.

AWARDS & HONORS (Selected)

- Eagle Scout, Boy Scouts of America, 1972.
- Brotherhood Member, Order of the Arrow, Boy Scouts of America, 1971.
- Virginia Jaycees Life Membership, 1986.
- Outstanding Young Man Award, Roanoke Jaycees, 1986.
- Roanoke Regional Homebuilders Association, Raymond Bryant Memorial Award, 1990.
- American Gas Association (AGA), Communications Award for Public Relations, 1994.
- LEED Certification (Leadership in Energy and Environmental Design) from the USGBC (US Green Building Council), 2007.
- Virginia Historic Rehab Award (juried competition) for the renovation of the Historic State and City Building in Downtown Roanoke, Virginia, 2007.
- Outstanding Young Men of America, 1983, 1984, 1985, 1986, 1987, 1988.
- Who's Who of Emerging Leaders in America, 1987, 1988, 1989, 1990.
- Who's Who in the South and Southwest, 85/86, 87/88, 89/90, 91/92, 93/94.
- Who's Who in America, 1988, 1989, 1990, 1991, 1992, 1993.

PUBLICATIONS (Selected)

- *Partisanship is not Leadership*. Robert W. Glenn, Jr.; © February 28, 1996; The Roanoke Times.
- *Roanoke Gas Company, 1883 to 1997, Celebrating the Proud History of a Hometown Gas Company*. Robert W. Glenn, Jr.; ©1997.
- *Leading Toward the New Century: Community Groups Need Clarity and Connectivity*. Robert W. Glenn, Jr.; © November 16, 1997; The Roanoke Times.
- *Successful Change Management: Lessons from Southwest Virginia*. Robert W. Glenn, Jr.;
- © June, 1998; Transformations in Public Health, National Association of City and County Health Officials (NACCHO) Volume 1/ Issue 2.
- *Smyth County Industrial Council – Demand Plan – Workforce Training Report*. The Issues Management Group, © 2003.
- *Smyth – Washington Counties – Regional Industrial Facilities Authority – Workforce Training Study: “Workforce Training Deficiencies that Hinder Industrial Development: An Identification of the Problem and the Needs”* – The Issues Management Group, © 2004.
- *White Paper: Proposed WIB III System Changes - “Creating A Preferred Future”* – Western Virginia Workforce Development Board of Directors – Robert W. Glenn, Jr., © 2005, www.westernvaworkforce.com
- *Blogs and Articles* – Robert W. Glenn, Jr. – “The Center for Ethics, Governance, and Accountability” (CEGA) – www.centerega.com – © 2009, 2010.

CONTACT INFORMATION

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The Issues Management Group

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Cell: (540) 520-2591

Email: rglenn@issuesmgmtgroup.com

Website: www.issuesmgmtgroup.com



Lisa Catron Ison

3453 Periwinkle Lane
 Roanoke, VA 24014
 (540) 525-5194

ADMINISTRATIVE, ORGANIZATIONAL, AND MANAGEMENT SKILLS:

- Excellent organizational skills with ability to prioritize and handle numerous projects simultaneously.
- Experienced small business owner totally responsible for day-to-day management and operation.
- Knowledgeable in research and preparation of data for various reports, grants, and official documents.
- Experienced in the preparation, management, and administration of budgets.
- Experienced in application and administration of loan and grant programs through local, State, and Federal sources.
- Experienced in management of industrial property and commercial property.

HUMAN RELATIONS AND COMMUNICATION SKILLS:

- Able to communicate verbally and in writing--clearly, concisely, and effectively.
- Active listener--able to help others by listening to their problems, experiences, and offer possible solutions.
- Able to develop excellent rapport with business and government leaders as well as peers.
- Able to handle crisis situations and interruptions while coordinating and managing multiple tasks simultaneously.

EDUCATION

- Wytheville Community College: AAS, Business Management, 1985
- Economic Development Institute, Certificate, Virginia Tech, 1993

EXPERIENCE

The New Century Venture Center, Salem, VA, 3/1/96 to 9/30/09, President. Instrumental in the start-up of a small business incubator which opened in July 1996. Manage the day-to-day operations of the Center and a satellite location in adjoining Franklin County. The purpose of the Center is to nurture young and start-up companies through the early stages of development to make them successful. Duties include business planning, counseling, networking, support of growth and development of young and start-up companies. Responsible for all accounting, budgeting, fundraising, and administration of grants. Involved in local, regional, state, national and international incubator efforts. Development and coordination of all Center programs, including seminar scheduling, marketing, recruitment of advisors and volunteers, and media coverage for all Center events and tenants. The Center is a 501(c)3 corporation, with a 9-member Board of Directors. Staff includes two part-time employees.

Montgomery County Department of Economic Development, Christiansburg, VA, 11-92 to 3-96, Product Development and Financing Associate. Responsible for projects which effect the economic base of the community such as the Shell Building program, expansion projects of existing industries, and development of industrial parks. Extensive coordination of activities between the Department, the IDA of Montgomery County, and MBC

Confidential

Development Corporation to ensure the timely completion of these and other initiatives. Responsible for the effective coordination and detailed working relationships between the Department and the organizations staffed, other county agencies, and various outside entities. Responsible for grant writing and loan applications, and accurate loan administration and management. Other responsibilities include: exploring financing options for projects; providing detailed staff support services to the IDA and MBC; performing property management functions for the former Health-Tex property; administration and management of outstanding loans awarded through the IDA and MBC; processing numerous confidential and sensitive documents in addition to those necessary for the efficient day-to-day operation of a professional organization; prioritizing projects to meet specific deadlines and project goals; represent the Department, IDA, and MBC at various networking opportunities, such as workshops, seminars, and social events.

Virginia's Center for Innovative Technology, Dublin, VA 1989-1992, Executive Assistant for Technology Transfer Program. Worked with existing industries to find ways to improve and grow their businesses.

Employment prior to 1989 available upon request.

MEMBERSHIPS:

- National Business Incubation Association -- Board of Directors, 6 years, Board Chair in 2005; Chairman, Education & Membership Committees;
- Virginia Business Incubation Association B Founding President, 5 year board tenure
- Goodwill Industries Board of Directors, 2005 - present; Chair of Business Development Services Committee 2007-09; Chair, Nominating Committee, 2008-09; Secretary 2007-09; Goodwill Industries Advisory Board, 2000 - present
- Smith Mountain Lake Chamber of Commerce – Board of Directors 2005-2008; 2007 and 2008, Treasurer.
- Appalachian Regional Commission Business Incubation Steering Committee – 1998 to present
- ARC Incubation Mentor – 1998 to present
- ARC/TVA/NBIA Peer-to-Peer Review Team – 2008-present

Broadus Chewing Fitzpatrick

Current Activities

- Director-Christian Mission Foundation
- Director-Executive Board-Blue Ridge Mountains Council-Boy Scouts of America
- Secretary, Director, Member of the Executive Committee– FRIENDS of the Blue Ridge Parkway
- Member – Habitat for Humanity Builders Team
- Disaster Recovery Team – Presbyterian Disaster Assistance; Team Coordinator-2nd Presbyterian Church and St. John's Episcopal Church, Roanoke, Virginia; North Carolina Baptist Builders; Virginia Baptist Mission Board; Lutheran Disaster Relief; Alabama Emergency Relief Task Force
- Construction Team - Solid Rock Missions - San Juan de la Maguena, Dominican Republic
- Construction Team – Appalachia Service Project, Hallie, Kentucky, Chavies, KY
- Adult and Senior High Sunday School Teacher - 2nd Presbyterian Church, Roanoke, Virginia
- Legal Advisor - Catawba LandCare

Education

- B. A. - Foreign Affairs - The University of Virginia
- Juris Doctor - The University of Richmond
Queens' College, Cambridge University: Studies in International Law and Law of the Seas

Professional Designations

- Member of the Bar of the Supreme Court of the United States
- Member of the VIRGINIA STATE BAR; Member of the Roanoke Bar Association

Past Memberships and Activities

- Ruling Elder; Chair-Congregational Care Committee; Bible Study Leader; Confirmand Mentor; Senior High Advisor and Leader - 2nd Presbyterian Church, Roanoke, Virginia
- Vice President - Christian Mission Foundation
- Director - National Board of Trustees - Leukemia Society of America
- Vice President - Virginia Board of Trustees - Leukemia Society of America
- Director - Virginia YMCA
- Board of Governors - VIRGINIA STATE BAR - Trusts & Estates Section
- President - Craigs Creek Watershed Association
- Director - Virginia Selective Service System
- Chairman - Family Service Roanoke Valley
- President - Council of Community Services, Roanoke Valley
- Director – Blue Ridge Soil and Water Conservation District-Representing, The City of Roanoke

- Vice President, Chair of Executive Committee; Member Development and Nominating Committees - Western Virginia Land Trust
- Chairman - Advisory Board - Nursing Education - Community Hospital College of Health Sciences- (Jefferson College)
- Secretary and Board Member - Habitat for Humanity
- Director and Legislative Liaison - Child Abuse Prevention Council
- Director - Blue Ridge Zoological Society
- Director - DePaul Children's Services
- Director - Roanoke's Festival in the Park
- Mentor - VIRGINIA STATE BAR (teaching law to 4th graders!)
- Director - Roanoke Bar Association
- John Marshall Fellow – VIRGINIA STATE BAR
- Trustee – Presbytery of the Peaks
- Judge - Mid Atlantic Regional Moot Court Competition
- Board Member and Legal Advisor - Good Samaritan Hospice
- Director - Price Ripley Memorial Foundation
- Legal Advisor - Pathfinders for Greenways
- Member - Ferrum College Estate Planning Council
- Member - Jefferson Center Foundation-Planned Giving Council
- Mentor - Roanoke Bar/Roanoke Public Schools "Barrister Bookbuddies" Program (reading to 1st through 4th graders)
- Mediator - Conflict Resolution Center, Roanoke, VA

Contact Information

BROADDUS C. FITZPATRICK

116 27th Street, S. E.
 Roanoke, Virginia 24014
 (540) 344-3680 (Home)
flyfishing@cox.net

The ONE O2 Institute
 102 W. Campbell Avenue
 Suite 2C
 Roanoke, VA 24011
 (540) 529-8646
Broaddus@oxygen102.com
 BCF 2010

Glenn L. Pfennigwerth

- 30 years of enriched uranium processing technical, engineering, and operational experience
- Broad experience in chemical recovery, casting, rolling, forming, machining, and materials
- Programmatic and supervisory experience in Non-destructive Analysis of EU Holdup
- Seasoned leadership, communication, and problem-solving skills – builds effective teams
- Strong combination of technical, management, and project management skills
- Provides sound, innovative, and unique solutions to non-routine issues and problems
- Coordination of compliance, production, support organization and customer needs

Education:

M. S. Chemical Engineering, Michigan Technological University, Houghton, MI (1981)
B. S. Chemistry, Geneva College Beaver Falls, PA (1978)

Employment: Y-12 National Security Complex, Oak Ridge, TN 37831

January, 2008 to Present: Senior Technical Advisor, Engineering Division
Provide technical and operations perspective to innovation and growth opportunities
Consult with NNSA, contractor, and commercial entities on enriched uranium topics
Support Non-proliferation projects and activities
Review Research and Development project proposals
Provide focus on uranium technology, development, and business activities

Spring 2004 to January, 2008: Senior Process Engineer, Manufacturing Processes and Program Manager for the Uranium Holdup Survey Program and Supervisor of the Non-destructive Analysis (NDA) Staff (Dual role)

Provide high-level technical guidance to Production Managers
Perform ad hoc technical projects – programmatic, process, and university studies

Program Supervise 12 NDA Engineers and Technicians performing holdup measurements for accountability and criticality safety purposes

Mentor and advise Process Engineering Staff on technical and engineering issues

Chairman, Startup Review Board, Management Oversight of production startups

Provide technical direction for proposed new enriched uranium facility (~\$1B)

1996 to Spring 2004: Manager of Special Technical Support Staff:

Special technical investigations, studies, proposals, and planning

Developed numerous new business, capital equipment, and strategic proposals

Manage Non-destructive Analysis/Holdup Measurement staff

Manage implementation of inventory and accountability systems in major facilities

1988 to 1996: Technical Support Manager for Enriched Uranium Operations:

Managed staff of 22 engineers, procedure writers, and technical support personnel

Project Manager, Rolling and Forming Restoration – equipment now operational

Team lead for response to January 1992 anhydrous hydrogen fluoride (HF) spill

Conceived and sponsored \$26M HF production equipment Line Item construction project

First implementation of Document Management Center for records retention

Restart Manager for Enriched Uranium Operations after stand down:

Generated comprehensive restart schedule and closure criteria for all scheduled tasks

Specified requirements for Engineering products, including baseline drawings

Developed and implemented “Cold Start” strategy for metalworking operations

Daily Production coordination of initial startup of metalworking operations

1981 to 1988: Development Engineer, Uranium Process Technology:

Lead Engineer for technical input to large capital improvement project (\$54M)

Solvent Extraction system control and improvements development
Production Plant Assistance Support for production problem diagnostics

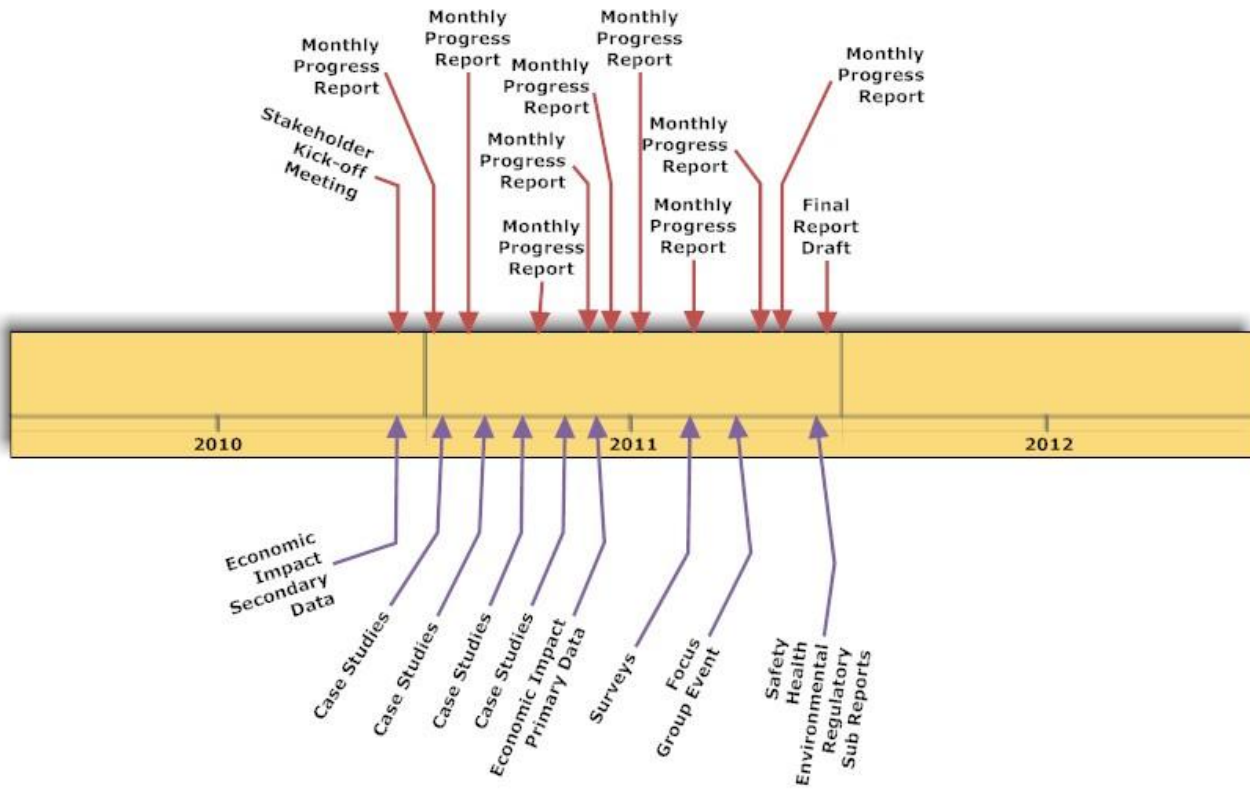
Contact Information

Y-12 National Security Complex
P.O.Box 2009
Oak Ridge, TN 37831-8112
(865) 574-1715



Project Plan, Timeline, and Price

Deliverable	Start Date	Resource	Stakeholder Engagement	Public Meetings	Completion Date
Item I: Economic Development	12/7/2010	Chmura, IMG	Stakeholder Group	Stakeholder Group	10/1/2011
Item II: Government Services & Regulation	3/7/2011	Chmura, IMG	Stakeholder Group	Chatham, VA	10/1/2011
Item: Public Health & Environment	7/7/2011	Chmura, IMG	Stakeholder Group	Chatham, VA	10/1/2011
Item IV: Social Impacts	9/7/2011	Chmura, IMG	Stakeholder Group	Stakeholder Group	10/1/2011



Price: \$200,000

Statement of Assumptions

The key assumptions underlying our case-study approach is whether the potential uranium mining and milling operations in Chatham will utilize the similar technologies and management with other uranium operations in the country. Depending on these discoveries, the projected size, economic and social impacts of the uranium mining and milling in Virginia can be estimated accordingly. Another major assumption is if there is sufficient sustained market demand for uranium, so that the ongoing operations of the mine can sustain that demand as long as it is technically feasible. For example, this study does not address potential impact of any demand for nuclear energy decline sharply in the short term—Chmura is not forecasting the demand for uranium in this approach.

Other assumptions include:

1. The Steering Committee will be available for several preliminary meetings to fine-tune the scope of work.
2. The Steering Committee expects the Chmura team to discuss the project with Virginia Uranium.
3. The Steering Committee will assist in establishing a collaborative connection between the Chmura Team and NAS.
4. The Steering Committee will assist in making state staff available to the Chmura Team.

Appendix: Examples of Related Projects

Chmura

a. Example of Economic Impact Study

Executive Summary

The analysis estimates the economic impact of a plant built by XYZ FIRM on ABC County, Virginia. The economic impact is estimated through associated employment and spending effects for the projected start-up in 2007 and full capacity in 2012. The analysis also estimates the revenues generation for local and state governments.

Chmura uses IMPLANPro¹³ modeling software to estimate the economic impacts. The software is widely used by economists interested in projecting the broader impact of a discrete economic event, such as the expansion of a company into a region.

Jobs, Wages and Benefits

¹³ IMPLANPro was created by the Minnesota IMPLAN Group (MIG), Inc.

XYZ FIRM estimates that **60 jobs** will be created in 2007 and up to **250 jobs** at build-out in 2012. As a result, **\$11 million** in sales (revenue generated by the plant, including employee compensation and raw material costs, minus profits) is expected in 2007, and **\$51 million** in sales is expected in 2012 for Nestle Waters.

Through direct, indirect and induced spending, a total of approximately **101 jobs** will be created in 2007 and up to **421 jobs** in 2012.

Tax Contribution

An investment by XYZ FIRM will generate additional tax revenue for both ABC County and the Commonwealth of Virginia. At start-up in 2007, the XYZ FIRM operation is expected to lead to a **tax gain of \$780,000**, including **\$420,000** for ABC County and **\$360,000** for Virginia.

At build-out in 2012, XYZ FIRM operations will contribute an estimated **\$2.5 million** in tax revenue annually, with **\$1.2 million** going to ABC County and **\$1.3 million** to Virginia.

Overall Spending

The XYZ FIRM investment will generate approximately **\$14 million** in annual spending for the local economy in 2007 and nearly **\$64 million** in annual spending in 2012.

Analysis

An expansion by XYZ FIRM to ABC County is expected to initially create **60 jobs** in 2007 at start-up and up to **250 jobs** in 2012 at build-out.¹⁴ As a result, XYZ FIRM is expected to spend about \$11.0 million on payroll and materials in ABC County in 2007 and \$51.2 million in 2012.¹⁵ Through direct, indirect, and induced spending, a **total of approximately 101 jobs will be created in 2007 and up to 421 jobs in 2012.**¹⁶ In total, the XYZ FIRM start-up is expected to generate **\$13.6 million** total economic impact on the community in 2007 and **\$63.8 million** in 2012.

An expansion of XYZ FIRM operations into ABC County will increase tax revenue for the state and local governments. **At start-up in 2007, XYZ FIRM operations are expected to lead to a tax gain of \$780,000 for both the state and local government, including \$420,000 for the County of ABC and \$360,000 for the state.**¹⁷ The largest contributor to this figure is the real estate tax, which will generate an estimated \$190,000 for ABC County in 2007. In addition, the XYZ FIRM operation will directly generate \$126,000¹⁸ from the manufacturing

¹⁴ Direct employment estimates are provided by the XYZ FIRM.

¹⁵ The direct spending figure is representative of gross sales minus profits. As a result, it includes spending on labor, equipments, and other inputs. IMPLAN estimates revenue by treating the firm as a stand-alone business. CEA backed profits out of the direct spending for this study.

¹⁶ Direct impact is defined as economic activity generated by the project under consideration. Indirect Impact is the secondary economic activity that is generated by the project. An example is a new manufacturing facility generating demand for supplies used in production. Induced impact is identified as economic activity generated by labor income resulting from direct and indirect impacts.

¹⁷ This number includes tax impact from direct, indirect and induced impact.

¹⁸ For the manufacturing and machinery tax, only the direct tax impact is estimated.

machinery tax and \$80,000 from the total personal property tax impact for ABC County. Local and state sales tax contributions are estimated to be \$120,000. In addition, XYZ FIRM operations are estimated to lead to an increase of \$120,000 in personal income tax and \$150,000 in corporate income tax at the state level.

At build-out in 2012, XYZ FIRM operations will contribute an estimated \$2.52 million in total tax revenue to the state and local governments annually, with \$1.19 million in local government tax revenue and \$1.32 million for the state. The real estate tax effect will be \$410,000, which will go to ABC County. In addition, the local government is expected to receive \$80,000 in personal property taxes (direct, indirect, and induced) as well as \$590,000 for the manufacturing machinery tax (only direct effect). Local and state sales tax revenues¹⁹ are estimated to be \$530,000 in government revenue (direct, indirect, and induced).²⁰ For the state, XYZ FIRM operations would contribute an expected \$540,000 in personal income tax revenue as well as \$370,000 in corporate income tax revenue (direct, indirect, and induced).

Economic Impact: 2007

- Based on the 60 employees XYZ FIRM estimates at the initial start-up, the expansion will directly create nearly \$11.0 million²¹ in spending on payroll and supplies in ABC County in 2007 (**Table 1**).

Table 1: Employment and Spending Effects of Start-up, 2007				
	Direct	Indirect	Induced	Total
Employment	60	22	19	101
Spending	\$10,950,000 ²²	\$1,610,000	\$1,070,000	\$13,630,000

- The indirect effects, which result from industries in ABC County that sell to Nestle Waters, are estimated to create 22 jobs and \$1.6 million in spending.
- Induced effects result when workers who are employed by XYZ FIRM spend their wages in ABC County. These effects will create an additional 19 jobs and nearly \$1.1 million in spending.
- In total, a XYZ FIRM expansion would create an estimated 101 jobs and \$13.6 million in spending for the local economy on an annual basis.
- The indirect and induced effects of XYZ FIRM operations spill over into other industries. In terms of job creation, wholesale trade, food services, and drinking places are the largest beneficiaries. The wholesale

¹⁹ Estimates for state sales tax should be viewed as conservative because the impact study area is limited to ABC County. In reality, the economic impact of the expansion will extend beyond the political boundary of ABC. Consequently, the economic impact will be larger.

²⁰ One percent of sales taxes go to the locality and the remainder to the state.

²¹ The direct spending figure is representative of gross sales minus profits. As a result, it includes spending on labor, equipments, and other inputs. IMPLAN estimates revenue by treating the firm as a stand-alone business. CEA backed out profits for this study.

²² Profits are backed out of the direct spending figure since XYZ firm is headquartered outside of Virginia.

trade industry and the owner-occupied dwellings industries are estimated to reap the largest gains in terms of gross receipts (**Tables 2 and 3**).

Table 2: XYZ FIRM Impact (Indirect and Induced) on Industry Employment, 2007

Industry	Employment
Wholesale trade	10
Food services and drinking places	4
Truck transportation	4
Food and beverage stores	2
Management of companies and enterprises	1
Nursing and residential care facilities	1
Plastics plumbing fixtures and all other plastics	1
Automotive repair and maintenance- except car wash	1
Gasoline stations	1
Depository credit intermediaries	1

Table 3: XYZ FIRM Impact (Indirect and Induced) on Industry Spending, 2007

Industry	Industry Spending
Wholesale trade	\$1,080,000
Owner-occupied dwellings	\$460,000
Truck transportation	\$410,000
Real estate	\$260,000
Management of companies and enterprises	\$260,000
Plastics plumbing fixtures, all other plastics	\$220,000
Food services and drinking places	\$190,000
Other State and local government enterprises	\$160,000
Depository credit intermediaries	\$120,000
Telecommunications	\$110,000

- The taxes generated by the XYZ FIRM start-up will total an estimated \$780,000 in revenue for the state and local governments in 2007 (**Table 4**). With the exception of the manufacturing machinery tax, all tax estimates are based on total tax impacts (direct, indirect, and induced) from IMPLAN. For the manufacturing and machinery tax, only the direct tax impact is estimated for 2007 (\$130,000).

Table 4: Tax Effects of Start-up, 2007

Tax Items	Total Effect
County Tax	
Real Estate Tax	\$190,000
Personal Property Tax	\$80,000
Manufacturing Machinery Tax	\$130,000
Local Sales Tax	\$20,000
County Tax Total	\$420,000



State Tax Impact	
Personal Income Tax	\$120,000
State Sales Tax	\$90,000
Corporate Income Tax	\$150,000
State Tax Total	\$360,000
Total Tax	\$780,000

- Real estate taxes are estimated to generate \$190,000 in revenue for ABC County, including \$140,000 paid by XYZ FIRM plant directly. The personal property taxes are expected to be \$80,000 in 2007.²³
- Based on \$14 million in machinery costs at start-up,²⁴ the manufacturing machinery tax directly contributes an estimated \$130,000 to ABC County revenue.²⁵
- Personal income tax revenue is estimated to be \$120,000 in 2007.
- The sales tax rate in Virginia is 5%, of which 4% is received by the state and 1% is returned to the locality. These taxes are estimated to generate a total of about \$120,000 in government revenue in 2007.
- In Virginia, the corporate income tax rate is 6%. Increased corporate income tax, due to this project, is estimated at \$150,000 in 2007, with the majority of them coming from direct impacts.²⁶

Economic Impact: 2012

- Based on the 250 employees that XYZ FIRM expects to employ at build-out in 2012, the expansion into ABC County will directly generate over \$51.2 million in payroll and purchases of supplies and equipment (*Table 5*).

Table 5: Employment and Spending Effects of Build-out, 2012				
	Direct	Indirect	Induced	Total
Employment	250	93	78	421
Spending	\$51,220,000 ²⁷	\$7,720,000	\$4,890,000	\$63,830,000

- When XYZ FIRM purchases supplies and services (indirect effects) from firms in ABC County, another 93 jobs will be created as well as \$7.7 million in spending each year starting with 2012.

²³ The direct personal property tax is estimated to be \$76,500. Both direct tax numbers come from XYZ firm.

²⁴ The \$14 million in manufacturing and machinery costs are estimated by the XYZ FIRM Company.

²⁵ According to ABC County, the manufacturing machinery tax is \$1.80/\$100 at 50% of the original capitalized cost for the first 5 years; 42% thereafter.

²⁶ The direct corporate income tax number, \$150,000, comes from XYZ Firm.

²⁷ Profits are backed out of the direct spending figure since XYZ firm is headquartered outside of Virginia.



- Starting in 2012, annual spending by workers employed at XYZ FIRM(induced effects) is expected to create 78 jobs and \$4.9 million in spending in ABC County.
- The total annual impact of XYZ FIRM on ABC County beginning with 2012 is estimated to be 421 jobs and \$63.8 million in spending.

Similar to the start-up impact, the largest beneficiaries in terms of job creation are wholesale trade, food services, and drinking places (**Tables 6 and 7**). In terms of gross receipts, the greatest spill over effect is expected to occur in the wholesale trade and truck transportation industries.

Table 6: XYZ FIRM Impact (Indirect and Induced) on Industry Employment, 2012

Industry	Employment
Wholesale trade	40
Food services and drinking places	18
Truck transportation	15
Food and beverage stores	8
Management of companies and enterprises	6
Nursing and residential care facilities	6
Plastics plumbing fixtures and all other plastics	5
Automotive repair and maintenance- except car wash	4
Gasoline stations	3
Depository credit intermediaries	3

Table 7: XYZ FIRM Impact (Indirect and Induced) on Industry Spending, 2012

Industry	Industry Spending
Wholesale trade	\$5,050,000
Truck transportation	\$1,820,000
Owner-occupied dwellings	\$1,720,000
Management of companies and enterprises	\$1,350,000
Real estate	\$1,240,000
Plastics plumbing fixtures and all other plastics	\$1,030,000
Food services and drinking places	\$880,000
Other State and local government enterprises	\$780,000
Depository credit intermediaries	\$560,000
Telecommunications	\$480,000

- Taxes generated from the operation of XYZ FIRM are estimated to be \$2,520,000 in 2012 (**Table 8**). All tax estimates are based on total tax impacts (direct, indirect, and induced) from IMPLAN, with the exception of the manufacturing machinery tax, for which only the direct impact is estimated.



Table 8: Tax Effects of Build-out, 2012	
Tax Items	Total Effect
County Tax Impact	
Real Estate Tax	\$410,000
Personal Property Tax	\$80,000
Manufacturing Machinery Tax	\$590,000
Local Sales Tax	\$110,000
County Tax Total	\$1,190,000
State Tax Impact	
Personal Income Tax	\$540,000
State Sales Tax	\$420,000
Corporate Income Tax	\$370,000
State Tax Total	\$1,330,000
Total Tax Impact	\$2,520,000

- The real estate and personal property taxes are estimated to increase ABC County government revenues by \$410,000 and \$80,000, respectively in 2012 and each year thereafter. The direct real estate tax, paid by XYZ FIRM to the county, is estimated at \$200,000.²⁸
- Based on total machinery build-out costs of \$70 million,²⁹ an estimated \$590,000 in manufacturing machinery tax will be generated for ABC County in 2012.
- An estimated \$540,000 in state government revenue is expected to result from the personal income tax.
- State and local sales taxes are expected to contribute \$530,000 in for state and local governments in 2012 and each year thereafter. Of the current 5% sales tax, 4% is received by the state and 1% is returned to the county; therefore, state sales tax revenue would be \$420,000 while local sales tax revenue would equal \$110,000.
- Increased corporate income taxes, due to this project, are estimated to be \$370,000 in 2012 and each year thereafter. This number includes \$350,000 in direct corporate income tax paid by XYZ FIRM to the state.³⁰

Glossary

IMPLAN Professional is an economic impact assessment modeling system. It allows the user to build economic models to estimate the impacts of economic changes in states, counties, or communities. It was created in the 1970s by the Forestry Service and is widely used by economists to estimate the impact of specific events on the overall economy.

²⁸ The direct tax impact of real estate tax and personal property tax are estimated by XYZ Firm.

²⁹ \$70 million in machinery costs is estimated by the XYZ FIRM Company. It includes \$14 million equipment cost to start the operation.

³⁰ The direct corporate income tax estimate comes from XYZ firm.

Input-Output Analysis—an examination of business-business and business-consumer economic relationships capturing all monetary transactions in a given period, allowing one to calculate the effects of a change in an economic activity on the entire economy (impact analysis).

Direct Impact—economic activity generated by a project or activity under consideration.

Indirect Impact—secondary economic activity that is generated by a project or operation; an example might be a new office building generating demand for parking garages.

Induced Impact—economic activity generated by labor income resulting from direct and indirect impacts.

b. Example of Focus Group Events

i. Focus Groups Voiced Taking a “Business First” Approach

The citizenry of Southern Virginia provided insight through focus groups that debated the technology selection aspect of strategic planning in light of the current strengths of the region.³¹ The focus groups support a common vision of higher education and business working together to bring about the transformation of Southern Virginia.

The focus groups³² were convened to gather background on the issues that need to be addressed in the strategic plan. Outputs from these groups helped frame the strategic plan’s strategic initiatives and core strategies. The focus groups were attended by stakeholder categories from private businesses, economic developers, locally elected officials, educators, entrepreneurs, philanthropies, and community visionaries. The table below summarizes the size, location and dates for the focus groups.

Southern Virginia Focus Group Meetings			
Sub-region	Location	Date (2006)	Number of Attendees*
Piedmont	Martinsville	August 2	14
Northern	Farmville	August 7	18
South Central	South Hill	August 8	18
Western	Altavista	August 9	8
Eastern	Blackstone	August 10	15
Piedmont	Danville	August 12	15

*Does not include focus group leaders (Christine Chmura & Leslie Peterson of Chmura Economics & Analytics).

³¹ Nanotechnology processes in 1) Aerospace, National Defense and Homeland Security, Energy, Environmental Improvements, Information Technologies, Medicine and Health, Transportation and Civil Infrastructure, Bio-Sciences (includes overlap to Nanotechnology), Information Technology (includes overlap to Nanotechnology), Global Logistics, Homeland Security (Includes overlap to Nanotechnology), Sustainable Energy (Includes overlap to Nanotechnology), Technologies for the Aging (Includes overlap to Nanotechnology), Motorsports and model simulation.

³² Chmura conducted six focus group sessions across the Southern Region.



ii. IV. The CTC Strategic Compass

1. Understanding the Challenges; Building on Strengths

Regional economies are constantly in a state of flux. Those that are growing are transitioning toward expanding industries at a faster pace than they are losing industries. That is not the case in most Southern Virginia regions where declining manufacturing firms have made up such a large proportion of the industry base that economic development successes have not overcome the losses. For example, during the three years ending with the third quarter of 2005, manufacturing employment fell by 7,000 in Southern Virginia while the higher-paying professional business services sector, which makes up 10 percent of total employment, added only 2,500 jobs. In Virginia, however, manufacturing-firms lost 23,000 jobs over the same period while professional business services more than made up for the loss by adding 69,000 jobs.

Unfortunately, the skill base is low for many workers in Southern Virginia who have lost their jobs over the last decade. This creates the secondary challenge of educational attainment that is critical in an increasingly global market where America’s competitive advantage is its knowledge base that leads to enhanced productivity and innovation.

In 2000, only 68 percent of the population in Southern Virginia age 25 and older had at least a high school degree compared with 81 percent in the state. College graduates make up only 13 percent of the Southern Virginia population compared with 29 percent in the state. The final column in the table below seems to highlight the prospect that a college education is not highly valued in the Southern region where only 29 percent of the 18 through 24 year olds are enrolled in college compared with 42 percent in the state.³³ Elevating the value placed on college degrees in Southern Virginia is necessary to position the region to be more competitive in the global market. Despite the challenges inherent in Southern Virginia, this strategic plan builds on the region’s current strengths, while recognizing its weaknesses.

Southern Virginia Education Attainment 25 Years and Older			
	High School Graduate ³⁴ or Greater	College Graduate or Greater	18-24 Year Olds Enrolled in College
Virginia	81 percent	29 percent	42 percent
Eastern Sub-region	65 percent	11 percent	19 percent
Northern Sub-region	65 percent	12 percent	57 percent
South Central Sub-region	65 percent	12 percent	23 percent
Piedmont Sub-region	66 percent	11 percent	21 percent
Western Sub-region	75 percent	17 percent	27 percent
Southern Virginia Total	68 percent	13 percent	29 percent

Source: U.S. Census, 2000.
(See Section II for regional definitions)

³³ Northern Sub-region’s percentage of 18-24 year olds enrolled in college is high because Longwood University and Hampden-Sydney College are located in that region. Census counts students as part of the region’s population.

³⁴ Data includes those who have passed general educational development (GED) tests.



c. Example of Prosperity Indicators from Section IV of the RFP document

i. Value Stream Maps and Strategy

Economic development is marked by myriad intersections, hubs, nodes, products, processes, and capital-impacting outputs that shape the prosperity of the stakeholders in the MARC Region. In terms of strategic and workforce planning, the conversation about targeted workforce development ought to be the same discussion as sustaining or increasing economic development. Value stream maps are provided to help stakeholders optimize workforce planning efforts while simultaneously suggesting an efficiently connected approach in the broader economy.

Value stream maps provide MARC with a roadmap on how to meet customers' needs as the region aims to prepare the workforce for occupations in demand. Value stream maps are visual and holistic; they address many of the tasks, activities, and results within the affected region as they focus on value creation for the communities engaged in the MARC WIRED³⁵ initiative. The MARC initiative is linked to other federal initiatives such as BRAC and the DOL Emergency Training Assistance (DOLETA) "Green Jobs" initiative.³⁶ The following three performance indicators are suggested to track the implementation of MARC as it links with complimentary initiatives for BRAC, ARRA, and the Green Jobs initiatives to create talent for the sub-regions:

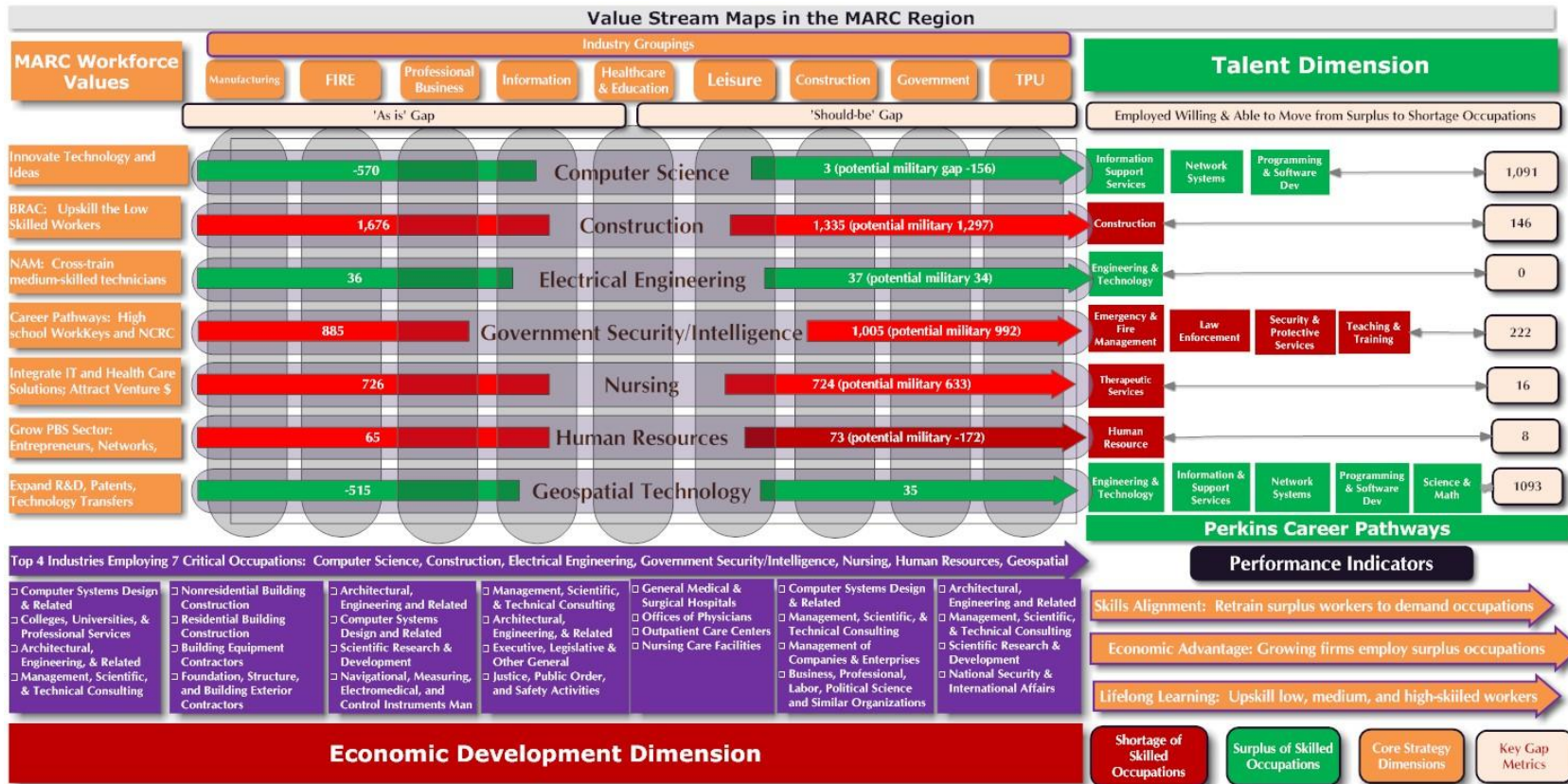
1. Skills alignment: retrain surplus workers to fill demand occupations
2. Economic advantage: growing firms employ surplus occupations
3. Lifelong learning; up-skill the low, medium, and high-skilled workers

The performance indicators reflect the stakeholders' areas of influence—workforce development, economic development, and educational and skills attainment. The value stream maps provide the key stakeholders—industries, workers, educators, the military, governments, and other organizations—with a roadmap that integrates the values from the key stakeholders in workforce and economic development with the education and training service providers. The MARC stakeholders' values are shown on the left, the training stakeholders' values on the right, with the economic development values located across the bottom of the first two value categories, showing the underpinning of the efforts of the MARC initiatives.

The performance indicators shown at the lower right can help MARC focus on a coordinated, collaborative process. Workforce practitioners have ownership for engaging businesses in the MARC initiative and providing governance over the administration of workforce resources from the WIRED grant. Economic development officials work to bring firms to the region that can use the surplus skills in the top four industries supporting the seven critical occupations. Higher education and training support existing businesses and firms entering the MARC Region by providing needed skills to people as well as career pathways for occupations in demand.

³⁵ WIRED is a federal initiative created by the Department of Labor for Workforce Innovation and Regional Economic Development. <http://www.doleta.gov/>

³⁶ http://www.doleta.gov/pdf/No_Workers_Frame_0306.pdf



The MARC Region value stream map shows the dimensions for change as values for the stakeholders. The MARC workforce practitioners and regional workforce planners operate in the left (orange) section, where key strategy dimensions, often expressed as outputs, are shown. The value stream information for the seven critical occupations flows from left (orange) to center (red or green occupation annual projections in shortage or surplus) to the right-hand talent dimension section of the upper quadrants. Occupations intersect with talent for skills-level planning. The talent dimension focuses on the intersection of education, training, and human capital development as they interact to change the skills-gaps profiles. The purple boxes indicate the four largest industry sectors within each of the seven critical occupations. These industry profiles are positioned above the economic development dimension, which has an interest in developing or de-emphasizing growth in these industries for the region's progress. The performance indicators at the lower right are indicators that the MARC stakeholders are meeting their targets. The data behind those outcomes are provided as a "deeper dive" into the interworking of the MARC sub-regional economies.



IMG Examples of Related Projects

a. “Turning Point” Regional and State Public Health Plan

Location: Roanoke & New River Valleys and Alleghany Region (“New Century Region”)

Contact: Jeff Lake
Deputy Commissioner
Virginia Department of Health

Summary: A two-year planning study was conducted for the Roanoke, New River, and Alleghany Regions (Planning Districts IV and V) and was jointly funded by the Kellogg Foundation and Robert Wood Johnson Foundation. Virginia was one of only 14 states selected and the Western Virginia Region was one of only 43 localities selected. IMG led the project team for the local component of the study and IMG conducted focus group meetings in five Virginia regions for VDH. The ‘local’ component was the only regional approach selected by Kellogg, so there was considerable interest in how a regional approach would be conducted and the Virginia project received much attention from the Foundations. The scope of work was intentionally open by the Foundations; this caused a number of grantees across the nation to struggle with the project. Given the regional work performed by The New Century Council in the early 1990s, regional relationships were already established and utilized by IMG to guide the project collaboration. The Virginia Hospital Association (VHA) was a partner with VDH at the state level and Carilion and three HCA affiliates in the region participated in the local component. IMG established the steering committee, conducted all reporting to the Foundations, served as the liaison with the Foundations and the state, led all of the focus group and work sessions, and oversaw the preparation of the final report to the Foundations.

b. “Forward Southern West Virginia” Economic Development Initiative

Location: Beckley, West Virginia

Contact: Carroll Simpkins, CPA
Secretary/Treasurer
Forward Southern West Virginia
Board of Directors

Summary: IMG was selected by a citizen and business committee in Beckley, WV to develop an economic development initiative for Downtown Beckley, which grew into an economic development initiative for a 17-county region referred to as southern West Virginia. IMG was responsible for the formation of the organization, its name, and obtaining its 501(c)3 IRS exemption. IMG worked with The Benedum Foundation to secure initial seed funding for the organization. A full-time executive director was selected, a downtown building donated and rehabilitated for the headquarters of the organization, and federal funding was received to conduct a number of initial project studies. The most significant accomplishment of the organization, to date, is the establishment, construction, and ongoing operation of the Erma Byrd Higher Education Center, patterned after the Roanoke Higher Education Center (where IMG was also involved).

c. “Workforce Profile 2003” – Smyth County Industrial Council

Location: Smyth County, Virginia

Contact: Mike Schewel
(former) Secretary of Commerce and Trade
Commonwealth of Virginia

Summary: IMG was selected to assemble the CEOs of the manufacturing industries in Smyth County and to determine their respective workforce training needs. In conjunction with the project, the Smyth County Industrial Council was formed and included approximately 30 private-sector CEOs from various manufacturing companies in the region. The need for the project arose from complaints by the private sector and the local government to the Governor’s Office (then Mark Warner) about the ineffectiveness of the Workforce Investment Board (WIB) serving the Smyth County area, together with concerns about the performance of the Virginia Employment Commission (VEC). IMG was responsible for interviewing each CEO individually, collecting input from their management teams, synthesizing it into a final report, discussing it with the Governor and the Secretary, and presenting it to the Virginia Workforce Development Board. The intended outcome of the project was to create a better working relationship between the manufacturing industries and the WIB, together with providing the state workforce oversight board and the VEC with instructive criticism to guide policy change. IMG also worked closely with the top administrators in VEC and with the Virginia Community College System (the Chancellor and several individual community college presidents).

d. Smith Farm Acquisition

Location: Smith Mountain Lake, Franklin County, Virginia

Contact: Rick Huff
County Administrator
Franklin County

Summary: IMG served as economic development consultants to Franklin County. The project was complex and took nearly 15 years to negotiate. IMG was responsible for the development of the strategy and for the facilitation between the parties, principally the county administrator, board of supervisors, local community college foundation, local community college president, state community college board and asset committee, and outside attorneys. The challenge was turning a stranded, non-performing asset (the Smith Farm) into an income-producing asset for the Virginia Community College System (VCCS). Thirty years prior, Mr. Smith died and left a 300-acre, lakefront parcel to VCCS. The restrictions in the will prevented the land from being developed, so numerous attempts by VCCS to persuade various Attorney Generals over the years to nullify the provision in the will had failed. There were also a number of confidential complicating factors. IMG took the restrictions in the will and turned them into a working model that would create a park for Franklin County and preserve the timber (in accordance with the will) by creating a ‘Sustainable Forest’ as a demonstration project for sustainable forestry practices. The ultimately successful strategy was for the County to purchase the Smith Farm for \$1 million, payable to the Virginia Western Community College Foundation, over a number of years at no interest, with the payments going into a scholarship fund for Franklin County Residents. From start to finish, the project took 15 years, owing to long-term dedication and determination as many elected officials, community college presidents, and county administrators came and went. The land transaction was completed in 2010 – thirty years following the death of Mr. Smith – and

planning is ongoing for the ultimate and best use of the property by the County. The scholarship fund has been established.

e. Regional Networked Incubation Program

Location: Winston County, Mississippi

Company: Winston County Economic Development Partnership
Community Development Partnership
Mississippi Band of Choctaw Indians

Contacts: Mr. David Vowell, President
Neshoba County Community Development Partnership

Mr. Ivy Owen, Community Development Coordinator
Mississippi Band of Choctaw Indians (now with Arkansas incubation program)

Mr. Joel O'Briant, Executive Director Winston County Economic
Development Partnership (now retired)

Scope of work:

1. Held meetings with business, community, government, and university leaders to provide educational sessions on business incubation in general and to garner support for this regional program
2. Worked with the organizations to identify and develop their incubator board and champion
3. Provided guidance in proper preparation of a feasibility study
4. Looked at selected sites and proposed sites in each community as a preliminary site validation of options available
5. Provided guidance as to types of incubator clients that they would be able to attract --used to determine type of incubator to develop
6. Provided educational session on what's involved in the overall set up, staffing, and marketing of a rural incubator
7. Reviewed final feasibility study and made additional recommendations for facility, types of businesses, etc.

f. Incubator Feasibility Study

Location: Kimball, West Virginia

Company: Travel Beautiful Appalachia, Inc.

Contact: Sharon Waldron (now with another agency)
SAFE Housing & Economic Development
Kimball, West Virginia

Scope of work:

1. Held meetings with business, community, government, and university leaders to provide educational sessions on business incubation in general and to garner support for this program
2. Developed survey instrument and held informational sessions with interested start-up and existing businesses who could be potential tenants.
3. Worked with champion to identify and develop potential mentors for tenants.
4. Reviewed site and suggested layouts for renovation for a mixed-use incubator.
5. Reviewed property for possible kitchen incubator, which was found to not be feasible for this location.
6. Identified and reviewed additional properties for operation of a shared kitchen facility separate from the proposed first choice site.
5. Provided guidance as to types of incubator clients that they would be able to attract --used to determine type of incubator to develop
6. Provided educational session on what's involved in the overall set up, staffing, and marketing of a rural incubator
7. Prepared final feasibility study and made additional recommendations for facility, types of businesses, etc. based on the outcome of findings.

g. Site Validation for Business Incubator and Entrepreneurship Center

Location: Albuquerque, New Mexico

Company: Southeast Community Economic Alliance

Contact: Erica Landry, President and CEO

Scope of work:

1. Inspected physical structure
2. Met with various government officials including representatives of the police department, city building code officials, Fire Marshall, zoning officials, tax assessor's office
3. Talked with security provider
4. Toured and inspected surrounding neighborhoods and business areas
5. Met with representatives of utility companies for service and capacity information
6. Assessed amenities of the facility
7. Made recommendations for facility floor plan
8. Prepared written report for presentation to Board of Directors

h. "The Corridor Foundation" – I-73 Advocacy

Summary: IMG was selected by a group of private sector individuals who were proactive advocates for I-73. IMG put together a funding organization to promote the benefits of the proposed interstate. The project outcome was a positive vote by the Commonwealth Transportation Board (CTB) and that was accomplished. IMG formed the organization, created its board of directors, solicited the funding, obtained the safety data and economic development data, utilized billboards along the US 220 corridor to promote the message, attended VDOT focus groups and CTB meetings, and voiced opinions about the advantages and disadvantages of various proposed

corridors. IMG worked closely with advocates, opponents, and various agency staffers. IMG also worked with Chmura to provide data to refute a flawed study that had been prepared by a student researcher. This project is an excellent example of how IMG works effectively with issues and people on all sides of an issue.

i. Hurricane Katrina - Disaster Relief Volunteer Work

Summary: One of the IMG team members led a disaster relief initiative in the aftermath of Hurricane Katrina, which made landfall in Louisiana at 5:10 AM on September 29th, 2005. As the human toll was heartbreaking, he wanted a hands-on opportunity to help victims of the storm. Having planned and built dozens of Habitat homes during the preceding years as well as having been trained and active as a disaster relief volunteer during the previous year of tropical storm devastation in Florida and N. Carolina, he was well qualified. He immediately began calling potential volunteers with the requisite talents for this specialty work. Duties would include clearing debris, “mucking-out” homes full of mud, decaying organic matter and black mold, “sanitizing” damaged homes and doing the requisite carpentry and drywall work to put families back into their homes. As there were many biological and chemical toxins present in the affected area, he organized training sessions for the safe handling of these materials. Funding played a crucial role, so he organized a major fund drive at his church (2nd Presbyterian-Roanoke) as well as at a sister downtown congregation (St. John’s Episcopal) in order to purchase and stage needed supplies and materials and pay for needed housing and food for relief volunteers. Additionally, to insure the efficient work of funds and talent, he coordinated the work of his team with the authorities along the Gulf Coast as well as with Presbyterian Disaster Relief and its Lutheran and Baptist counterparts. He led five successful trips to the Gulf Coast of Mississippi (Kiln, Bay St. Louis, Pass Christian, Diamondhead, Waveland areas) and Alabama (Bayou la Batre). His cost control efforts enabled excess funds to be donated to the disaster area to be used for more relief supplies.

j. Conservation Land Easements

Summary: One of the IMG team members has performed in-depth work with conservation land easements. His involvement began as a board member with the Western Virginia Land Trust (WVLT). He committed much time and financial resources to the effort of preserving the natural beauty of the Commonwealth. He served as Vice President of the WVLT and chaired the executive committee for the better part of a year in the President’s absence. During this same period, Governor Tim Kaine “mandated” that Virginia place 400,000 acres in conservation easements during his term in office. His work as a conservation easement professional placed approximately 40,000 acres in permanent easement in Southwest Virginia alone. One of his partners worked on land easements in the Southside area. His dedication to land preservation led to becoming an easement specialist, holding public seminars on the subject, talking with individual landowners, facilitating placing land in conservation easement through: research of county “land use” and VDOT planning records; field studies, including GPS and ARC/GIS mapping; detailed reviews of soil studies; discussions with specialty real estate appraisers and CPAs and coordinating their expertise and work product with attorneys throughout Virginia; going before the Virginia Outdoors Foundation as an advocate for easement projects, etc. Additionally, he served as a Director of the Blue Ridge Soil and Water Conservation District, representing the City of Roanoke by appointment of Roanoke City Council. Through this service he expanded his knowledge and interest in water quality and use and riparian matters, nutrient and sediment control, as well as other agriculture and wetland issues.

Appendix: Determination of the Watershed

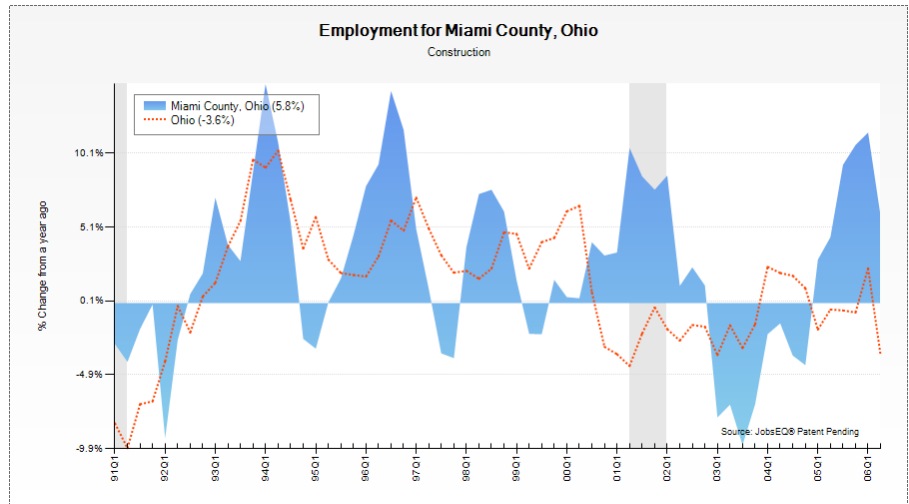
We realize that water issues will be among the most important environmental issues to be considered, so establishment of the pertinent watershed is important.

The Coles Hill prospects lie in Pittsylvania County northeast and approximately 6.5 miles from Chatham in Virginia's Piedmont. Preliminary research shows the mineralized area has two main deposits: the "north deposit" and the "south deposit," both of which are found in the Roanoke (Staunton) River Basin Watershed. Specifically, the deposits lie between Whitehorn and Mill Creeks which have their confluence approximately 1.5 miles to the east, where they flow as one into the Banister River. The Banister forms Banister Lake which flows under State Route 501 at Halifax before finally joining the Dan River five miles east of South Boston within Halifax County. The Dan and Roanoke (Staunton) Rivers converge to form the John H. Kerr Reservoir (Buggs Island Lake) in close proximity to the borders of Halifax, Mecklenburg and Charlotte Counties. Kerr Reservoir is located on either side of the Virginia North Carolina border and as the Roanoke River flows over the Kerr Dam in Mecklenburg County, VA, it then forms Gaston Lake as it flows east toward the Albemarle Sound. Of note is the fact that Virginia Beach, among several municipalities, draws drinking water from Gaston Lake (aka Lake Gaston). The Federal Energy Regulatory Commission (FERC) authorized a rare interbasin transfer, allowing Virginia Beach to tap into Lake Gaston to withdraw up to 60 million gallons per day for its municipal water supply (Virginia Beach is outside of the Roanoke River watershed.). Lake Gaston is approximately 35 miles in length, contains 20,000 acres of water surface, and has a shoreline of approximately 351 miles. It has a population around its shore and immediate adjacent area of 150,000 residents, and, like Kerr Reservoir upstream, is a popular vacation/recreation spot for the Research Triangle area of North Carolina. The Roanoke River leaves Lake Gaston, passing north of Roanoke Rapids, NC on its way southeast across the North Carolina coastal plain and then briefly turns north as it enters Batchelor Bay on the western end of the Albemarle Sound.

Any study of uranium mining and milling must include "water" discussions with municipal leaders, staff of appropriate soil and water conservation districts as well as geologists and chemists with an expertise in water management, mineral oxidation and weatherization, soluble mineral migration, etc. We will work with all of these organizations and individuals to come to a consensus of watershed specifics and possible problems prior to starting our comprehensive study.

Appendix: JobsEQ

JobsEQ™ combines data from many different sources into a single, easy to use tool. It is used for analysis, workflows, tracking, and reporting. Timely data, such as employment, wages, and firm statistics, are updated quarterly. Industry data are described by the North American Industry Classification System (NAICS) codes and analyses of these data are provided at various industry levels. Occupation data are described by the Standard Occupations Codes (SOC) and are fully O*Net compliant. Output tables and graphics are user-friendly and customizable. The entire package is intuitive and supported by extensive documentation. No special technical resources are required by users. Training and continued support are provided by Chmura.



JobsEQ™ is organized into analytic groupings. Summary descriptions of analytics within each group follow below.



Career

Willing and Able – The *Willing and Able* tool enables the user to examine an occupation and view related occupations that are realistic and desirable options for a job-seeker. Analysis is conducted via comparative skills (based on O*Net skill sets) as well as comparative wages.

Alternative Industries and Alternative Occupations – These two tools are linked to the *Willing and Able* tool and are show occupation and industry employment options that are overlaid with growth forecasts. The projections enable the user to conduct a sophisticated analysis of the short- and long-term outlook for a given career move. Using local data, forecast industry and occupation growth are shown.

NAICS Code	Industry Title	Current Empl	Expected Industry 10Yr Growth Rate	Expected Occ 10Yr Growth Rate	Estimated 10Yr Occupation Net Change
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	607	-2.0 %	4.7 %	3
3219	Other Wood Product Manufacturing	1,176	17.2 %	15.5 %	3
5613	Employment Services	13,747	45.2 %	50.6 %	2
4441	Building Material and Supplies Dealers	4,738	13.8 %	11.5 %	1
4422	Home Furnishings Stores	1,563	13.8 %	13.1 %	0
4421	Furniture Stores	1,487	13.8 %	8.1 %	0
	Home Furnishings Stores		13.8 %		

Abilities Gap – An analysis of attribute differences between two occupations (based on SOC codes) with a graphic display of attributes of greatest deficiency. This shows how realistic a career change may be and where the most retraining may be required.

Career Training Ladders - Career paths that may be followed as individuals increase their knowledge and capabilities. The ladders are supplemented with regional employment figures and links to occupation

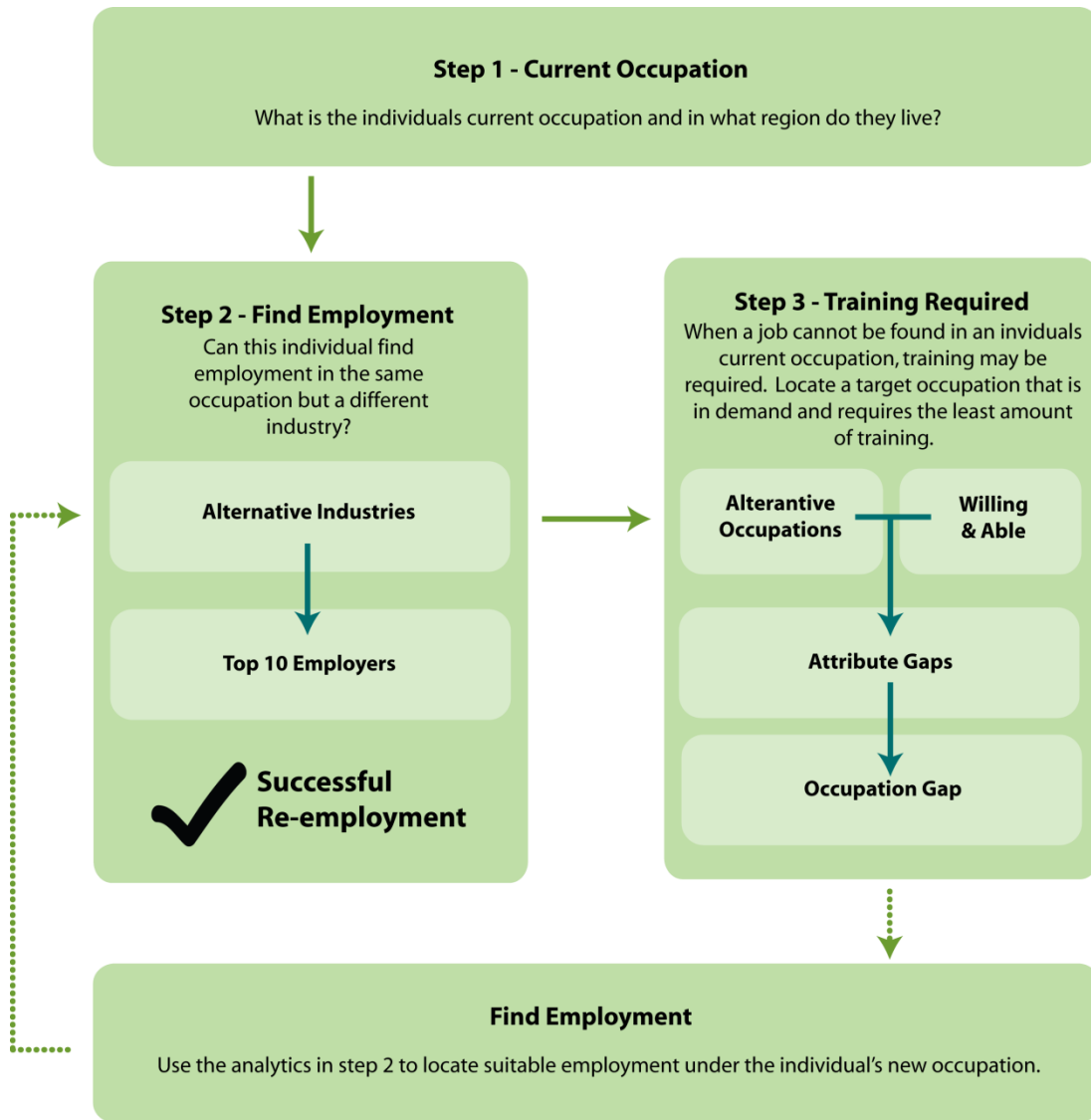
Farm Labor Contractors (2)	Animal Breeders (12)
Farmers and Ranchers (0)	First-Line Supervisors/... (103)
Food Batchmakers (232)	Fish and Game Wardens (72)
	Gaming Managers (8)
	Gaming Supervisors (66)
↑	
Agricultural and Food S... (52)	Animal Control Workers (31)
Agricultural Equipment ... (77)	Farming, fishing, and f... (0)
Tree Trimmers and Pru... (284)	Logging Workers, All O... (27)
	Slaughterers and Meat ... (67)
↑	
Farmworkers and Labo... (339)	Agricultural Workers, A... (45)
Food and Tobacco Roa... (125)	Farmworkers, Farm an... (109)
Forest and Conservatio... (18)	Fishers and Related Fis... (1)
	Poultry, and (168)

descriptions.

Occupation Details – For all occupations, based on the Standard Occupation Classification (SOC) codes at the six-digit level of detail, this listing includes a description of worker attributes, average wages by industries employing that occupation, and training programs that support that occupation.

Occupation Staffing – A listing of which industries most employ a given occupation. The analysis is based upon regional data.

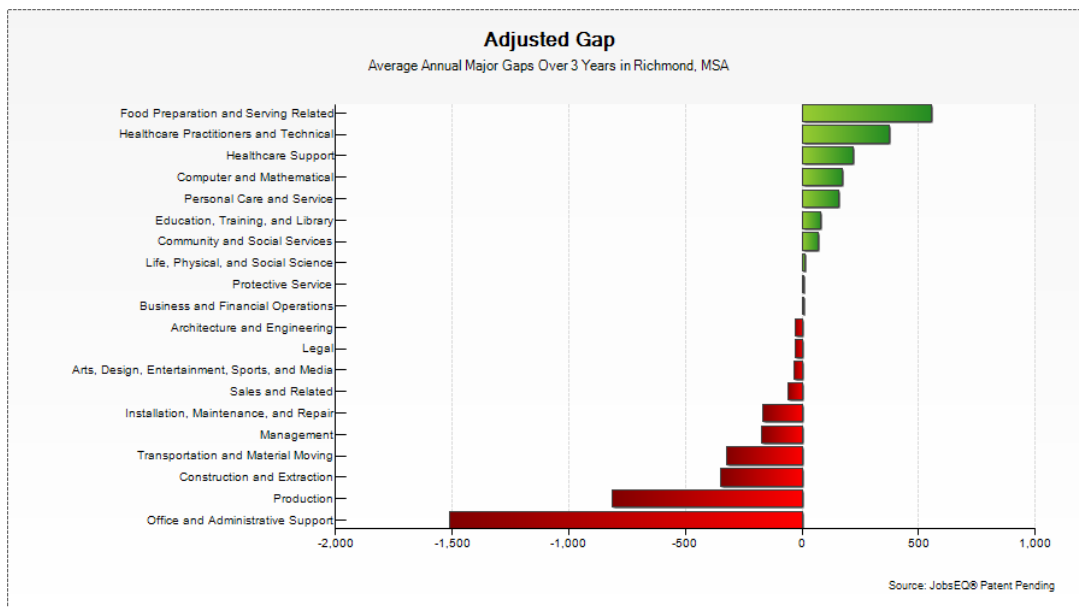
In combination, the career analytics can be used in a workflow that allows for successful navigation through the many options that may be available to an individual or group. An example of such a workflow is below. Applied as such, this intelligence system makes the market transparent to the workforce to improve participation and, as a result, improve industry benefits.



Policy and Economic Development

What-If Scenario – A function whereby the user examines the employment and occupation impact of a firm relocation—either **into** or **out of** a given region. If a firm is entering a region, this tool allows the user to examine the number of jobs by occupation that will need to be filled. Also shown is the current supply of each occupation in the region, including: current employed in each occupation, current unemployed in each occupation, and current extended employed and unemployed—the size of the regional labor force in occupations closely related enough to fill that occupation need.

Gaps – Using current employment and unemployment data, industry and occupation growth forecasts, regional population demographics, and occupation turnover assumptions, this analysis reveals forecast surpluses and shortages in a regions supply of occupations. Gaps are forecast for the short-term as well as long-term. The **Local Business Portal** allows regional, real-time input into short-term needs; the interface allows local business people to enter their current occupation needs into the modeling system, which will then be accessible by workforce development.



Clusters – A graphic analysis of a given region’s industry clusters. The employment size of each cluster is compared to the national average. Wages and the projected growth for each cluster are also displayed. The tool allows a region to gauge its competitive advantages. It also provides a “big picture” view of the region’s industry mix.

Desirability Index – An index which gauges the wellness of fit between a firm and a region based upon occupation, employment, unemployment, wage, and growth forecast data.



Labor

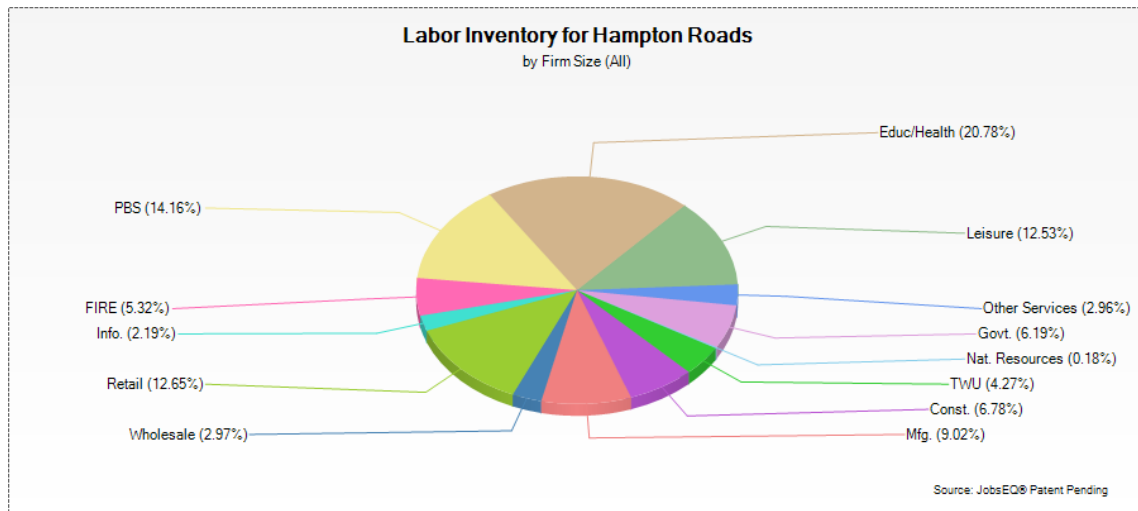
Total Wages, Annual Average Wages per Worker, Percent Change in Employment – These functions share a common presentation and layout. Data for these analytics are updated quarterly. Each analysis can be modified by region and industry level. A historic chart is produced and can include state data and peer region data for comparison.

Unemployment Characteristics and Unemployment Rate – *Unemployment Characteristics* provides details of the regional unemployed by gender, occupation, race, education attainment, etc. The *Unemployment Rate* chart will allow for monthly tracking of the unemployment rate for each county unit within the region.

Mobility Index – An examination of forecast industry and occupation growth in a region and how the two interact. It is so named because it indicates occupation mobility within the regional industry mix.

Ad-Hoc Reports – Customizable reports based upon wages, workers, and characteristics of the unemployed.

Entrepreneurial Activities – Firm start-up and exit activity, yearly or quarterly, at the 4-digit NAICS industry level of detail.



Labor Inventory – Analysis and graphic display of a region’s employment mix based on industry type, firm size, and occupations.

Maps – Interactive display of variables at the county/city level of detail. Included variables are commuting data, unemployment rate, employment growth, and rural scale.

Emerging Workforce – Projections of the first-time entrants into the workforce by number and educational attainment.

Chmura Quality Statement

Vision Statement

To be the nation's preferred provider of economic research and applied solutions.

Mission Statement

- We provide dynamic economic results which enable our customers to achieve 100% customer satisfaction with Chmura products.
- We provide goods and services based on continual process improvements targeting zero defects (0%).
- We respond to demands from business cycles with process-centered business practices and continually improving efficiencies, which create value for our clients.
- Chmura measures and policies result in business growth based on improved customer demand for Chmura products, goods, and services.

Business Values

- Honesty in all our professional relationships.
- Sound business practices supporting a stable business environment.
- Integrity for all colleagues and customers.
- Leadership within the sphere of influence of Chmura.
- Business corroborations creating partnership relationships with our customers.
- Employee satisfaction stemming from fairness and providing an environment stimulating motivation and loyalty.
- Communication, which not only informs but educates and instructs and is open in structure.