SOCIAL AND ECONOMIC EFFECT OF EXPANDED ENERGY FACILITIES ON THE ISLAND OF ST. CROIX AND THE TERRITORY OF THE VIRGIN ISLANDS

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SOCIAL AND ECONOMIC EFFECTS OF EXPANDED ENERGY FACILITIES ON THE ISLAND OF ST. CROIX AND THE TERRITORY OF THE VIRGIN ISLANDS

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The availability of information on Virgin Islands energy production facilities is limited. Due to the present political and economic climate, i.e., negotiations between the Territory and Hess Oil Virgin Islands Corporation (HOVIC), the availability of credible information is limited and difficult to obtain. We greatly appreciate the assistance of officials of Virgin Island Refinery Corporation (VIRCO) who provided information based on their projected operations. Unfortunately, the request for similar information from the Hess Oil Corporation was denied after a considerable delay. This resulted in the use of Hess Oil Corporation data and material from other sources which we believe are accurate and credible for this report.

We are also grateful for the assistance provided by the staff of the Virgin Islands Department of Commerce, the Coastal Zone Management Office, the Virgin Islands Planning Office, the Office of the Budget, and the Federal Programs Office.

SUMMARY

The primary impact of a new oil refinery in the Virgin Islands will be fiscal. Currently about 19 percent of the territorial government's tax receipts are attributable to the Hess refinery. This percentage would rise to about 35-40 percent if a refinery the size of the VIRCO proposal were put into operation. Given the multi-island nature of V.I. government, fiscal impact is not limited to St. Croix and any modification to the tax contribution of refining activities would reverberate throughout the Islands.

Changing employment patterns may also have a significant impact particularly if new refinery jobs are not made available to local residents. VIRCO's pledges to hire locally must be monitored closely and compliance attained. If these pledges are not upheld, the distrust sown among the local labor force and the needs of the resultant wave of inmovers could well offset much of the positive fiscal advantages of a new refinery.

Available skilled personnel must also be kept in mind if any additional refineries beyond VIRCO are contemplated. If the level of unemployment drops to 3-4 percent, the likelihood of immigration will increase as job seekers follow opportunities. At some point in the future, the economic and fiscal contributions of additional refining capacity are virtually certain to be undermined by the strain placed on the physical and social fabric of the Virgin Islands by the everexpanding population of residents and inmovers.

The possibility of refineries beyond VIRCO must be examined in the light of a comprehensive land use plan for the Virgin Islands. Several questions must be answered: Is greater industrialization appropriate for St. Croix? ... If so, what type: oil-based, high-technology, low-technology, capital intensive, labor intensive? ... Are there suitable locations? The answers to these questions are in the province of long range planning, a must for the Virgin Islands.

Although it can be shown in an impact statement that the socio-economic effects of a refinery the size that VIRCO proposes are manageable and positive if appropriate employment practices are followed, refineries proposed in addition to VIRCO would render this impact statement inadequate. The questions of additional refineries calls for the establishment of a threshold capacity for population and industrialization on the

Territory. This limiting capacity can only be established through a comprehensive planning process.

Fiscal Impact

- Based on existing agreements with Hess Oil Virgin Islands Corporation and the Virgin Islands Refining Corporation, the taxes generated by the one existing and one proposed facility could be approximately 35-40 percent of the total taxes collected in the Virgin Islands annually.
- The existing Hess Oil Refinery provides about 11 percent of the Gross Territorial Product.
- Based on available data, existing and planned energy production facilities would provide 15-20 percent of the Gross Territorial Product.

Population Impact

- Assuming that VIRCO fulfills its commitments to employ native Virgin Islanders, and no other similar facilities are built, population increases via immigration should be minimal.
- If the construction of similar facilities takes place after VIRCO, population increases via immigration could be significant if skilled local labor is not found.

Employment Impact

- HOVIC employees and on-facility contract employees constitute about 4-5 percent of total territorial employment.
- The improvement of facilities at HOVIC are not anticipated to substantially change the existing employment at that facility.
- Energy production facility employees receive significantly higher salaries and benefits than any other segment of the labor force.
- While some redistribution of local labor might take place due to energy facility employment expansion, the labor force can absorb the vacancies without bringing on in-migration, provided training programs are made available for persons residing in the Virgin Islands.

Tourism Impact

- While the energy production facilities contribute to the local tourism economy through hotel and restaurant use, automobile rentals, etc., this impact is small.
- If recreational fishing is further adversely impacted, a loss in tourism revenues from this activity is possible.
- Although the energy production facilities are not located in the immediate proximity of the hotel complexes, careless operations of the refineries could have a substantial adverse impact if oil spills, or air pollution or noise pollution occur.

Fishing Industry Impact

- The fishing industry in the Virgin Islands is restricted primarily due to changes in habitat conditions in the fishing areas on St. Croix. This is attributed to previous construction on the south shore. The size of the fishing industry is small and the impact of new construction of energy facilities is not expected to be significant due to previous changes which were substantial.

- Increased disruption of the small fishing industry due to oil spills, further loss of habitat and loss of fishing traps could reduce employment in the existing fishing industry.

Social Infrastructure Impact

Housing

Assuming permanent employment of off-islanders is minimized, no substantial impact on housing is anticipated. For those employees immigrating for employment at VIRCO housing will be difficult to obtain. However the number of arrivals will be insignificant if current VIRCO commitments are fulfilled.

Education

The St. Croix school system is overcrowded at this time. Increased permanent enrollment due to energy facility increases will be comparatively small. The increase would average about five students per grade. This, while an increase, should be manageable.

Health

Since immigration should be minimal and out-patient family health facilities are usually provided by the energy industries, impact on the territorial wide health care system is expected to be minimal.

Physical Infrastructure Impact

Water and Power

VIRCO, as does HOVIC, proposes to provide its own power, water and industrial waste disposal. These facilities do not adversely impact the existing public facilities. Since waste disposal collection lines are available to VIRCO for non-industrial waste, VIRCO will be required to use them. Sufficient treatment capacity is available.

Transportation

The highway system, existing and proposed, in the vicinity of HOVIC/VIRCO appears to be adequate to service daily transportation requirements. Some improvements for increased highway capacity are underway. Traffic safety improvements are being made as part of a continuing traffic improvement program.

Public transportation is a continuing problem for St. Croix and steps should be taken to improve public transportation between the employment centers and the principal towns and housing concentrations.

Conclusion

The socio-economic effect of expanded energy facilities is primarily the fiscal impact on the Territory rather than solely on St. Croix. The objectives of a Coastal Energy Impact Program should not be restricted to physical improvements but should also address the need to improve public institutions and the processes that make them work for the public interest.

The Virgin Islands with its 100,000± population in an area of about 140 square miles is roughly the equivalent of a coastal county in Florida. The ability to systematically use the fiscal benefits of the energy production facilities based on sound management techniques and processes is of great importance to the social, economic and physical development of this community. While current attention in the CEIP is focused on physical improvements such as providing and improving recreation facilities, the need to enhance the processes and institutions for social and economic improvement should not be ignored.

PREFACE

The assignment to assess the "Consequence of Specific New or Expanded Energy Facilities Significantly Affecting the Coastal Zone" is a part of the Virgin Islands Coastal Energy Impact Program. This report responds to three tasks:

1. Assess the social and economic effects that expanded energy facilities will have on the Island of St. Croix as well as the Territory of the Virgin Islands by forecasting employment, population increases, tax revenues and changes in employment patterns especially in tourism and fishing.

2. Forecast the change in demand for public facilities and services as a result of population increases and indicate any stress on public facilities and services.

3. Present baseline information containing the economic and social data necessary to plan for and mitigate the impacts of increased population associated with new energy facilities, of loan applications under the Coastal Energy Impact Program (CEIP), and for development of a public facilities improvement program.

As stated, this report addresses only social and economic impacts, not physical impacts. In most CEIP jurisdictions the impact of a major energy production facility appears to be rather local. Indeed, this view might be taken in the Virgin Islands since the existing and proposed facilities are in one area of one island. However the Territory of the Virgin Islands is unique among coastal zone jurisdictions. The islands are small in size and population, and somewhat isolated and separated. But most significant is the form of government, i.e., totally centralized without island or municipal governments. Thus size, employment and location of these energy production facilities have a major impact on the territorial government.

The overall territorial impact is primarily fiscal and as such goes far beyond the immediate boundaries of the energy facility. The CEIP approaches this unique situation be addressing the energy production facilities' contribution to the public's general welfare and by providing new and improved public facilities for residents and tourists.

ECONOMIC ENVIRONMENT

Population Trends

The U.S. Virgin Islands have experienced in the last two decades strong population growth, fueled in part by increased employment opportunities in tourism and manufacturing. Table 1 below summarizes those changes for the Territory and for each of the three islands.

Table 1
Population Trends

	1960	1970	1976	1980	2000
Virgin Islands	32,099	75,151	87,120	95,930	128,510
St. Croix	14,973	35,945	43,600	49,280	81,317
St. Thomas	16,201	37,285	41,280	44,170	70,884
St. John	925	1,921	2,240	2,480	3,474

Source: U.S. Bureau of the Census
U.S.V.I. Planning Office (Linear Projection Model)
U.S.V.I. Department of Commerce

From 1960 to 1970, total population of the U.S. Virgin Islands increased from 32,000 to over 75,100, an increase of less than 10.0 percent annually. By 1976, the population was estimated to have increased to 87,120, an annual increase of about 2.5 percent. The net gains in population from 1960 to 1970 were about 4,300 annually, decreasing to about 2,000 annually in the 1970-1976 period. If the 1980 preliminary counts are correct, the rate of growth in the 1970's would be substantially reduced.

The estimated population in 1978 was 92,000 (about 4,000 less than the 1980 preliminary count) which suggests very little change in the population rate in more recent years. The 1980 census count for the V.I. was 95,930. The population projection for the year 2000 is 128,500 for the territory. However this is based upon a linear projection model prepared during years of strong growth and is considered somewhat high.

St. Croix has also experienced strong growth, increasing from just under 15,000 in 1960 to 35,945 in 1970, an average annual increase over 11.0 percent. From 1970 to 1976, an estimated 7,600 residents were added, an annual rate of increase of about 3.5 percent. Linear projections based on previous high periods of growth show St. Croix increasing in population to 81,300 by the year 2000.

These forecasts for St. Croix may not be too far off the mark especially if industrialization continues. Current estimates indicate St. Croix population at about 50,000 although preliminary Census figures do not confirm these numbers. Of that population, an estimated 55 percent are of Puerto Rican descent, 5-10 percent are U.S. Continentals, and only 25-30 percent are native Virgin Islanders. The balance comes mostly from other Caribbean countries and islands.

Employment Trends

Of a total labor force in the Territory of about 43,000, all but about 2,350 are employed. Although there are certain definitional problems, the labor force has remained essentially unchanged - increasing by less than 3,000 workers from March, 1978 to March, 1980. There are indications that unemployment is probably higher. The use of standard definitions can increase the size of the labor force and underestimate "hidden unemployment" (those that are not working and have given up looking for work) and tends to lower the unemployment figures.

Table 2
Employment Trends

				Unemployment Rate	
	Labor Force	Employment	Unemployment	V.I.	U.S.
March 1978	40,460	37,840	2,620	6.5%	6.6%
Sept. 1978	40,160	37,630	2,530	6.3%	5.7%
March 1979	41,900	39,720	2,180	5.2%	6.1%
Sept. 1979	41,050	38,600	2,450	6.0%	5.8%
March 1980	43,300	40,970	2,350	5.4%	6.2%

Source: V.I. Division of Labor Statistics

The unemployment rate was marginally higher than the U.S. total (6.0 percent vs. 5.8 percent) in March 1980, but dropped below the U.S. rate during the tourist season in March 1980 - 5.4 percent in the Virgin Islands versus 6.2 percent for the U.S. total.

In addition, the "discouraged worker" who wants work but does not seek work, and the high school dropouts are frequently not included in the labor force. To date, no methodology is available nationally which attempts to count these potential employees. The inability of the public agencies to identify these people and to measure them in computing the unemployment statistics locally is a national problem and is not to be considered a criticism of the Virgin Islands Bureau of Labor Statistics.

It is generally felt that persons capable of being trained for refinery operations are available and that sizeable numbers of the skilled workers required during the construction phases are also available. The requirements for highly specialized and skilled refinery construction workers will probably come from off-island sources. This should only be a problem during the construction phases.

Earnings in manufacturing industries in St. Croix are lower than in the U.S. Mainland as summarized in Table 3 for the year 1977.

Table 3

Average Weekly Earnings in Manufacturing

1977 - St. Croix

SIC	Industry	St. Croix	U.S. Mainland
	All Manufacturing	$197.20	$220.30
20	Food	$104.59	$206.71
22-23	Textile, Apparel	98.33	155.93
24-25	Lumber, Furniture	132.33	59.64
27	Printing	156.02	224.47
28-29	Chemicals	267.22	327.17
33-34	Metals	250.00	230.52
37	Transp. Equipment	138.04	296.38
38	Instruments	111.94	205.53

Source: V.I. Department of Labor

In 1977, chemical workers in St. Croix, including employees of HOVIC and Martin Marietta earned an average of $267.22 per week compared to a $327.17 per week average on the U.S. Mainland. The only manufacturing category in which St. Croix employees were paid more than the U.S. average was metals. On the average, U.S. Mainland manufacturing wages were $220.30 per week compared to $197.20 per week, in St. Croix.

In sum: workers in major St. Croix industries are the best paid employees in the Islands. Employees to staff a new refinery could cause considerable movement from other employment sectors, i.e., tourism, merchandising, etc., for better paying job opportunities. If VIRCO does not employ residents of the Territory and their salary scale encourages in-migration, then an adverse impact on many island institutions could be sizable especially in schools and housing.

EXISTING ENERGY FACILITIES

The Hess Oil Corporation of Perth Amboy, New Jersey, operating through a subsidiary - Hess Oil Virgin Islands Corporation (HOVIC) - reached agreement with the Virgin Islands Government in September 1965 to construct a major refinery on St. Croix. On a 1,200-acre tract of land located in Estates Hope, Blessing and Jerusalem, Hess constructed the world's largest refinery, utilizing hydro-skimming techniques of refining crude oil. The refinery has a nominal capacity of 700,000 barrels of oil per day with an actual current capacity of about 625,000 barrels per day. Hess Oil relies heavily on the St. Croix refinery for providing heating oil (Hess supplies some 20 percent of all East coast heating oil), for providing gasoline to its own service stations and to meet other sales requirements. The only other refineries operated by Hess are a 70,000 barrel per day refinery in New Jersey (now closed) and a 30,000 barrel per day refinery in Mississippi.

The 1965 agreement between the Virgin Islands Government and HOVIC provides for the following:

1) HOVIC agrees to construct a refinery costing at least $10 million.
2) 75 percent of all employees shall be legal residents of the Virgin Islands.
3) Hess and its affiliates shall be exempted for a period of 16 years on the following taxes and fees:
   a) the 6 percent customs duty on all imports
   b) all property and franchise taxes
   c) all license fees (except automobile licenses)
   d) all excise and gross receipts taxes on exports
   e) 75 percent of all income taxes
   f) 75 percent of all income taxes paid on HOVIC dividends
4) Hess agrees to dredge a portion of the Krause Lagoon and construct two docks - one for its own exclusive use and one for use by the Port Authority for handling general cargo.

The value of these exemptions is considerable - without them it is considered impossible to operate a refinery profitably in the Virgin Islands.

In 1979, if HOVIC were receiving no tax and fee exemptions, it would have been obligated to pay over $400 million annually to the Virgin Islands Government, approximately four times the company's taxable income. In actuality, HOVIC paid a total of $62 million in corporate income and withholding taxes and $29 million in royalties to the Virgin Island Conservation Fund from 1968 through 1978.

Table 4

Total Value of Tax Exemptions and Subsidies - HOVIC

	1979	
Income Tax	$ 33.0	million
Property Tax	6.3	(up to 10.0)
Gross Receipts Tax (2%)	72.0	
Import Duties (6%)	164.5	
Excise Tax (3% on crude oil)	105.4	
Ships dues ($0.65/ton)	21.4	
TOTAL	$402.6	million

Source: U.S. Department of the Interior

Since the current agreement expires in 1981, HOVIC has been negotiating with the Virgin Islands Government for a new agreement. The draft agreement, which the Governor found to be unsatisfactory, provides for payment of 25 percent of all taxable income, with a minimum guaranteed payment to the Virgin Island Government of $20 million annually. In addition, HOVIC agreed to pay a flat tax of $1 million in lieu of real estate taxes, but would no longer be required to deposit with the Territorial Government all customs duties on a quarterly basis before being reimbursed. The estimated value to the Virgin Islands Government from interest payments on those deposits is two million dollars annually. Because negotiations must now be re-opened due to the Governor's objections, it is difficult to analyze the fiscal impact of the HOVIC facilities. However, for purposes of this analysis, we will assume annual tax payments of $25 million per year.

In FY 1980, total taxes to the Virgin Islands Government from all sources, are estimated to reach $130,897,000. This is up from $94 million in FY 1977 and $77 million in FY 1973. Therefore, the fiscal contribution of HOVIC (exclusive of St. Croix Petrochemical Company which is under a separate agreement) is as follows:

HOVIC Payments to V.I. Government	$25.0 million	= 19.1%
Total FY 1980 taxes	$130.9 million	

In total HOVIC pays about one-fifth of all taxes received by the Virgin Islands Government. It must be remembered that the Government of the Virgin Islands is centralized in a single unit without governmental units for each island or each municipality. Although the HOVIC operations are confined to St. Croix, it is obvious from these calculations that the total fiscal impact extends throughout the Islands.

As the principal manufacturing employer, HOVIC's impact on the Virgin Islands economy extends far beyond fiscal implications. The HOVIC current employment profile is shown below in Table 5.

Table 5

HOVIC Employment Profile

587		U.S. Citizens
	250	Native Virgin Islanders
	220	Continental Citizens
	117	Puerto Ricans and other U.S. Citizens
609		Green Card Holders (Permanent Non-Citizen Residents)
27		Non-Citizens (Bonded Temporary Residents)
1,223		TOTAL EMPLOYEES

These 1,200 employees represent in excess of 40 percent of all manufacturing employment in the Virgin Islands. Salaries paid range upward from a low of about $8,200. The local HOVIC payroll is estimated to be approximately $20 million exclusive of mainland and island contractors working for HOVIC on St. Croix. These contractors employ up to 500 additional employees.

Based on these estimates, we calculate the total direct contribution of the HOVIC Refinery to be as follows:

Table 6

Existing Economic Contribution

(in millions)	
$ 20.8	Local payroll
13.0	Local contractors and purchases
1.5	Mainland contractors
25.0	Projected payments to V.I. Government
.25	Tourist-related expenditures (automobile rentals, hotel rooms, restaurant meals, etc.)
$ 60.55	TOTAL

The latest estimate of Gross Territorial Product for the U.S. Virgin Islands is $542 million. This includes the value of all goods and services produced in the Islands over the past year. Therefore, HOVIC's contribution is:

$$\frac{\text{HOVIC Economic Contribution}}{\text{U.S.V.I. Gross Territorial Product}} \quad \frac{\$60.55 \text{ million}}{\$542.0 \text{ million}} = 11.17\%$$

As shown in Table 6, HOVIC has little economic impact on tourist-related facilities, with estimated annual local expenditures of about $250,000.

SOCIO-ECONOMIC IMPACTS OF EXPANDED OR NEW FACILITIES

Adjacent to the HOVIC facilities on the south shore of St. Croix, the Virgin Islands Refining Corporation (VIRCO) proposes to construct a new refinery capable of producing up to 200,000 barrels per day. VIRCO has received all the required permits for a facility designed to refine the heavier crude oils and has signed an agreement with the Virgin Islands Government which grants certain tax exemptions and concessions.

The major industrial firms on St. Croix have attempted to provide for their own infrastructural requirements to avoid making undue demands on the local economy. HOVIC provides its own water through desalinization, handles its own industrial waste on-site, generates its own electricity, has its own fire department, and maintains its own roads. In addition, it has sponsored company-owned housing for management and some supervisory personnel. However, most of the population increase in the Virgin Islands has been due to in-migration rather than natural increase. This has been particularly true in St. Croix where greater job opportunities exist. All of these people make demands on the Island's economy, local infrastructure and government which are not fully compensated by industry.

Current plans call for a total work force of 500 employees, of which 470 will be production workers. VIRCO expects pay levels to be between $10,000 and $50,000 with an estimated annual payroll of $8 million. In addition the company expects to pay approximately $200,000 annually for hotels and other transient lodging, and a total of $3 to $5 million each year for on-island purchases of industrial materials and services.

Inmovers

To build a refinery the size of VIRCO will require a construction force of up to about 4,500 and require about twenty-four months to build. This phase of energy facility development could have most serious impacts. In the Background Narrative report (January, 1979) of the Economic Policy Council, we find the following statement: "The problem in construction that has been generated is that of "great expectations" with comparatively few alternatives to present a cushion to lessen the impact of a serious decline in construction activity. The withdrawal symptoms of a reduction in construction activity of the dimensions of what occurred on St. Croix are rather severe. The two major plants (HOVIC and Martin Marietta) completed their expansion activities almost

simultaneously with a rather severe drop in all other activity, including tourism. There was a decline of some 75-80 percent in construction activity in the period from 1972 to 1976 in St. Croix with a concurrent shrinkage in employment in that area. There were severe shock effects, and justifiably so ..."

At the peak of construction activity, about six months, the work force could number about 4,500 persons. During the initial six months, the work force would increase from zero to the peak and during six months after the peak, reduce to 500 ±. During the final construction six month period, the work force would taper to zero.

Given the fragile nature of the construction industry in St. Croix, problems may once again be difficult to avoid. Indeed, until the construction of energy facilities is seen as an artificially high level of construction activity and one that cannot be easily maintained after construction is substantially completed, the boom and bust cycle may be foreordained. Some construction work force will always be required. However, specialized workers will not be retained in large numbers.

The number of inmovers during the construction period is nearly impossible to predict. At HOVIC, peak activity saw as many as 5,000 construction workers. As with most modern refineries, much of the work required was of a highly skilled and technical nature. It is anticipated that all of the generalized and a substantial portion of the specialized construction labor force is available from among the resident labor force. The exact number of specialized craftsmen required and those available will depend on the level of activity of the construction industry at the time of construction. Short term immigrants may be required in certain skills if territorial residents are not available. VIRCO hopes it will be limited to ten percent of the construction labor force. However, if mainland experience with similar facilities can be a guide, as much as 20-40 percent of the peak construction force will be transient. If the inmoving construction force proves to be large and VIRCO makes no provision for temporary housing and other facilities, the strain on community services could be severe although of short duration.

Following the construction period and assuming that VIRCO fulfills its commitments to employ native Virgin Islanders and other resident citizens, the impact of permanent inmovers would be minimal. If at a minimum, 75 percent of the total work force is locally recruited, only 125 permanent jobs would be filled by non-locals. The population effect of these 125 workers would be as follows:

Table 7

Impact of Permanent Inmovers

PROJECTED EMPLOYMENT	500
Permanent Inmovers	
Number of Movers	125
Movers with Families (70%)	88
Movers without Families	37
School Age Children	62
Total Population Influx *	320
Housing Needs	
Total Dwelling Units	125

* Assuming 3.2 persons/family

Personal Income

After construction, $6-8 million per year of additional personal income should be realized, with roughly one-half of this amount spent in the retail sector. See the following table for how households in St. Thomas divide their monthly expenditures. No similar breakdown is available for St. Croix. Nevertheless, a similar breakdown is assumed. If adjustment for inflation is desired, the Implicit Price Deflator for the Gross National Product suggests a factor of 45-50 percent for the period 1975 to 1980.

Table 8

Consumer Expenditure Patterns

St. Thomas 1975-76

	Average Monthly Expenditures	Percent
Food	$239.	25.3
Shelter	235.	24.9
Transportation	110.	11.7
Apparel	51.	5.4
Utilities	61.	6.5
Furniture	41.	4.3
Other	206.	21.8
TOTAL	$943.	100.0

Source: J.L. McElroy and Joseph Caines, Consumer Expenditure Patterns, A Survey of St. Thomas, (1979)

In 1975-76, approximately one-quarter of the average household budget went to food purchases and another quarter to shelter (housing, rent or mortgage payments, insurance,

taxes and utilities). Based on discussions, it is believed that a greater portion of the household budget now goes for food and shelter due to current inflation. Transportation costs (automobile purchases, maintenance and gasoline, plus bus, air and boat costs) run almost twelve percent of personal income, while specialty purchases, discretionary spending and savings make up just over one-fifth of all purchases. With food and shelter costs increasing, discretionary spending and savings have decreased.

VIRCO would contribute less than $1 million per year of spending in the service sector and over $4 million per year in local purchases would be generated. These purchases are probably within the capacity of the existing local firms already supplying HOVIC and Martin Marietta. However, some additional employment may be required.

The effect of increased expenditures or total territorial employment in the trade and service sectors would appear to be small, especially if employment is not substantially increased.

Housing

According to the Community Development Block Grant Application for FY 1980 approximately 8,000 new housing units will be required in the Virgin Islands by 1985. This is a yearly average of 1,600 new units. The most recent available figures on new construction show a rate far lower than that required.

Table 9

New Construction 1975-1978

1975	732 units
1976	449 units
1977	287 units
1978	621 units

Another dimension of this problem is that most housing activity has been in luxury type units. These units are clearly outside the price range and household size of most residents of the Virgin Islands.

Although the new housing need generated by the VIRCO facility is small - 125 units - it is another addition to the serious overall housing shortage in the Territory. Whether VIRCO intends to help meet the housing needs of its employees through its own resources is an issue that bears watching.

Education

The estimated number of school age children expected to accompany the inmoving permanent population is about 62. This estimate is predicated on VIRCO's ability to obtain trained or to train native Virgin Islanders or existing permanent residents to meet the many skilled and supervisory personnel required for this new facility. If these goals are not achieved, especially in the skilled labor and supervisory categories, the impact on the public school system could be significant with about 50 students per 100 employees.

Another critical question which is difficult to qualify is the impact during the construction period. VIRCO estimates up to 4,500 construction workers with the upper limit on site for six months. A substantial portion of these workers will be on-site for about one year. VIRCO again is committed to employ local labor, but the availability of many skilled trades is small. The level of employment at the time VIRCO begins its construction program could also profoundly impact the availability of construction workers.

It is highly probable that many skilled workers will come from the mainland with families due to the relatively long term of their employment. Families come even if services and housing are in short supply. It is our understanding from previous experiences that short term workers from outside the United States and its Territories are permitted to bring families without restriction.

If the importation of labor does happen, the impact will generate significant problems, especially in education where classroom space is in short supply and the fiscal resources to provide classrooms, teachers and staff are very limited.

If 50 to 60 students per 100 employees is a reasonable standard, then the impact is most significant if VIRCO is unable to meet its employment goals. The key issue is not VIRCO commitment, but the availability of employable persons with skills or who can be properly trained.

The current enrollment of the St. Croix elementary and secondary system is 13,064. The system is 56 elementary students over capacity and the secondary system is on double sessions. A 1,250 student secondary facility is now under construction but an additional need of 351 elementary seats and 695 secondary seats is forecast over the next three years. The addition of 62 students under these circumstances would appear to have little

impact particularly because of their distribution over all grades. In addition, the permanent inmovers can be expected to be at the higher VIRCO management and supervisory pay levels with a significant number of their children attending private schools. This is substantiated by existing school attendance patterns.

Government Budget

VIRCO has secured an agreement with the Virgin Islands Government similar to the agreements with HOVIC and Martin Marietta. The key provision of that agreement is a rebate of 65 percent of all corporate income taxes (compared to 75 percent rebate for HOVIC). Based on this and other concessions, VIRCO expects to pay a total of $43 million to the Virgin Islands Government for the first full year of operations. This is an increase of about one-third on the Virgin Islands total annual revenue.

In sum, then, VIRCO's impact on the Virgin Islands is as follows:

Table 10

Economic Impact of VIRCO Facilities

Annual Amount (in millions) - 1979	
$ 8.0	Annual Payroll
$ 5.0	Local Purchases
$43.0	Taxes
$ .2	Tourism related
$56.2	Total Payments to V.I.

Source: Virgin Island Refining Corporation

HOVIC also expects to expand and modernize its facilities to include catalytic cracking and other techniques needed for producing unleaded gasoline. One estimate given by HOVIC officials is that the company expects to invest $50 million in new capital. However, this expansion/modernization presumably will be covered under the new agreement currently being negotiated. If we assume that this is the case, then work force levels will remain generally the same with existing workers being shifted over to the new equipment. The total contribution from energy production facilities to the Virgin Islands will be as follows:

$ 60,550,000.	HOVIC (1979)
$ 56,200,000.	VIRCO (EST)
$116,750,000.	TOTAL

Based on a projected Gross Territorial Product (GTP) which reflects VIRCO and expanding tourism, VIRCO is expected to account for an increase of about 10 percent in the GTP and energy production facilities for 15-20 percent of the GTP. In terms of tax payments alone, the two companies are expected to pay about $70 million annually, or about 35-40 percent of all tax revenues received by the Virgin Islands Government. The potential economic impact of VIRCO is substantial. The potential fiscal impact in terms of major increases in the territorial tax base is extremely large.

Water/Sewer/Power

The Virgin Island Water and Power Authority (WAPA) on St. Croix generates 67 mega-watts per day through a combination of gas turbine, steam and diesel generators. An additional 20 mega-watts is anticipated to be on line in the late Spring of 1981. Martin Marietta produces daily about 12.5 mega-watts (maximum rated capacity of 20 mega-watts) primarily for their internal use.

While WAPA has generation problems at times, the additional 125 households should not create service problems for electric service.

WAPA also provides potable water for St. Croix by means of two desalination units with a rated capacity of 2.5 million gallons per day to be increased to 3.75 million gallons per day. Martin Marietta produces about 850,000 gallons per day with one desalination unit with a rated capacity of 2 million gallons per day. Martin Marietta on occasion sells water for distribution on St. Croix.

VIRCO will supply its own facilities to meet water and power needs with no demands placed on local systems. The impact from the presence of an additional 320 permanent residents is expected to be insignificant. A provision of Virgin Islands Law requires the connection to waste water collection lines if they are available. Lines are available to VIRCO and treatment capacity exists for non-industrial waste. VIRCO would have to treat industrial waste on-site.

Health

The need for improved and expanded health and medical care in the Territory is great. The two main hospitals do not provide adequate service for the total population. The need to modernize and expand health facilities has been recognized and actions are now underway for the construction of additional facilities.

The small number of inmovers and the expectation that VIRCO will provide its own health services (as do most large industrial concerns) indicate that the new energy facility will do little to aggravate the current situation in health care, provided these services are provided to families as well as the employees.

Traffic

Assuming a peak permanent employment level of 500 after construction, two persons per vehicle and a day shift that is 80 percent of the work force, adverse impacts on local traffic will be minimal. Road improvements undertaken during the construction period and possible use of improved public transportation should reduce any adverse impacts created by a larger work force in the area.

Tourism

Other industries may be adversely affected by the presence of energy facilities. Even though all existing and planned refineries are on the south shore of St. Croix away from most tourist facilities, there may be adverse effects resulting from shipping, dredging, or accidental oil spills. In 1978, over one million tourists visited the Virgin Islands, spending a total of $241 million. It is estimated that tourist expenditures account for $150 million of the gross territorial product, roughly 28 percent of the total. Tourism supports over 12,000 jobs in the local economy and generates $25 million in local taxes each year, greater than the taxes and fees paid by HOVIC. Clearly, the tourist industry on all islands is too important to the Virgin Islands economy to risk damaging.

In the U.S. Virgin Islands, the number of hotel rooms has increased from approximately 1,400 rooms in 1960 to over 4,000 rooms in 1975. Approximately 45 percent of these hotel rooms are on St. Croix. Hotel occupancy on St. Croix has experienced an irregular up and down pattern over the past ten years. However, occupany rates have continued to improve in 1979 and 1980. In 1979, the annual average was 71.1 percent occupancy (with a peak month of 92.6 percent in February), which was the highest rate in the last ten years.

Overall, while energy production facilities contribute to local tourism economics through hotel and restaurant use, to rentals, etc., this impact is small and relatively insignificant. Further, while the energy facilities on St. Croix represent an important part of the entire Virgin Islands economy and although tourism is the largest industry, there is considerable support among the citizenry for attracting new business in an attempt to further develop the economy (see Economic Development Policy Guidelines, Vol. 3: The Virgin Islands Household Survey). Although tourist expenditures have varied widely from year to year, we see no evidence that this is a result of the energy facilities located on the south shore of St. Croix.

IMPACT ON THE FISHING INDUSTRY

Another sensitive industry is commercial fishing. It is estimated that there are approximately 1,000 full-time and 700 part-time fishermen on all three islands. The reported annual catch is about one million pounds but it is estimated to be closer to 1.6 million pounds, according to Coastal Zone Management officials. This volume has a value of $2.5 to $3.2 million annually. This local catch represents about 25 percent of all fish consumed in the Virgin Islands, thus most fish are being imported.

The prognosis for growth in the industry is mixed. Some environmentalists indicate that the energy production facilities on the south shore of St. Croix have already had an adverse effect on fishing in nearby waters, by impacting the juvenile habitat in the mangroves, but it is unclear how this has affected the fishing industry as a whole. However, there is no evidence that the number of active commercial fishermen or the territorial catch has been reduced since the inauguration of industrial facilities on St. Croix's south shore. However, there is as yet no direct evidence that the industry, small as it is, has not been able to shift operations elsewhere in the Virgin Islands without significant adverse effect. It is worth noting, however, that the shoreline from Canegarden Bay to Pt. Harvey (where energy facilities are located) is considered to be a "Marine area under stress" in the Coastal Zone Management Program. Since the prevailing winds are east to west, it will bear watching to see that pollution from the industrial area does not spread to other areas and have an adverse impact.

Another adverse impact on the fishing industry has been the loss of fishing traps as a result of ship movements in the shelf areas. Trap loss has been estimated at 100 percent of the total per year with ship traffic being blamed far more than theft. No definitive estimate on trap loss is available.

Habitat loss also impacts the local recreational fishing industry which in 1978 was estimated by the Department of Conservation and Cultural Affairs to contribute $10 million in direct expenses and about $8 million in secondary benefits to the economy. While many of the species sought by recreational fishermen are found as juveniles in impacted habitats, no estimate of the impact has been made.

It appears that this industry, commercial and sport, probably has been impacted and could be further impacted. However, no detailed information is available to quantify the impact. Losses have driven marginal operations from the business while others appear to be adapting to habitat losses and changes in the fishing industry.

MITIGATION OF IMPACTS

Aside from the clear fiscal impact of the new energy facility, the mitigation of potential adverse impacts are based on existing employment practices and the lack of training programs. Three potential areas of action are: the intensified recruitment of local qualified personnel, the establishment of training programs for local residents and the improvement of the local public transportation system. These actions should apply to both the construction and operation periods at VIRCO.

Projected impacts are based on existing and reasonably expected future conditions which indicate the magnitude and expected location of project-related impacts. However, changing development patterns, changing preferences of workers with respect to commuting and moving, changing fuel costs and other external variables, that no one can control, may change both the size and location of the projected impacts. For this reason, it is necessary to maintain a socio-economic monitoring process during the construction period.

In projects similar in magnitude to the VIRCO effort, a full-time program coordinator is often present throughout the construction period. It is recommended that such a position be established for this project. A program coordinator is the principal liaison between the government, industry and the community within the project area to handle impact program issues. The coordinator handles all requests for assistance and coordinates all assignments related to these issues.

Working with appropriate agencies and groups, the program coordinator should monitor the various impacts as they occur, verifying the projections of need and implementing mitigation actions as required. This process should include continuing contact and discussion with affected groups, organizations and agencies and the use of employee surveys which document important employee characteristics. Through this process, local residents, businesses, and government agencies are able to participate in further deliberations regarding the projects socio-economic impacts and related mitigation actions.

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