

**POLYMER PLANT CONSTRUCTION
COST ANALYSIS**

PREPARED FOR THE:

POLYMER ALLIANCE ZONE
(Ripley, West Virginia)

PREPARED BY:

PARAGON DECISION RESOURCES, INC.TM
(Danbury, CT; Oakbrook Terrace, IL; Rancho Santa Margarita, CA)

February 2002

TABLE OF CONTENTS

	<u>Page #</u>
Introduction	3
Polymer Location Analysis	3
Understanding the Local Market	8
Assessing the Competition	15
Comparisons of All Areas	23
Detailed Construction Cost Analysis	29
Additional Observations	35
Recommendations	41
Appendix	44

INTRODUCTION

Polymer Alliance Zone, Inc. (PAZ) is working to promote the growth of polymer-related manufacturing in West Virginia. There is concern, however, regarding the lack of significant new manufacturing activity in the region. Therefore, Paragon Decision Resources, Inc. was commissioned to conduct a comparative analysis in order to assist the region in improving their competitive position for polymer manufacturing projects in the future.

The goal of this project is to compare key construction cost and condition factors of the polymer industry in the Polymer Alliance Zone, Inc. of West Virginia with those in other States in the region. Briefly, the project objectives are:

- To gain a complete understanding of polymer industry location trends around the country and identify the most active regions in each state for the polymer industry and to collect construction cost and condition information from these regions.
- To gain a thorough understanding of the Polymer Alliance Zone's situation regarding the key construction cost and condition factors of this industry.
- To compare construction costs and conditions between the Polymer Alliance Zone and the other active regions.
- To recommend ways to enhance strengths and minimize weaknesses in the Polymer Alliance Zone.

POLYMER INDUSTRY LOCATION ANALYSIS

Introduction

Polymer-related manufacturing has been a major growth industry over the last decade. The most important factors in the site selection or expansion of a polymer-related manufacturing project are in general (by priority):

- Access raw materials/transportation (highway/rail/barge)
- Geographic markets/transportation
- Production skills availability and costs
- Production labor quality
- Labor/management relations
- Utility costs/reliability
- Supplier access
- Site costs/availability
- Incentives
- Construction costs/conditions.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Construction costs are low on the priority list. However, the construction environment is closely tied to a number of the more important factors such as labor costs/quality and site costs.

Growth Trends

We first conducted an analysis to determine polymer industry growth trends around the country. Our proprietary methodology is based on actual site locations that have occurred during recent years.

In fact, we utilize this same targeting methodology in our selection of site location candidate communities. We want to present the best communities to our corporate clients.

Our database allows us to review actual industry location trends from recent years, by industry, facility type and geography. The data is then screened to determine recent industry location patterns where industry groups, or clusters, are tending to select locations with similar characteristics as Polymer Alliance Counties. This analysis will also allow us to accurately pinpoint polymer industry growth regions.

Elements of this analysis included:

1. Evaluate major location and expansion trends in the polymer industry in select states (Louisiana, Mississippi, Virginia, North Carolina, Indiana, Illinois, Ohio, and West Virginia) over the last three years, in order to determine which regions have attracted the most polymer industry activity.
2. Evaluate the "high" activity level industry clusters by geographic preference.
3. Identify the most active regions.

According to the data, several areas across the country have been very successful in attracting new and encouraging expansions of existing polymer plants. Unfortunately, the PAZ has not been one of these areas. This in part, has prompted the need for this study.

It is important to identify those "success areas" and then study cost and condition differences between them and the PAZ area. Emulating these success areas may help lead to success in the future.

Paragon maintains a database of actual industrial and office site locations/expansions¹. This database assists us in predicting growth trends and we utilize this data for selecting the best initial communities for our site location clients. The methodology is sound and proven for the following reasons:

¹ We use Conway Data information 3rd quarter 1997 through 3rd quarter 1999 which tracks locations and expansions.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

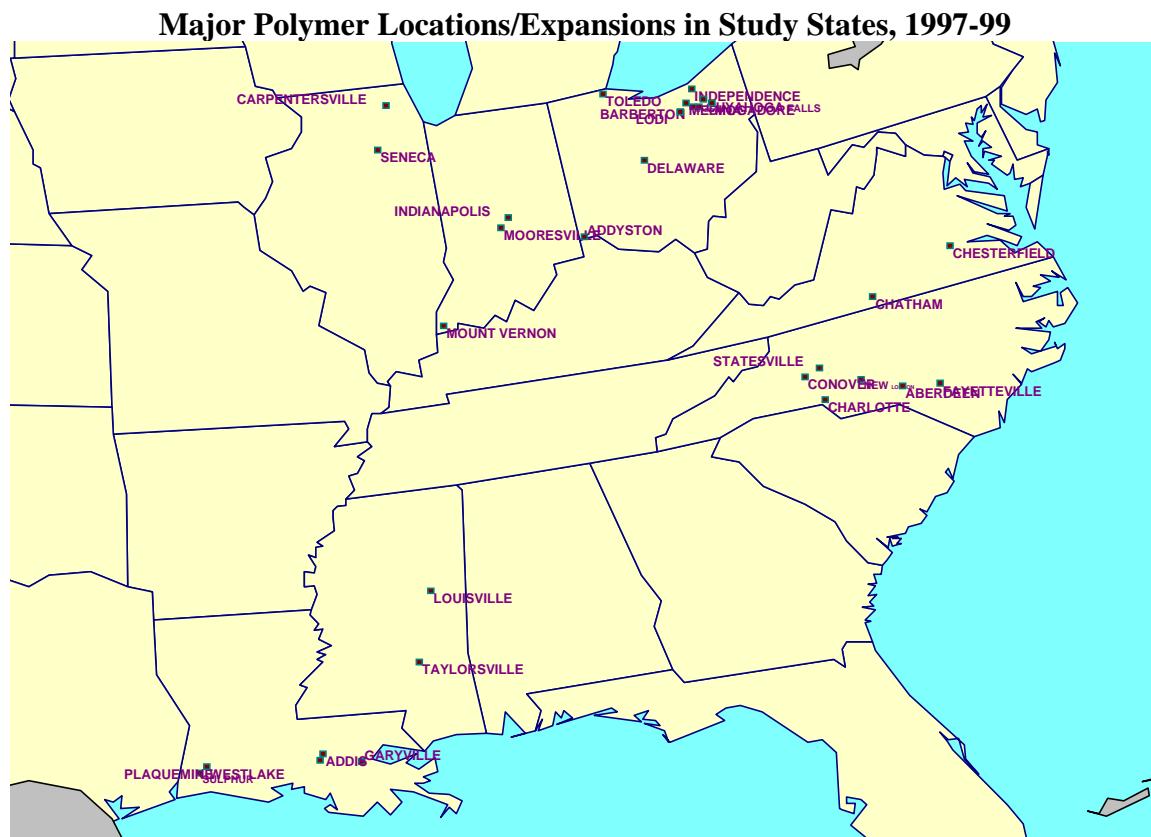
- Locations/expansions are driven by recent market conditions and these conditions will generally continue into the near future.
- Companies (and site selection consultants) select locations/expansions with the best business climates. This may mean, for example, a good labor climate, good market proximity, good transportation, the availability of incentives, all positive business conditions. This will result in clustering; a concentration of like companies due to favorable business conditions.
- Clustering is a “green light” for other similar companies to take a look. But they will only locate if the good business conditions remain. For example, they may find the labor market for select skills depleted due to too much location/expansion activity. This is why we conduct careful fieldwork interviews with local companies for our site location clients, in order to help them to thoroughly understand the local business conditions.

We looked at activity that occurred over the last two years in the polymer industry² in designated study states. Prominent clustering has occurred in three areas: Northeast Ohio, North Carolina, and Southern Louisiana (see maps).

For the next phases of this project, we propose to study these three areas further. Next phases will include construction cost and condition items, (including availability, quality and wages), a construction cost model and annual operating cost model.

² Primarily SIC 2821 & NAIC 325211.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia



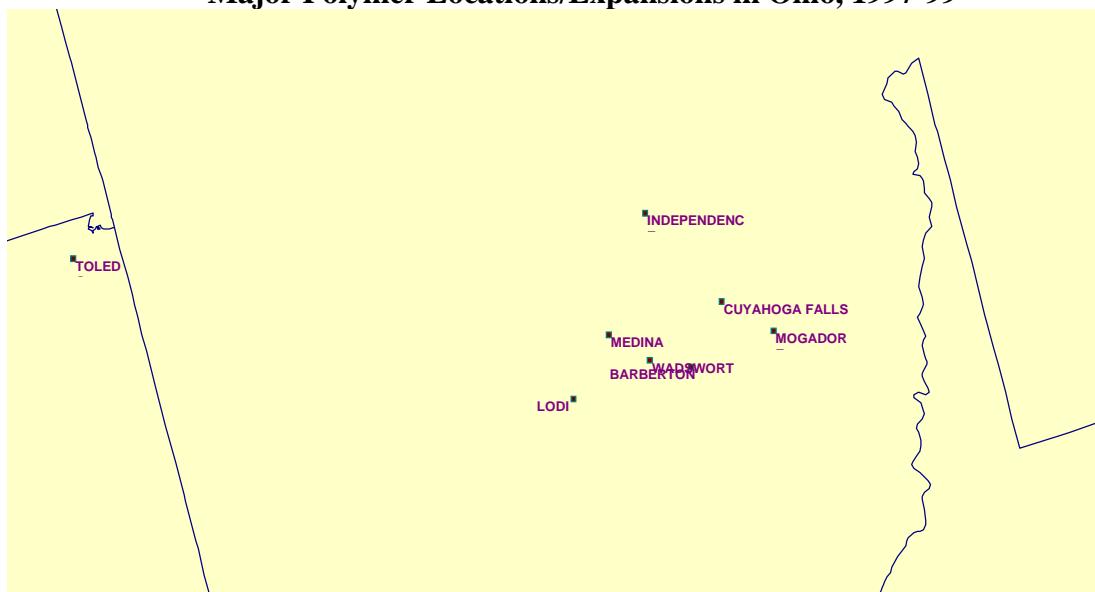
The most new activity (largest clusters) has taken place in the following regions:

- Ohio
- North Carolina
- Southern Louisiana

These areas were chosen as the key competitors to study further.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

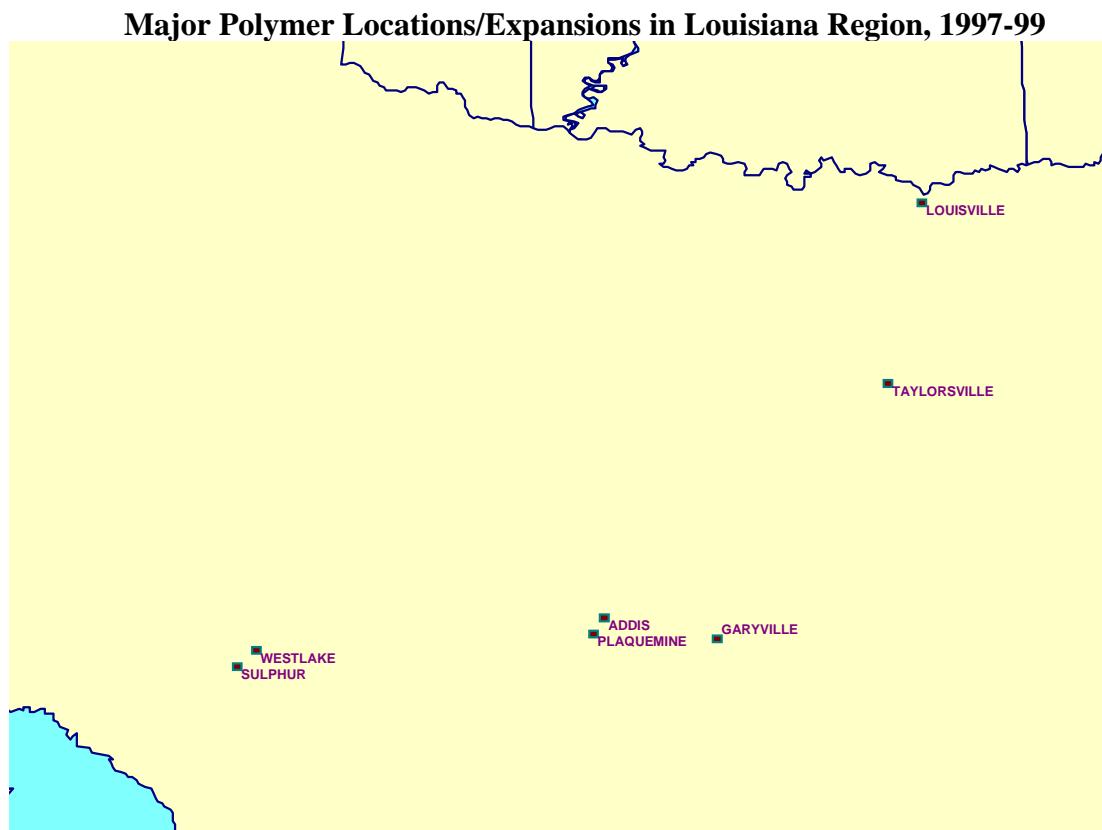
Major Polymer Locations/Expansions in Ohio, 1997-99



Major Polymer Locations/Expansions in North Carolina, 1997-99



Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia



UNDERSTANDING THE LOCAL CONSTRUCTION MARKET

Paragon conducted detailed fieldwork in the PAZ in order to thoroughly understand the area from a polymer project construction viewpoint. During the weeks of October 4 and November 8, 1999, Paragon conducted a series of fact-finding interviews with the polymer industry, contractors, and union leaders, and other stakeholders in the Polymer Alliance Zone. We first looked at workforce availability and quality factors since labor costs are the largest single factor in total annual operating costs of a polymer project.

Construction Workforce Availability and Quality

In today's tight labor markets, an employer's number one concern is the availability of skilled workers and the quality of these workers. Availability and quality of the construction workforce is also critical in evaluating this factor.

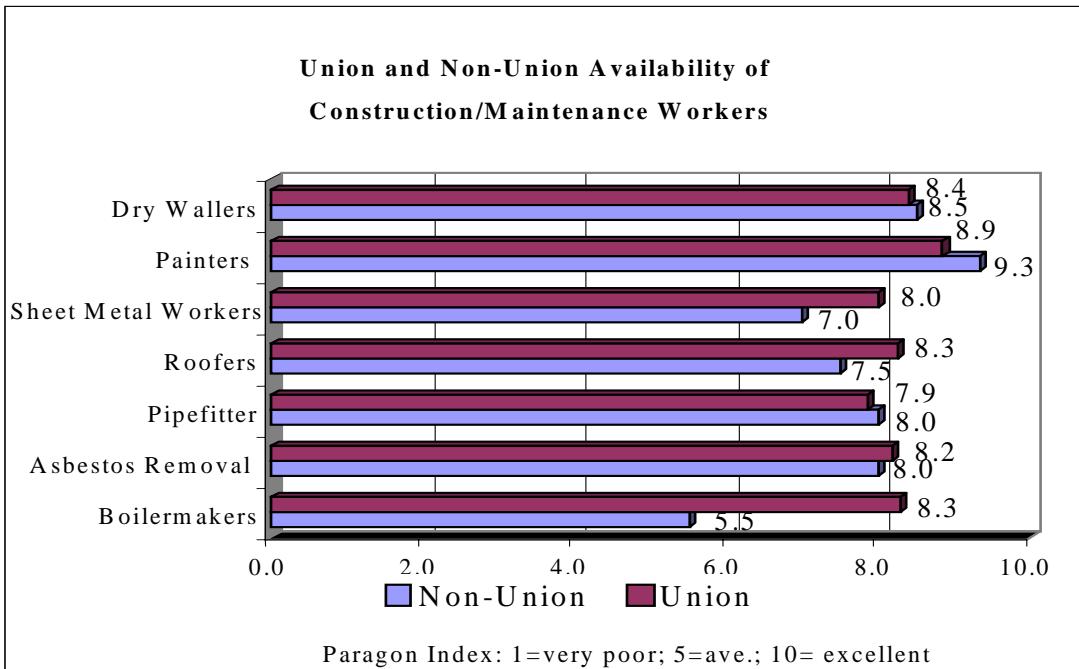
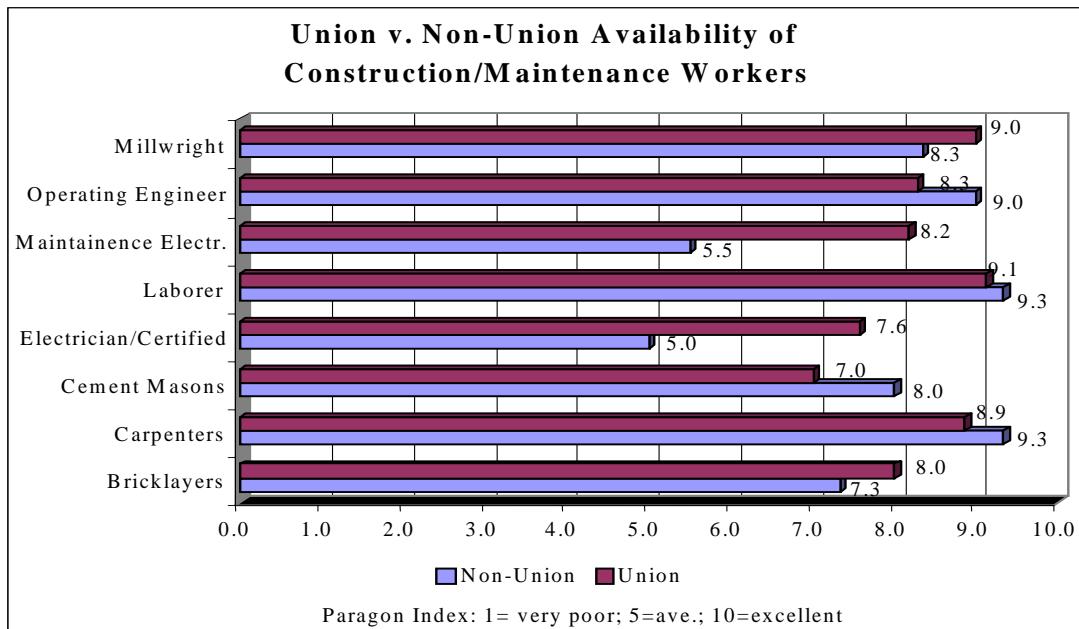
Unemployment-type statistics are no longer a valid indicator of availability. More sophisticated assistance is needed, in order to cope in today's environment.

Paragon's unique index is designed to compare availability and quality issues on an "apples to apples" basis across the country. The index measures key characteristics on a one ("very poor") to ten ("excellent") scale (5 is "average").

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Labor Availability

The interviews conducted with the employers focused on the availability and recruitment of the skilled trades. The following graphs compare availability for union versus non-union workers.



Paragon has found that, nationwide, over the last two years availability of all skilled workers has dropped substantially. In the skilled trades, the availability of these skills may even become a crisis in some parts of the country.

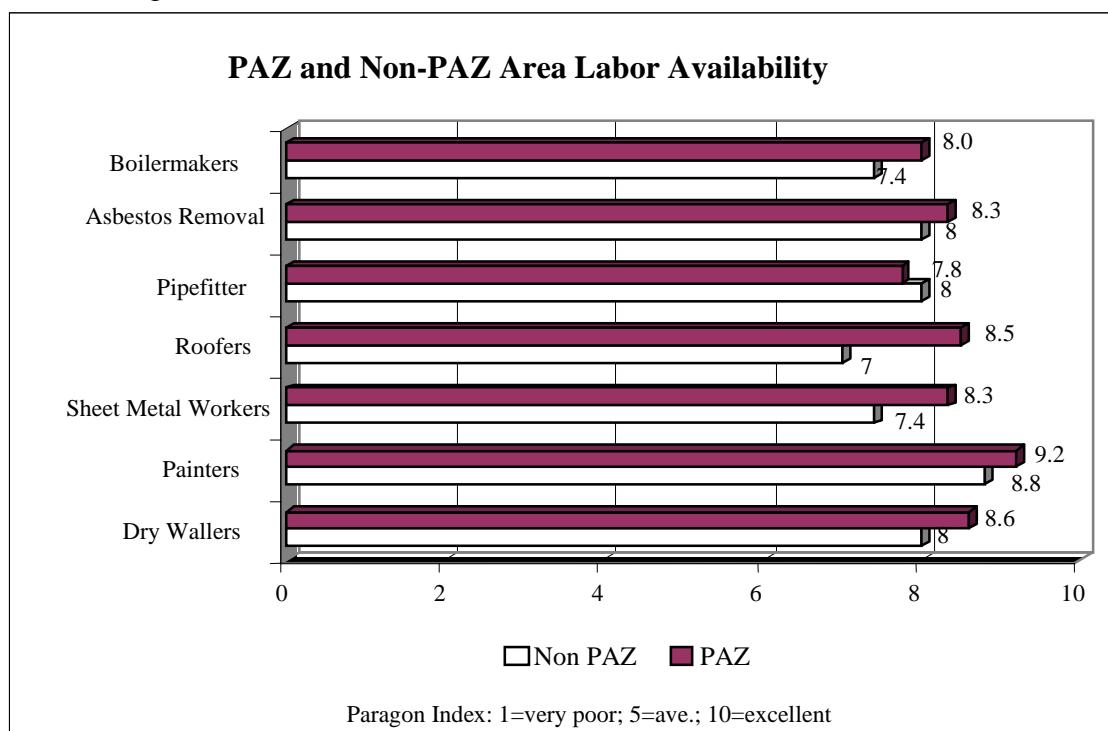
Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Availability in the Polymer Alliance Zone is good and excellent overall compared to other parts of the nation. The ratings indicate that the availability of unionized workers is generally better for most occupations. There are major differences between recruiting union and non-union electricians and boilermakers. However, non-unionized firms enjoy small advantages in recruiting laborers and carpenters.

The availability of general laborers, painters and carpenters is excellent. Employers have found no difficulty in recruiting locally for these trades during construction jobs and filling vacant maintenance positions.

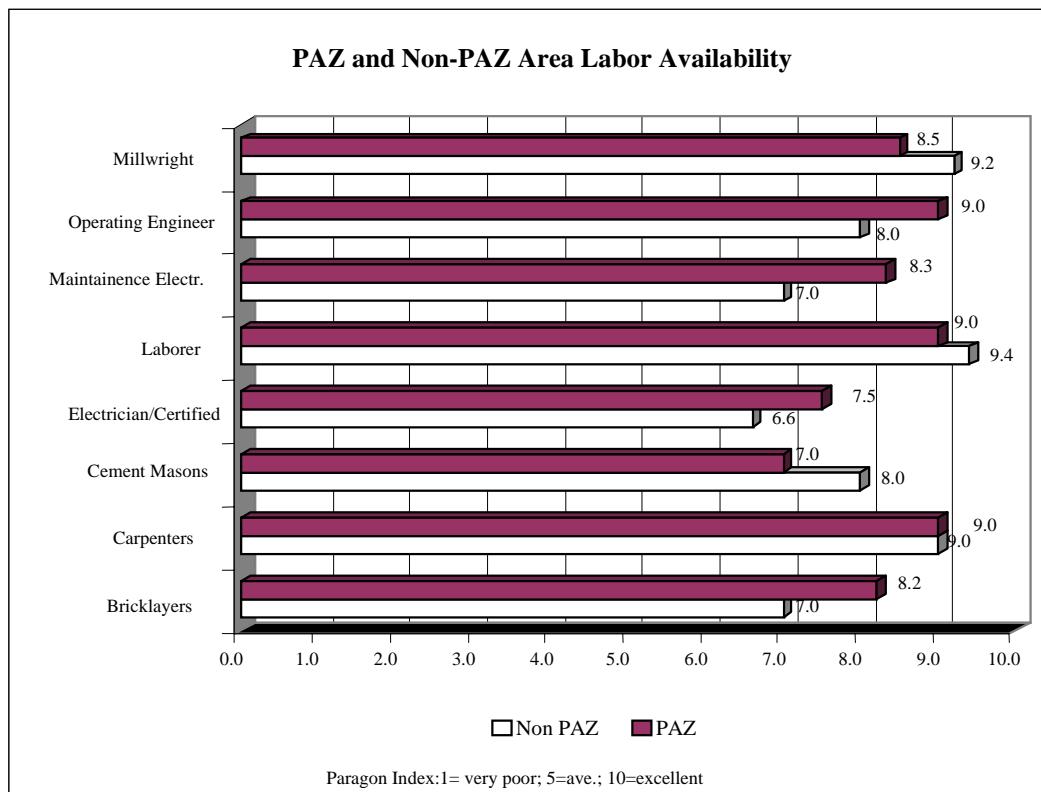
It is important to note the very good to excellent availability for millwrights and boilermakers. Unionized operations are therefore stating that there is an abundance of these trades in the unions.

We next did an availability comparison between occupations inside the Polymer Alliance Zone and regional areas outside the zone.³



³ Generally in Western West Virginia and Eastern Ohio.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia



There is not a great deal of difference in availability in the PAZ versus outside. Overall, availability appears above average to good across the region. In the PAZ, availability is substantially better for roofers, sheet metal workers, electricians and bricklayers.

Overall, there does not appear to be any major shortages in West Virginia trades' workers, either inside the Polymer Alliance Zone or outside, union or non-union. Next steps will include comparing West Virginia's availability with competing states/regions.

Availability Quotes

“Having been a union contractor, I know that they have a big advantage in attracting people because all you have to do is go the rep and ask, while I have to keep my people on the payroll at all times as a non-union contractor.”

“Availability of construction workers in WV is much greater than MS.”

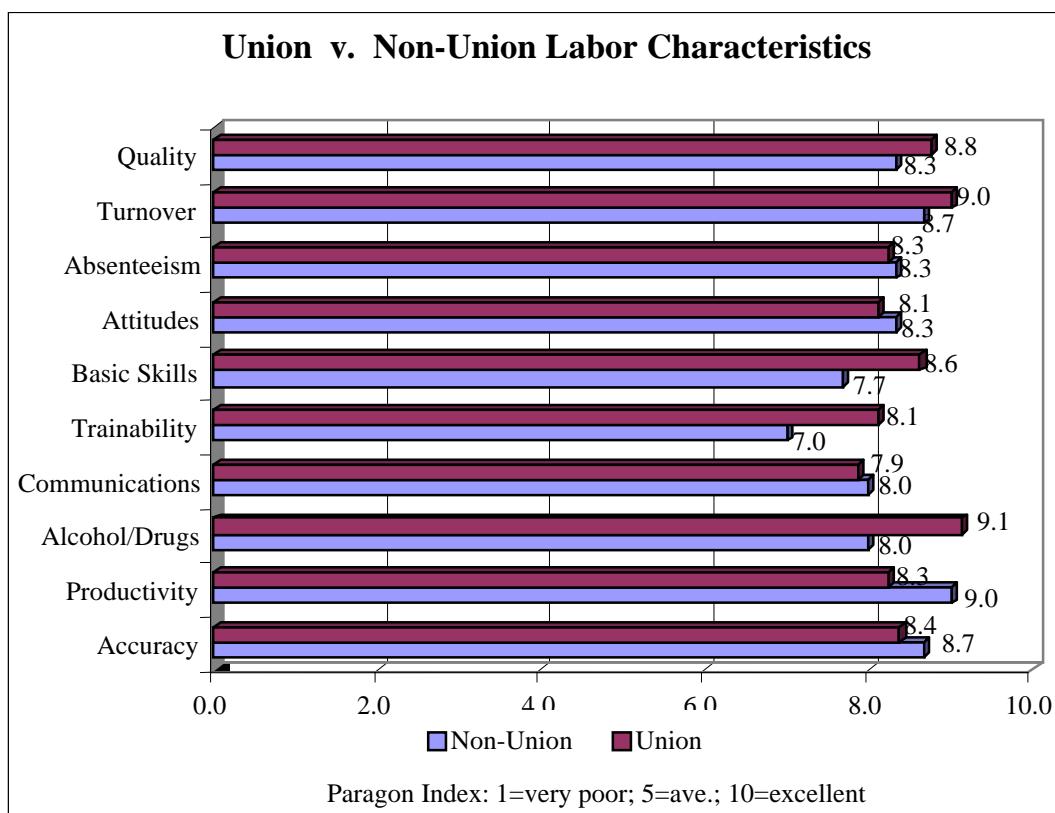
“Some workers are transient by nature, especially pipe fitters and electrician-maintenance positions.”

Labor Quality

The quality of the construction workforce in an area will influence a companies desire to expand or locate in an area. Using the Paragon Index, we measured the following quality characteristics in the area.

- Quality – average of scores from items above
- Turnover
- Absenteeism
- Attitudes – on-the-job
- Trainability – employees response to training
- Basic skills – math, English, grammar, etc. of new applicants
- Communications – Employer/employee and employee/employee on-the-job
- Alcohol/drugs – Perceived situation.
- Productivity – Employer's measure⁴
- Accuracy – eliminating rework, adhering to ISO standards

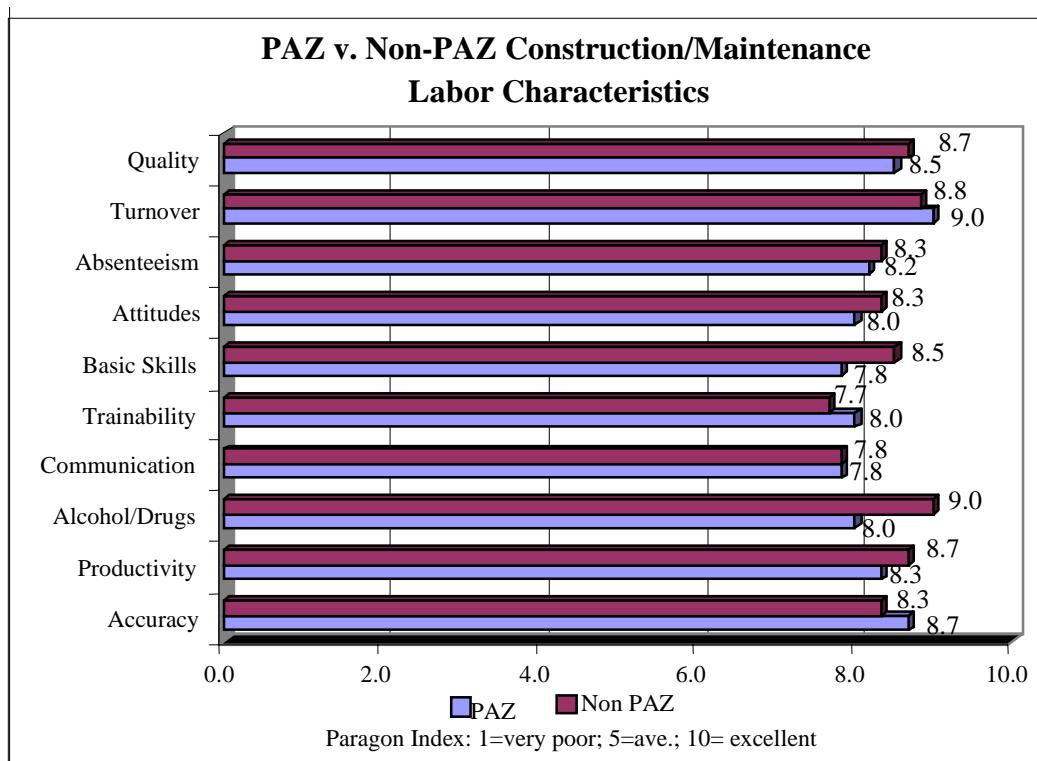
We first compared quality for union versus non-union workers in the PAZ.



⁴ Note: This rating is not to be confused with productivity analysis found in the last section of the report, however, the two are certainly related.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Next, we compared quality characteristics in the PAZ versus the surrounding regional area.



The quality of the construction workforce is generally very good to excellent.

- Employers felt that even though communications are good, they could be better.
- Productivity and accuracy are rated high by employers.
- Employers were very supportive of the union's alcohol and drug training.
- Even though employers generally have concerns over work rules, ratings for communications do not differ between union and non-union employers.
- Union basic skills and trainability are better due to apprenticeship programs.
- Ratings for union electricians are much better due to licensing after 5-year training.
- Ratings for boilermakers are higher for union employers due to specialized training.

The good quality of construction workforce is influenced by:

- Union training and apprenticeship programs and the educational system for journeyman.
- Random alcohol and drug testing.
- Union's standard 3-day policy that eliminates absenteeism and turnover. Paragon has generally found that turnover and absenteeism rates are much higher in other parts of the nation.

Quality Comments:

- “*Productivity rates are higher than most other plants.*”
- “*Very skilled and cooperative construction and maintenance workers.*”
- “*Quality of workmanship of Charleston workers is 50% of the mid Ohio Valley.*”

The following is a review of key strengths and weaknesses that we discovered during our fieldwork.

PAZ Strengths

- **Characteristics of workers are considered very good.** Overall quality is rated 8.64 (very good to excellent).
- **Turnover is extremely low.** West Virginia construction workers work at polymer plants for the long term.
- **Accuracy and productivity is high** according to most employers, an important aspect in maintaining polymer plants.
- **The availability of general laborers, painters and carpenters is excellent.** Additionally, unionized operations in West Virginia feel there is an abundance of millwrights and boilermakers available for work. However, non-union operations have some difficulty recruiting these two trades.

PAZ Weaknesses

- **Jurisdictional issues play a major role in hiring and in hiring delays in the region.** Construction firms are concerned that pre-hiring meetings take time and money from their prospective budgets.
- **Both union and management officials are concerned about the lack of young people entering the trades.** There is no strong community college system in West Virginia to assist post high school graduates who wish to enter the trades.
- **Management officials feel that work rules are detriments to productivity and efficiency.** This is an overwhelming concern to construction firms working at sites, as well as to management who need trades workers to have more flexibility and for cross training to exist.
- **Some indexes indicate that West Virginia's workers compensation costs are the most burdensome in the nation** (i.e., Small Business Survival Index). The structure of the workers compensation system in West Virginia is a concern to all of those interviewed.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **Polymer plants are older and larger than those in the Carolinas and Louisiana.** Therefore, they are more difficult to manage and are more costly to maintain.

Issues

- The high cost of workers compensation costs is a concern to all businesses. Major reform is needed.
- Union jurisdictions and work rules are not a debatable topic.
- There is no helper system allowed and union rules only allow for apprenticeships for trades.
- The trades unions need to be more involved at the secondary school level to encourage more young people to enter the trades.

ASSESSING THE COMPETITION

Paragon did similar fieldwork in each of the key competitive areas. The following is our strengths and weaknesses comparison.

Louisiana (Lake Charles Region)

Strengths

- **The state and region offer very favorable tax incentives.** All polymer plants are placed in enterprise zones, which offer large tax savings.
- **Associated Builders and Contractors (ABC) have a strong presence in Lake Charles and good training programs for the crafts.**
- **Elected officials are considered to be reliable and strong supporters of business.** They follow through on large and small-scale commitments to polymer firms.
- **Unionized construction firms use an "orange book," which outlines agreements between unionized workers and management.** This basically adheres to no work rules, complete flexibility of work, no strike clause, as well as job sharing (cross crafts).
- **Overall quality of construction and maintenance workers is rated "good."**
- **Plant managers meet monthly and have a fully staffed office in the Chamber of Commerce.**
- **All younger workers must start at helper level and work at instrumentation.**

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

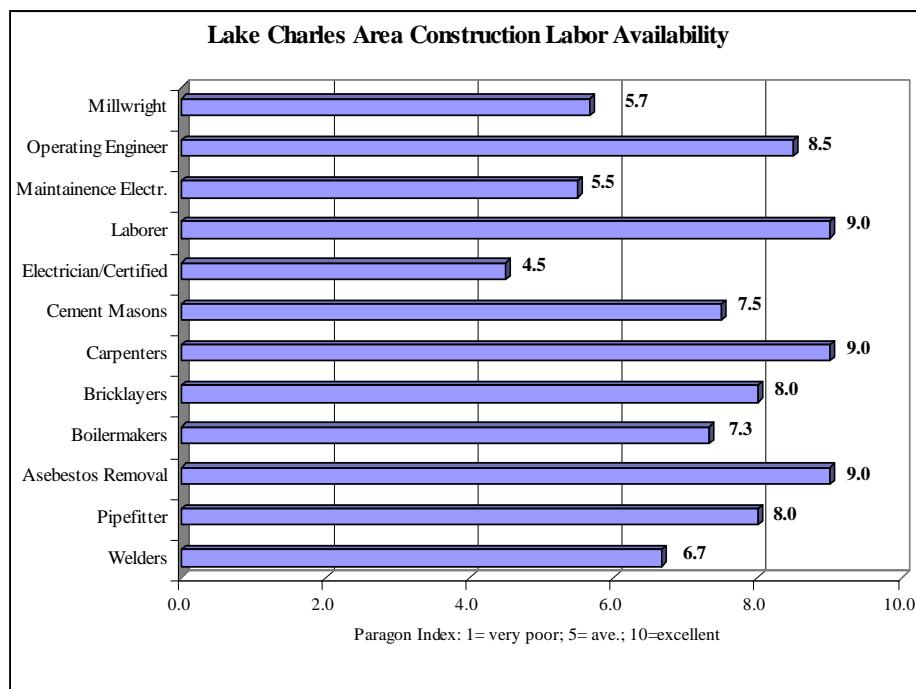
- **There is very little turnover and low absenteeism in the region.** Other labor characteristics such as attitudes and communication are very good. Basic skills, however, are only average.
- Firms in the area have been able to expand partially because the productivity measurements are historically higher in the Lake Charles LA region (see chart on page 17).

Weaknesses

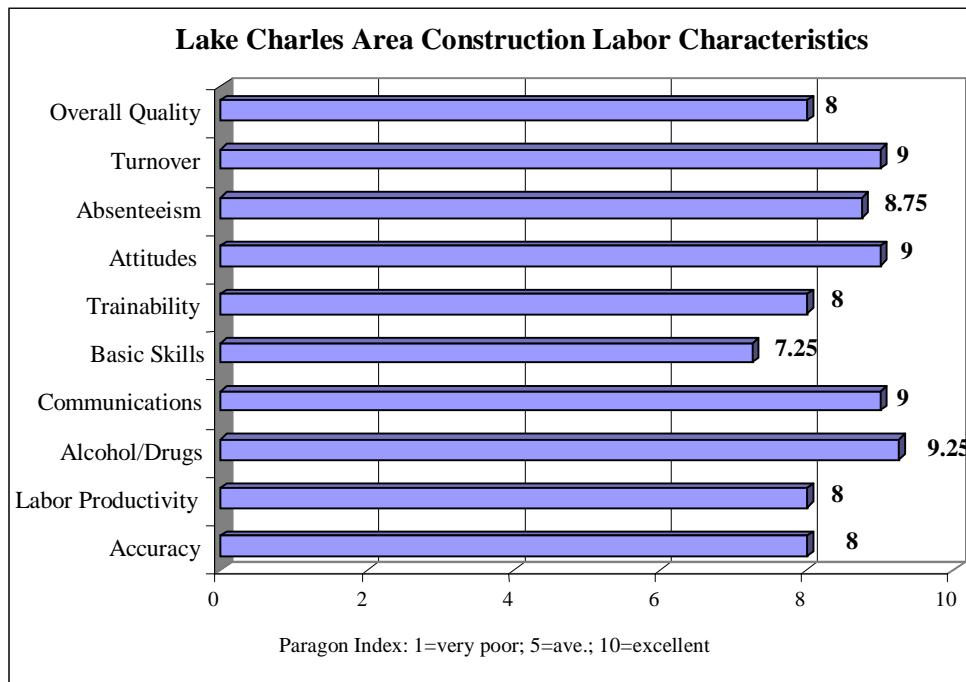
- **Firms in the area reported some current shortages for millwrights and electricians.**
- The firms in the area reported major shortages for the skilled trades a few years ago when several plants were undergoing capital improvements at the same time. **There is a fear that this will happen again since expansions are likely.**

Issues

- Currently, one firm has a \$200 million capital expansion on hold in the Lake Charles area. The firm and contractors are confident that they will be able to attract the necessary construction crews once this becomes a “go.”
- Some employers prefer to use union workers because ABC is not able to certify workers, only train them. However, employers are very happy with the training capabilities of ABC.



Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia



Louisiana (Baton Rouge-New Orleans Region)

Strengths

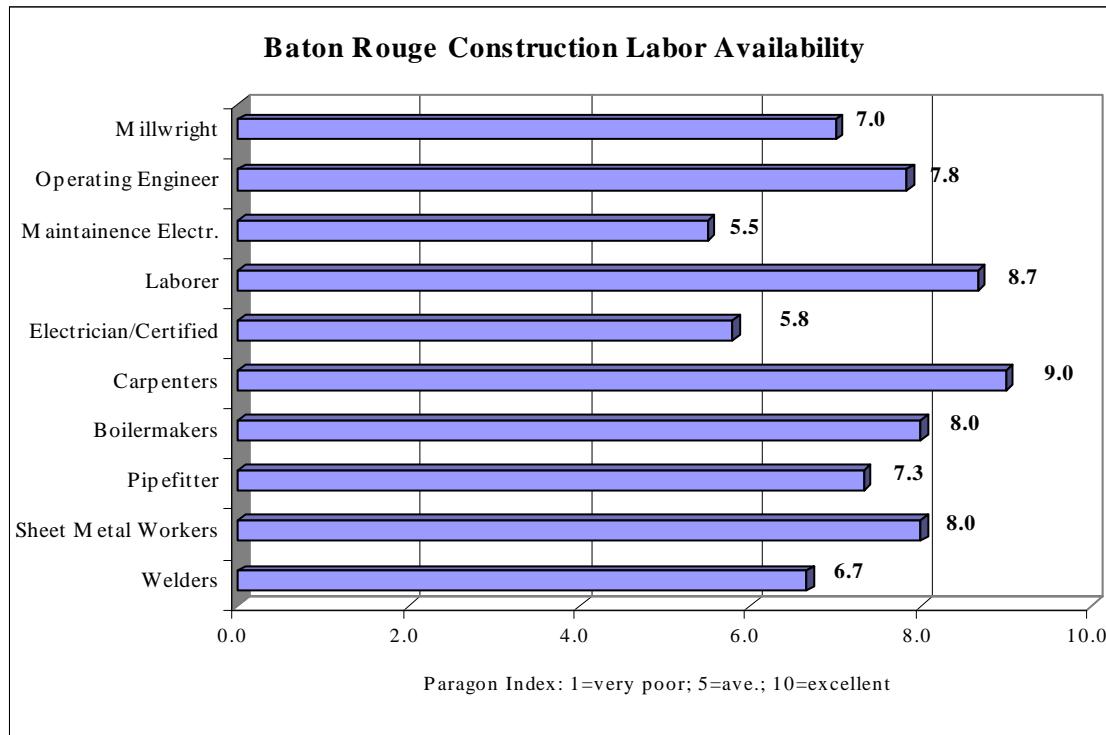
- **Many of the plants have an equal number of non-union and union workers working side by side in a good cooperative environment.**
- **The majority of polymer firms have received major incentives with tax credits training programs, and abatements.** Standard incentives include:
 - 1.) \$2,500/employee tax credit to hire employees
 - 2.) 5 year property tax abatement
 - 3.) 4% rebate on sales tax (\$30 million in sales times .04 = \$1.2 million in savings)
- **The construction workforce migrates; therefore, workers are easily attracted to the region** because of lifestyle enhancement, entertainment, recreation and cultural opportunities.
 - The construction workforce migrates between the Mississippi border and Houston. Their migration may last from 6 months to two years.
 - Seventy percent of crews live in the parishes around the region.
- **ABC is providing a good source of talent because they are in Lake Charles.** Hiring vo-tech graduates saves \$275 in apprenticeship fees.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

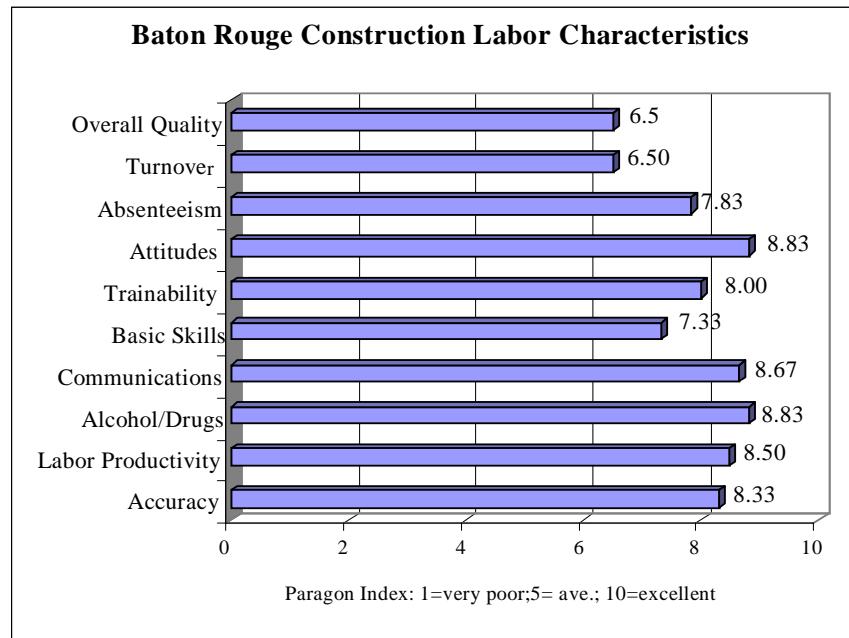
- Job sharing is a non-issue with all plants in the region.
- Plants undergoing expansions with large capital improvements have not reported any major shortages.
- The polymer and construction industry is satisfied with core competencies of the process technology program that is being initiated at the community colleges, even though there are no graduates yet.
- There is a general belief by region employers that New Orleans is an easy state in which to do business. The Department of Economic Development and the Chamber of Commerce offices are extremely reliable.

Weakness

- There could be difficulty finding maintenance and certified electricians.



Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia



Ohio

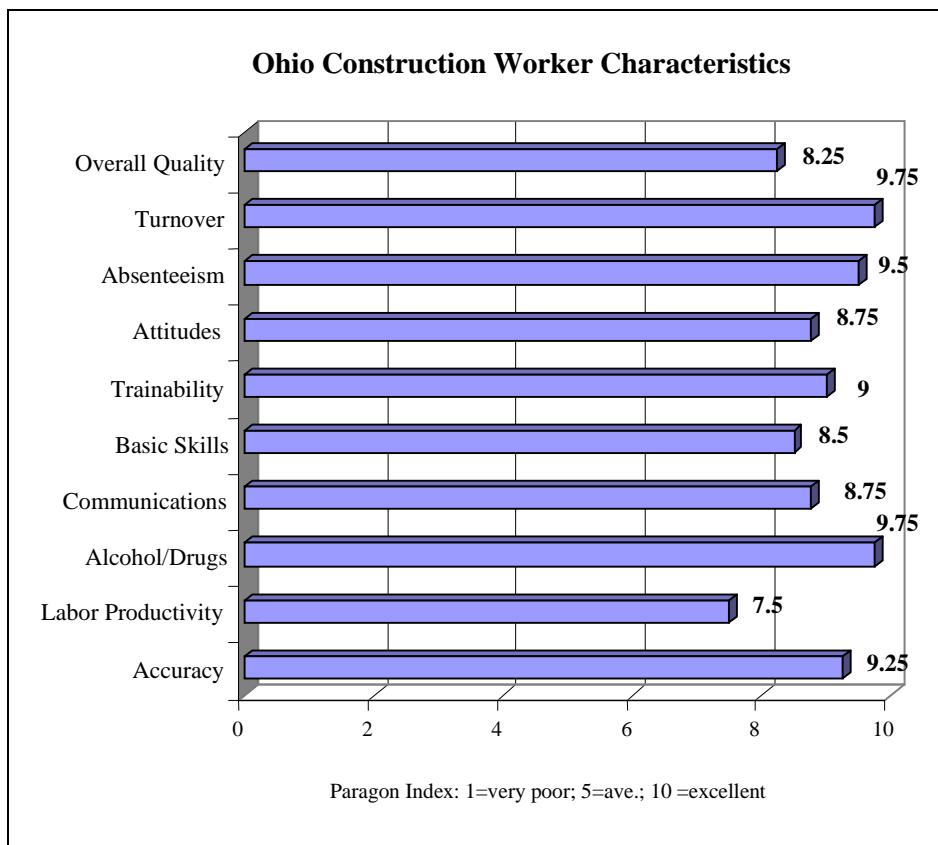
Strengths

- **The area Columbus Chamber of Commerce has formed an aggressive workforce development program that addresses problems**, such as the lack of workers in construction trades, by encouraging high school students to look at the trades as a profession.
- **Employers generally feel that the state and local governments are very reliable and come through on promises of tax abatements and credits.**
- **Employers regard community colleges and training programs highly for construction and for operations workers.**
- **Unionized construction contractors have not had difficulties with jurisdictional issues.**
- **Ohio State University has a strong polymer program with proven research capacity.** They offer polymer firms technical assistance and internships.
- **Firms using non-union contractors find no difficulty in hiring unionized construction contractors and having the two crews work together.**
- **Employers rated the characteristics of Ohio construction workers very high.** Almost all other labor characteristic ratings were over 8.0.
- **Sheet metal workers and laborers are generally easy to find in Ohio.**

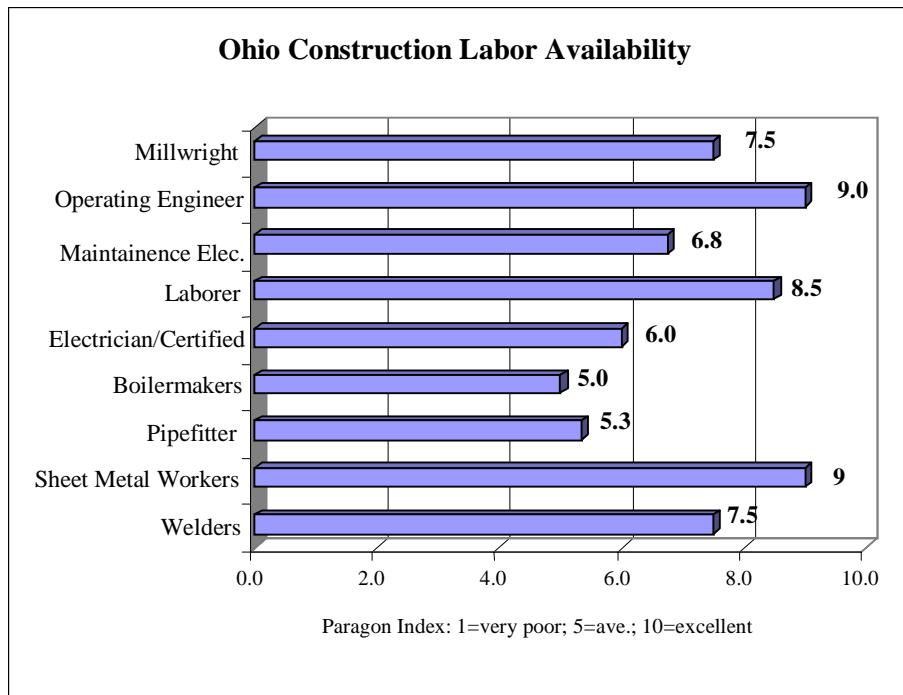
Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Weaknesses

- **Construction firms are having difficulty finding boilermakers and pipefitters whether or not they belong to the union.**
- **Firms, whose operations are unionized, tend to use unionized contractors to keep harmony in the plant and in construction areas, despite higher costs on some bids.**
- **There are shortages in some of the skilled trades.** There are no shortages for less skilled workers because of the strength of the Ohio economy. Construction workers have choices on where to work and do not necessarily have to work in the polymer industry to receive respectable wages.
- **Labor productivity is rated only average.**



Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia



North Carolina

Strengths

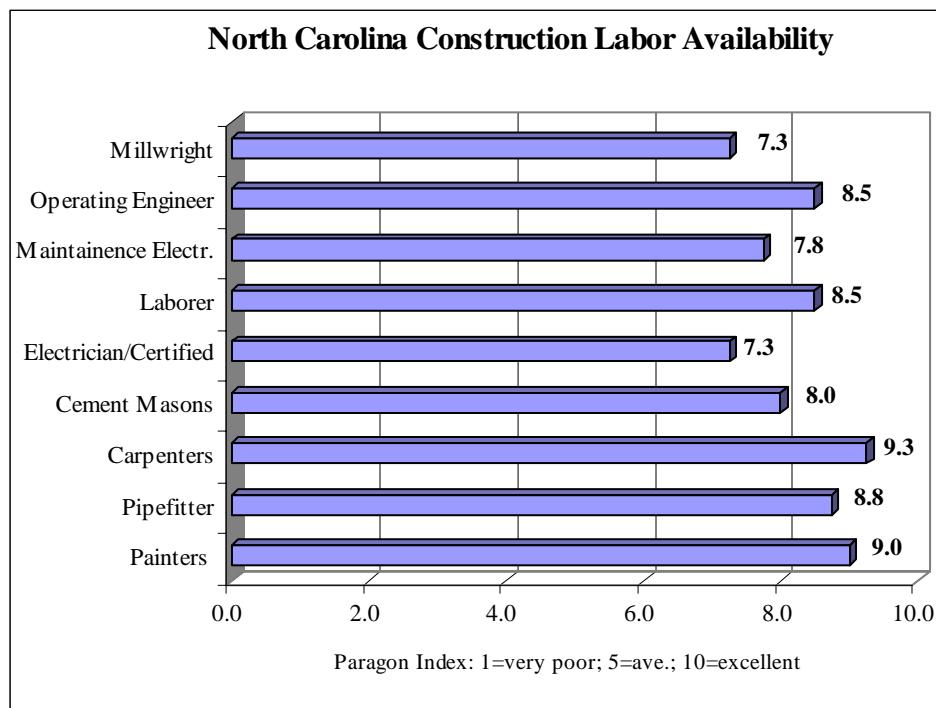
- A large number of boilermakers, pipefitters, welders and others have migrated to North Carolina to fill vacancies in the polymer construction and maintenance operations.
- Employers and contractors are very pleased with the North Carolina Community College system, which awards grants and trains construction workers for new positions.
- The University of North Carolina has a leading polymer/plastics department that has developed patents in key product lines and transferred the technology to industry.
- The state has been making a major effort in retraining garment workers as construction workers.
- Polymer construction positions are being filled easily. Excellent networking among contractors and Internet sites is helping.
- There is complete flexibility among workers. One firm has stated that there are carpenters in their facility doing ironwork.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

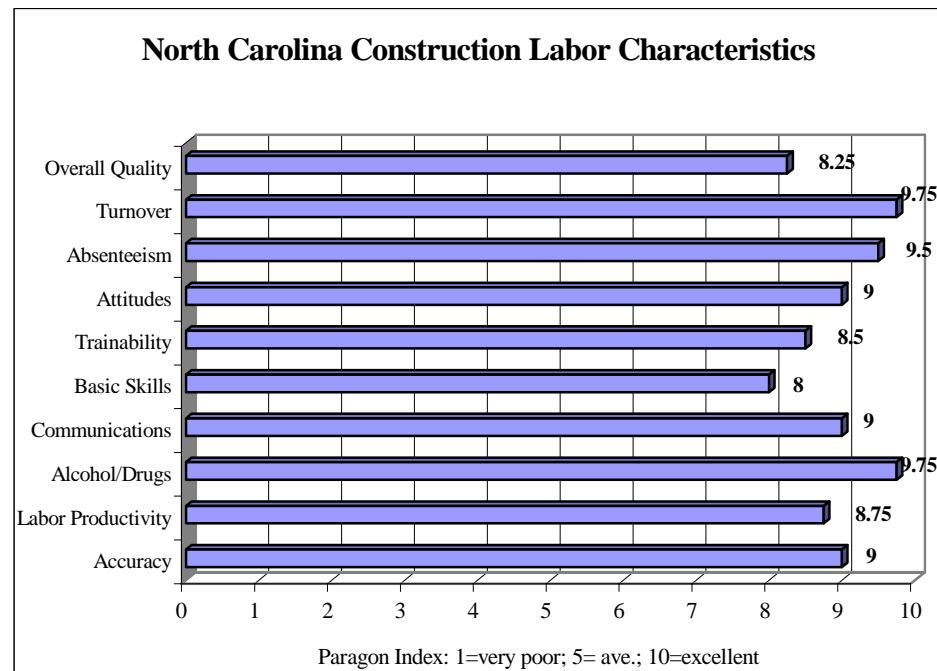
- A special bill was passed by the North Carolina legislature to provide for the financing and tax incentives to assist Du Pont in their expansion near Fayetteville.
- Construction workers will commute 60-90 miles to polymer plants.
- The journeyman rates for carpenters are \$15.65/hr. and \$16.15/hr. for electricians with a 50% (of wage) fringe package.
- With Fort Bragg nearby, Fayetteville firms and construction companies are easily able to hire discharged military personnel.
- Labor quality is very good to excellent. Turnover and absenteeism are almost non-existent.
- Availability is considered good to excellent for all construction trades positions, even electricians. Contractors contend that they have never incurred any problems with recruitment of any trades positions.

Weaknesses

- More stringent environmental regulations may affect the long-term viability of chemical and polymer plants along the coast.



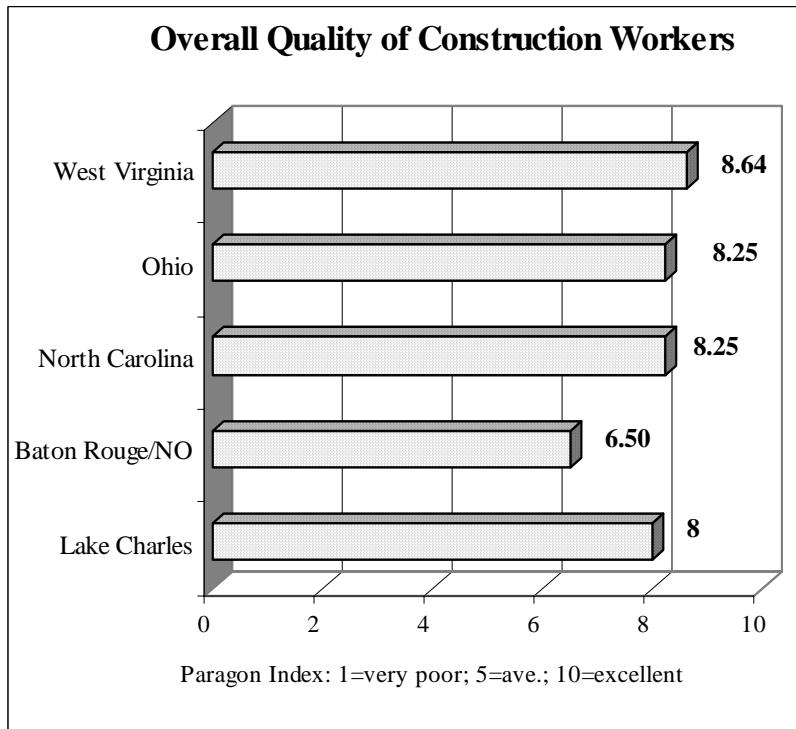
Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia



COMPARISONS OF ALL AREAS

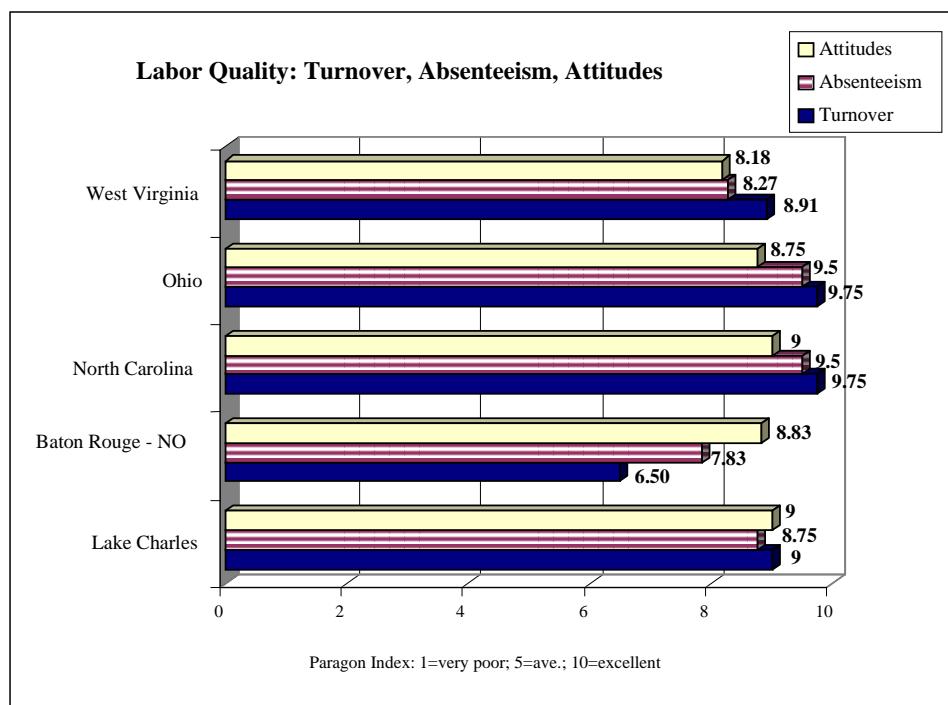
Labor Quality

- West Virginia has an overall quality advantage over the other areas.

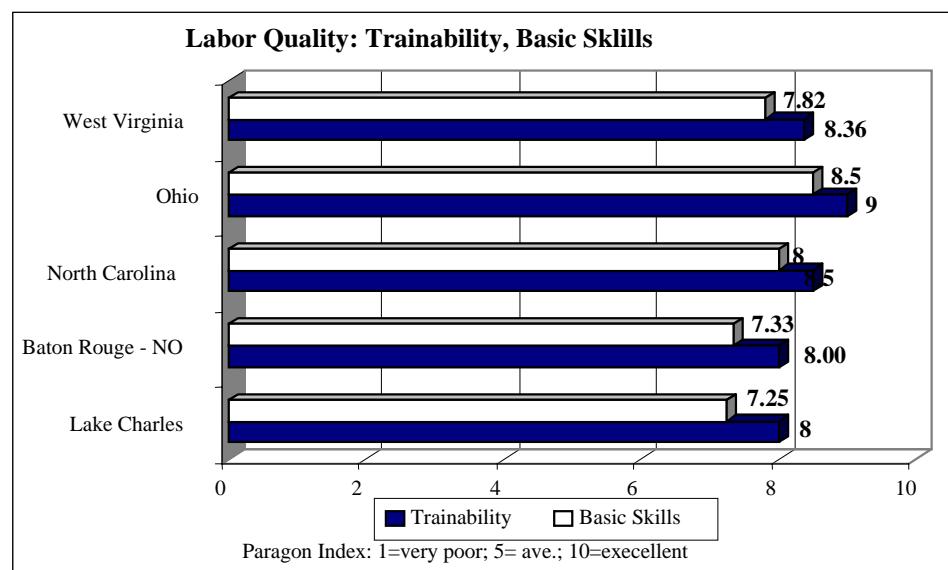


Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- West Virginia worker attitudes are slightly below other areas.
- Turnover and absenteeism factors are similar.
- The Baton Rouge-New Orleans area has a higher turnover because of the number of opportunities afforded workers due to the high level of activity.

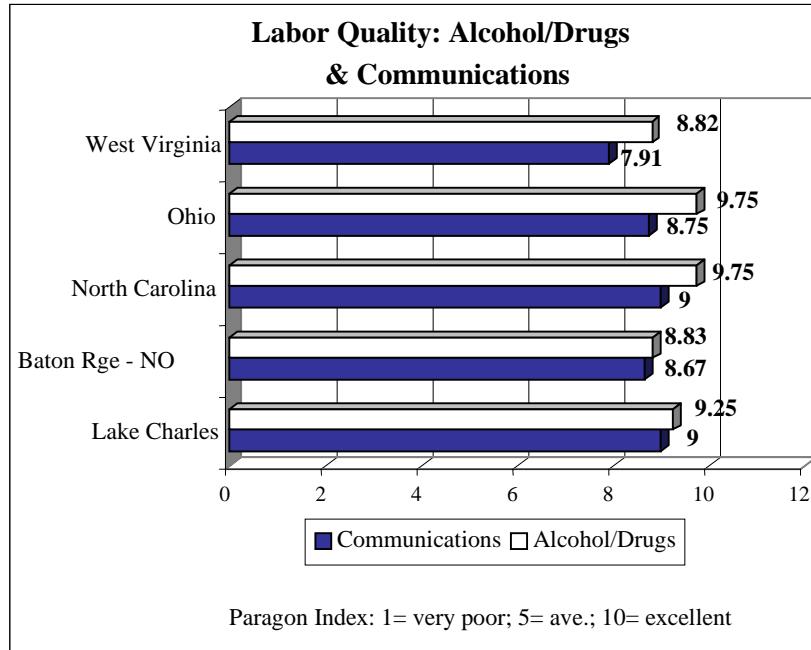


- West Virginia also has no distinct advantage over the other areas in basic skills and trainability. Therefore, the right to work states and the predominantly union areas have no advantage over each other.

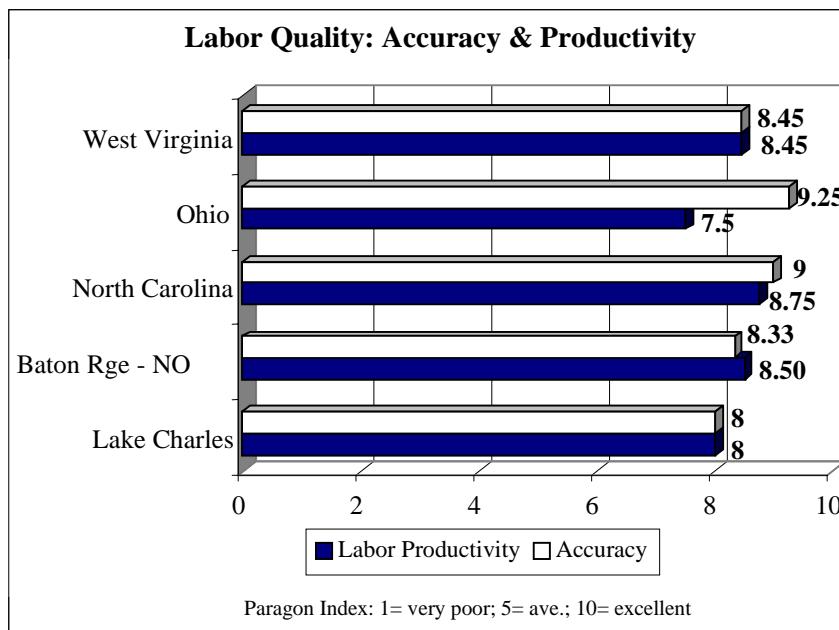


Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- West Virginia ratings are comparable to the other areas.
- Ohio and North Carolina ratings for alcohol and drugs are near perfect.



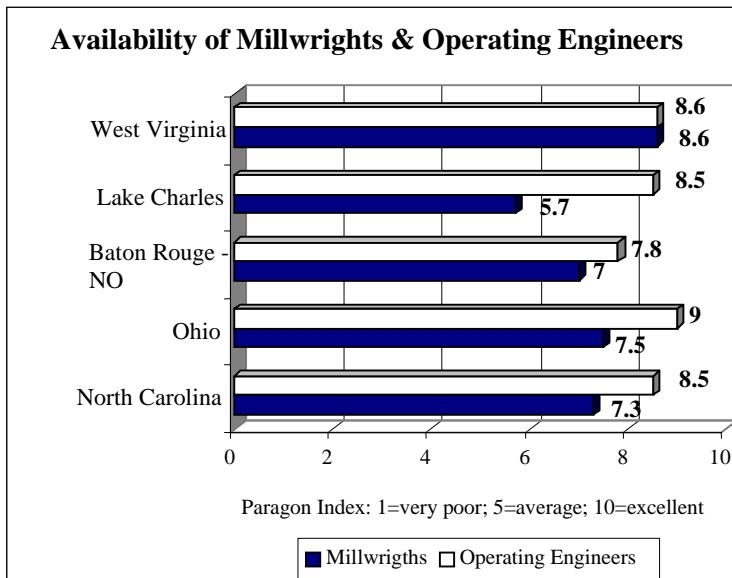
- West Virginia productivity rates higher than Ohio and Lake Charles.
- Accuracy is comparable to all areas.



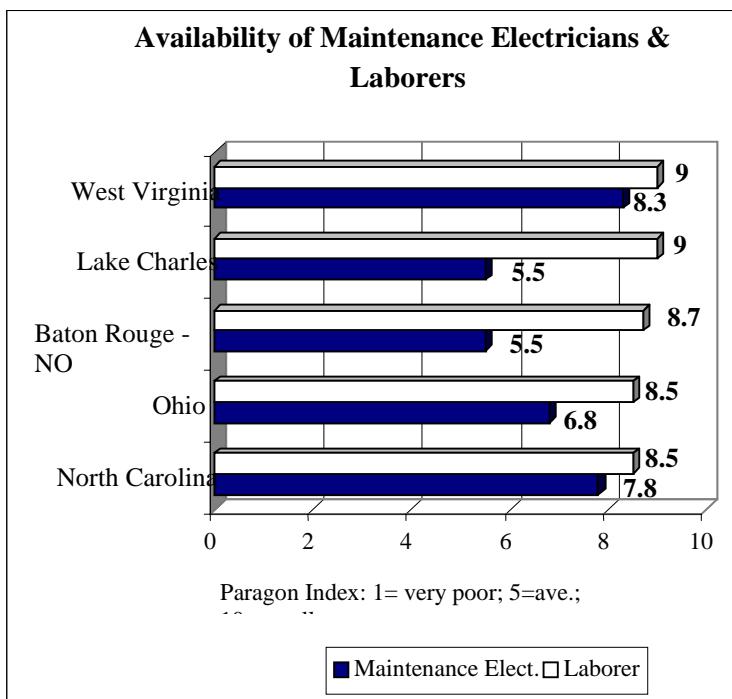
Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Labor Availability

- **Availability in West Virginia is as good or better than all competitors in most job categories.** There are no shortages in any categories.
- West Virginia is best for millwrights.

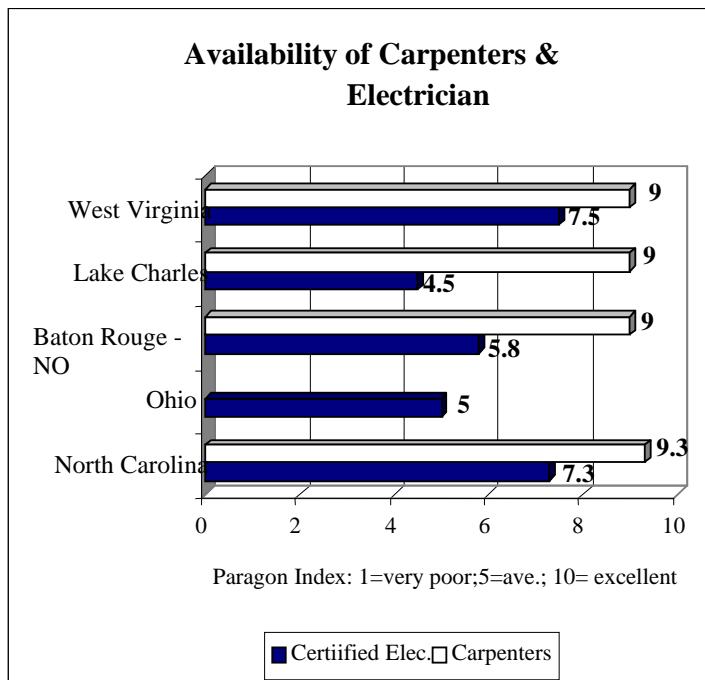


- West Virginia has much better availability of electricians than all other areas.



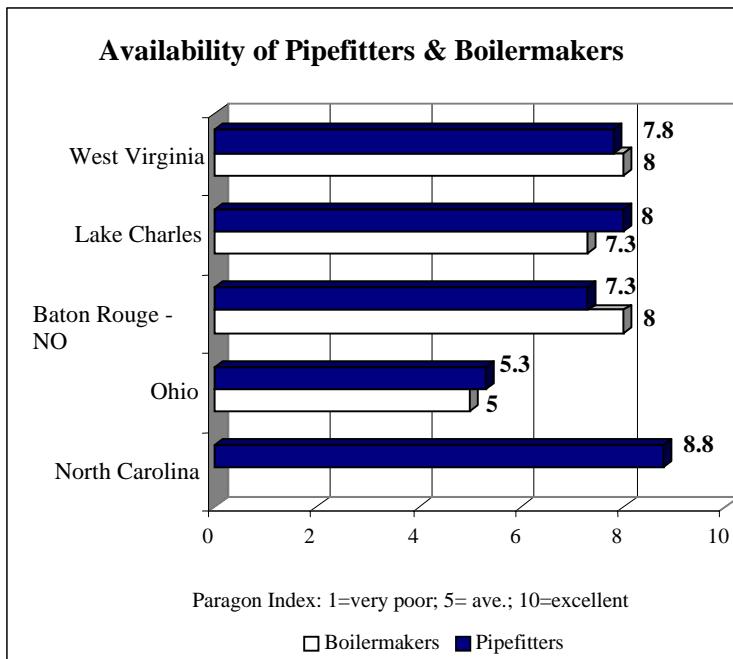
Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- West Virginia carpenter availability is comparably good to all areas.



Pipefitters and boilermakers are often considered the most critical positions for the construction of polymer operations. Up to 40% of expansion project work will be for pipefitters.

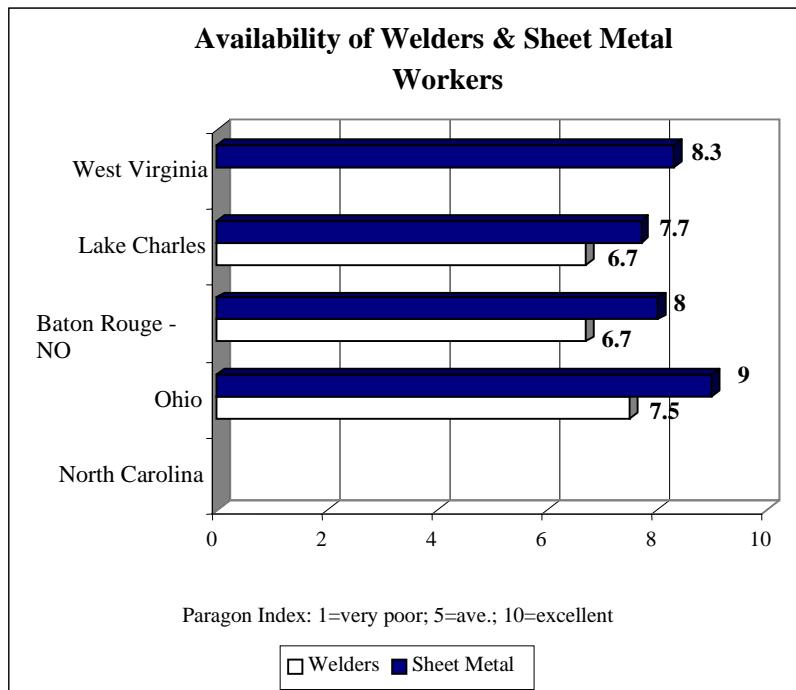
- Pipefitter availability is good in West Virginia, exceeded only by North Carolina.



Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Welder positions often have heavy crossover, which means they are also doing pipefitting, painting, sheet metal work and asbestos removal. Some projects subcontract out all the brick and cement work and therefore availability of those workers is difficult to assess.

- Availability of sheet metal workers in West Virginia is “very good.”



DETAILED CONSTRUCTION COST ANALYSIS

Introduction

Analysis of the comparative construction cost among states has many dimensions. Costs can vary because of differences in:

- 1.) the cost of materials
- 2.) hourly cost of workers
- 3.) cost of workers' fringe benefits
- 4.) productivity of workers
- 5.) state and regional cost differences resulting from different taxing structures, etc.

This section of the analysis of the West Virginia Polymer industry addresses three of the potential reasons for differences in cost of construction of polymer plants among states. Since the fieldwork was completed in fall of 1999, all of the analysis is based on the economic conditions at that time. For purposes of analysis, data from four states are used:

- West Virginia
- North Carolina
- Ohio
- Louisiana (two locations)

In some cases, data was collected from specific municipalities within the state; however, all data is not available for geographies smaller than the state. Therefore, some comparisons are presented at the state level and others for locations within states. The analysis presented addresses issues of wage and fringe benefit differences, productivity differences, and differences in state unemployment and workmen compensation costs.

Labor Cost Differences

Total labor costs are a combination of wage rates, cost of fringe benefits, and unemployment and workmen compensation costs. In completing the analysis, we used wage data from three sources.

- **A Wage Survey.** The first was information provided by construction and polymer companies that do business in the five states. Each company was asked to complete a wage survey form and return the form.
- **Economic Research Institute (ERI).** ERI data is based on its propriety database made up of surveys from various companies, labor unions and associations. It is one of the most reliable national sources of wage data and used extensively in our site selection assessments.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **Occupational Employment Statistics (OES).** The U.S. Department of Labor collects this wage data nationally.

To provide a complete picture, several different comparisons were completed based on differences in data available.

The first analysis uses wage data from the field interviews (which includes fringe benefits) and productivity information derived from the 1997 Census of Construction, a publication of the U.S. Dept. of Commerce based on survey data collected from construction firms. The data from the 1997 Census of Construction are only available at the state level.

Table 1: The Census of Construction data was used to derive a comparative productivity index. The most common measure of productivity is the value of output per dollar of labor cost. This measure of output was calculated for two types of general construction projects to determine a lower and upper bound on relative productivity among states.

- One productivity index was developed using data from labor cost and value of output for manufacturing and industrial buildings (scenario 1).
- A second productivity index was developed using a mix of construction projects⁵ that might better reflect a polymer plant since polymer plant construction is not reported separately (scenario 2).

TABLE 1

PRODUCTIVITY ANALYSIS

Manufacturing and Industrial Building under 2 story (scenario)					
	Construction Workers	Construction Work Payroll	Net Value Construction	Net value per Worker	Relative Productivity
West Virginia	668	\$ 20,652	\$ 108,734	\$ 163	100%
Ohio	4940	161,070	922,986	187	115%
North Carolina	3687	92,543	395,784	107	66%
Louisiana	3490	100,712	366,307	105	64%
Mix of Construction Projects (scenario 2)					
	Construction Workers	Construction Work Payroll	Net Value Construction	Net value per Worker	Relative Productivity
West Virginia	7692	\$ 206,811	\$ 801,889	\$ 104	100%
Ohio	67705	2,015,134	8,098,869	120	115%
North Carolina	58685	1,418,634	6,198,693	106	101%
Louisiana	30871	819,993	3,387,993	110	105%

Source: 1997 Census of Construction, U.S. Department of Commerce

⁵ The mix includes building equipment and other machinery installation contractors; heating and air conditioning contractors; structural steel contractors; water, sewer, and pipeline construction; electrical contractors; and roofing, siding, and sheet metal contractors.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

In each case, the value of construction in the state was divided by the cost of labor to get a measure of output per dollar of labor cost, the measure of productivity. This provided a range for relative productivity of labor in the comparison states.

Using data for manufacturing and industrial building construction, the productivity index ranged from a high of 1.15 for Ohio to a low of .64 in Louisiana (West Virginia is 1). This means that North Carolina workers are about 44 percent less productive than West Virginia workers and Ohio workers are about 15 percent more productive.

If the mix of construction projects is used, the productivity index ranges from a high of 1.15 in Ohio to a low of 1.01 in North Carolina (West Virginia is again 1).

Table 2: To compare the cost of construction in the various states, the productivity measures discussed above were combined with the crew mix for a polymer plant⁶ and labor wage rates. The table compares wages and fringe benefits for the five locations analyzed in the study. Wage data is from Economic Research Institute, Inc. and fringe benefit data is from the Paragon field visits.

TABLE 2

WAGE COMPARISONS					
ERI Data					
	Carpenters	Electrician	Pipefitters	Sheet Metal	Other
Parkersburg, WV	\$28,459	\$37,394	\$38,623	\$26,826	\$21,488
Columbus, OH	30,563	39,684	40,940	28,979	23,405
Fayetteville, NC	27,211	35,532	36,677	25,767	20,717
Lake Charles, LA	29,867	38,766	39,991	28,323	22,892
New Orleans, LA	29,867	38,766	39,991	28,323	22,892
Fringe Benefits					
	Carpenters	Electrician	Pipefitters	Sheet Metal	Other
Parkersburg, WV	34.26%	30.96%	31.87%	51.15%	41.67%
Columbus, OH	34.26%	30.96%	31.87%	51.15%	41.67%
Fayetteville, NC	27.49%	27.49%	27.49%	27.49%	27.49%
Lake Charles, LA	37.46%	37.46%	37.46%	37.46%	37.46%
New Orleans, LA	34.26%	30.96%	31.87%	41.65%	41.67%
ERI Data Adjusted for Fringe Benefits					
	Carpenters	Electrician	Pipefitters	Sheet Metal	Other
Parkersburg, WV	\$38,209	\$48,971	\$50,931	\$40,547	\$30,442
Columbus, OH	41,034	51,970	53,987	43,801	33,158
Fayetteville, NC	34,691	45,300	46,760	32,850	26,412
Lake Charles, LA	41,055	53,288	54,972	38,933	31,467
New Orleans, LA	40,099	50,768	52,736	40,120	32,431

⁶ The crew mix is based on a proposed construction project of Shell Chemical Company in 1994.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Table 3: To obtain a more accurate account of labor costs for building a polymer plant, the above data was adjusted for a crew mix that represents the mix necessary for building a polymer plant. The table gives that crew mix based on a 1994 Shell Chemical Company analysis for building a new plant.

Table 3
SHELL CREW MIX

Carpenters	Electrician	Pipefitters	Sheet Metal	Other
10.00%	15.00%	35.00%	15.00%	25.00%

Table 4: Information from Table 2 and Table 3 was combined with information on relative productivity to develop a true measure of the total labor cost for construction of a polymer plant in Parkersburg, West Virginia and four other areas.

The productivity information for the two scenarios presented above is combined with the relative wage cost to estimate a relative cost of labor at the five sites.

- **Using scenario 1, West Virginia is the second lowest cost location.** Locations in Louisiana have a significant labor cost disadvantage, 165 percent and 163 percent of costs in West Virginia.
- **However, using scenario 2, the differences disappear.** In that case North Carolina becomes the low cost area with labor costs being 89 percent of West Virginia. The Louisiana costs at virtually the same as West Virginia.

The differences in the two results are because of differences in the relative productivity given the two different construction scenarios.

Table 4

Final Labor Cost Comparison					
	Relative Wage	Relative Productivity Scenario 1	Relative Labor Cost Scenario 1	Relative Productivity Scenario 2	Relative Labor Cost Scenario 2
Parkersburg, WV	100%	100%	100%	100%	100%
Columbus, OH	107%	115%	93%	115%	93%
Fayetteville, NC	89%	66%	135%	101%	89%
Lake Charles, LA	106%	64%	165%	105%	101%
New Orleans, LA	104%	64%	163%	105%	99%

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **Unfortunately, the above analysis does not provide a definitive answer to the question of comparative costs of constructing a polymer plant.⁷** Depending on what data is used, it can be demonstrated that West Virginia is less costly or about the same cost as other states that have a large presence of polymer plants. In general, this would tend to indicate that significant differences in costs are not related to the direct cost of labor (wages and fringe benefits).

Unemployment Insurance Costs

Table 5: Unemployment insurance rates were collected for the states involved in the study.

Table 5
Unemployment Insurance Rates

	Unemployment Insurance Rates			Notes
	Existing Companies	New Companies	New Construction	
West Virginia	1.05% - 8.5%	2.7%	8.5%	On first \$8,000 of earnings
North Carolina	0.0% - 5.7%	1.2%		On first \$13,000 of earnings
South Carolina	0.54% - 5.4%	2.64%		On first \$7,000 of earnings
Ohio	0.0% - 6.4%	2.7%	4.0%	

- **It would appear that the unemployment insurance rates are higher in West Virginia.** This would contribute to higher overall costs of construction in the state.

Workmen Compensation Costs

Table 6: We collected information that would provide a general overview of possible differences in the cost of workmen compensation costs among the states.

⁷ The relative wage comparisons would be different if the mix of journeymen, apprentices, and helpers changed.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

Table 6

Workmen Compensation Rates			
	General Rate	Chemical Mfg. Rate	Notes
West Virginia	\$ 9.24	\$2.75	
North Carolina	\$ 14.49	\$2.61	General rate is less 50% if obtained through private insurance
Ohio	\$ 14.57	\$ 3.18	
Louisiana			Private insurance only

- **West Virginia workmen compensation costs are generally lower than or comparable to the other states studied.**

A side-by-side study of worker's compensation costs between North Carolina and West Virginia further substantiates no substantial differences:⁸

Workmen Compensation Costs			
	WV	NC	
Iron and Steel Erection	\$ 9.84	\$ 19.03	
Plumbing	\$ 4.77	\$ 3.97	
Electrical Wiring	\$ 5.13	\$ 9.90	
Masonry	\$ 11.57	\$ 7.20	
Boiler Installation	\$ 9.07	\$ 3.97	
General Construction (over 2 stories)	\$ 13.15	\$ 8.56	
Painting Steel & highrise Structures	\$ 22.75	\$ 6.82	
Excavation and Casson Work	\$ 7.74	\$ 6.01	
General Construction (under 2 stories)	\$ 7.66	\$ 12.20	

Source: National Council on Workman Compensation Insurance
they do not collect data on other states in study

Conclusion

- **It does not appear that labor costs in West Virginia should result in significantly higher wage costs than in the other states studied. Any difference in wages appears to be offset by differences in productivity.**

⁸ The rates quoted are the general rates and surcharges of 30 percent are common.

ADDITIONAL OBSERVATIONS

The following observations are supported with *quotes* derived from the fieldwork interviews.⁹

- **Financial and training incentives play a major role in the determination of where a polymer plant will expand or be built.** Louisiana's tax abatement program is a good example. (Training incentive comparisons are outlined in Appendix A.)
 - “*State and local incentives are extremely important in making a decision on where to manufacture a new product line.*”(OH)
 - “*We are going to invest \$275 million, 80% in machinery and equipment; our direct payback will be around \$446 million into the area and state.*” We will be getting a \$44 million investment tax credit over 20 years.” “*This will not include the infrastructure improvements the state and local governments are making.*”(NC)
 - “*Our expansion is being driven by tax credits, grants for infrastructure improvements and training funds.*”(NC)
 - **“We have built a plant in Mississippi just recently, most of it was due to excellent incentives issued by the state, and it was convenient for the shipment of resins.”**(NC)

Training and Education Incentives

- “*We are excited about the career cluster or academy program that the Columbus Area Chamber of Commerce is starting up. It may ensure that there will be crafts people available ten years from now.*”
- “*The unions shouldn't have duplicate training programs, the state of North Carolina pays for all our training in Fayetteville.*” (NC)
- “*The unions should establish a pre-apprenticeship training pool so young people can migrate into apprenticeship.*”(WV)
- “*A craft problem exists with non-union workforce. ABC does a good job, but it's tough to get folks to take night classes. Contractors are always seeking better talent.*” (LA)

⁹ Comments were obtained from field interviews with company and industry representatives in the states indicated.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- “One hundred percent of our construction and 85% of our maintenance is contracted. We use all of the major contractors in area: Industrial Specialist, Triad, Nichols, B&G, Shaw, Merit, Performa, General.”(LA)
- “ABC is good source of talent, and our ability to meet frequently as a management group in these adjoining parishes helps ABC set up training and now contract with the schools if needed.” (Training) (LA)
- “Now, we are reaching the secondary schools with the career cluster system in New Orleans, which will help work with students in the trades at an early age.” (Education) (LA)
- “ABC is providing the major thrust of the training and retraining. Tech colleges do JIT training and customized training and ABC has training facility in Westlake area. (Incumbent worker training \$270,000/company on a 2 yr. training plan ABC not held to four-year industrial apprenticeship training program). All young people must start at the helper level and work at instrumentation.”
- “Lake Charles wages differ greatly between seasoned maintenance crews and migrant construction crews (electricians are \$22/hr in maintenance and \$16.60 in construction.)” (LA)
- “Our electrician helpers and carpenter helpers can progress to journeymen in four to four and one-half years.” (NC)”
- **State and local building regulations do not weigh heavily on an expansion decision.**
 - “Environmental permitting is streamlined and optimized in North Carolina.” It is the same way in Louisiana because they are conditioned for polymer construction (NC). ”
- **The cost of building materials plays only a minor role in plant location or expansion decisions.** Compared to the overall costs of operation, this is insignificant, even though it is important while the firm is operational.
 - “There is no difference in the cost of building materials between the two sites. It depends on how you deal.” (NC)
 - “Cost of materials is a key factor but in making a plant location or expansion it is a factor that management must control better with more efficiency.”(WV)
 - “The internal supply purchasing at Firm X hurts their productivity and they could be saving 25% by letting the contractor handle it.” (WV)

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **Good weather conditions are beneficial to Southern states** in regards to length of the building season; however, there may often be problems.
 - *"We have just as much bad weather here in Louisiana as the northerners do. We have ugly hot weather, hailstorms and hurricanes." So, our weather is not a factor, it is our state and our ability to cooperate with one another."* (LA)
- **Polymer plants on the coast and Gulf have obvious transportation advantages** and in a worldwide marketplace it is a factor in transporting goods overseas.
 - *"It is important to be near the Cape but transportation costs will not vary that critically between shipping to California from North Carolina or West Virginia."* (NC)
 - *"Transportation costs are a given item. Louisiana has the distinct advantage of being in the middle of the United States, yet has the Gulf. These are obvious fixed advantages."* (LA).
- **Management practices and costs are critically important factors in the costs at the site.** (Adding additional engineers and supervisors and programs, such as duplicate safety and drug testing programs). If more manpower hours must be added because the union has strong jurisdiction lines and work rules, costs of managing the process increases.
 - *"Since we don't have the luxury of having a union, we must get to know the workforce ourselves along with our contractor. This takes us a little extra time in interviewing, assessments and background checks. In other words we have to get to know the people."* (NC)
 - *"If people complain about productivity they need to look in the mirror, management practices have a lot to do with it: (BEST PRACTICES EVALUATION COMPLETED BY FIRM X). The size and age of a plant is a factor in trying to manage it."* (OH)
 - *"Having worked at larger polymer plants, the smaller the plant usually the more productive." Size is a factor in productivity, therefore management practices must be adapted to compensate for the cumbersome task of managing large plants and we will be faced with that here because we have multiple sites."* (NC)
- **Jurisdictional issues are detriments to areas seeking polymer industry expansion.** The mere presence of jurisdictions adds more time in hiring and meetings and adds costs to management and decreases management productivity.
 - *"The system is very hard for a union contractor. Our biggest problem is not getting the work but handling the jurisdictional issues. I have lost a lot of money from these problems and are not be able to hire who we wanted because the union*

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

local wants his people hired first and I can't hire from the union hall down the street from the location because it is technically in another jurisdiction." (WV)

- “*We have not had anyone breathe the word jurisdiction since we became a right to work state in the mid-80's, let alone have any jurisdictional issues.”(LA)*
- **Universities and their polymer departments often play an important role in the introduction of new product lines and value added to polymer operations in that state.** This has led to expansions of plants in North Carolina and Ohio.

University/Technology Transfer

- “*University and R&D are critical to future development of plants in West Virginia or any other state.” (WV)*
- “*We are committed to Ohio and want to continue to expand and use the Ohio State University for technology assistance.”(OH)*
- “*Strong internship programs in engineering with LSU & Southern University helps recruiting and we work closely with their technology programs!”(LA)*
- “*Technology transfer from the universities has been the number one factor in expanding in North Carolina. Our Teflon process using carbon dioxide has been developed by labs at North Carolina State and University of North Carolina.”(NC)*
- “*This West Virginia plant needs to draw new technology into it to have a future.”(WV)*
- **States in which community colleges have strong trades programs are very successful.** Plant officials can work directly with the colleges to assist skill upgrades, understand new instrumentation methodology, or train new workers when an expansion is taking place often times at no cost to the employer.
- “*Retraining garment workers at the community colleges and getting discharged Army personnel at Fort Bragg has been critical to our success in recruiting helpers and other workers who are later trained for crafts positions.”(NC)*
- “*Contractors train on their own and draw some from vocational technical schools. Community Colleges are brand new in LA, no grads yet.”(LA)*
- “*There is no question that apprenticeship programs with unions are good and that we have to compensate here by having long term relationships with our community college by having them do the training for us over a number of years.”(NC)*

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **Work rules and lack of cross training are also major impediments to growth.** The inability of a worker to be able to finish a task in its entirety because of the lack of cross training in his/her trade, serves as a major problem for management. The Presidential Agreement allows for as much flexibility in West Virginia as the orange book in Louisiana. The contractors and employers must be more assertive in using the Presidential Agreement.
 - “*We are very concerned about work rules, we need composite work crews and shared responsibility.*”(WV)
 - “*Union environment is very restrictive, you have third party interference, and the contractor may not have any freedom.*”(WV)
 - “*All work, construction and maintenance, is done with contractors (3 tiers). (50/50 union vs. non-union environment). They all work side by side in a good cooperative climate.*” (LA)
 - “*Some are still sensitive to union and non-union issues, we have to have committees established and they must work together, so it is easier if all contractors are union.*”(OH)
 - “*Sometimes we may add crews for special projects and even though we are unionized we have not had a jurisdictional problem in 15-20 years. Our crews may come from Texas or right here in Lake Charles.*”(LA)
- **Labor availability drives wages.** In 2001, labor is becoming more available. This is likely making the good availability previously found even better. Few major wage changes are expected.
 - “*We only have availability problems with the more sophisticated trades occupations if we decide to put in a new unit while someone else in the corridor is doing a major expansion. Our Chamber committee helps us plan these things.*”(LA)
 - “*As we go through our expansion here, I know we will have all the skills trades people we need. In addition, North Carolina Job Service has a had good track record of attracting pre-retirement Northern workers for large scale construction projects.*”(NC)
 - “*The problem Firm X has in their non-union plants is that wages are less, but in order to draw people in these tight labor markets, they often have to pay per diems, train to get certifications, and pay overtime.*”(NC)

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **A good business environment and professional economic development assistance is important to polymer officials.**
 - *“Political reliability is good in Ohio. We have gotten what we were promised in incentives.” (OH)*
 - *“Much of our expansion depends upon what this state administration will do in terms of incentives and tax relief.” (OH)*
 - *“Political reliability is considered great, especially in Lake Charles, gotten year tax abatement on two new sites, so we consider politicians in this state and region to be very reliable.” (LA)”.*

RECOMMENDATIONS

The following recommendations are designed to assist the PAZ in future planning.

- **Form a Workforce Development Roundtable for the polymer; construction and chemical industries cluster in order assist education and training.**
 - Members of the Roundtable should include; polymer and chemical industry leaders, human resource managers, trade union leadership, educators and appointed and elected public officials.
 - The Roundtable should develop a long-term workforce development strategic plan that encompasses all issues regarding the polymer industry.
 - The Roundtable should address close adherence to the presidential agreement.

The Roundtable would address all following recommendations:

- **Encourage the legislature and the state economic development officials to greatly enhance the financial incentives programs for polymer industry expansion and development, particularly tax abatements.**
- **Encourage the local trade unions, contractors and polymer firms to adhere more closely to the presidential agreement.** This agreement between unionized workers and management basically adheres to no work rules, complete flexibility of work, no strike clause and job sharing (cross crafts).
- **Work toward ending all jurisdictional practices.** Union leaders need to cooperate with each other and allow complete crossover between union jurisdictions. The Roundtable efforts should help push this forward.
- **Encourage West Virginia University leadership to begin a polymer engineering program.** Bring together all post-secondary institutions interested in polymer research in West Virginia.
- **Aggressively promote cost, quality and availability of the construction workforce in order to stimulate interest in investment in West Virginia.**
- **Develop an operating cost comparison report for the secondary polymer industry for marketing.** This report would take a hypothetical project and compares costs and conditions in Polymer Zone versus select competitors and/or source cities. The study **should include transportation costs with multiple outbound destinations.** Use select results from this analysis, including availability, cost and quality factors.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **Work to develop a workforce strategy built on a “career cluster system.”**
 - Assist in forming career clusters in trade professions.
 - Begin a career-clustering program at all schools.
 - Encourage industry leaders, educators, teachers, union officials, and government leaders, to develop a collaborative, public and private business driven partnership, and sign a compact built around the trades.
 - Encourage the secondary school and universities and colleges officials to become major members of the compact.
 - Look to other areas, such as Columbus, Ohio for guidance in the compact process.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

For more information regarding this report, please contact:

Mr. Jack Allston

**Paragon Decision Resources, Inc.
One Oakbrook Terrace, Suite 208
Oakbrook Terrace, Illinois 60181
(630) 889-7020
FAX (630) 889-7022**

APPENDIX A

TRAINING PROGRAMS

North Carolina

Companies receive free, customized training programs for their new employees and re-training their existing ones.

- Administered by the 59 community college campus system
- Programs can run up to three years, if project is still running after three years, new contract can be written.
- All construction companies affiliated with large projects are eligible.
- Eligible reimbursable costs: instructors (can be third party contractors); materials, tools, books, training manuals, videos, computer based training and other supplies; and transportation costs of trainers from company
- No minimum or maximum on reimbursable funds/job; usually averages \$1,000 to \$5,000 per job
- In addition, Worker Training Tax Credit enables companies to take credit for employee wages while in training, which supports the company deducting the wages paid during training (up to \$1,000 per eligible employee)

Example: **\$100 million construction polymer project.** 200 construction jobs associated. Enhanced skill training needed for all. (\$3,000 per job for one year of training for 200 construction employees) = \$600,000 plus \$1,000 per employee construction company can deduct on wages = \$200,000 = \$800,000

Ohio

- Enterprise Ohio designs and delivers programs specifically designed for the company's needs (indirect assistance)
- Ohio Industrial Training Program offers up to 50% funding for the instructors and instructional materials;
- Between 25-50% reimbursement for special needs, including train-the trainer, curriculum development and assessment.
- No limit on funding and how long programs can run
- Ohio Training Tax Credit Program will provide up to \$100, 000 a year to offset the costs of training current workers to upgrade their skills.

Example: \$100 million construction polymer project. 200 construction jobs associated. Enhanced skill training needed for all. (Instructors will cost \$100,000 per year for three

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

years and instructional materials cost \$20,000) \$320,000 X .50 = \$160,000 per class. Certification and classes are needed instrumentation and statistical process control. Equivalent of three years. \$160,000 X 3 years = \$480,000 + .25 of special needs of \$50,000 = \$25,000. Total = \$505,000 + \$100,000 tax credit for 3 years (\$300,000) = \$805,000

Louisiana

Louisiana's program is known as Incumbent Worker Training:

- Provides funds for trainers (instructors) who could be employees of the company or a consultant
- Travel is limited to 30% of total training award
- Also includes raw materials, AV materials, training materials and texts, equipment, furniture, classroom fixtures, facility rental
- Any applications in excess of \$270,000 should contain documentation needed for additional funding
- Therefore, there are no maximums or minimums in the program
- Tax credits are available for new hires of \$2,500 per employee, and then again for a second year

Example: \$100 million construction polymer project. 200 construction jobs associated. Enhanced skill training needed for all. (Instructors will cost \$100,000 per year for three years and instructional materials cost \$20,000) \$300,000 per class + \$20,000. Certification and classes are needed instrumentation and statistical process control. Equivalent of three years. \$300,000 X 3 years = \$900,000 + \$20,000= \$920,000.

Tax Credit for those applicable: assume: 70 employees of 200 fit criteria. 70 X \$2,500 = \$175,000

Total = 920,000 + 175,000= \$1,095,000

Community College Worker Training Programs:

- Community colleges in North Carolina have unlimited flexibility in working with expanding employers to develop and fund programs to train workers
- The programs are strictly tailor made to assist expanding firms with developing programs for new and existing workers and assisting those employees with understanding new technology. Grants have no limitations

Appendix B

State Incentive Programs Incentives: Fall 2001

North Carolina

Credits for Creating Jobs:

- Tax Credits may not exceed 50% of the tax against which they are claimed for the taxable year, reduced by the sum of all credits allowed against that tax. Credits may be carried forward for five succeeding years. (Credits are based on the zone in the state, the higher the unemployment, the higher the credit) (If in development zone, then \$4,000 credit is added)

Credit for Investing in Machinery and Equipment:

- The credit is 7% of the eligible investment amount over the applicable threshold. The threshold is based on the location in the state. The credit is a 7% credit but may qualify for a technology commercialization credit of up to 15% to 20%.

Credit for Worker Training:

- For training of workers a credit applies that may be up to \$1,000 per employee

Credit for Research and Development:

- A credit of anywhere from 5% to 25% can be applied for increase in research and development activities can be applied of the state's share of the federal credit claimed. In the case of polymer research in North Carolina it would be 25%

Business Property Tax Credit

- The credit can equal 4.5% of tangible business property capitalized under the tax code.

Local and Regional Incentives:

- Grants can be awarded for up to 100% of real and personal property taxes assessed as a result of project expansion (For polymer expansions full property tax exemptions are available for property improvements)
- \$25,000 per project is available for job creation (rules can be suspended for larger projects and grants can be larger)
- Development zone enhancements are awarded on a case by case basis

Ohio

Ohio has a total of 26 programs in business development, tax incentives, and technology enhancements that can be utilized as incentives. The following are the programs that are most applicable for expanding or improving polymer plants.

- **Ohio Enterprise Bond Program:** providing for funding for capital improvements between \$1.5 million and \$10 million in size. (Applicable for smaller polymer projects). Long term fixed rate financing for up to 20 years at below market rates with an A- S&P rating.
- **Buckeye Loan Fund Program:** provides direct loans for businesses locating or expanding in Ohio's priority investment areas. The program blends funds with the Ohio Enterprise Bond Fund. (See above) (Long term fixed rate direct loans at not greater than half of prime)
- **Ohio 166 Program;** similar to the programs above and run through the Development Financing Advisory council.

Tax Incentives:

- **Machinery and equipment investment tax credit:** purchase of new or used equipment or machinery of up to 13.5% The total value of the tax credit is divided equally over seven years and the manufacturer is allowed is permitted to carry forward any unused tax credit for up to three years.
- **Ohio Job Creation Tax Credit:** State income tax credit for up to 75% for 10 years. (Municipalities can provide a similar arrangement with their local employee income taxes.)
- **Enterprise Zone:** Substantial reductions in real and/or personal property investment and potentially franchise or state income tax benefits. Up to 75% exemption in incorporated areas.

- **Community Reinvestment Areas:** 100% exemption on real and personal property taxes for up to 15 years. (Local school board for need to approve)
- **Research and Development Sales Tax Exemption:** provides exemption from the usual state and county sales tax for purchase of equipment used for RD activities
- **Manufacturing Machinery and Equipment Sales Tax Exemption:** provides exemption for all state and county sales tax for purchases of machinery and equipment used primarily for manufacturing
- **Ohio Investment in Training Program:** Provides financial assistance and technical resources for customized training involving employees. Up to 50% reimbursement to fund instructional costs, materials and training related activities.

(Essentially if all the incentive programs are added together, the firm may pay no state corporate income, sales, or payroll tax)

Edison Technology Centers: Provides business (ie. Polymer firms) access to state of the art applied research performed in-house or obtained through linkages with universities, federal laboratories and other institutions; educational and training programs; plant site assignments; technical problem solving; conferences, seminars and other networking opportunities.

- Seven centers, each focusing on specific research areas: polymer research is included

Louisiana

- **Industrial Property Tax Exemption:** New and expanding manufacturers (including polymer plants) are eligible to receive a 100% five-year property tax exemption on manufacturing facilities and related equipment (including buildings, machinery, equipment, furniture and fixtures). This incentive can be extended for an additional five years. (Effectively all polymer plants in Louisiana have 10 exemptions on all their improvements)
- **Enterprise Zone Program:**
 - 1) A \$2,500 tax credit (can be up to \$5,000 depending on industry classification) for each new job created. (Cases for retention of jobs, such as construction jobs can be made). The credit can be applied to any state income tax or corporate franchise tax obligation
 - 2) The credit can also be used as a rebate on state sales tax and equipment.

Strengths and Weaknesses, Parkersburg/Polymer Zone, West Virginia

- **Quality Jobs Program:** provides an annual refundable credit of up to 5% for 10 years that can be applied to any state income tax or franchise tax obligation. Credits exceeding tax liabilities will be available as a cash refund. (If in enterprise zone supercedes Quality Jobs Program.)
- **Louisiana Workforce Development and Training Program:** New and expanding businesses seeking training in the State of Louisiana can be eligible for up to \$500,000 in training funds. These funds are available through an application process with the Louisiana Department of Economic Development.

(Note: Exceptions are made on the \$500,000 limitation, especially upgrading skills in the polymer construction, such as instrumentation skill development). This provision is made under Incumbent Worker Training Program. Each contract is for a 2-year period.

In addition, all companies are allowed an Inventory Tax Credit allow for 100% in the amount of local inventory tax paid.

Appendix C

**Memorandum to
Robert Bowen**

CGS

Memo

To: James Kennett
From: John Lewis
CC: Deane Foote
Jack Allston
Date: 4/15/2005
Re: Response to Robert Bowen's questions

Data Bases

Information on construction costs was taken from the *Survey of Construction* published by the United States Department of Commerce. This data is updated every five years and is derived from a survey of construction companies. While detailed information on construction of polymer plants is not available, information is provided for a number of types of construction, such as commercial buildings, industrial buildings under three stories, etc. Information is also provided by type of construction activity such as structural steel contractors, electrical contractors, etc. It is my position that these construction costs do not vary by type of project except for the mix of activity. That is why we did two estimates for productivity, one bases on manufacturing and industrial buildings and a second using costs for specific construction activity based on the Shell mix of activity in building a polymer plant.

Productivity

Net value of construction is the best measure of value added by labor. It is different than construction costs in that it excludes the costs of intermediate goods such as steel, piping, etc. In essence it is the cost of labor, net income to the construction company, and interest cost incurred by the company. It is the best measure of direct output of labor.

Construction Work Payroll and Wage Comparisons

Construction work payroll is the total labor cost for construction costs in the state. This figure is provided as background information but is not used in the analysis.

Net Value per Worker in Not Value Construction Work divided by Construction workers. It is the value added to the construction project by each worker.

We used annual income as opposed to wage rates to capture the effect of overtime. This provides a better measure of true labor costs.

Union vs. Open Shop

We had no specific information on union vs. open shop. To the extent open shops exist in a state and the wages are different, that should be reflected in the wage comparisons by state.

Field vs. ERI data

ERI data does not include fringe benefits, therefore we calculated fringe benefits based on field data and data gleaned from reviewing union agreements. The field data on wages was not comprehensive. Additionally, we completed analysis using both field data and ERI data in an earlier draft and the committee made the decision to limit the report to using ERI data only.

I hope this answers the questions raised by Mr. Bowman.