Feasibility Study for the Aiquile - Santa Cruz Interconnection Project Phase 1

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1. Introduction & Summary of Findings

Bolivia's Rail Interconnection Project involves a new rail line linking the eastern Bolivian rail system with the western system. The line would join the eastern system at Santa Cruz and the western system at Aiquile, roughly 130 kilometers southeast of Cochabamba. The proposed line would provide a direct link between the soybean-producing territories of Bolivia and western Brazil and the Chilean ports of Arica and Antofagasta. It also offers the possibility of a connection to Mejillones where major new port facilities are to be developed.

1.1 Phase I Objective

The main objective of Phase I of the *Feasibility Study for the Aiquile-Santa Cruz Interconnection Project* is to determine the major sources of traffic for the interconnection project and to assess in a **preliminary fashion** the project's financial viability and the level of subsidy that will be required from the Bolivian government. To complete Phase I of the feasibility study, Hagler Bailly has focused on the following four analytic elements:

❶ Concept Feasibility—will the interconnection result with transportation cost savings to producers, exporters, and shippers when compared to alternative, competing transportation systems and routes? In other words, if built, will the interconnection attract significant levels of traffic?

❷ Business Structure—what business structure will most improve the economic and financial feasibility of the interconnection? Is there a way to ensure that the interconnection forms a part of a broader rail system so that revenues can be accrued along a longer route?

❸ Revenue and Costs—what are reasonable expectations with respect to the sources of traffic and revenues for the interconnection? What are the likely construction and operating costs?

❹ Preliminary Assessment of Financial Feasibility—assuming concept feasibility and given alternative revenue and cost scenarios, what are the financial returns of the project? What subsidy levels must the Bolivian government provide to support financial feasibility?

1.2 Summary of Technical Approach

To answer these and other questions the Hagler Bailly relied on the following sources of information and technical approach.

- First, key members of the Hagler Bailly team conducted a two week mission to the study region, which included visits to the following cities: 1) Santa Cruz, Bolivia, 2) Cuiabá, Brazil, 3) Campo Grande, Brazil, 3) Cochabamba, Bolivia, and 4) La Paz, Bolivia. The Bolivian government arranged all meetings in these cities, sponsored a low altitude flight over the proposed interconnection rail alignment, and provided a team of counterparts which

contributed to the data gathering and analytic framework development aspects of this Phase I study.

- Second, the Hagler Bailly team reviewed all key documents relevant to the economic and financial viability of the interconnection project. These included: 1) the Sondotecnica final engineering study (Executive Summary and excerpts of the final reports), Wilbur Smith's national transportation plan developed during 1997 and 1998, the CANAC study, other reports developed by consultants for ENFE, and ENFE's analyses of interconnection construction costs.

- Third, the Hagler Bailly team conducted numerous interviews with relevant stakeholders in the cities visited during the team's in-country mission (listed above) including: 1) producers and exporters of soybeans in Brazil and Bolivia (e.g., representatives of producers' associations in Cuibá, Campo Grande, and Santa Cruz, as well as ADM in Sao Paulo), 2) relevant railroad operators (e.g., Ferrocarril Oriental in Bolivia), 3) potential investors, and 4) government authorities (e.g., ENFE, Bolivia's Viceministry of Transport, members of the governments of the Brazilian state's of Mato Grosso and Mato Grosso do Sul, etc.). These interviews helped to confirm information obtained from reports and site visits, to assess the competitiveness of alternative routes, and to validate the team's traffic and revenue forecasts.

The information and data obtained from this analytical approach were used to develop traffic, revenue, and construction cost scenarios for use in a financial cash flow model for the project. The financial model is used to assess in a preliminary fashion the financial feasibility of Bolivia's rail interconnection project.

1.3 Summary of Findings

The underlying findings of the analyses conducted under Phase I of the feasibility study can be summarized as follows:

❶ The Aiquile-Santa Cruz rail interconnection will face significant competition from the Hidrovia (a low cost waterway barge transportation alternative) for coveted soybean traffic originating from Mato Gross and Mato Grosso do Sul.

❷ As a result, the project's feasibility is highly tied to: 1) increases in soybean production and traffic within Bolivia (which requires investments in the roadway network in producing regions), 2) growth in intermodal (container) traffic, 3) reductions in the current rail tariffs being charged by operators of the Bolivian sub-systems, and 4) a business structure that basically unifies the Bolivian system from East to West from the perspective of revenue collection.

❸ Although Sondotecnica's estimated construction costs for the interconnection appear to be inflated, other investments will be required to ensure that the interconnection "system" provides an efficient means of transport to producers, exporters, and shippers of soybeans

and other commodities (including containers, minerals, and other traffic). For example, a permanent solution to the Red Zone between Cochabamba and Oruro is integral to the development of a cost-effective rail alternative.

The Hagler Bailly team developed three analytic cases to reflect different estimates of revenue and construction costs. The cash-flow analysis of the ***standard case*** (the team's expected scenario) shows a return on equity (ROE) of about 24 percent. The standard case includes two forms of subsidy:

❶ a lump-sum contribution to the initial investment of $75 million by the Bolivian government (basically for the rehabilitation of the Red Zone) and

❷ complete forgiveness of taxes until the construction debt is retired.

However, this is a *provisional* finding of potential feasibility since various events must coincide to ensure that private developers/investors participate in the project's development. Specifically,

- *if* the Bolivian government is willing to provide the subsidies referred to above;
- *if* construction financing from a multilateral lender is available on the terms described in this study; and
- *if* the revenue and cost estimates that underlie the standard case are valid,

then private-sector consortia would be willing to undertake the construction of the interconnection, the associated improvements, and operation of the railway system.

There are other critical conditions as well as those related to finance, revenue, and cost. Perhaps the foremost of these relates to the business structure. *If* the Bolivian government can offer a concession to operate the entire Bolivian railway system, as well as build the interconnection, some significant business uncertainties are eliminated.

Nevertheless, the findings of Phase I are sufficiently positive to warrant a deeper and more detailed investigation of the feasibility of the interconnection. Our preliminary analysis has shown that there are scenarios under which the project may be feasible given the conditions summarized above. However, we recommend that any further study of the feasibility of the interconnection also include a thorough examination of the options for intermodal service prior to, or in the place, of the interconnection (e.g., RoadRailer and other types of intermodal equipment). This is not to prejudge a decision on the interconnection. But it is important that the decision be made with a full understanding of the potential for intermodal options, both as alternatives to, and as supplements to, the interconnection.

2. Concept Feasibility

Concept feasibility refers to the comparative cost advantages associated with the alternative transportation systems and routes that are available for exporting commodities (such as soy beans) to the Pacific Rim and Andean Pact markets. A central premise of the feasibility of the interconnection project is that once it is constructed it will provide transportation cost savings to producers, exporters, and/or shippers active in those markets.

Among grain traders it is an axiom that transportation costs are a critical factor in profitability of sales on world markets. World grain markets are intensely competitive, and producers and shippers of grain must bear the brunt of the transport costs. A reduction in transport cost becomes, to a large degree, an increase in income for producers. And, if the cost of movement to buyers is too high, growers have no incentive to increase production for distant markets. An obvious first question is, therefore, the extent to which the interconnection would let the soybean regions of eastern Bolivia and western Brazil obtain transportation cost savings and, thereby, help these regions to reach their full export potential.

Consequently, a feasibility analysis of the interconnection project must begin with an assessment of the costs associated with alternative transportation systems/routes, especially for exporting soy beans to the Pacific Rim markets. A necessary condition for feasibility is that the interconnection reduces the transportation costs associated with exporting commodities to Pacific Rim and Andean Pact markets. This section focus on concept feasibility by analyzing the cost advantages that can be expected from the development of the Aiquile-Santa Cruz rail interconnection.

2.1 Alternative Routes to Soybean Export Markets

A major source of traffic for the interconnection can be expected to be carriage of export soybeans or meal to the Pacific coast of Chile, either at Arica or Meijillones. Shipped from these ports, soybeans or derivatives could be competitive in the Andean Pact markets, Peru and Colombia, or in the Far East. The interconnection would not be, however, the only feasible route to these markets for either Bolivian or Brazilian soybeans. Highly competitive alternatives are available and are now in use.

A large amount of Brazilian soybean production is in the states of Mato Grosso and Mato Grosso do Sul. Mato Grosso lies a few hundred kilometers to the east of the principal soybean-growing area in Bolivia; Mato Grosso do Sul is immediately to the south of Mato Grosso. The principal soybean-producing land in Bolivia is around Santa Cruz, in an area that extends north to Montero and east to Pilon, but not very far south from Santa Cruz. East of Pilon, the land in soybean production is a fairly narrow belt along the railway line. The rail line east from Santa Cruz runs to the Brazilian border; the Bolivian railway line ends at the Brazilian city of Corumba, just across the border, where it connects with the Brazilian system. Corumba is on the Paraguay River, and there are river terminals in the immediate vicinity where soybeans (or derivatives) can be transloaded to river barges.

The major competitive route for Bolivian soybeans and those grown in the western part of Brazil is the Paraguay/Paraná river system, often referred to as the Hidrovia. This is a major waterway. There are some restrictions immediately south of Corumba, but basically it is a high-capacity freight carrier from Corumba down to the Atlantic ports of Rosario (Argentina) and Nueva Palmira (Uruguay), both located near Buenos Aires. Approximately 70 percent of Bolivian exports of soybeans (or derivatives) now move east by rail from Santa Cruz to Corumba, where they are transloaded into barges at one of the nearby river ports, and thus go to the Atlantic. Most are then shipped via Cape Horn to Peru or Colombia. Because of the very low cost of water transportation, this river system is a powerful competitor for the interconnection, both for Peru and Colombia and for the Far East.

It is useful to consider the transportation alternatives facing soybean shippers in Mato Grosso. Corumba is near the southwestern corner, just over the state border in Mato Grosso do Sul. The railhead for the Brazilian railway, Ferronorte, in Mato Grosso is currently near Alto Taquari in the southeastern corner of the state. This provides rail service to the Atlantic ports of Santos and Paranagua; and there is a highway running southeast from Cuiaba that provides access to the the Ferronorte near Alto Taquari.

Soybean traffic originating in the southern part of Mato Grosso will either go southwest to Corumba and the river or go southeast and by rail to Santos or Paranagua on the coast of Brazil. Somewhere to the east of Corumba is a line of demarcation, east of which it pays to ship by rail to the ports on the Brazilian coast and west of which it pays to carry soybeans to Corumba for river shipment to Atlantic ports near Buenos Aires. Where that line actually is depends on relative shipping costs of the different routes. We are mainly interested, however, in comparing the costs of shipping down the river from Corumba with the cost of shipping west from Santa Cruz over the interconnection. The relationship between these costs will tell us what the prospects are for carriage of Brazilian soybeans to the Pacific coast on the interconnection.

We start this analysis by considering the transportation costs for soybeans starting the journey to market at Santa Cruz and going either to Colombia or Japan. These soybeans could go east by rail to Corumba and down the river to Nueva Palmira or west by the interconnection to either Meijillones or Arica.

In order to estimate these costs, we used cost parameters from the 1998 Wilbur Smith study for port charges and ocean freight. We used Wilbur Smith and current reports for the cost of the river journey to Nueva Palmira. We used our own estimate for rail tariffs based on our analysis of rail operating costs as reported in the CANAC and Wilbur Smith studies. Our estimated tariffs are below current tariffs on Bolivian railways, but we know that tariffs have to be below current tariffs or the interconnection will have no prospect for attracting export soybean traffic. From the sources indicated, we make the following estimates of transportation costs.

- River movement:

- ✓ Corumba to Nueva Palmira—$27.50 per metric ton (includes charges for border crossings and rail-to-barge transfer).

- Ocean freight: $0.003 per metric ton per nautical mile.
- Port charges (per metric ton):
  - ✓ Nueva Palmira—$3.20
  - ✓ Arica—$5.00
  - ✓ Antofagasta—$5.00
  - ✓ We assume that Meijillones would have the same port charge as Arica and Antofagasta.
- Rail tariffs at two levels: 1) $0.030 per metric ton per kilometer and 2) $0.035 per metric ton per kilometer.
- Rail distances:
  - ✓ Santa Cruz to Corumba—651 kilometers
  - ✓ Santa Cruz to Meijillones—1,814 kilometers
  - ✓ Santa Cruz to Arica—1,440 kilometers.
- Ocean distances:
  - ✓ Nueva Palmira to Colombia—5,183 nautical miles
  - ✓ Nueva Palmira to Yokohama—11,095 nautical miles
  - ✓ Meijillones to Colombia—1,723 nautical miles
  - ✓ Meijillones to Yokohama—9,000 nautical miles
  - ✓ Arica to Colombia—1,400 nautical miles
  - ✓ Arica to Yokohama—9,000 nautical miles.

Using these cost parameters, we arrive at the following costs, for the three ports we are considering, with both levels of rail tariff.

Soybean Transportation Costs from Santa Cruz		
Port and Destination	**Rail at $0.030/mt/km**	**Rail at $0.035/mt/km**
Nueva Palmira to Colombia	$65.78	$69.04
Meijillones to Colombia	$64.62	$73.62
Arica to Colombia	$52.40	$59.60
Nueva Palmira to Yokohama	$83.23	$86.49
Meijillones to Yokohama	$86.42	$95.42
Arica to Yokohama	$75.20	$86.60

This table shows how the shorter overall distances west from Santa Cruz are largely offset by the very low costs of river and ocean transportation. With the rail tariff at $0.030, the movement to Colombia is almost the same cost for both Nueva Palmira and Meijillones. Meijillones would have a slight advantage because of time cost. The carrying cost for grain is approximately $2.00 per metric ton per month. Meijillones would have a time advantage over Nueva Palmira of better than half a month, a little more than $1.00 per ton. With the rail tariff at $0.035, any advantage for Meijillones disappears. With these costs, Meijillones is not competitive for Japan at either rail rate. Shipments through Arica are competitive at both rail rates.

One thing this table demonstrates clearly is that comparatively low rail tariffs are essential if the interconnection is to attract export soybean traffic. It also suggests an advantage for Arica over Meijillones; this must be treated with some caution. That advantage is due to the shorter rail move. Arica is approximately 360 kilometers closer to Santa Cruz than is Meijillones. The costs associated with the very steep grade (6.0 percent) on part of the line to Arica might reduce or offset this advantage. If, however, costs of operations to Arica could be achieved within the tariffs assumed here, the rail move to Arica would be a viable competitor with the river route to Nueva Palmira, *for traffic originating in Santa Cruz.* If the origin point were shifted east to Corumba, the competitive advantage for the interconnection would entirely disappear.

Soybean Transportation Costs from Corumba		
Port and Destination	**Rail at $0.030/mt/km**	**Rail at $0.035/mt/km**
Nueva Palmira to Colombia	$46.25	$46.25
Meijillones to Colombia	$84.15	$96.41
Arica to Colombia	$71.93	$82.39
Nueva Palmira toYokohama	$63.70	$63.70
Meijillones toYokohama	$105.95	$118.21

Soybean Transportation Costs from Corumba		
Port and Destination	**Rail at $0.030/mt/km**	**Rail at $0.035/mt/km**
Arica toYokohama	$94.73	$109.39

This shows clearly that if a load of soybeans is anywhere near Corumba it will move down the river to the Atlantic. If it is to the east or northeast of Corumba it will, as noted above, either move to the Hidrovia or go east by rail to Brazilian ports on the Atlantic. If our load of soybeans is to the south, in Mato Grosso do Sul, the situation is the same. The load will move west to the river or east by rail. Once traffic reaches the river, it will move on the river; that is what this analysis is showing us.

The Hidrovia's power to draw traffic suggests that we look north and west of Corumba to see if there are areas at a distance from Corumba where the transportation links might carry traffic toward Santa Cruz rather than to the river. We note that there is a highway running southwest from Cuiaba that crosses the Paraguay River at Caceres and reaches the Bolivian border at a town called San Matias. The road is paved from Cuiaba to San Matias but is unpaved on the Bolivian side; the unpaved Bolivian segment reaches the rail line somewhat east of Santa Cruz. It might appear that this road would draw traffic to Santa Cruz, especially if the stretch in Bolivia were to be paved.

It turns out, however, that the river pulls traffic as far north as Caceres. Despite the fact that there are some shallow stretches on the river north of Corumba, it is in active use for commercial navigation even at relatively low water. We were told that ADM Sao is currently (late October) loading barges at Caceres even though the controlling depth on the river is less than two meters. They use towboats that draw only slightly more than a meter and small, partially loaded, barges. The soybeans are carried downriver to Corumba where they are transloaded to bigger barges for the trip to Nueva Palmira. This means the prospect for interconnection traffic from the western portion of Mato Grosso is limited.

If we consider the northwestern section of Mato Grosso, we find that there are no significant transport links to Bolivia. The principal road to the northwest of Cuiaba stays north of the Bolivian border and goes, eventually, to Porto Velho on the Madeira River. The Madeira is navigable and flows north to the Amazon. It appears that soybeans that reach this road will either move northwest to Porto Velho and the Madeira River or southeast to Caceres and the Paraguay River.

We need to consider whether there might be capacity constraints on the Hidrovia that would divert soybean cargoes to the interconnection. The general answer is that such constraints could occur, but the likelihood is that they would be temporary. From time to time constraints on the

river could send a surge of traffic to the interconnection, but this could not be relied on as a regular source of revenue.

Further, there are some obstacles in the river south of Corumba that restrict the number of barges in a single tow on some stretches of the river. These factors would appear, however, to have more of an effect on cost than on capacity. A more important point regarding the Paraguay/Paraná river system is this: it is a very important transport link for both the Brazilian and Argentinian economies. To the extent that obstacles pose restriction on navigation and removal of those obstacles would be an economically justified investment, we have to assume that such an investment would be made.

Brazil and Argentina are large economies, and their governments dispose of substantial resources. We cannot forecast traffic for the interconnection on the basis that these governments would fail to make desirable investments in river transport. The same consideration applies to ports. If soybean traffic pushes the capacity of Atlantic ports, we have to assume that investments will be made to increase that capacity. In short, we cannot assume traffic for the interconnection on the basis that problems in competing systems will not be fixed.

It is for these reasons that we cannot expect the interconnection to attract Brazilian soybeans; the project must rely on Bolivian soybean traffic and on other traffic that might be attracted by the interconnection.

2.2 Potential for Other Traffic

Intermodal movement of international containers is the likeliest source of significant revenue from other traffic that the interconnection might generate. Other potential traffic sources are: minerals; domestic soybean movements; and other domestic traffic. Let us consider these other sources first and then look at the international-container traffic.

Minerals

The CANAC report suggested that there would be substantial eastbound mineral traffic on the interconnection, traffic coming from existing western mines and bound for Europe. We gave limited time to analyzing the potential for mineral traffic, but it seems unlikely the existing traffic would move east. This would entail moves by rail of 2,500 to 3,000 kilometers to an Atlantic port or shorter moves to Corumba for transloading to the river. That is unlikely, given the alternative ocean routes. Almost all of the existing mineral traffic is moving west to Antofagasta or Arica. On the face of it, it seems that mineral traffic, unless it is time sensitive, would continue to go to the Pacific ports to take advantage of low ocean rates.

The case is different when we consider the new mine for silver, zinc, and lead that is being developed near San Cristobal. Construction of smelting and refining facilities is projected for this mine, perhaps eight to ten years from now. Until such facilities are operational, the unrefined ore from this mine would make a short rail move to Antofagasta (or to Meijillones when it is

developed) just as the existing mineral traffic does. When the refining equipment is built, however, the circumstances will change; the more valuable refined ore will probably be sufficiently time sensitive that it will move east, at least to Corumba, if not all the way to the Brazilian coast.

Domestic Soybeans

There would be some domestic soybean traffic on the interconnection. The soybeans are produced around Santa Cruz and a good part of the domestic market is west of the interconnection. As a working hypothesis, we would assume that half of domestic soybean consumption would move west over the interconnection.

Other Domestic Traffic

Some portion of the truck traffic now moving between Cochabamba and Santa Cruz is likely to become interconnection traffic. Further, it is likely that the interconnection will generate some new traffic as businesses on either side of the interconnection find they have new opportunities for markets and sources of supply.

International Containers

As noted above, we think a more promising source of additional traffic would be containers. High-value manufactured goods coming east across the Pacific are usually very time sensitive. The interconnection would offer a way to eastern Bolivia and to Brazil that would be days shorter than the ocean move around Cape Horn and up the Hidrovia or along the Atlantic coast to Brazil. There is considerable potential here. There is already a signficant level of container traffic through Arica, on the order of 700,000 tons, likely more than 60 percent of it moving to or from Bolivia. Over 95 percent of this traffic is now moving by truck for the entire distance. Managers of the Chilean railway that serves Arica and connects to FCA (FCALP) believe they are prevented from competing for the container traffic by the high charges FCA demands for movement of FCALP traffic over its line. If this situation should change, international containers might start moving by rail as far east as Cochabamba without the interconnection and continue the journey to Santa Cruz by truck in an intermodal move.

Similarly, westbound manufactured goods from Europe might be shipped across South America by rail to Bolivia, Chile and other western markets. In this connection, we note that Crowley Marine plans to operate container barges up the Paraguay River to a port in the vicinity of Corumba. We understand that Crowley is currently in negotiation with Ferroviaria Oriental over rates for westward rail movement to Santa Cruz. These containers would certainly become interconnection traffic. The potential for container traffic on the interconnection deserves much closer analysis than we have been able to give it in Phase I.

2.3 Conditions for Concept Feasibility

From the preceding discussion, we see several key conditions for the feasibility of the interconnection concept. These are:

- Future growth of Bolvian soybean production
- Potential for international-container traffic
- Rail rates and costs of competitive routes
- Costs associated with port of Arica

The future growth of Bolivian soybean production will depend on the rate at which land is brought into soybean production and the rate at which the productivity of Bolivian soybean land grows. These factors are discussed in more detail in the following sections on traffic and revenue forecasts. It is likely, however, that feasibility would require at least a fourfold increase in Bolivian soybean output over the next 20 years.

The potential for hauling international containers on the interconnection appears to be significant. This view is based on the volume of Bolivian container traffic moving through Arica now. Whether this traffic can be captured by the rail system, and whether it grows rapidly thereafter are key issues for interconnection feasibility. An additional question is whether the possibility of service to inland cities in Brazil (e.g., Cuiaba and Campo Grande) would further enhance the level of container traffic.

In light of current costs on the Hidrovia, we have seen that rail rates for soybeans moving from Santa Cruz to Arica cannot exceed $0.035 per mt/km. This requirement must be met for concept feasibility. If improvements in the Paraguay/Paraná system were to reduce costs of river transportation, a lower rail rate might be required. Whether such lower rates could be achieved would be a key question.

Movement through the port of Arica appears to be a promising alternative because Arica is the Pacific port closest to Santa Cruz and because a significant level of container traffic is already moving through Arica. The rail line from Bolivia to Arica has a very steep grade, six percent for a considerable distance. Such a grade raises questions about both cost and capacity. If the operating cost on this stretch is too high, it might be impossible to meet the requirement for a maximum rate of $0.035 for the Santa Cruz-Arica move. The grade raises a similar issue with respect to capacity. A large investment might be required of FCALP, the rail firm that operates that line, to reduce the grade for reasons of both cost and capacity. Whether such an investmen would be financially justified is an unanswered question. Finally, there are no grain handling facilities to speak of in Arica. This is not a problem for current low levels of soybean traffic through the port, but a substantial investment could be required to accommodate higher levels of

traffic. Again, there is an open question as to whether such invesment would meet a test of financial viability.

3. Traffic, Revenue, and Cost

3.1 Analytical Context: Business Structure and Time Frame

This section contains the foundations of the analysis of the feasibility of the interconnection: the estimates of traffic, revenue, and cost. In order to be useful, however, these estimates have to be set in the context of a specific business operation and in a specific time frame.

With regard to the business structure, we have assumed, for the analysis, a railway firm that operates the entire Bolivian system. Such a firm would comprise the systems operated by the two existing firms—Ferroviaria Andina (FCA) and Ferroviaria Oriental (FCO)—and the interconnection linking the two systems. From an analytical point of view, this is a convenient, almost an essential, device. Most of the traffic that would move on the interconnection would also move on other portions of the system; very little cargo would move just from Santa Cruz to Aiquile. Thus, revenues flowing from interconnection traffic would accrue across the whole system. Rather than hypothesize arrangements by which an interconnection operator would seek to recover the benefits of the investment from the FCA and the FCO, it is far easier to assume a single firm and estimate revenues and costs on that basis.

This issue also has to be considered with regard to the structure of the concession the Bolivian government might offer to potential bidders. A concession that entails both construction of the interconnection and operation of the whole system is likely to be more attractive to bidders than an arrangement where the concessionaire has to negotiate with other railroad firms over the division of the revenues from interconnection traffic moving on other parts of the system. Indeed, the prospect of such negotiations would add a considerable element of uncertainty to a project that already carries significant risk. As a practical matter, the Bolivian government might find it necessary to put the concession forward on the basis of operation of the whole system. Also, as a matter of financial feasibility, operation of the whole system would give a concessionaire some operating income during the construction period.

Due to these considerations, both of business practicality and ease of analysis, we have put the analysis on the basis of a single entity operating rail service in Bolivia. We have done this both for the estimates of traffic, revenue, and costs in this section, and for the cash-flow analysis and feasibility considerations in a later section.

The time frame we have selected starts with 2002 and runs through 2030. We assume a concession is awarded some time in 2001. At the beginning of 2002 the concessionaire takes over operation of the FCA and FCO, construction starts, and the concessionaire starts paying interest on the construction financing. Construction takes three years and inter-connection operation starts in 2005. We have projected traffic, revenue, and cost through 2030, 26 years of

inter-connection operation. The length of the construction period is an important factor affecting feasibility. It is tested for sensitivity as part of the cash-flow analysis.

Note on Sensitivity Analysis

The estimates developed in this analysis necessarily involve a high degree of uncertainty. We deal with this problem in two ways. One way is to call attention to those estimates or assumptions where uncertainty is a particular issue. Another way is to perform sensitivity analysis, using different assumptions or estimates for key variables, and determining the degree to which the outcome of the analysis is affected by changes in these variables.

The sensitivity analysis is treated in Section 4 along with the cash-flow analysis and preliminary assessment of project feasibility. In this section we develop a "standard case," which will serve as the basis for sensitivity analysis in Section 4.

3.2 Traffic

Traffic estimates are developed in three components:

❶ Export soybeans

❷ Other interconnection traffic

- ✓ Domestic-consumption soybeans
- ✓ Other domestic traffic
- ✓ Minerals
- ✓ Intermodal containers

❸ Base traffic.

Export soybean traffic is likely to be the largest single class of traffic attracted by the interconnection, and analysis of the potential for this traffic has received primary attention in Phase I. Among the other traffic attracted by the interconnection, intermodal containers is by far the largest class. These are largely, but not entirely, international containers moving through the port of Arica.

Base traffic is all the traffic, other than soybeans and derivatives, now moving on the FCA and FCO. This is traffic that would be moving by rail whether or not the interconnection is built. It would be a factor, however, in the attractiveness of the package offered to bidders, and, as noted before, it would be a source of earnings during the construction period.

Export Soybean Traffic

Estimating soybean traffic for the interconnection requires one to consider future growth of the world soybean market and then what that growth implies for future production in Bolivia. We begin this process by considering current conditions for soybean demand in world markets. We have to bear in mind, however, that the interconnection would be unlikely to be in service before 2005 or 2006, so it is conditions for those years and beyond with which we are particularly concerned.

- World Demand for Soybeans—For this purpose, we place our initial reliance on the official projections of world agricultural trade from the United States Department of Agriculture (USDA). These projections are to be found in the report, "USDA Agricultural Baseline Projections to 2008." We supplemented the report with discussions with staff of USDA's Economic Research Service (ERS) and agricultural economists on the faculty of Iowa State University.

  Currently, world demand for soybeans is relatively weak. Demand growth was strong from the late 1980s through 1997. The financial crisis in Asia caused a fall in demand from those markets which had been a source of growth in soybean consumption. Further, the poor performance of other Asian economies had a negative effect on the economy of China, causing a drop in that nation's demand. The effect of this weakness on the world market can be seen clearly in the prices offered soybean producers in Santa Cruz. In the 1996-97 period these prices were in a range from $205-$220 per metric ton. Current prices are around $140 per ton at Santa Cruz. (The comparable price in Iowa at this time is $160 per metric ton, reflecting lower transportation costs; these lower costs are due to an efficient transportation system and the presence of a very large domestic market for soybeans.)

  The Asian nations, however, are recovering from their financial problems, and growth of demand in those markets is expected to return over the next few years. USDA projects, for example, that Chinese imports of soybeans and soybean meal will grow at an annual rate in excess of 5.0 percent from now through 2008. Over the same period, demand from the European Union is expected to remain unchanged or even decline slightly. For the entire world, USDA projects that soybean consumption will grow at an annual rate of 2.2 percent; they forecast that this rate of growth will take effect before 2008. Discussions with one of the economists responsible for these forecasts suggest that this projection may be conservative. For the same time period, soybean prices are forecasted to return to 1997 levels. This would suggest prices in Santa Cruz above $200 per metric ton.

- Implications for Future Production in Bolivia—In the favorable market conditions that prevailed before 1998, the amount of Bolivian land in soybean production was growing rapidly as was soybean output. Land cultivated for soybeans grew from 330,000 hectares in 1995 to 490,000 in 1998. The current total is approximately 510,000 hectares. Counting both the spring and winter crops, Bolivian soybean production in 1998 was 1.1 million metric

tons. Poor growing conditions are resulting in a smaller harvest for 1999, approximately 880,000 tons.

The USDA forecast does not address Bolivian soybean production because it is relatively small on a world scale, but it gives extensive consideration to Brazilian production. As in Bolivia, Brazilian soybean hectarage and production grew very rapidly in the early 1990s. Brazilian output went from 23 million metric tons in 1992 to 31 million tons in 1997, an annual growth rate of 6.2 percent. USDA believes that, if favorable market conditions develop, the growth in Brazilian output will return to this high rate.

Persons familiar with the Bolivian soybean trade told us that the same thing could be true for Bolivia. Prices above $200 per metric ton would encourage development of more land for soybeans, but other conditions would have to be met. In particular, the local road network would have to be improved. The soybean-producing area around Santa Cruz now reaches north to the vicinity of Montero and east to Pilon; it does not extend far south of Santa Cruz. East of Pilon, the soybean land is a fairly narrow belt along the railway line to Corumba. People we spoke with were unanimous in the view that better local roads were an essential requirement for bringing more land into cultivation; otherwise the cost of bring the soybeans to the storage facilities and processing plants around Santa Cruz is simply too high. The final condition is that the soybean farmers have access to enough capital to meet the cost of bringing new land into production.

Let us assume that all three of these conditions are met. The Santa Cruz price for soybeans rises above $200 per ton; the local road network is significantly improved; and farmers can find capital to pay for expansion. What, then, would be the potential for increase in Bolivian production? In part, the answer to this question must be somewhat speculative; it depends on how high the price rises and how much the roads are actually improved. An official of ADM Sao who is very knowledgeable about conditions around Santa Cruz told us he thought it possible that hectares under soybean cultivation in Bolivia could triple, increasing to 1.5 million, if strong demand were sustained over a long enough period of time.

We were told that the Bolivian soybean industry has the capacity, if credit is available, to bring 50,000 to 75,000 hectares a year into new production. Output will also grow due to increasing productivity; USDA estimates that soybean productivity, outside the U.S., will grow in the future at 1.3 percent per year. We would expect Bolivia to do better than the non-U.S. average. From 1992 to 1998, Brazilian soybean productivity increased at 2.5 percent annually, and the soil in the Bolivian soybean-growing region is essentially the same as that of western Brazil.

Let us assume, following USDA, that soybean prices recover by 2003. Starting with that year, we estimate that 60,000 hectares per year are brought into production. And we assume that output per hectare increases by 2.0 percent per year from 2003 forward. As a starting point, we assume 2.0 metric tons per hectare as current productivity and hold that figure constant through 2002. We assume farmers will not make the investments to increase productivity until they see soybean prices rise. This leads to the following scenario for future Bolivian soybean production and exports.

Standard Case: Bolivian Soybean Production and Exports (in thousands)			
Year	**Hectares in Production**	**Output (metric tons)**	**Exports (metric tons)**
2002	500	1,000	699
2003	560	1,136	835
2004	620	1,277	976
2005	680	1,422	1,120
2010	980	2,208	1,904
2015	1,280	3,107	2,802
2020	1,500	3,922	3,616
2025	1,500	4,225	3,917
2030	1,500	4,552	4,242

Exports are arrived at by subtracting an estimate for domestic consumption. We set domestic consumption at 301,000 tons in 2002 and allow it to grow at a rate of 1.0 percent per year. This is based on the fact that domestic consumption in 1998 was approximately 300,000 tons. We know, from our discussions and from the USDA trade estimates, that Bolivian production costs are low enough to be competitive in world markets. At the prices assumed, Bolivian producers will have ample incentive to expand production. When world soybean consumption rates grow at 2.2 percent per year, as forecasted by USDA, Bolivia will be able to export all of its surplus over domestic consumption.

The above estimates are valid to the extent that the potential for bringing new land into production has been correctly estimated. The number used is based on the opinions of well-informed businessmen but is necessarily somewhat speculative. All observers agree, however, that higher prices, improved internal transportation, and credit for expansion will lead to substantial increases in Bolivian production.

Other Interconnection Traffic

Other classes of traffic that could be generated by the interconnection are:

- Domestic-consumption soybeans
- Minerals
- Other domestic traffic

- Intermodal containers.

With regard to soybeans (or products) for domestic consumption, we assume that half of these will move by rail because of the interconnection. In other words, half of the difference between output and exports will become rail traffic. We have assumed very slow growth for domestic consumption of soybeans, 1.0 percent per year.

For estimating new mineral traffic, we focused on the new mine to be developed near San Cristobal that will produce lead, zinc, and silver. An official of the Bolivian government suggested that daily output would be 1,800 tons of unrefined ore. He further estimated that, ten years or so after the beginning of operations, refining equipment would be installed at the mine and refined material to be shipped would amount to 1,000 tons per day. We do not project any growth in the mine's output. We expect the mine would be in full operation by 2002, and the refining equipment to be in operation in 2010. Annual traffic is obtained by multiplying daily output by 365.

We believe that other types of domestic rail traffic would increase because the interconnection would stimulate some growth in rail traffic between Santa Cruz and the cities on the other side of the interconnection, but we have no good way of estimating this traffic. We assume 100,000 tons of such traffic in 2005, and we assume an annual growth rate of 3.0 percent. We expect this traffic to grow at the same rate as GDP, and we use 3.0 percent as a conservative estimate of future GDP growth (the current real GDP growth rate is around 4.0 percent).

We estimate intermodal container traffic by considering the international traffic through the Chilean port of Arica. In the period January-September 1999, total container movement through Arica was not quite 530,000 tons. In the same time period, just under 64 percent of all traffic through Arica was transit traffic to or from Bolivia. If we apply 64 percent to the container traffic, we get an estimate, for the January-September period, of approximately 337,000 tons of container traffic as Bolivian traffic. We increase this by one-third to get a figure for the year of almost 450,000 tons of Bolivian container traffic moving through Arica. Over 95 percent of this tonnage is now moving by truck.

As noted in Section 2, some managers associated with FCALP believe a reduction in FCA's access charges to FCALP could lead to a shift of almost all this traffic from truck to rail even without the interconnection in place. We assume a scenario in which the tariff for container traffic becomes $0.05 per mt/km at the beginning of 2001, and 200,000 tons of container traffic move on the railroad in that year. We assume the traffic grows at 25 percent per year for the next five years, reflecting a continued rapid shift from truck to rail and at ten percent per year for the next five years, reflecting continued, but slower, modal shift to rail. After that, container tonnage is projected to increase at seven percent per year for ten years and five percent thereafter. In time, the total would include some domestic movements; if the railroad provides satisfactory service, some domestic shippers will find intermodal container moves to be preferable to all-truck moves.

We have been discussing container traffic that could develop from the Bolivian traffic now moving through Arica. But this would not be the only source of intermodal containers. We have noted earlier that there is likely to be some container traffic coming up the Paraguay/Paraná river system and moving east by rail from Corumba. Depending on where these containers are coming from, this traffic might or might not persist after completion of the interconnection. Further, there is a genuine potential for movement of containers from Arica to the inland cities of western Brazil. For high-value manufactured goods, the time saved by a rail movement as compared to the ocean voyage could be a significant factor. We note that this is definitely the case for container traffic coming to the west coast of the United States. Virtually all containers coming across the Pacific and bound for the U.S. Mid-west or East enter Pacific ports and move across the country by rail.

In 2005, the year the interconnection opens, we add 100,000 tons to container traffic in addition to what the projected growth rate would add. In part, this reflects a start-up of service into Brazil. But it is also the case that completion of the interconnection would bring all-rail service to Santa Cruz, eliminating the truck move from Oruro or Cochabamba to Santa Cruz, improving the service, reducing the rate, and attracting more traffic.

Base Traffic

In 1999, the two Bolivian railway firms hauled approximately 1,000,000 tons of traffic other than soybeans.[1] Since privatization, non-soybean traffic has been growing at about 5.0 percent per year, and we use this as the growth rate for the non-soybean base traffic throughout the analysis period. It may seem imprudent to forecast that this traffic will grow faster than GDP indefinitely. But most of the base, certainly the portion that is growing now, is cargo moving to or from Santa Cruz, and Santa Cruz is likely to continue to be at the center of the fastest growing part of Bolivia.

Projections for other interconnection traffic plus base traffic, in tonnage terms, are shown in the following table. During the construction period domestic-soybean traffic and other-domestic traffic are shown at zero; by definition, both classes of traffic depend on the interconnection.

[1] Statistics provided by ENFE show a slightly higher number for total traffic and non-soybean traffic. Because of some inconsistencies between FCO data on soybean traffic and ENFE data, we have chosen to use a slightly higher number for soybeans than ENFE's and a slightly lower total.

Standard Case: Export Soybean Traffic, Other Interconnection Traffic plus Base Traffic (in thousand metric tons)							
Year	**Export Soybeans**	**Domestic Soybeans**	**Other Domestic**	**Minerals**	**Intermodal Containers**	**Base Traffic**	**Total Traffic**
2002	699	0	0	657	250	1,158	2,764
2003	835	0	0	657	313	1,216	3,021
2004	976	0	0	657	391	1,276	3,300
2005	1,120	151	100	657	588	1,340	3,956
2010	1,904	151.7	128	365	1,077	1,710	5,335.7
2015	2,802	152.5	163	365	1,552	2,183	7,217.5
2020	3,616	153	208	365	2,177	2,786	9,305
2025	3,917	154	265	365	2,832	3,556	11,089
2030	4,242	155	339	365	3,614	4,538	13,253

3.3 Revenue

In order to convert traffic estimates into revenue projections, we need to estimate tariffs and average distances for the various classes of traffic. The following table shows the figures we have estimated for this purpose.

Standard Case: Tariffs and Distances		
	Tariffs ($U.S. per mt/km)	**Distances (kms.)**
Export soybeans	0.035	1,376
Domestic soybeans	0.045	815
Minerals	0.050	1,500
Other domestic traffic	0.045	1,000
Intermodal Containers	0.050	815
Base traffic	0.045	520
Soybeans (2002-2004)	0.035	550
Minerals (2002-2009)	0.050	100
Containers (2002-2004)	0.050	615

We have selected $0.035 as the main-scenario tariff for export soybeans. We saw in Section 2 that this is the maximum rate at which shipment to the Far East via rail to Arica would be competitive with the Hidrovia. As the rail rate is lowered below this level, the greater becomes the risk that earnings will be insufficient to cover significant investment. For some other classes of traffic—domestic soybeans, other domestic traffic, and base traffic—we use a rate of $0.045. This rate is higher than that for export soybeans, because the principal competition is from trucks, not from the low-cost Hidrovia. On the other hand, we expect the highway system in Bolivia to be improved over time, and this should have some restraining effect on rail rates. We have used $0.050 for minerals and containers; both containers and refined minerals from the San Cristobal mine will be high-valued traffic where shippers are willing to pay higher rates. For the movement of unrefined ores (during the period 2002-2009), $0.050 is also assumed for the standard case because we do not expect effective truck competition for these shipments.

The distance for export soybeans is the distance from Santa Cruz to Charaña, the town where the line to Arica crosses the Bolivian border. (In accord with the assumed business structure, we are not concerned with revenue generated outside Bolivia.) The distance for domestic soybeans is the distance from Santa Cruz to Oruro. Some of the soybeans going west to domestic markets would stop at Cochabamba, some would go on to La Paz or other towns. We chose the distance to Oruro, since Oruro is part way between Cochabamba and La Paz.

The distance for minerals is set at 1,500 kilometers as an approximation of the length of the rail move from the San Cristobal mine to Corumba. The distance for unrefined minerals in the period 2002-2009 is the distance from the mine to the Chilean border.

Other domestic traffic is set at 815 kilometers for the same reason this number was chosen for domestic soybean traffic; it is an interim distance between Santa Cruz-La Paz and Santa Cruz-Cochabamba.

International containers moving from Arica to Brazil would move all the way across Bolivia, 2,027 kilometers from Charaña to Corumba. Some containers would stop in Santa Cruz, 1,376 kilometers from Charaña. Others would terminate in the cities west of the interconnection. We are uncertain of the actual distribution of this traffic among destinations; we believe 1,000 kilometers is a plausible assumption for the average distance.

The distance for base traffic is set at 520 kilometers, the average distance for non-soybean traffic now moving on the FCA and the FCO.

In the construction period (2002-2004), the distance for soybean traffic is set at 550 kilometers, the average length of haul for soybean traffic now moving on the Bolivian systems. The container distance in the construction period is estimated at 615 kilometers; the maximum haul would be Charaña-Aiquile, 985 kilometers, but a large amount of this traffic would also be going to La Paz or to Oruro and Cochabamba. Six hundred fifteen kilometers is our estimate of the average.

The following table summarizes revenue projection by class of traffic.

Standard-case Revenue Projection (in thousand constant US$)							
Year	**Export Soybeans**	**Domestic Soybeans**	**Minerals**	**Other Domestic**	**Containers**	**Base Traffic**	**Total**
2002	13,456	none	3,285	none	7,688	27,088	51,517
2003	16,139	none	3,285	none	9,609	28,443	57,467
2004	18,924	none	3,285	none	12,012	29,865	64,086
2005	54,571	5,687	3,285	3,668	29,414	31,358	127,983
2010	94,900	5,977	27,375	4,681	53,831	40,023	226,787
2015	142,990	6,282	27,375	5,974	77,618	51,079	311,318
2020	189,013	6,602	27,375	7,624	108,864	65,192	404,670
2025	209,606	6,939	27,375	9,731	141,587	83,203	478,441
2030	232,390	7,293	27,375	12,419	180,705	106,190	566,372

3.4 Cost

For analysis of the feasibility of the interconnection, we need estimates of both construction cost and operating cost. For these estimates, we rely on Carl Martland of the Department of Civil Engineering and Environment of the Massachusetts Institute of Technology. Mr. Martland's memorandum to us and supporting materials are to be found in Appendix A of this report. Mr. Martland developed his estimates by reviewing earlier studies of the interconnection project and related aspects of Bolivian railways. The earlier studies reviewed are:

- **Sondotecnica** (1990): a thorough engineering analysis and construction cost estimation for the interconnection along the Santa Cruz-Aiquile route that is the focus of this study.
- **ENFE** (1990): a revision of the Sondotecnica estimate.
- **CANAC** (1993): an estimate of construction cost of an alternative route for the interconnection.
- **JICA** (199?): an estimate of the cost of rehabilitating the segment of the line between Oruro and Cochabamba known as *la Zona Roja* (the Red Zone).
- **Wilbur Smith** (1998): includes a further revision of the Sondotecnica estimate, an estimate of rail operating costs in Bolivia, and analyses of a variety of aspects of Bolivian transportation.

Construction Cost

Interconnection Construction—The original cost estimate from the Sondotecnica study was a figure approximating one billion dollars for the construction of the Santa Cruz-Aiquile line. That estimated has been disputed since then, seemingly on good grounds. ENFE reviewed the Sondotecnica work in 1990. They reached, essentially, two conclusions. The first conclusion was that the Sondotecnica study was a very thorough, very reliable piece of work in terms of engineering analysis. In other words, ENFE felt that Sondotecnica provided correct findings in terms of the extent and character of the construction work required; the estimates of the quantity of excavation, embankments, bridges, tunnels, and so forth, are accurate.

The core of ENFE's criticism was that Sondotecnica had assumed Brazilian construction practices and Brazilian labor costs. While the engineering work was good, the unit costs were too high, and the overall cost estimate was, thus, too high. Moreover, since the Sondotecnica work was done, a robust road-building industry has emerged in Bolivia with the capability of preparing a railbed, using local labor and low-cost construction techniques. On this basis, ENFE reduced the estimate for the interconnection to $713 million.

In 1998, Wilbur Smith carried out essentially the same exercise, using Bolivian road-building firms as consultants for estimating the unit costs. Their estimate was $693 million.

The CANAC study did not attempt an estimate of the Santa Cruz-Aiquile line. Rather, it identified an alternate route to the south and offered a preliminary cost estimate of $473 million. This estimate was based primarily on a visual inspection of the route from an airplane flying over the proposed line. It cannot be accorded the same weight as the Sondotecnica study and its subsequent revisions. We therefore set the CANAC study aside for our purposes, since it is not focused on the route we are analyzing and its findings do not rest on detailed analysis. It does have some value as a sort of lower bound on the estimate.

With regard to the Sondotecnica study and its two revisions, we have the following set of estimates:

Construction Cost Scenarios	
Sondotecnica (1990)	$976 million
ENFE (1990)	$713 million
Wilbur Smith (1998)	$693 million

We also note that the Wilbur Smith estimate includes a 20-percent allowance for unexpected costs. We take $700 million as the main-scenario estimate for construction cost.

Rehabilitation of Existing Lines—Major rehabilitation, as noted above, is required for the Red Zone on the line between Oruro and Cochabamba. Some rehabilitation is also required for the

track between Cochabamba and Aiquile; this track is not now in service. JICA estimated the Red-zone cost at $100 million; Wilbur Smith put it at $75 million. Our figure for the standard case is $75 million.

For the Aiquile-Cochabamba segment, ENFE has offered an estimate of $20 million for rehabilitation; the Wilbur Smith study provided an estimate of $5 million. We have chosen $15 million for the standard case. Our estimates of construction and rehabilitation costs are summarized below:

Summary of Estimates for Construction and Rehabilitation (Standard Case)	
Interconnection construction	$700 million
Cochabamba-Oruro rehabilitation	$ 75 million
Aiquile-Cochabamba rehabilitation	$ 15 million
TOTAL:	$790 million

There would also be rehabilitation costs on lines in Chile; we have already noted that there could be a requirement for a substantial investment for upgrading the line between Charaña and Arica. These costs are not included here because the analysis is concerned with costs and revenues on the Bolivian system.

Operating Cost

Our operating-cost estimates depend on the Wilbur Smith study and engineering-economics analysis conducted by Mr. Martland. Operating costs are considered in two parts: variable cost and fixed cost. Fixed cost consists of certain maintenance costs that do not vary with the level of traffic; replacement of ties is a good example of such a cost. Rate of deterioration of ties is a function of the weather and the type of tie, not of the characteristics of the traffic on a line.

Fixed cost per mt/km will vary inversely with traffic; as tonnages and distances rise, cost per mt/km will decline. Variable operating costs, which include cars and locomotives, do not depend so closely on traffic levels. It is possible, however, that significant growth in traffic and accumulation of experience with operation of a higher-volume railroad might lead to some increases in efficiency. Higher volumes, for example, could justify larger cars.

For bulk operations such as soybean carriage, Mr. Martland estimates $0.022 per mt/km, assuming total tonnage on the railroad in the range of 3.0 million to 5.0 million tons. The estimate of $0.022 includes variable cost at $0.018 and fixed cost at $0.004. The main-scenario traffic projection shows the rail system reaching 5.0 million tons at the end of the fourth year of the interconnection's operation and 10.0 million tons at the end of the 18th year. In discussion

with Mr. Martland, we therefore decided to reduce the operating cost to $0.019 for bulk traffic. We consider all traffic other than containers as bulk.

For container traffic, a higher figure is appropriate. Where a loaded grain car (of the type now used by the FCO) has a net capacity of 46 metric tons and would usually move fully loaded, the average tonnage for a 40-foot container moving through Arica is just under 15 metric tons. On a mt/km basis, then, the cost should be higher for containers. In the absence of good information, we have chosen $0.028 per mt/km for containers, based mostly on the costs of intermodal rail service in the U.S. This number could, however, be reduced depending on the kind of equipment actually used as the intermodal service grows. Lower-cost equipment might include, for example, vehicles of the RoadRailer type, container chassis, or spine cars.

Summary of Operating Costs	
Cost per mt/km for container traffic	$0.028
Cost per mt/km for all other traffic	$0.019.

4. Preliminary Assessment of Financial Feasibility

This section summarizes the methodology and findings of the financial feasibility analysis conducted during this Phase 1 study for the Interconnection Project.

4.1 Overview of Methodology

To assess the financial feasibility of the project the study team developed a financial model reflecting the economic and technical parameters discussed in Section 3 of this report. These include demand forecasts by type of good and market and cost inputs for construction and operating and maintenance of the project/system.

The cash flow analysis was conducted in 1999 dollars without regard for inflation. For the analysis future operating and maintenance unit costs and tariffs are constant throughout the project life.

As discussed in prior sections, the project was examined as a concession granted by the Bolivian government to a private sector consortium with construction and operating capabilities. In order to assess the financial viability of the proposed concession structure, assumptions were developed for the project's capital structure – debt and equity sources of funds – and governmental support including construction funding and tax allowances.

In addition to the Standard Case assumption for construction costs, we analyzed cases with the high and low construction cost estimates as described in Section 3.

The primary criteria used to assess the project's financial feasibility are the following:

- Return on Equity—the project's projected rate of return on investment for the equity investors. The project needs to adequately compensate equity investors for risk and opportunity cost related to their investment in the project. We expect potential investors to require returns on equity in the range of 20% to 25%.

- Payback Period—the number of years until the nominal value of the invested equity is returned to the investors. We expect potential investors to expect a payback of the original investment in about 10 years.

- Debt Coverage Ratio—the ratio of net income to debt service requirements. We are particularly focused on the first year of debt amortization year following the interest only period. We expect the project's lenders would require debt coverage of 1.5 times in the first year after the five-year interest-only period following construction.

After the Standard Case and the high and low investment level derivations were analyzed, several sensitivity cases were developed to assess effects on financial feasibility of changes to key variables.

Uses of Funds

For the Standard Case and the high and low investment cases discussed in Section 3, we assume the capital costs are distributed over the three year construction period as follows; 20 percent of the total project costs spent in year 1, 50 percent in the second year, and the final 30 percent in the third year. In addition to construction costs, funding requirements during the year construction period include interest on the project debt and fees and expenses related to acquiring the financing.

The following table summarizes the total uses of funds during the construction period for the Standard Case and the high and low investment cases.

Investment Level	Low	Standard	High
Construction Budget	$580 million	$790 million	$925 million
Finance Costs	$19 million	$25 million	$30 million
Construction Period Interest	$71 million	$92 million	$105 million
Total Uses	$670 million	$907 million	$1,060 million

Sources of Funds

The capital structure of the project is comprised of four elements:

- Project Debt

- Government Contributions
- Concessionaire Equity
- Project Income

Primary debt financing is assumed to be available in the form of sovereign loan from an international multinational bank, such as the World Bank, to the Government of Bolivia on behalf of the project. For the purpose of this Phase 1 financial feasibility analysis, we assume a sovereign guarantee will be sufficient to offset construction risk and that no other credit enhancement if necessary during the construction period. The terms of this loan assumed in the Standard Case are summarized in the following table:

Terms of Loan Assumed in Standard Case	
Loan Amount as Percent of Project Budget	80%
Borrowing Costs	8%
Financing Costs (fees, expenses)	4% of loan
Construction Draws	20% year 1 50% year 2 30% year 3
Interest Only Period after Construction	5 years
Reserves	Until debt service coverage ratio exceeds 2.0x, 50% of all net cash flow is held as debt service reserve.
Amortization	20 years level principal and interest after interest only period.

For the Standard Case we assume that the Bolivian government will be able to contribute $75 million to the project costs. We assume that these funds will be provided fifty percent in each of the second and third year of construction.

We assume the concessionaire will fund the remaining capital requirements with equity or loans from members of the consortium, construction period interest earnings, and construction period net operating income.

For all three cases the net income and interest available for the project is projected at $90 million. Net income during the project's three-year construction period is possible because of the contemplated business structure that combines all operating rail service in Bolivia into a single entity. This business structure is discussed in greater detail in Section 3.

We assume modest interest earnings will accrue to the concessionaire on the project's capital balances prior to spend down.

Concessionaire equity completes the funding sources. The amount required varies by investment level. We project the equity requirement to range from $40 million for the lowest investment level to $155 million in the highest. If the projected government contribution is less than $75 million or the project's net income and investment earnings are lower than projected, the equity requirement would increase.

The following table summarizes the sources of funds for each of the Standard Case and the high and low investment cases.

Sources of Funds by Investment Case			
Investment Level	**Low**	**Standard**	**High**
Multinational Bank Debt	$464 million	$632 million	$740 million
Government Contribution	$75 million	$75 million	$75 million
Concession Equity	$40 million	$110 million	$155 million
Net Income and Interest	$90 million	$90 million	$90 million
Total Sources	$670 million	$907 million	$1,060 million

After construction, this analysis assumes the concessionaire will fund all operating and maintenance costs from project revenues. As discussed in Section 3, operating and maintenance costs are forecast on a per ton-kilometer basis using the following unit costs:

Traffic Type	O&M Unit Cost
Intermodal Traffic	$0.028 per ton-kilometer
All Other Traffic	$0.019 per ton kilometer

The unit costs are assumed to be sufficient for all railcar acquisition, power, and major maintenance for the project.

Concession Structure

This Phase 1 analysis contemplates a 40-year concession agreement between a private sector partner and the Government of Bolivia. In exchange for the right to construct and operate the interconnection and related railroad systems, the concessionaire would be required to provide an equity contribution adequate to fund the project when added to the multi-lateral debt and contribution provided by the Bolivian government. The concession agreement would stipulate the capital improvements that are required for the system and the regulatory framework for the operating period.

The concessionaire team will be required to possess design–build construction capability as well as operating capabilities. The target rate of return on equity investments made by the concessionaire would likely be 20% to 25% reflecting the market rate for competing investments and the project's risk .

For the purposes of this feasibility analysis, equity distributions to the concessionaire are prohibited until principal amortization starts in year 6. After amortization begins, distributions are limited to 50 percent of the project's cash flow until net operating income available for debt service is 2.0 times annual debt service.

Taxes

The concession would be affected by three national taxes as follow:

- Revenue Tax – 13% of total gross revenue
- Transaction Tax – 3% of total gross revenue
- Income Tax – 25% of net income

Under current tax regulations, 50 percent of the total project investment can be used to offset 13% gross income tax. In addition, all payments made for the 3% gross transaction tax can offset 25% corporate income tax liabilities.

For the purposes of determining the preliminary financial feasibility of the Standard Case, all taxes have been waived for the duration of the bank debt.

4.2 Case Results

Under the Standard Case outlined in this section and in Section 3, the project is within the targeted outcomes for the financial feasibility criteria. The analysis shows that the project is very sensitive to changes in the construction cost. Financial feasibility improves significantly under the low investment level. Nearly all of the financial targets are met in the high investment level

scenario. The following table summarizes the key results of these cases. While Appendix B presents the results of the financial model applications for various cases.

Results of Financial Modeling by Case				
Investment Case	**Target**	**Low**	**Standard**	**High**
Return on Equity	20-25%	43%	24%	19%
Payback	10 +/- years	6	9	11
Debt Coverage Ratio (2010)	1.5 x	2.6 x	1.9 x	1.6 x

4.3 Sensitivity Cases

In order to determine the degree to which the outcome of the analysis is affected by changes in key demand, revenue and cost parameters, a number of sensitivity cases were evaluated.

Lower Tariff for Soy Exports

Under this alternative case the tariff per ton-kilometer of soy beans for export would be decreased from the $0.035 used in the Standard Case to $0.030 to reflect the market price determined by the competing modes available to move the beans to international markets. The impact of this change is a significant reduction in the financial outcomes when compared to the Standard Case. The return on equity drops to 21% from 24% projected for the Standard Case. Similar reductions are also seen in the high and low investment scenarios.

Slower Intermodal Traffic

Under this alternative case, growth in intermodal traffic between 2001 and 2005 is decreased from 25% assumed in the Standard Case to 10%. This change reduces the projected return on equity from 24% to 22%.

No Tax Relief

If we assume that the government does not grant tax relief for the duration of the bank debt as contemplated in the Standard Case the projected return on equity decreases to 21% from 24%. In this case the usual credits are available to the project to offset a portion of the tax liability.

No Government Contribution

In the event that the Bolivian government does not contribute $75 million as contemplated in the Standard Case, additional equity would be required from the concessionaire. If there were no contribution from the government to the project, we estimate the project's return on equity to be 19%, down from 24% in the Standard Case.

Lower Intermodal Operating Costs

If we assume that intermodal unit operating costs are $0.02 per ton-kilometer instead of the $0.028 assumed in the Standard Case, the projected return on equity increases to 26% from 24%.

Lower Intermodal Operating Costs and Faster Intermodal Traffic Growth

In a maximum "upside" case we:

- Increase intermodal growth during the period 2006-2010 from 10% per year to 25%,
- Increase the one-time increase in intermodal traffic that occurs when the interconnection opens from 100,000 tons to 200,000, and
- Assume that intermodal unit operating costs are $0.02 per ton-kilometer instead of the $0.028 assumed in the Standard Case.

The combined effect of these changes is an increase in the financial outcomes. The projected return on equity is raised to 31% from the 24% that results from the Standard Case.

5. Project Feasibility and Required Subsidies

The cash-flow analysis of the standard case shows a return on equity (ROE) of about 24 percent. The standard case includes two forms of subsidy:

❶ a lump-sum contribution to the initial investment of $75 million by the Bolivian government and

❷ complete forgiveness of taxes until the construction debt is retired.

Elimination of the tax holiday reduces ROE to 21 percent.

The lump-sum contribution would be, in effect, the rehabilitation of the Red Zone. This might be accomplished directly by the government or by payment of the equivalent sum to the concessionaire. Elimination of the contribution from the Bolivian government reduces the standard-case return to 19 percent.

Although not a subsidy from the Bolivian government, a critical element of assistance in the standard case is a construction loan for 80 percent of the project budget at 8.0 percent, with a grace period on principal payments for five years after project completion and 20 years of level payments (principal and interest) thereafter. We have not analyzed the case without financing on such terms, but it is clear that financing on normal commercial terms would significantly reduce the return to equity.

We may call this a *provisional* finding of potential feasibility. *If* the Bolivian government is willing to provide the subsidies referred to above; *if* construction financing from a multilateral lender is available on the terms described above; and *if* the revenue and cost estimates that underlie the standard case are valid, private-sector consortia would be willing to undertake the construction of the interconnection, the associated improvements, and operation of the railway system.

There are other critical conditions as well as those related to finance, revenue, and cost. Perhaps the foremost of these relates to the business structure. If the Bolivian government can offer a concession to operate the entire Bolivian railway system, as well as build the interconnection, some significant business uncertainties are eliminated.

5.1 Key Factors Affecting Feasibility

Key issues regarding revenue and cost projections relate to the following areas:

- Export soybean traffic
- Intermodal traffic
- Intermodal Operating cost
- Investment required in Chile
- Construction cost

Export Soybean Traffic

One important issue is the volume of Bolivian exports of soybeans and their derivatives. Our projections depend on recovery of the world soybean price and robust expansion of Bolivian production in response. The expert view of soybean markets is that the current low prices are due to the financial problems that struck many of the major Asian economies in 1997. There is now strong evidence that those economies are recovering faster than had been expected. This supports the forecast that the price will recover, before 2002, to a level that will encourage Bolivian producers to bring additional land into soybean cultivation. Our estimate of the rate of growth of production is based on recent history in Bolivia and Brazil, as well as on USDA estimates of growth of world output. Any work in Phase II should include a close review of these estimates. In particular, the outer limit on the hectarage under soybean cultivation needs close examination as does the question of where the expansion would occur.

An equally important point would be the potential for cost reduction in carriage on the Hidrovia. We are not aware of possible improvements on the Paraguay/Paraná system that would further reduce barge operating costs, but this question would require close attention if Phase II goes forward.

Intermodal Traffic

Rapidly growing intermodal container traffic is a key component of the forecasted revenue stream that leads us to a finding of provisional feasibility. The intermodal-traffic forecast rests on three bases. One is the current volume of Bolivian container traffic flowing through the port of Arica. On that point, we have reasonably hard information.

The second base is the view of some people active in Chilean railroad management that high charges for movement over FCA track prevent FCALP from competing with trucks for the Bolivian container traffic. Coupled with this view is an opinion that, if a competitive rail rate could be offered, there would be a substantial, immediate shift of container traffic to the railroad. This view underlies the estimate of a switch to rail of 200,000 tons (something less than half the total of Bolivian traffic now moving through Arica) occurring by 2001, with very rapid growth for the next few years after that. This phenomenon would also require some event or action that actually causes a reduction in the FCA charges to FCALP.

The third base is an opinion, held by the same people, that rail container traffic would continue to grow rapidly even after a near-complete modal shift of the international traffic from truck to rail. This opinion is supported by a belief that international container traffic through Arica will grow rapidly, that there is a significant potential for carrying containers to western Brazil, and that Bolivian businesses will find advantages in rail intermodal shipment.

We find all of these views plausible. U.S. experience supports the notion that there might be early rapid growth as businesses find advantage in rail movement of containers for part of a journey. U.S. experience also supports a belief that there could be considerable potential for container shipment to western Brazil, if not all the way to cities such as Sao Paolo or Santos.

Further study would have to include a substantial amount of effort focused on the potential for growth in intermodal container traffic. An in-depth analysis of all aspects of this market is required. It is important to note that, to some degree, the intermodal market could develop without a rail connection across Bolivia. Under current conditions, containers could move as far as Oruro by rail, then eastward to Cochabamba and Santa Cruz by truck. If the Red Zone rehabilitation were carried out ahead of the interconnection, the rail movement could go as far as Cochabamba. A key issue here is the degree to which specialized equipment, e.g., RoadRailers, could enhance the growth of intermodal traffic.

Intermodal Operating Cost

The operating cost entailed in moving containers by rail is a critical point in the cash-flow analysis. The estimate of $0.028 per mt/km was developed by the study team through a rough calculation based on known costs of moving containers in the U.S. with double-stack equipment. The estimate was developed late in the study, and there is little supporting data from Bolivian rail operations. We believe that use of other types of equipment might result in significantly lower operating costs, but we have no strong basis now for an alternative estimate. Sensitivity

testing in the cash-flow analysis showed that an intermodal operating cost of $0.020 per mt/km would increase the ROE to 26 percent. Analysis of the costs and operating characteristics of alternative types of intermodal equipment should be a key element in any further study.

Requirement for Investment in Chilean Rail and Port Facilities

In a number of ways, our analysis of revenue and cost depends on shipment through the port of Arica. Two critical issues arise here. The grade on the FCALP line between Charaña and Arica is very steep, six percent on one stretch, requiring slow and costly "switchback" operations. The level of traffic entailed by our projections could require substantial investment to reduce the grade on this segment to allow faster, higher-volume operations. How large such an investment might be, and whether it would be a profitable investment for FCALP, are major open questions. Similarly, rising levels of soybean and container traffic might require major investment in port facilities which would raise the same questions. Both issues would have to be addressed in detail in further study.

Construction Cost

Construction cost is obviously a major issue. The fact that we find feasibility possible under some scenarios stems, in part, from the ENFE and Wilbur Smith revisions of the unit costs in the Sondotecnica study. We have no particular reason to be skeptical of the Wilbur Smith findings, but the issue is so important that the unit costs should be examined again by an engineering firm that specializes in railroad work. This is especially important because, among people familiar with the history of the interconnection, there is a widespread impression that the Aiquile-Santa Cruz route is not feasible because of the high construction costs estimated in the Sondotecnica study. Further close review is essential if this impression is to be dispelled.

5.2 Recommendations and Next Steps

We believe that the findings of Phase I are sufficiently positive to warrant a deeper and more detailed investigation of the feasibility of the interconnection. Our preliminary analysis has shown that there are scenarios under which the project may be feasible, given assistance from the Bolivian government in the form of a tax holiday, a direct contribution of $75 million to the construction funds, and construction financing on relatively generous terms as described at the beginning of this section and in Section 4.

A number of aspects of the analysis require special attention in further study, and most of these have been enumerated in the preceding discussion. There are two further points to be made.

Business Structure

We must re-emphasize the importance of the business structure. Potential bidders must see a workable business entity with operating rights over all of the Bolivian system. In concept, it might be possible for one entity to build the interconnection and operate part of the system, while

one or more entities operate other parts of the system. But a requirement that a concessionaire negotiate revenue divisions or access prices with other rail firms, after winning the interconnection concession, would seem to introduce a discouraging level of uncertainty in a project where risk is already a significant factor.

Timing of an Interconnection Decision

It has to be noted that there are some key issues where uncertainty might be reduced in the next two years or so, should the government choose to defer a decision on the interconnection project. More will become known, for example, about world demand for soybeans and likely responses from Bolivian producers.

Further, some significant experience with intermodal traffic could be gained without a government decision on the interconnection. If some action were taken with regard to FCA access pricing for example, there would be an opportunity to observe market response to lower rates for rail container movements between Bolivian points and Arica. And, in this regard, investigation of the suitability of various types of rolling stock for carrying containers takes on considerable significance. Operation of an intermodal service between Oruro or Cochabamba on one end and Santa Cruz on the other could provide valuable information on the market for container service across Bolivia. Indeed, such service should be considered both as an alternate, and a supplement, to the interconnection. Development of good intermodal service into Brazil, for example, might pave the way for fuller exploitation of that market.

Regardless of the decision the Bolivian government makes about the interconnection, or when it makes it, that decision will be better informed if Phase II includes a thorough examination of the options for intermodal service prior to, or in the place, of the interconnection. This is not to prejudge a decision on the interconnection. But it is important that the decision be made with a full understanding of the potential for intermodal options, both as alternatives to, and as supplements to, the interconnection.

Appendix I
Cost Review by Carl Martland

TO: Sergio Ostria
FROM: Carl Martland
RE: **Cost Scenarios for Phase I of the Interconnection Study**
DATE: October 29, 1999

Introduction

The purpose of this memo is to present various cost scenarios for the Interconnection that can be used in the financial model developed by Hagler Bailly. These cost scenarios are based upon information published in prior studies, insights gained from in-country interviews, and general knowledge about the costs of constructing and operating railroads.

There are two major issues in the cost analysis:

What will it cost to build the interconnection?
What will it cost to operate over the interconnection?

Construction Cost

The Sondotecnica Route

The Sondotecnica Route is the only route for which detailed engineering plans and cost estimates have been made. The Sondotecnica study produced detailed engineering drawings, including track charts at a scale of approximately 60m/cm (0.1mile/inch), along with drawings and studies of bridges, embankments, and other specialized track work. The study produced precise estimates of the amount of excavation, embankments, bridges, tunnels, etc. that would be necessary. ENFE was confident that these engineering aspects of the study were very good.

The original cost estimate from Sondotecnica was around $1 billion. However, according to ENFE, the costs in the Sondotecnica study were overestimated for three reasons:

1. They assumed that the route would be developed by Brazilian companies using Brazilian technology and labor costs.
2. They assumed that inflation would be higher than it actually was during the 1990s.
3. They chose the most direct route and did not consider alternatives that would be longer, but have better grades.

Since 1988, a substantial private sector road-building capability has emerged in Bolivia. According to ENFE, there are now 100-200 companies that are capable of doing the basic work to prepare a road bed (which would be equivalent to preparing a railbed) using local labor and low cost construction techniques. This provides both the capacity to construct the roadbed for the railway and the ability to estimate construction costs. ENFE therefore revised this study to reflect Bolivian construction costs and thereby reduced the estimated cost of constructing the Interconnection to $713 million.

Wilbur Smith looked at the costs of the Sondotecnica route in more detail, taking into account both financial and economic costs. They also found that the costs would be lower than the original Sondotecnica estimate. For the interconnection, the financial cost would be $693 million and the economic cost would be $559 million. For upgrading the routes from Oruro to Cochabamba and from Cochabamba to Aiquile, the financial costs were estimated to be $75 and $5 million, for a total of $773 million (with economic costs of $623 million). These estimates include provision of 20% (i.e $129 million) for unexpected expenses.

Other Routes

Canac identified an alternative route for the interconnection that would still link up to the existing Oruro - Cochabamba line, but save 400m of elevation and reduce the ruling grade from 2.45% to about 2%. The preliminary cost estimate for this route was $473 million.

Other routes have been suggested. One option would be to build the connection to Sucre rather than toward Cochabamba, and another would be to build across the southern part of the country via Tarija. The technical difficulties of any route would be similar, as the primary challenge is to reach the high plateau at 4,000+ meters, which will require extensive amounts of earth movement and construction of embankments, bridges and tunnels. The Wilbur Smith study (Chart 8.3) showed that the Sondotecnica route would be approximately the same "virtual" length (i.e. about 8% longer, but with less rise and fall) as the route via Sucre in terms of access to Chile. They also found that prior construction-cost estimates for the two routes were equivalent, with the northern route estimated as $976 million and the southern route as $941 million (Chart 8.5, based on Sondotecnica and ENFE studies).

We did not receive any advice or information from ENFE to indicate that alternative routes would be any easier to construct than the routes covered by Sondotecnica or CANAC. Therefore, for the purposes of this preliminary study, the work and cost estimates provided by Sondotecnica, ENFE, Wilbur Smith and CANAC are assumed to provide an acceptable range for construction costs.

Unit Construction Costs

It is beyond the scope of this review to update the unit costs used by ENFE and Wilbur Smith to estimate construction costs. However, it is possible that some of the cost factors could be lowered. For example, the above studies have generally estimated the costs of tunnels as $10,000 per meter. A major US construction company indicated that they have used a unit cost of $7,000 per meter for railroad tunnel construction in the Andes. Using the lower cost for tunnels would reduce the estimated cost of the project by about $40 million, as there are 12.4 km of tunnels on the Sondotecnica route plus 1.5 miles of tunnels on the portion of the Oruro-Cochabamba route that would need to be rebuilt (Wilbur Smith, Chart 8.11).

Range of Construction Costs

Based upon the above logic, we can reach the following conclusions:

It is feasible to build the Interconnection for approximately $700 million (1997 Bolivian costs and 1997 exchange rates as documented by Wilbur Smith) by following the Sondotecnica route from Santa Cruz to Aiquile.

It may be possible to build the Interconnection on a more favorable route for approximately $500 million (1994 Bolivian costs and exchange rates) by following a different route, e.g. the CANAC route.

These costs include some margin of error, as some important unit costs (e.g. the cost for tunnels) may still be high, and an extra 20% is included in the Wilbur Smith cost estimates to cover unexpected costs. However, these costs are just estimates, and construction costs are always subject to increase as a result of unanticipated problems that may arise. Therefore, the costs could be higher than these estimates, and a reasonable range to consider in Phase I would be $500 to $800 million.

ENFE estimated that these costs (expressed in $US) have not escalated much, because of a combination of low inflation in Bolivia and a strong US dollar. (Wilbur Smith concluded that Bolivian construction costs, when reported in $US, have been nearly constant since 1980, as changes in the exchange rate reflecting the strength of the US $ have offset the effects of inflation within Bolivia).

For the purposes of the Phase I study, I recommend using a range of $500 to $900 million for the construction costs, with an expected cost of $775 million (i.e. the Wilbur Smith estimate). I have biased the expected cost above the midpoint because of the much greater level of effort that went into the Sondotecnica study, which provides much greater assurance that that route is in fact feasible.

Rehabilitation Costs

As noted in the Wilbur Smith study, the Interconnection can work only if the entire route is able to handle the same level of traffic. If the interconnection is built, the major traffic is expected to be exports of soy beans (or soy meal), with annual volumes of at least 3-5 million net tons per year during the first few years of operation. The entire route, including the route to the ports, must therefore be able to handle at least 10 trains per day with an average load of 2000 net tons. This level of traffic cannot be handled by unusual Andean operations, such as operating 10-car trains up switch backs or breaking down trains to 5- or 10-cars in order to climb very steep grades. Therefore, the entire route must have grades and curvature that are suitable for handling trains that carry at least 2000 net tons at reasonable speeds.

Based upon interviews with ENFE and with representatives of the Oriental Railroad, there do not appear to be any major problems in handling additional traffic east of Santa Cruz. Based upon

interviews with and information provided by ENFE, there are portions of the Andina Railway that would have to be upgraded. The most serious problems are in the "Red Zone" of the line that descends from Oruro to Cochabamba. For a stretch of nearly 50 km, much of this line is flooded during the rainy season. The line is closed on the order of five to seven months per year, and the annual costs of repairing flood damage run to a few hundred thousand dollars. The Wilbur Smith report summarized the findings of a study by JICA, a Japanese agency that evaluated various options for upgrading this link. JICA estimated that the costs ranged from $3 million (to replace the rail) to $100 million (to reduce the grades to the 2.45% standard for the Sondotecnica Interconnection and to eliminate the worst curves). The Wilbur Smith study estimated that it would cost $75 million ($60 million in economic costs) to upgrade this route.

The other major problem in Bolivia would be the link from Cochabamba to Aiquile (or to Misque, if that becomes the western end of the Interconnection). ENFE estimated that approximately $20 million would be needed to open this line for Interconnection traffic. The Wilbur Smith study estimated that it would cost $5 million ($4 million in economic costs) to upgrade this route.

Once the railroad rises to the Alto Plano, there are few operating or maintenance problems within Bolivia. We did not receive information concerning the quality of the Chilean lines that descend to the ports of Antofagasta or Arica, except that trains are indeed operating over these lines. The line to Antofagasta does not have serious operating problems (at least for a railroad operating in the Andes) related to grades or curvature. The route to Arica has very steep grades (6%) that would likely be a hindrance to operations and capacity. If we assume that bulk traffic moving over the Interconnection is destined to Mejillones via Antafagosta, then some container (or other) traffic could move to Arica without necessarily requiring major rehabilitation.

From this brief discussion, we can conclude that additional investment will be required in the Andina Railway to handle the traffic projected for the Interconnection. The JICA study indicates that the major problem in the "Red Zone" could be corrected for approximately $100 million, and ENFE indicated that approximately $20 million would be needed east of Cochabamba. While either of these projects would be a very large investment for the minor traffic currently available on this line, they represent only a 15-25% increase in the investment for the Interconnection itself. Therefore, in the Phase I study of the Interconnection, it is reasonable to assume that these investments will be made at a total cost of $70 - $125 million.

We did not receive any information concerning investment requirements on the Chilean lines. Given that those lines have more traffic than the Oruro - Cochabamba line, the rehabilitation costs might not be as great a problem. However, substantial investments could also be required. For initial planning purposes, I have assumed that $20 to $50 million will be needed to upgrade the line to Antofagasta to handle an additional 3-5 million net tons of traffic.

Summary of Construction Cost Scenarios

Interconnection: $700 million with a range of $500 to $800 million
Aiquile to Cochabamba: $15 million with a range of $10 to $25 million
Cochabamba: $75 million with a range of $60 to $100 million
Chilean lines: $30 million with a range of $20 to $50 million
Total: $820 million with a range of $600 to $975 million

Time Required for Construction

The time required for construction will depend upon the time required for preparation (to secure construction permits, land acquisition, etc.) and the resources devoted to construction. The Wilbur Smith study assumed that construction costs would be incurred uniformly over a 5-year construction period (Exhibit 8.17). The CANAC study (June 1994) apparently assumed that construction would be completed in a single year, as all construction expense is shown as being incurred at the beginning of the first year of their project (which was 1995). Discussions with a civil engineer familiar with the construction environment in Chile indicated that the project could be done in less than 3 years if the government were willing to expedite land acquisition and other preparations.

My conclusions is that the project could be built in a shorter time horizon than assumed by Wilbur Smith, but not in a year as contemplated by CANAC. For Phase I, we should allow 3 years for construction and consider 2 to 4 years in the sensitivity analysis.

Operating Costs

Once the interconnection is available and the improvements have been made to the connecting lines, operations should be relatively straightforward. The design standards will allow operation of trains of 2,000 or more net tons at average speeds of 30-50 km per hour, so that there will be no capacity problems for the expected traffic levels.

Wilbur Smith estimated that operating costs would be $0.022 per ton-km, of which $0.004 would be fixed and $0.018 would be variable expense. These costs were based upon an analysis of the actual operating costs of Red Andina for 1997, which were $0.026 per ton-km including $0.008 fixed cost. Wilbur Smith therefore was allocating the fixed operating costs over a broader base and keeping the same variable costs.

CANAC used a different approach, as they developed operating costs from detailed assumptions concerning equipment, track maintenance, and operations. They ended up with costs of about $0.013 per ton-km (Appendix C, Exhibit 5, p. 36). These costs represented only the operation over the interconnection, so some elements (e.g. equipment costs) were very low because this operation requires no terminals and no loading or loading operations. Also, track maintenance costs would be low at first because this would be a brand new line.

I conducted a simplified engineering economics analysis to come up with an estimate of the cost per ton-km for operating a 2,000 km trip from eastern Bolivia to the Pacific ports. My methodology was similar to that used by CANAC study, except that I was considering operations and cycle times over the entire route. I ended up with an estimate of $0.018 per ton-km, which is really an estimate of the variable costs. This figure includes the costs of owning and maintaining cars and locomotives. I assumed that the cars were similar to the ones being outfitted in Santa Cruz by the Oriental Railway: 46 metric ton capacity, 18.5 metric ton tare weight, and $45,000 purchase price (including delivery to Bolivia). I assumed that 3000 HP locomotives costing $2.2 million were used, with helper locomotives available for the steepest grades. The $0.018 per ton-km may not include sufficient costs to cover routine inspections or certain aspects of track maintenance, and it does not include administration or any overhead expense. Hence, this estimate is actually quite consistent with Wilbur Smith estimate of $0.022 per ton-km.

Conclusion

For Phase I, we should use $0.022 per ton-km as the initial estimate of operating costs for a 2,000 km movement of soy beans from the field to a port over a line that handles 3-5 million net tons of traffic. This cost would decline if traffic increased, because it includes all of maintenance costs for the lines, some of which are fixed costs.

For sensitivity analysis, we should use a range of $0.018 to $0.026 per ton-km (i.e. current variable to current fully allocated costs of transportation); even lower costs could be considered, but only if supported by some additional analysis. As a comparison, costs in high density North American unit train operations are generally close to $0.01 per ton-mile (i.e $0.006 per ton-km) - so there is quite a bit of room for improvement if there is ever enough traffic to justify moving to larger cars and heavy-haul operating standards.

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Appendix II
Cash-flow Analyses

Case Results

Debt Coverage Ratio in 2010	1.85
Return on Concessionaire Equity	23.84%
Project NPV @ 20% (millions)	$44.13
Equity Payback (project years)	9

Capital Structure Summary

(US$ in millions)

Construction Period Sources		
Bank Loan	632.000	69%
Government Support	75.000	8%
Interest Earnings	5.011	1%
Net Operating Funds	92.257	10%
Concession Equity	110.000	12%
Total Sources	914.267	
Construction Period Uses		
Construction Costs	790.000	86%
Finance Costs	25.280	3%
Construction Period Interest	96.064	11%
Surplus/(Deficit)	2.923	0%
Total Uses	914.267	

Construction Costs	
Budget (millions)	$790.000
Construction Draws Year 1 (%)	20%
Construction Draws Year 2 (%)	50%
Construction Draws Year 3 (%)	30%
Construction Draws Year 4 (%)	0%
Construction Period (years)	3
Government Construction Contribution	
Contribution Amount (millions)	$75.000
Year 1 (%)	0%
Year 2 (%)	50%
Year 3 (%)	50%
Year 4 (%)	0%
Concessionaire Equity	
Investment Amount (millions)	$110.000
Equity Pay-in Year 1 (%)	100%
Equity Pay-in Year 2 (%)	0%
Equity Pay-in Year 3 (%)	0%
Equity Pay-in Year 4 (%)	0%
Bank Debt	
Share of Construction Costs	80%
Loan Amount (millions)	$632.000
Loan Draw Year 1 (%)	20%
Loan Draw Year 2 (%)	50%
Loan Draw Year 3 (%)	30%
Loan Draw Year 4 (%)	0%
Interest Rate	8%
Interest Only Period After Construction	5
Amortization Periods	20
Final Maturity (project year)	28
Costs of Issuance (% of loan amount)	4%
Last year prior to Amortization	8
Micellaneous Concession Terms	
Minimum Coverage to Free Reserves	2.00
Equity Distributions Prior to Debt Amortization	50%

I/C Export Soy Bean Traffic	
Production per Hectacre Growth	2.0%
Tariff ($ per ton-km)	$0.035
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	1,376
I/C Domestic Soy Bean Traffic	
Share of Domestic Beans on Rail	50%
Growth (% per year)	1.0%
Tariff ($ per ton-km)	$0.045
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	815
I/C Intermodal Traffic	
2005 Traffic (millions, metric tons)	0.588
Growth (% per year) 2001-2005	25%
Growth (% per year) 2006-2010	10%
Growth (% per year) 2011-2020	7%
Growth (% per year) After 2020	5%
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.028
Average Haul (km)	1,000
I/C Mineral Traffic	
2005 Traffic (millions, metric tons)	0.250
Growth (% per year)	0%
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	1,250
I/C Other Traffic	
2005 Traffic (millions, metric tons)	0.100
Growth (% per year)	5%
Tariff ($ per ton-km)	$0.045
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	815
Other Revenues	
Earnings Rate on Construction Funds	5%
Earnings Rate on Reserve Funds	5%
Non-operating Revenues % of Operating Rev	1%

Base General Traffic	
Base Traffic Growth before 2010	5%
Base Traffic Growth after 2010	3%
Average Haul (KM)	520
Tariff ($ per ton-KM)	$0.045
OM Costs ($ per ton-KM)	$0.019
Base Mineral Traffic	
2002 Traffic Level (millions, metric tons)	0.657
Base Traffic Growth	0%
Average Haul (km)	100
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Base Soy Beans Traffic	
Average Haul (km)	550
Tariff ($ per ton-km)	$0.035
OM Costs ($ per ton-km)	$0.019
Base I/M Traffic	
2001 Traffic Level (millions, metric tons)	0.200
Traffic Growth through 2004	25%
Average Haul (km)	615
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.028
Tax Rates	
Income Tax Rate During Loan Period	0%
Income Tax Rate After Loan Period	25%
13% Gross Revenue Tax During Loan Period	0%
13% Gross Revenue Tax After Loan Period	13%
3% Gross Revenue Tax During Loan Period	0%
3% Gross Revenue Tax After Loan Period	3%
13% Tax Credit - Percent Total Investment	50%

Results Snapshot	
Return on Equity	23.84%
Equity Payback	9
NPV @ 20%	$44.13
Debt Coverage in 2010	1.85

Period		Construction Period Cash Flow														
Project Year	Calendar Year	Starting Balance	Equity Pay-In	Excess Op Funds	Govt Grant	Bank Debt	Total New Capital	Cumulative Debt	Average Balance	Interest Earnings	Total Available	Financing Costs	Construction Draws	C/P Interest	Total Outlays	Ending Balance
	Units	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
1	2002	0.000	110.000	27.737	0.000	126.400	264.137	126.400	35.372	1.769	265.905	(25.280)	(158.000)	(10.112)	(193.392)	72.513
2	2003	72.513	0.000	30.651	37.500	316.000	384.151	442.400	49.393	2.470	459.134	0.000	(395.000)	(35.392)	(430.392)	28.742
3	2004	28.742	0.000	33.869	37.500	189.600	260.969	632.000	15.446	0.772	290.483	0.000	(237.000)	(50.560)	(287.560)	2.923
4	2005								0.000							
5	2006															
6	2007	*Totals*	*110.000*	*92.257*	*75.000*	*632.000*	*909.257*			*5.011*		*(25.280)*	*(790.000)*	*(96.064)*	*(911.344)*	
7	2008															
8	2009															
9	2010															
10	2011															
11	2012															
12	2013															
13	2014															
14	2015															
15	2016															
16	2017															
17	2018															
18	2019															
19	2020															
20	2021															
21	2022															
22	2023															
23	2024															
24	2025															
25	2026															
26	2027															
27	2028															
28	2029															
29	2030															
30	2031															
31	2032															
32	2033															
33	2034															
34	2035															
35	2036															
36	2037															
37	2038															
38	2039															
39	2040															
40	2041															

Period		*Soy Bean Production*				
Project Year	Calendar Year	Hectares in Prod	Productivity per Hectare	Output (millions)	Output Domestic	Output Export
	Units	hectares	metric tons	metric tons	metric tons	metric tons
1	2002	500,000	2.000	1.000	0.301	0.699
2	2003	560,000	2.040	1.142	0.304	0.838
3	2004	620,000	2.081	1.290	0.307	0.983
4	2005	680,000	2.122	1.443	0.310	1.133
5	2006	740,000	2.165	1.602	0.313	1.289
6	2007	800,000	2.208	1.767	0.316	1.450
7	2008	860,000	2.252	1.937	0.320	1.617
8	2009	920,000	2.297	2.114	0.323	1.791
9	2010	980,000	2.343	2.296	0.326	1.971
10	2011	1,040,000	2.390	2.486	0.329	2.157
11	2012	1,100,000	2.438	2.682	0.332	2.349
12	2013	1,160,000	2.487	2.885	0.336	2.549
13	2014	1,220,000	2.536	3.095	0.339	2.755
14	2015	1,280,000	2.587	3.312	0.343	2.969
15	2016	1,340,000	2.639	3.536	0.346	3.190
16	2017	1,400,000	2.692	3.768	0.349	3.419
17	2018	1,460,000	2.746	4.009	0.353	3.656
18	2019	1,500,000	2.800	4.201	0.356	3.844
19	2020	1,500,000	2.856	4.285	0.360	3.925
20	2021	1,500,000	2.914	4.370	0.364	4.007
21	2022	1,500,000	2.972	4.458	0.367	4.091
22	2023	1,500,000	3.031	4.547	0.371	4.176
23	2024	1,500,000	3.092	4.638	0.375	4.263
24	2025	1,500,000	3.154	4.731	0.378	4.352
25	2026	1,500,000	3.217	4.825	0.382	4.443
26	2027	1,500,000	3.281	4.922	0.386	4.536
27	2028	1,500,000	3.347	5.020	0.390	4.630
28	2029	1,500,000	3.414	5.121	0.394	4.727
29	2030	1,500,000	3.482	5.223	0.398	4.825
30	2031	1,500,000	3.552	5.328	0.402	4.926
31	2032	1,500,000	3.623	5.434	0.406	5.028
32	2033	1,500,000	3.695	5.543	0.410	5.133
33	2034	1,500,000	3.769	5.654	0.414	5.240
34	2035	1,500,000	3.844	5.767	0.418	5.349
35	2036	1,500,000	3.921	5.882	0.422	5.460
36	2037	1,500,000	4.000	6.000	0.426	5.573
37	2038	1,500,000	4.080	6.120	0.431	5.689
38	2039	1,500,000	4.161	6.242	0.435	5.807
39	2040	1,500,000	4.245	6.367	0.439	5.928
40	2041	1,500,000	4.329	6.494	0.444	6.051

Period		*Revenues from Base Traffic*												
Project	Calendar	General			Soy Beans (Base)			I/M (Base)			Minerals (Base)			Total Base
Year	Year	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Revenue
	Units	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	$
1	2002	1.158	601.965	27.088	0.699	384.450	13.456	0.250	153.750	7.688	0.657	65.700	3.285	51.517
2	2003	1.216	632.063	28.443	0.838	461.115	16.139	0.313	192.188	9.609	0.657	65.700	3.285	57.476
3	2004	1.276	663.666	29.865	0.983	540.675	18.924	0.391	240.234	12.012	0.657	65.700	3.285	64.085
4	2005	1.340	696.850	31.358							0.657	65.700	3.285	34.643
5	2006	1.407	731.692	32.926							0.657	65.700	3.285	36.211
6	2007	1.477	768.277	34.572							0.657	65.700	3.285	37.857
7	2008	1.551	806.691	36.301							0.657	65.700	3.285	39.586
8	2009	1.629	847.025	38.116							0.657	65.700	3.285	41.401
9	2010	1.678	872.436	39.260										39.260
10	2011	1.728	898.609	40.437										40.437
11	2012	1.780	925.567	41.651										41.651
12	2013	1.833	953.334	42.900										42.900
13	2014	1.888	981.934	44.187										44.187
14	2015	1.945	1,011.392	45.513										45.513
15	2016	2.003	1,041.734	46.878										46.878
16	2017	2.063	1,072.986	48.284										48.284
17	2018	2.125	1,105.176	49.733										49.733
18	2019	2.189	1,138.331	51.225										51.225
19	2020	2.255	1,172.481	52.762										52.762
20	2021	2.322	1,207.655	54.344										54.344
21	2022	2.392	1,243.885	55.975										55.975
22	2023	2.464	1,281.202	57.654										57.654
23	2024	2.538	1,319.638	59.384										59.384
24	2025	2.614	1,359.227	61.165										61.165
25	2026	2.692	1,400.004	63.000										63.000
26	2027	2.773	1,442.004	64.890										64.890
27	2028	2.856	1,485.264	66.837										66.837
28	2029	2.942	1,529.822	68.842										68.842
29	2030	3.030	1,575.716	70.907										70.907
30	2031	3.121	1,622.988	73.034										73.034
31	2032	3.215	1,671.678	75.225										75.225
32	2033	3.311	1,721.828	77.482										77.482
33	2034	3.411	1,773.483	79.807										79.807
34	2035	3.513	1,826.687	82.201										82.201
35	2036	3.618	1,881.488	84.667										84.667
36	2037	3.727	1,937.932	87.207										87.207
37	2038	3.839	1,996.070	89.823										89.823
38	2039	3.954	2,055.952	92.518										92.518
39	2040	4.072	2,117.631	95.293										95.293
40	2041	4.195	2,181.160	98.152										98.152

Period		Revenues from Interconnection Traffic														
Project	Calendar	Export Soy Beans			Domestic Soy Beans			Intermodal			Minerals			Other Traffic		
Year	Year	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue
	Units	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$
1	2002															
2	2003															
3	2004															
4	2005	$0.035	1,559.176	54.571	$0.045	126.374	5.687	$0.050	588.281	29.414				$0.045	81.500	3.668
5	2006	$0.035	1,773.358	62.068	$0.045	127.638	5.744	$0.050	735.352	36.768				$0.045	85.575	3.851
6	2007	$0.035	1,995.441	69.840	$0.045	128.914	5.801	$0.050	808.887	40.444				$0.045	89.854	4.043
7	2008	$0.035	2,225.655	77.898	$0.045	130.203	5.859	$0.050	889.775	44.489				$0.045	94.346	4.246
8	2009	$0.035	2,464.236	86.248	$0.045	131.505	5.918	$0.050	978.753	48.938				$0.045	99.064	4.458
9	2010	$0.035	2,711.425	94.900	$0.045	132.820	5.977	$0.050	1,076.628	53.831	$0.050	547.500	27.375	$0.045	104.017	4.681
10	2011	$0.035	2,967.472	103.862	$0.045	134.149	6.037	$0.050	1,184.291	59.215	$0.050	547.500	27.375	$0.045	109.218	4.915
11	2012	$0.035	3,232.632	113.142	$0.045	135.490	6.097	$0.050	1,267.191	63.360	$0.050	547.500	27.375	$0.045	114.679	5.161
12	2013	$0.035	3,507.166	122.751	$0.045	136.845	6.158	$0.050	1,355.895	67 795	$0.050	547.500	27.375	$0.045	120.413	5.419
13	2014	$0.035	3,791.342	132.697	$0.045	138.214	6.220	$0.050	1,450.807	72.540	$0.050	547.500	27.375	$0.045	126.433	5.689
14	2015	$0.035	4,085.436	142.990	$0.045	139.596	6.282	$0.050	1,552.364	77.618	$0.050	547.500	27.375	$0.045	132.755	5.974
15	2016	$0.035	4,389.731	153.641	$0.045	140.992	6.345	$0.050	1,661.029	83.051	$0.050	547.500	27.375	$0.045	139.393	6.273
16	2017	$0.035	4,704.516	164.658	$0.045	142.402	6.408	$0.050	1,777.302	88.865	$0.050	547.500	27.375	$0.045	146.362	6.586
17	2018	$0.035	5,030.089	176.053	$0.045	143.826	6.472	$0.050	1,901.713	95.086	$0.050	547.500	27.375	$0.045	153.680	6.916
18	2019	$0.035	5,289.686	185.139	$0.045	145.264	6.537	$0.050	2,034.833	101.742	$0.050	547.500	27.375	$0.045	161.364	7.261
19	2020	$0.035	5,400.385	189.013	$0.045	146.716	6.602	$0.050	2,177.271	108.864	$0.050	547.500	27.375	$0.045	169.433	7.624
20	2021	$0.035	5,513.347	192.967	$0.045	148.184	6.668	$0.050	2,329.680	116.484	$0.050	547.500	27.375	$0.045	177.904	8.006
21	2022	$0.035	5,628.617	197.002	$0.045	149.665	6.735	$0.050	2,446.164	122.308	$0.050	547.500	27.375	$0.045	186.799	8.406
22	2023	$0.035	5,746.244	201.119	$0.045	151.162	6.802	$0.050	2,568.472	128.424	$0.050	547.500	27.375	$0.045	196.139	8.826
23	2024	$0.035	5,866.273	205.320	$0.045	152.674	6.870	$0.050	2,696.896	134.845	$0.050	547.500	27.375	$0.045	205.946	9.268
24	2025	$0.035	5,988.753	209.606	$0.045	154.200	6.939	$0.050	2,831.740	141.587	$0.050	547.500	27.375	$0.045	216.244	9.731
25	2026	$0.035	6,113.735	213.981	$0.045	155.742	7.008	$0.050	2,973.327	148.666	$0.050	547.500	27.375	$0.045	227.056	10.218
26	2027	$0.035	6,241.269	218.444	$0.045	157.300	7.078	$0.050	3,121.994	156.100	$0.050	547.500	27.375	$0.045	238.409	10.728
27	2028	$0.035	6,371.406	222.999	$0.045	158.873	7.149	$0.050	3,278.093	163.905	$0.050	547.500	27.375	$0.045	250.329	11.265
28	2029	$0.035	6,504.199	227.647	$0.045	160.462	7.221	$0.050	3,441.998	172.100	$0.050	547.500	27.375	$0.045	262.846	11.828
29	2030	$0.035	6,639.701	232.390	$0.045	162.066	7.293	$0.050	3,614.098	180.705	$0.050	547.500	27.375	$0.045	275.988	12.419
30	2031	$0.035	6,777.967	237.229	$0.045	163.687	7.366	$0.050	3,794.803	189.740	$0.050	547.500	27.375	$0.045	289.787	13.040
31	2032	$0.035	6,919.054	242.167	$0.045	165.324	7.440	$0.050	3,984.543	199.227	$0.050	547.500	27.375	$0.045	304.277	13.692
32	2033	$0.035	7,063.017	247.206	$0.045	166.977	7.514	$0.050	4,183.770	209.189	$0.050	547.500	27.375	$0.045	319.491	14.377
33	2034	$0.035	7,209.916	252.347	$0.045	168.647	7.589	$0.050	4,392.959	219.648	$0.050	547.500	27.375	$0.045	335.465	15.096
34	2035	$0.035	7,359.809	257.593	$0.045	170.333	7.665	$0.050	4,612.607	230.630	$0.050	547.500	27.375	$0.045	352.238	15.851
35	2036	$0.035	7,512.757	262.946	$0.045	172.037	7.742	$0.050	4,843.237	242.162	$0.050	547.500	27.375	$0.045	369.850	16.643
36	2037	$0.035	7,668.821	268.409	$0.045	173.757	7.819	$0.050	5,085.399	254.270	$0.050	547.500	27.375	$0.045	388.343	17.475
37	2038	$0.035	7,828.065	273.982	$0.045	175.495	7.897	$0.050	5,339.669	266.983	$0.050	547.500	27.375	$0.045	407.760	18.349
38	2039	$0.035	7,990.552	279.669	$0.045	177.249	7.976	$0.050	5,606.652	280.333	$0.050	547.500	27.375	$0.045	428.148	19.267
39	2040	$0.035	8,156.348	285.472	$0.045	179.022	8.056	$0.050	5,886.985	294.349	$0.050	547.500	27.375	$0.045	449.555	20.230
40	2041	$0.035	8,325.520	291.393	$0.045	180.812	8.137	$0.050	6,181.334	309.067	$0.050	547.500	27.375	$0.045	472.033	21.241

Period		Revenue Summary			
Project Year	Calendar Year	Op Rev Subtotal	Non Op Revenue	Reserves Earnings	Gross Revenue
	Units	$	$	$	$
1	2002	51.517	0.515		52.032
2	2003	57.476	0.575		58.051
3	2004	64.085	0.641		64.726
4	2005	127.983	1.280	0.000	129.263
5	2006	144.641	1.446	0.354	146.441
6	2007	157.987	1.580	0.914	160.481
7	2008	172.078	1.721	1.648	175.446
8	2009	186.963	1.870	2.569	191.401
9	2010	226.024	2.260	3.691	231.975
10	2011	241.840	2.418	3.691	247.950
11	2012	256.785	2.568	3.691	263.044
12	2013	272.397	2.724	3.691	278.813
13	2014	288.708	2.887	0.000	291.596
14	2015	305.752	3.058	0.000	308.809
15	2016	323.562	3.236	0.000	326.798
16	2017	342.177	3.422	0.000	345.599
17	2018	361.634	3.616	0.000	365.251
18	2019	379.279	3.793	0.000	383.072
19	2020	392.240	3.922	0.000	396.163
20	2021	405.845	4.058	0.000	409.903
21	2022	417.801	4.178	0.000	421.979
22	2023	430.200	4.302	0.000	434.502
23	2024	443.061	4.431	0.000	447.492
24	2025	456.404	4.564	0.000	460.968
25	2026	470.248	4.702	0.000	474.951
26	2027	484.616	4.846	0.000	489.462
27	2028	499.530	4.995	0.000	504.525
28	2029	515.013	5.150	0.000	520.163
29	2030	531.089	5.311	0.000	536.400
30	2031	547.785	5.478	0.000	553.263
31	2032	565.127	5.651	0.000	570.778
32	2033	583.142	5.831	0.000	588.974
33	2034	601.862	6.019	0.000	607.880
34	2035	621.315	6.213	0.000	627.528
35	2036	641.535	6.415	0.000	647.951
36	2037	662.555	6.626	0.000	669.181
37	2038	684.410	6.844	0.000	691.254
38	2039	707.138	7.071	0.000	714.209
39	2040	730.776	7.308	0.000	738.084
40	2041	755.365	7.554	0.000	762.919

Period		Gross Revenue Taxes						
Project Year	Calendar Year	Gross Revenue	13% Tax	Credits Available	Credits Taken	Net 13% Tax Due	3% Tax Due	Total Tax Due
	Units	$	$	$	$	$	$	$
1	2002	52.032	-	-	-	-	-	0.000
2	2003	58.051	-	-	-	-	-	0.000
3	2004	64.726	-	-	-	-	-	0.000
4	2005	129.263	-	395.000	-	-	-	0.000
5	2006	146.441	-	395.000	-	-	-	0.000
6	2007	160.481	-	395.000	-	-	-	0.000
7	2008	175.446	-	395.000	-	-	-	0.000
8	2009	191.401	-	395.000	-	-	-	0.000
9	2010	231.975	-	395.000	-	-	-	0.000
10	2011	247.950	-	395.000	-	-	-	0.000
11	2012	263.044	-	395.000	-	-	-	0.000
12	2013	278.813	-	395.000	-	-	-	0.000
13	2014	291.596	-	395.000	-	-	-	0.000
14	2015	308.809	-	395.000	-	-	-	0.000
15	2016	326.798	-	395.000	-	-	-	0.000
16	2017	345.599	-	395.000	-	-	-	0.000
17	2018	365.251	-	395.000	-	-	-	0.000
18	2019	383.072	-	395.000	-	-	-	0.000
19	2020	396.163	-	395.000	-	-	-	0.000
20	2021	409.903	-	395.000	-	-	-	0.000
21	2022	421.979	-	395.000	-	-	-	0.000
22	2023	434.502	-	395.000	-	-	-	0.000
23	2024	447.492	-	395.000	-	-	-	0.000
24	2025	460.968	-	395.000	-	-	-	0.000
25	2026	474.951	-	395.000	-	-	-	0.000
26	2027	489.462	-	395.000	-	-	-	0.000
27	2028	504.525	-	395.000	-	-	-	0.000
28	2029	520.163	-	395.000	-	-	-	0.000
29	2030	536.400	69.732	395.000	69.732	-	16.092	(16.092)
30	2031	553.263	71.924	325.268	71.924	-	16.598	(16.598)
31	2032	570.778	74.201	253.344	74.201	-	17.123	(17.123)
32	2033	588.974	76.567	179.143	76.567	-	17.669	(17.669)
33	2034	607.880	79.024	102.576	79.024	-	18.236	(18.236)
34	2035	627.528	81.579	23.552	23.552	58.027	18.826	(76.853)
35	2036	647.951	84.234	-	-	84.234	19.439	(103.672)
36	2037	669.181	86.993	-	-	86.993	20.075	(107.069)
37	2038	691.254	89.863	-	-	89.863	20.738	(110.601)
38	2039	714.209	92.847	-	-	92.847	21.426	(114.273)
39	2040	738.084	95.951	-	-	95.951	22.143	(118.093)
40	2041	762.919	99.179	-	-	99.179	22.888	(122.067)

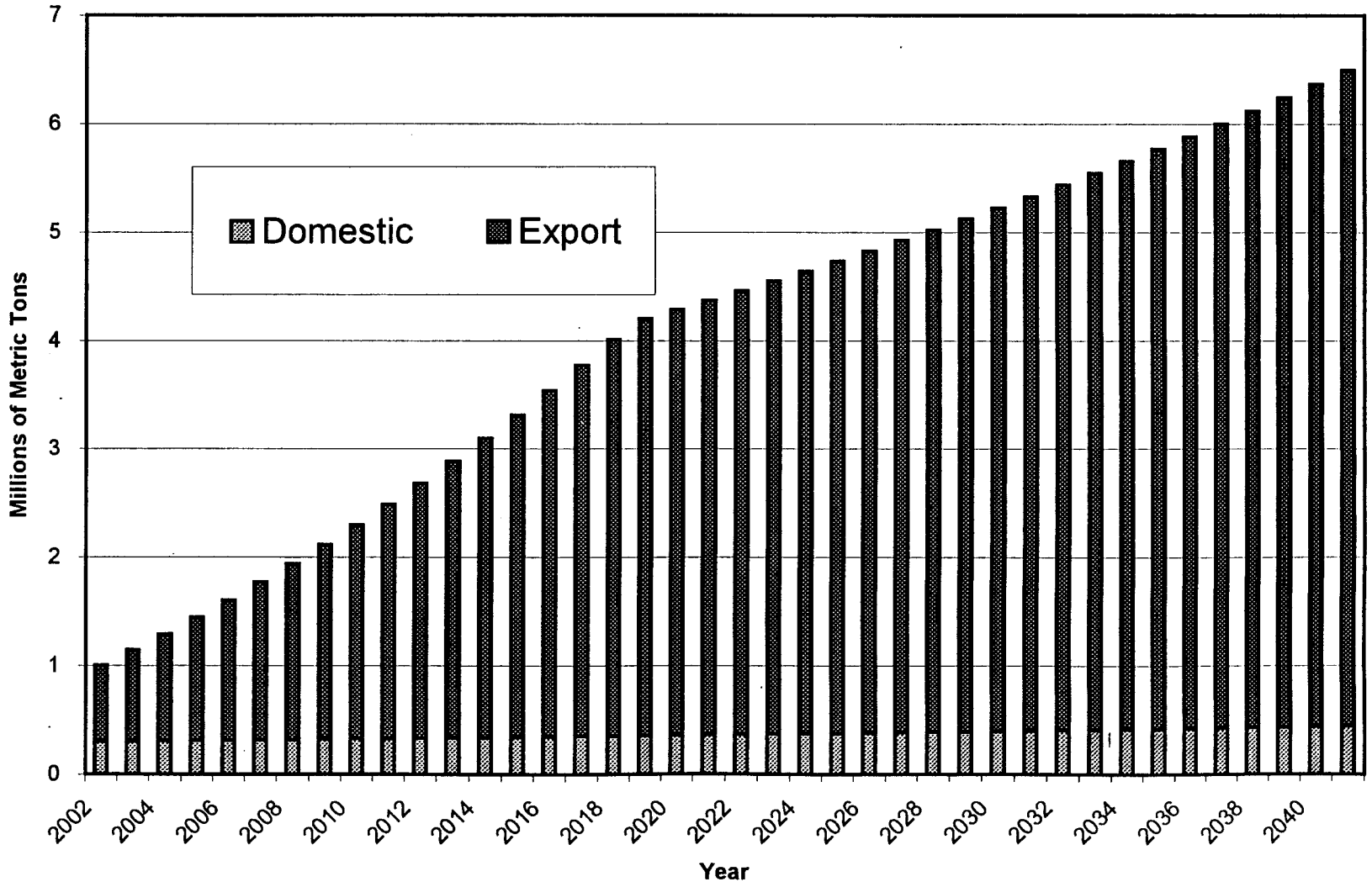
Period		Operating Costs - Base Traffic												
Project	Calendar	General			Base Beans			Base Intermodal			Base Minerals			Base
Year	Year	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Subtotal
	Units	$	ton-km	$	$	ton-km	$	$	ton-km	$	$	ton-km	$	$
1	2002	(0.019)	601.965	(11.437)	(0.019)	384.450	(7.305)	(0.028)	153.750	(4.305)	(0.019)	65.700	(1.248)	(24.295)
2	2003	(0.019)	632.063	(12.009)	(0.019)	461.115	(8.761)	(0.028)	192.188	(5.381)	(0.019)	65.700	(1.248)	(27.400)
3	2004	(0.019)	663.666	(12.610)	(0.019)	540.675	(10.273)	(0.028)	240.234	(6.727)	(0.019)	65.700	(1.248)	(30.857)
4	2005	(0.019)	696.850	(13.240)							(0.019)	65.700	(1.248)	(14.488)
5	2006	(0.019)	731.692	(13.902)							(0.019)	65.700	(1.248)	(15.150)
6	2007	(0.019)	768.277	(14.597)							(0.019)	65.700	(1.248)	(15.846)
7	2008	(0.019)	806.691	(15.327)							(0.019)	65.700	(1.248)	(16.575)
8	2009	(0.019)	847.025	(16.093)							(0.019)	65.700	(1.248)	(17.342)
9	2010	(0.019)	872.436	(16.576)										(16.576)
10	2011	(0.019)	898.609	(17.074)										(17.074)
11	2012	(0.019)	925.567	(17.586)										(17.586)
12	2013	(0.019)	953.334	(18.113)										(18.113)
13	2014	(0.019)	981.934	(18.657)										(18.657)
14	2015	(0.019)	1,011.392	(19.216)										(19.216)
15	2016	(0.019)	1,041.734	(19.793)										(19.793)
16	2017	(0.019)	1,072.986	(20.387)										(20.387)
17	2018	(0.019)	1,105.176	(20.998)										(20.998)
18	2019	(0.019)	1,138.331	(21.628)										(21.628)
19	2020	(0.019)	1,172.481	(22.277)										(22.277)
20	2021	(0.019)	1,207.655	(22.945)										(22.945)
21	2022	(0.019)	1,243.885	(23.634)										(23.634)
22	2023	(0.019)	1,281.202	(24.343)										(24.343)
23	2024	(0.019)	1,319.638	(25.073)										(25.073)
24	2025	(0.019)	1,359.227	(25.825)										(25.825)
25	2026	(0.019)	1,400.004	(26.600)										(26.600)
26	2027	(0.019)	1,442.004	(27.398)										(27.398)
27	2028	(0.019)	1,485.264	(28.220)										(28.220)
28	2029	(0.019)	1,529.822	(29.067)										(29.067)
29	2030	(0.019)	1,575.716	(29.939)										(29.939)
30	2031	(0.019)	1,622.988	(30.837)										(30.837)
31	2032	(0.019)	1,671.678	(31.762)										(31.762)
32	2033	(0.019)	1,721.828	(32.715)										(32.715)
33	2034	(0.019)	1,773.483	(33.696)										(33.696)
34	2035	(0.019)	1,826.687	(34.707)										(34.707)
35	2036	(0.019)	1,881.488	(35.748)										(35.748)
36	2037	(0.019)	1,937.932	(36.821)										(36.821)
37	2038	(0.019)	1,996.070	(37.925)										(37.925)
38	2039	(0.019)	2,055.952	(39.063)										(39.063)
39	2040	(0.019)	2,117.631	(40.235)										(40.235)
40	2041	(0.019)	2,181.160	(41.442)										(41.442)

Period		I/C Operating Costs (A)											
Project	Calendar	Export Soy Beans			Domestic Soy Beans			Intermodal			Mineral		
Year	Year	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	$/T-KM	Units	O&M Costs
	Units	$	ton-km	$	$	ton-km	$	$	ton-km	$	$	ton-km	$
1	2002												
2	2003												
3	2004												
4	2005	$0.019	1,559.176	(29.624)	0.019	126.374	(2.401)	$0.028	588.281	(16.472)	$0.019	0.000	0.000
5	2006	$0.019	1,773.358	(33.694)	0.019	127.638	(2.425)	$0.028	735.352	(20.590)	$0.019	0.000	0.000
6	2007	$0.019	1,995.441	(37.913)	0.019	128.914	(2.449)	$0.028	808.887	(22.649)	$0.019	0.000	0.000
7	2008	$0.019	2,225.655	(42.287)	0.019	130.203	(2.474)	$0.028	889.775	(24.914)	$0.019	0.000	0.000
8	2009	$0.019	2,464.236	(46.820)	0.019	131.505	(2.499)	$0.028	978.753	(27.405)	$0.019	0.000	0.000
9	2010	$0.019	2,711.425	(51.517)	0.019	132.820	(2.524)	$0.028	1,076.628	(30.146)	$0.019	547.500	(10.403)
10	2011	$0.019	2,967.472	(56.382)	0.019	134.149	(2.549)	$0.028	1,184.291	(33.160)	$0.019	547.500	(10.403)
11	2012	$0.019	3,232.632	(61.420)	0.019	135.490	(2.574)	$0.028	1,267.191	(35.481)	$0.019	547.500	(10.403)
12	2013	$0.019	3,507.166	(66.636)	0.019	136.845	(2.600)	$0.028	1,355.895	(37.965)	$0.019	547.500	(10.403)
13	2014	$0.019	3,791.342	(72.035)	0.019	138.214	(2.626)	$0.028	1,450.807	(40.623)	$0.019	547.500	(10.403)
14	2015	$0.019	4,085.436	(77.623)	0.019	139.596	(2.652)	$0.028	1,552.364	(43.466)	$0.019	547.500	(10.403)
15	2016	$0.019	4,389.731	(83.405)	0.019	140.992	(2.679)	$0.028	1,661.029	(46.509)	$0.019	547.500	(10.403)
16	2017	$0.019	4,704.516	(89.386)	0.019	142.402	(2.706)	$0.028	1,777.302	(49.764)	$0.019	547.500	(10.403)
17	2018	$0.019	5,030.089	(95.572)	0.019	143.826	(2.733)	$0.028	1,901.713	(53.248)	$0.019	547.500	(10.403)
18	2019	$0.019	5,289.686	(100.504)	0.019	145.264	(2.760)	$0.028	2,034.833	(56.975)	$0.019	547.500	(10.403)
19	2020	$0.019	5,400.385	(102.607)	0.019	146.716	(2.788)	$0.028	2,177.271	(60.964)	$0.019	547.500	(10.403)
20	2021	$0.019	5,513.347	(104.754)	0.019	148.184	(2.815)	$0.028	2,329.680	(65.231)	$0.019	547.500	(10.403)
21	2022	$0.019	5,628.617	(106.944)	0.019	149.665	(2.844)	$0.028	2,446.164	(68.493)	$0.019	547.500	(10.403)
22	2023	$0.019	5,746.244	(109.179)	0.019	151.162	(2.872)	$0.028	2,568.472	(71.917)	$0.019	547.500	(10.403)
23	2024	$0.019	5,866.273	(111.459)	0.019	152.674	(2.901)	$0.028	2,696.896	(75.513)	$0.019	547.500	(10.403)
24	2025	$0.019	5,988.753	(113.786)	0.019	154.200	(2.930)	$0.028	2,831.740	(79.289)	$0.019	547.500	(10.403)
25	2026	$0.019	6,113.735	(116.161)	0.019	155.742	(2.959)	$0.028	2,973.327	(83.253)	$0.019	547.500	(10.403)
26	2027	$0.019	6,241.269	(118.584)	0.019	157.300	(2.989)	$0.028	3,121.994	(87.416)	$0.019	547.500	(10.403)
27	2028	$0.019	6,371.406	(121.057)	0.019	158.873	(3.019)	$0.028	3,278.093	(91.787)	$0.019	547.500	(10.403)
28	2029	$0.019	6,504.199	(123.580)	0.019	160.462	(3.049)	$0.028	3,441.998	(96.376)	$0.019	547.500	(10.403)
29	2030	$0.019	6,639.701	(126.154)	0.019	162.066	(3.079)	$0.028	3,614.098	(101.195)	$0.019	547.500	(10.403)
30	2031	$0.019	6,777.967	(128.781)	0.019	163.687	(3.110)	$0.028	3,794.803	(106.254)	$0.019	547.500	(10.403)
31	2032	$0.019	6,919.054	(131.462)	0.019	165.324	(3.141)	$0.028	3,984.543	(111.567)	$0.019	547.500	(10.403)
32	2033	$0.019	7,063.017	(134.197)	0.019	166.977	(3.173)	$0.028	4,183.770	(117.146)	$0.019	547.500	(10.403)
33	2034	$0.019	7,209.916	(136.988)	0.019	168.647	(3.204)	$0.028	4,392.959	(123.003)	$0.019	547.500	(10.403)
34	2035	$0.019	7,359.809	(139.836)	0.019	170.333	(3.236)	$0.028	4,612.607	(129.153)	$0.019	547.500	(10.403)
35	2036	$0.019	7,512.757	(142.742)	0.019	172.037	(3.269)	$0.028	4,843.237	(135.611)	$0.019	547.500	(10.403)
36	2037	$0.019	7,668.821	(145.708)	0.019	173.757	(3.301)	$0.028	5,085.399	(142.391)	$0.019	547.500	(10.403)
37	2038	$0.019	7,828.065	(148.733)	0.019	175.495	(3.334)	$0.028	5,339.669	(149.511)	$0.019	547.500	(10.403)
38	2039	$0.019	7,990.552	(151.820)	0.019	177.249	(3.368)	$0.028	5,606.652	(156.986)	$0.019	547.500	(10.403)
39	2040	$0.019	8,156.348	(154.971)	0.019	179.022	(3.401)	$0.028	5,886.985	(164.836)	$0.019	547.500	(10.403)
40	2041	$0.019	8,325.520	(158.185)	0.019	180.812	(3.435)	$0.028	6,181.334	(173.077)	$0.019	547.500	(10.403)

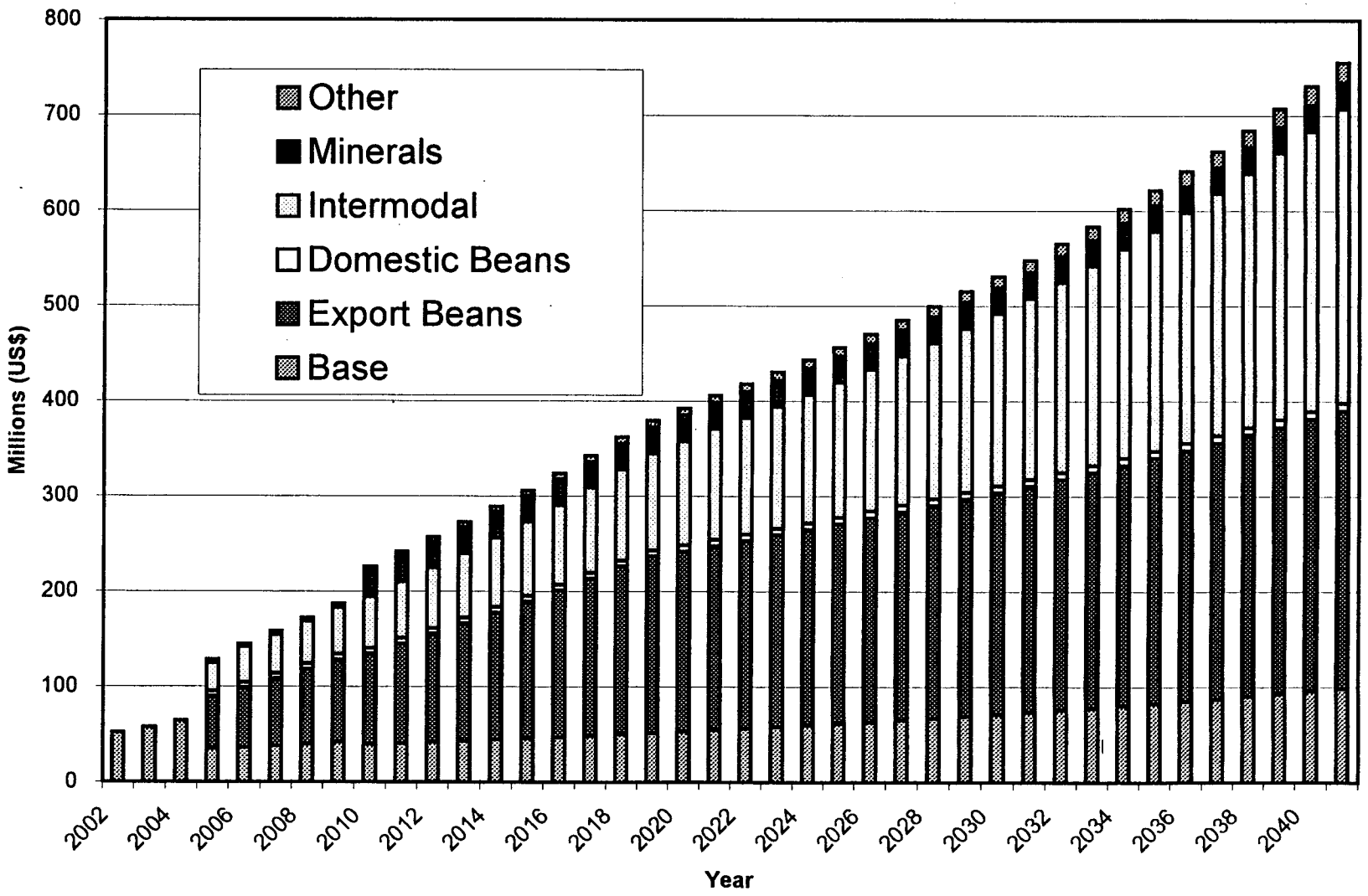
Period		*I/C Operating Costs (B)*					
Project Year	Calendar Year	$/T-KM	Other Units	O&M Costs	OM Cost Summary Base	I/C	Total
	Units	$	ton-km	$	$	$	$
1	2002				(24.295)	0.000	(24.295)
2	2003				(27.400)	0.000	(27.400)
3	2004				(30.857)	0.000	(30.857)
4	2005	$0.019	81.500	(1.549)	(14.488)	(50.046)	(64.534)
5	2006	$0.019	85.575	(1.626)	(15.150)	(58.335)	(73.485)
6	2007	$0.019	89.854	(1.707)	(15.846)	(64.719)	(80.564)
7	2008	$0.019	94.346	(1.793)	(16.575)	(71.468)	(88.043)
8	2009	$0.019	99.064	(1.882)	(17.342)	(78.606)	(95.948)
9	2010	$0.019	104.017	(1.976)	(16.576)	(96.565)	(113.141)
10	2011	$0.019	109.218	(2.075)	(17.074)	(104.569)	(121.642)
11	2012	$0.019	114.679	(2.179)	(17.586)	(112.057)	(129.643)
12	2013	$0.019	120.413	(2.288)	(18.113)	(119.892)	(138.005)
13	2014	$0.019	126.433	(2.402)	(18.657)	(128.089)	(146.746)
14	2015	$0.019	132.755	(2.522)	(19.216)	(136.667)	(155.883)
15	2016	$0.019	139.393	(2.648)	(19.793)	(145.644)	(165.436)
16	2017	$0.019	146.362	(2.781)	(20.387)	(155.039)	(175.426)
17	2018	$0.019	153.680	(2.920)	(20.998)	(164.875)	(185.873)
18	2019	$0.019	161.364	(3.066)	(21.628)	(173.708)	(195.336)
19	2020	$0.019	169.433	(3.219)	(22.277)	(179.980)	(202.257)
20	2021	$0.019	177.904	(3.380)	(22.945)	(186.583)	(209.528)
21	2022	$0.019	186.799	(3.549)	(23.634)	(192.232)	(215.865)
22	2023	$0.019	196.139	(3.727)	(24.343)	(198.097)	(222.440)
23	2024	$0.019	205.946	(3.913)	(25.073)	(204.189)	(229.262)
24	2025	$0.019	216.244	(4.109)	(25.825)	(210.516)	(236.341)
25	2026	$0.019	227.056	(4.314)	(26.600)	(217.090)	(243.690)
26	2027	$0.019	238.409	(4.530)	(27.398)	(223.921)	(251.319)
27	2028	$0.019	250.329	(4.756)	(28.220)	(231.021)	(259.241)
28	2029	$0.019	262.846	(4.994)	(29.067)	(238.401)	(267.468)
29	2030	$0.019	275.988	(5.244)	(29.939)	(246.075)	(276.013)
30	2031	$0.019	289.787	(5.506)	(30.837)	(254.054)	(284.891)
31	2032	$0.019	304.277	(5.781)	(31.762)	(262.354)	(294.116)
32	2033	$0.019	319.491	(6.070)	(32.715)	(270.988)	(303.703)
33	2034	$0.019	335.465	(6.374)	(33.696)	(279.972)	(313.668)
34	2035	$0.019	352.238	(6.693)	(34.707)	(289.321)	(324.028)
35	2036	$0.019	369.850	(7.027)	(35.748)	(299.051)	(334.800)
36	2037	$0.019	388.343	(7.379)	(36.821)	(309.181)	(346.002)
37	2038	$0.019	407.760	(7.747)	(37.925)	(319.728)	(357.654)
38	2039	$0.019	428.148	(8.135)	(39.063)	(330.712)	(369.775)
39	2040	$0.019	449.555	(8.542)	(40.235)	(342.152)	(382.387)
40	2041	$0.019	472.033	(8.969)	(41.442)	(354.069)	(395.511)

Period		Net Income									Equity Cash Flow Analysis				24%	
Project Year	Calendar Year	Net Oper. Income	Debt Service	DCR	Net Income	25% Income Tax	Credit Available	Credit Taken	Tax Paid	After-Tax Net Income	Equity Distributions	Contributions to Construction	Reserves Deposits	Project Reserves	Equity Cash Flow	Equity Payback
	Units	$	$		$	$	$	$	$	$	$	$	$	$	$	year
1	2002	27.737			27.737	0.000	-	0.000	0.000	27.737		(27.737)			(110.000)	-
2	2003	30.651			30.651	0.000	-	0.000	0.000	30.651		(30.651)			0.000	-
3	2004	33.869			33.869	0.000	-	0.000	0.000	33.869		(33.869)			0.000	-
4	2005	64.728	(50.560)	1.280	14.168	0.000	-	0.000	0.000	14.168	7.084		7.084	7.084	7.084	-
5	2006	72.956	(50.560)	1.443	22.396	0.000	-	0.000	0.000	22.396	11.198		11.198	18.282	11.198	-
6	2007	79.916	(50.560)	1.581	29.356	0.000	-	0.000	0.000	29.356	14.678		14.678	32.961	14.678	-
7	2008	87.403	(50.560)	1.729	36.843	0.000	-	0.000	0.000	36.843	18.422		18.422	51.382	18.422	-
8	2009	95.453	(50.560)	1.888	44.893	0.000	-	0.000	0.000	44.893	22.447		22.447	73.829	22.447	-
9	2010	118.834	(64.371)	1.846	54.463	0.000	-	0.000	0.000	54.463	54.463		0.000	73.829	54.463	9
10	2011	126.308	(64.371)	1.962	61.937	0.000	-	0.000	0.000	61.937	61.937		0.000	73.829	61.937	9
11	2012	133.401	(64.371)	2.072	69.031	0.000	-	0.000	0.000	69.031	69.031		0.000	73.829	69.031	9
12	2013	140.808	(64.371)	2.187	76.437	0.000	-	0.000	0.000	76.437	150.266		(73.829)	0.000	150.266	9
13	2014	144.850	(64.371)	2.250	80.479	0.000	-	0.000	0.000	80.479	80.479		0.000	0.000	80.479	9
14	2015	152.926	(64.371)	2.376	88.556	0.000	-	0.000	0.000	88.556	88.556		0.000	0.000	88.556	9
15	2016	161.362	(64.371)	2.507	96.991	0.000	-	0.000	0.000	96.991	96.991		0.000	0.000	96.991	9
16	2017	170.173	(64.371)	2.644	105.802	0.000	-	0.000	0.000	105.802	105.802		0.000	0.000	105.802	9
17	2018	179.378	(64.371)	2.787	115.007	0.000	-	0.000	0.000	115.007	115.007		0.000	0.000	115.007	9
18	2019	187.736	(64.371)	2.916	123.365	0.000	-	0.000	0.000	123.365	123.365		0.000	0.000	123.365	9
19	2020	193.905	(64.371)	3.012	129.535	0.000	-	0.000	0.000	129.535	129.535		0.000	0.000	129.535	9
20	2021	200.375	(64.371)	3.113	136.004	0.000	-	0.000	0.000	136.004	136.004		0.000	0.000	136.004	9
21	2022	206.113	(64.371)	3.202	141.742	0.000	-	0.000	0.000	141.742	141.742		0.000	0.000	141.742	9
22	2023	212.062	(64.371)	3.294	147.691	0.000	-	0.000	0.000	147.691	147.691		0.000	0.000	147.691	9
23	2024	218.230	(64.371)	3.390	153.859	0.000	-	0.000	0.000	153.859	153.859		0.000	0.000	153.859	9
24	2025	224.626	(64.371)	3.490	160.256	0.000	-	0.000	0.000	160.256	160.256		0.000	0.000	160.256	9
25	2026	231.261	(64.371)	3.593	166.890	0.000	-	0.000	0.000	166.890	166.890		0.000	0.000	166.890	9
26	2027	238.143	(64.371)	3.700	173.773	0.000	-	0.000	0.000	173.773	173.773		0.000	0.000	173.773	9
27	2028	245.284	(64.371)	3.811	180.914	0.000	-	0.000	0.000	180.914	180.914		0.000	0.000	180.914	9
28	2029	252.695	(64.371)	3.926	188.325	0.000	-	0.000	0.000	188.325	188.325		0.000	0.000	188.325	9
29	2030	244.295	0.000	na	244.295	61.074	16.092	16.092	44.982	199.313	199.313		0.000	0.000	199.313	9
30	2031	251.774	0.000	na	251.774	62.943	32.690	32.690	30.254	221.520	221.520		0.000	0.000	221.520	9
31	2032	259.538	0.000	na	259.538	64.885	49.813	49.813	15.071	244.467	244.467		0.000	0.000	244.467	9
32	2033	267.602	0.000	na	267.602	66.900	67.482	66.900	0.000	267.602	267.602		0.000	0.000	267.602	9
33	2034	275.976	0.000	na	275.976	68.994	85.719	68.994	0.000	275.976	275.976		0.000	0.000	275.976	9
34	2035	226.648	0.000	na	226.648	56.662	104.545	56.662	0.000	226.648	226.648		0.000	0.000	226.648	9
35	2036	209.479	0.000	na	209.479	52.370	123.983	52.370	0.000	209.479	209.479		0.000	0.000	209.479	9
36	2037	216.110	0.000	na	216.110	54.027	144.059	54.027	0.000	216.110	216.110		0.000	0.000	216.110	9
37	2038	223.000	0.000	na	223.000	55.750	164.796	55.750	0.000	223.000	223.000		0.000	0.000	223.000	9
38	2039	230.161	0.000	na	230.161	57.540	188.223	57.540	0.000	230.161	230.161		0.000	0.000	230.161	9
39	2040	237.604	0.000	na	237.604	59.401	208.365	59.401	0.000	237.604	237.604		0.000	0.000	237.604	9
40	2041	245.341	0.000	na	245.341	61.335	231.253	61.335	0.000	245.341	245.341		0.000	0.000	245.341	9

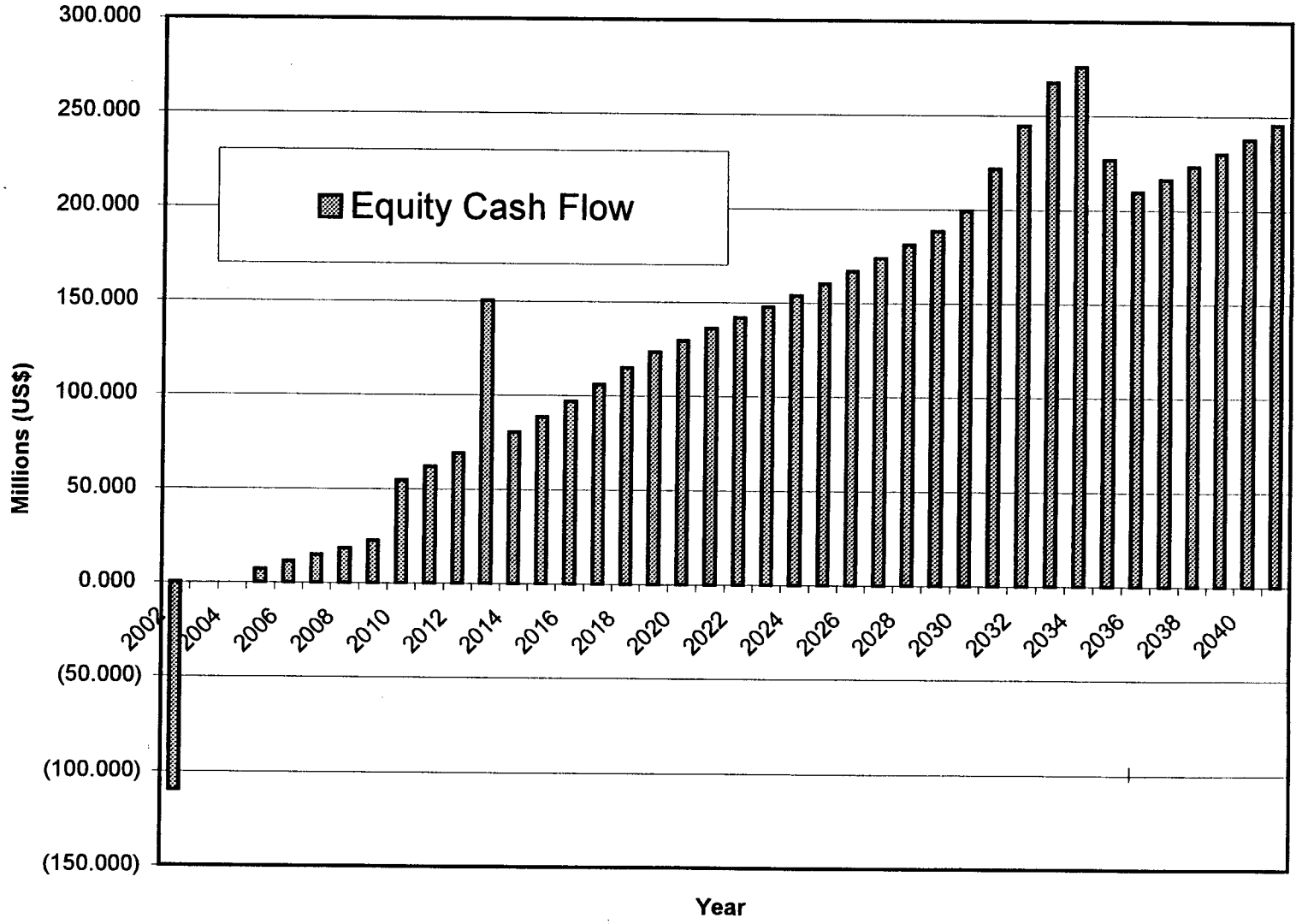
Soy Bean Production



Total Revenue



Equity Cash Flow



Case Results

Debt Coverage Ratio in 2010	2.50
Return on Concessionaire Equity	30.79%
Project NPV @ 20% (millions)	$151.61
Equity Payback (project years)	8

Capital Structure Summary

(US$ in millions)

Construction Period Sources		
Bank Loan	632.000	69%
Government Support	75.000	8%
Interest Earnings	5.336	1%
Net Operating Funds	96.946	11%
Concession Equity	110.000	12%
Total Sources	919.282	
Construction Period Uses		
Construction Costs	790.000	86%
Finance Costs	25.280	3%
Construction Period Interest	96.064	10%
Surplus/(Deficit)	7.938	1%
Total Uses	919.282	

Construction Costs	
Budget (millions)	$790.000
Construction Draws Year 1 (%)	20%
Construction Draws Year 2 (%)	50%
Construction Draws Year 3 (%)	30%
Construction Draws Year 4 (%)	0%
Construction Period (years)	3
Government Construction Contribution	
Contribution Amount (millions)	$75.000
Year 1 (%)	0%
Year 2 (%)	50%
Year 3 (%)	50%
Year 4 (%)	0%
Concessionaire Equity	
Investment Amount (millions)	$110.000
Equity Pay-in Year 1 (%)	100%
Equity Pay-in Year 2 (%)	0%
Equity Pay-in Year 3 (%)	0%
Equity Pay-in Year 4 (%)	0%
Bank Debt	
Share of Construction Costs	80%
Loan Amount (millions)	$632.000
Loan Draw Year 1 (%)	20%
Loan Draw Year 2 (%)	50%
Loan Draw Year 3 (%)	30%
Loan Draw Year 4 (%)	0%
Interest Rate	8%
Interest Only Period After Construction	5
Amortization Periods	20
Final Maturity (project year)	28
Costs of Issuance (% of loan amount)	4%
Last year prior to Amortization	8
Micellaneous Concession Terms	
Minimum Coverage to Free Reserves	2.00
Equity Distributions Prior to Debt Amortization	50%

I/C Export Soy Bean Traffic	
Production per Hectacre Growth	2.0%
Tariff ($ per ton-km)	$0.035
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	1,376
I/C Domestic Soy Bean Traffic	
Share of Domestic Beans on Rail	50%
Growth (% per year)	1.0%
Tariff ($ per ton-km)	$0.045
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	815
I/C Intermodal Traffic	
2005 Traffic (millions, metric tons)	0.688
Growth (% per year) 2001-2005	25%
Growth (% per year) 2006-2010	25%
Growth (% per year) 2011-2020	7%
Growth (% per year) After 2020	5%
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.020
Average Haul (km)	1,000
I/C Mineral Traffic	
2005 Traffic (millions, metric tons)	0.250
Growth (% per year)	0%
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	1,250
I/C Other Traffic	
2005 Traffic (millions, metric tons)	0.100
Growth (% per year)	5%
Tariff ($ per ton-km)	$0.045
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	815
Other Revenues	
Earnings Rate on Construction Funds	5%
Earnings Rate on Reserve Funds	5%
Non-operating Revenues % of Operating Rev	1%

Base General Traffic	
Base Traffic Growth before 2010	5%
Base Traffic Growth after 2010	3%
Average Haul (KM)	520
Tariff ($ per ton-KM)	$0.045
OM Costs ($ per ton-KM)	$0.019
Base Mineral Traffic	
2002 Traffic Level (millions, metric tons)	0.657
Base Traffic Growth	0%
Average Haul (km)	100
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Base Soy Beans Traffic	
Average Haul (km)	550
Tariff ($ per ton-km)	$0.035
OM Costs ($ per ton-km)	$0.019
Base I/M Traffic	
2001 Traffic Level (millions, metric tons)	0.200
Traffic Growth through 2004	25%
Average Haul (km)	615
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.020
Tax Rates	
Income Tax Rate During Loan Period	0%
Income Tax Rate After Loan Period	25%
13% Gross Revenue Tax During Loan Period	0%
13% Gross Revenue Tax After Loan Period	13%
3% Gross Revenue Tax During Loan Period	0%
3% Gross Revenue Tax After Loan Period	3%
13% Tax Credit - Percent Total Investment	50%

Results Snapshot	
Return on Equity	30.79%
Equity Payback	8
NPV @ 20%	$151.61
Debt Coverage in 2010	2.50

Period		Construction Period Cash Flow													
Project Year	Calendar Year	Starting Balance	Equity Pay-In	Excess Op Funds	Govt Grant	Bank Debt	Total New Capital	Cumulative Debt	Average Balance	Interest Earnings	Total Available	Financing Costs	Construction Draws	C/P Interest	Total Outlays	Ending Balance
	Units	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
1	2002	0.000	110.000	28.987	0.000	126.400	265.387	126.400	35.987	1.799	267.186	(25.280)	(158.000)	(10.112)	(193.392)	73.774
2	2003	73.774	0.000	32.189	37.500	316.000	385.689	442.400	51.422	2.571	462.034	0.000	(395.000)	(35.392)	(430.392)	31.642
3	2004	31.642	0.000	35.791	37.500	189.600	262.891	632.000	19.307	0.965	295.498	0.000	(237.000)	(50.560)	(287.560)	7.938
4	2005								0.000							
5	2006															
6	2007	*Totals*	*110.000*	*96.946*	*75.000*	*632.000*	*913.946*			*5.336*		*(25.280)*	*(790.000)*	*(96.064)*	*(911.344)*	
7	2008															
8	2009															
9	2010															
10	2011															
11	2012															
12	2013															
13	2014															
14	2015															
15	2016															
16	2017															
17	2018															
18	2019															
19	2020															
20	2021															
21	2022															
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34	2035															
35	2036															
36	2037															
37	2038															
38	2039															
39	2040															
40	2041															

Period		*Soy Bean Production*				
Project Year	Calendar Year	Hectares in Prod	Productivity per Hectare	Output (millions)	Output Domestic	Output Export
	Units	hectares	metric tons	metric tons	metric tons	metric tons
1	2002	500,000	2.000	1.000	0.301	0.699
2	2003	560,000	2.040	1.142	0.304	0.838
3	2004	620,000	2.081	1.290	0.307	0.983
4	2005	680,000	2.122	1.443	0.310	1.133
5	2006	740,000	2.165	1.602	0.313	1.289
6	2007	800,000	2.208	1.767	0.316	1.450
7	2008	860,000	2.252	1.937	0.320	1.617
8	2009	920,000	2.297	2.114	0.323	1.791
9	2010	980,000	2.343	2.296	0.326	1.971
10	2011	1,040,000	2.390	2.486	0.329	2.157
11	2012	1,100,000	2.438	2.682	0.332	2.349
12	2013	1,160,000	2.487	2.885	0.336	2.549
13	2014	1,220,000	2.536	3.095	0.339	2.755
14	2015	1,280,000	2.587	3.312	0.343	2.969
15	2016	1,340,000	2.639	3.536	0.346	3.190
16	2017	1,400,000	2.692	3.768	0.349	3.419
17	2018	1,460,000	2.746	4.009	0.353	3.656
18	2019	1,500,000	2.800	4.201	0.356	3.844
19	2020	1,500,000	2.856	4.285	0.360	3.925
20	2021	1,500,000	2.914	4.370	0.364	4.007
21	2022	1,500,000	2.972	4.458	0.367	4.091
22	2023	1,500,000	3.031	4.547	0.371	4.176
23	2024	1,500,000	3.092	4.638	0.375	4.263
24	2025	1,500,000	3.154	4.731	0.378	4.352
25	2026	1,500,000	3.217	4.825	0.382	4.443
26	2027	1,500,000	3.281	4.922	0.386	4.536
27	2028	1,500,000	3.347	5.020	0.390	4.630
28	2029	1,500,000	3.414	5.121	0.394	4.727
29	2030	1,500,000	3.482	5.223	0.398	4.825
30	2031	1,500,000	3.552	5.328	0.402	4.926
31	2032	1,500,000	3.623	5.434	0.406	5.028
32	2033	1,500,000	3.695	5.543	0.410	5.133
33	2034	1,500,000	3.769	5.654	0.414	5.240
34	2035	1,500,000	3.844	5.767	0.418	5.349
35	2036	1,500,000	3.921	5.882	0.422	5.460
36	2037	1,500,000	4.000	6.000	0.426	5.573
37	2038	1,500,000	4.080	6.120	0.431	5.689
38	2039	1,500,000	4.161	6.242	0.435	5.807
39	2040	1,500,000	4.245	6.367	0.439	5.928
40	2041	1,500,000	4.329	6.494	0.444	6.051

Period		*Revenues from Base Traffic*												
Project	Calendar	General			Soy Beans (Base)			I/M (Base)			Minerals (Base)			Total Base
Year	Year	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Revenue
	Units	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	$
1	2002	1.158	601.965	27.088	0.699	384.450	13.456	0.250	153.750	7.688	0.657	65.700	3.285	51.517
2	2003	1.216	632.063	28.443	0.838	461.115	16.139	0.313	192.188	9.609	0.657	65.700	3.285	57.476
3	2004	1.276	663.666	29.865	0.983	540.675	18.924	0.391	240.234	12.012	0.657	65.700	3.285	64.085
4	2005	1.340	696.850	31.358							0.657	65.700	3.285	34.643
5	2006	1.407	731.692	32.926							0.657	65.700	3.285	36.211
6	2007	1.477	768.277	34.572							0.657	65.700	3.285	37.857
7	2008	1.551	806.691	36.301							0.657	65.700	3.285	39.586
8	2009	1.629	847.025	38.116							0.657	65.700	3.285	41.401
9	2010	1.678	872.436	39.260										39.260
10	2011	1.728	898.609	40.437										40.437
11	2012	1.780	925.567	41.651										41.651
12	2013	1.833	953.334	42.900										42.900
13	2014	1.888	981.934	44.187										44.187
14	2015	1.945	1,011.392	45.513										45.513
15	2016	2.003	1,041.734	46.878										46.878
16	2017	2.063	1,072.986	48.284										48.284
17	2018	2.125	1,105.176	49.733										49.733
18	2019	2.189	1,138.331	51.225										51.225
19	2020	2.255	1,172.481	52.762										52.762
20	2021	2.322	1,207.655	54.344										54.344
21	2022	2.392	1,243.885	55.975										55.975
22	2023	2.464	1,281.202	57.654										57.654
23	2024	2.538	1,319.638	59.384										59.384
24	2025	2.614	1,359.227	61.165										61.165
25	2026	2.692	1,400.004	63.000										63.000
26	2027	2.773	1,442.004	64.890										64.890
27	2028	2.856	1,485.264	66.837										66.837
28	2029	2.942	1,529.822	68.842										68.842
29	2030	3.030	1,575.716	70.907										70.907
30	2031	3.121	1,622.988	73.034										73.034
31	2032	3.215	1,671.678	75.225										75.225
32	2033	3.311	1,721.828	77.482										77.482
33	2034	3.411	1,773.483	79.807										79.807
34	2035	3.513	1,826.687	82.201										82.201
35	2036	3.618	1,881.488	84.667										84.667
36	2037	3.727	1,937.932	87.207										87.207
37	2038	3.839	1,996.070	89.823										89.823
38	2039	3.954	2,055.952	92.518										92.518
39	2040	4.072	2,117.631	95.293										95.293
40	2041	4.195	2,181.160	98.152										98.152

Period		Revenues from Interconnection Traffic														
Project Year	Calendar Year	Export Soy Beans			Domestic Soy Beans			Intermodal			Minerals			Other Traffic		
		Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue
	Units	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$
1	2002															
2	2003															
3	2004															
4	2005	$0.035	1,559.176	54.571	$0.045	126.374	5.687	$0.050	688.281	34.414				$0.045	81.500	3.668
5	2006	$0.035	1,773.358	62.068	$0.045	127.638	5.744	$0.050	860.352	43.018				$0.045	85.575	3.851
6	2007	$0.035	1,995.441	69.840	$0.045	128.914	5.801	$0.050	1,075.439	53.772				$0.045	89.854	4.043
7	2008	$0.035	2,225.655	77.898	$0.045	130.203	5.859	$0.050	1,344.299	67.215				$0.045	94.346	4.246
8	2009	$0.035	2,464.236	86.248	$0.045	131.505	5.918	$0.050	1,680.374	84.019				$0.045	99.064	4.458
9	2010	$0.035	2,711.425	94.900	$0.045	132.820	5.977	$0.050	2,100.468	105.023	$0.050	547.500	27.375	$0.045	104.017	4.681
10	2011	$0.035	2,967.472	103.862	$0.045	134.149	6.037	$0.050	2,625.585	131.279	$0.050	547.500	27.375	$0.045	109.218	4.915
11	2012	$0.035	3,232.632	113.142	$0.045	135.490	6.097	$0.050	2,809.376	140.469	$0.050	547.500	27.375	$0.045	114.679	5.161
12	2013	$0.035	3,507.166	122.751	$0.045	136.845	6.158	$0.050	3,006.032	150.302	$0.050	547.500	27.375	$0.045	120.413	5.419
13	2014	$0.035	3,791.342	132.697	$0.045	138.214	6.220	$0.050	3,216.454	160.823	$0.050	547.500	27.375	$0.045	126.433	5.689
14	2015	$0.035	4,085.436	142.990	$0.045	139.596	6.282	$0.050	3,441.606	172.080	$0.050	547.500	27.375	$0.045	132.755	5.974
15	2016	$0.035	4,389.731	153.641	$0.045	140.992	6.345	$0.050	3,682.518	184.126	$0.050	547.500	27.375	$0.045	139.393	6.273
16	2017	$0.035	4,704.516	164.658	$0.045	142.402	6.408	$0.050	3,940.295	197.015	$0.050	547.500	27.375	$0.045	146.362	6.586
17	2018	$0.035	5,030.089	176.053	$0.045	143.826	6.472	$0.050	4,216.115	210.806	$0.050	547.500	27.375	$0.045	153.680	6.916
18	2019	$0.035	5,289.686	185.139	$0.045	145.264	6.537	$0.050	4,511.243	225.562	$0.050	547.500	27.375	$0.045	161.364	7.261
19	2020	$0.035	5,400.385	189.013	$0.045	146.716	6.602	$0.050	4,827.030	241.352	$0.050	547.500	27.375	$0.045	169.433	7.624
20	2021	$0.035	5,513.347	192.967	$0.045	148.184	6.668	$0.050	5,164.922	258.246	$0.050	547.500	27.375	$0.045	177.904	8.006
21	2022	$0.035	5,628.617	197.002	$0.045	149.665	6.735	$0.050	5,423.168	271.158	$0.050	547.500	27.375	$0.045	186.799	8.406
22	2023	$0.035	5,746.244	201.119	$0.045	151.162	6.802	$0.050	5,694.327	284.716	$0.050	547.500	27.375	$0.045	196.139	8.826
23	2024	$0.035	5,866.273	205.320	$0.045	152.674	6.870	$0.050	5,979.043	298.952	$0.050	547.500	27.375	$0.045	205.946	9.268
24	2025	$0.035	5,988.753	209.606	$0.045	154.200	6.939	$0.050	6,277.995	313.900	$0.050	547.500	27.375	$0.045	216.244	9.731
25	2026	$0.035	6,113.735	213.981	$0.045	155.742	7.008	$0.050	6,591.895	329.595	$0.050	547.500	27.375	$0.045	227.056	10.218
26	2027	$0.035	6,241.269	218.444	$0.045	157.300	7.078	$0.050	6,921.490	346.074	$0.050	547.500	27.375	$0.045	238.409	10.728
27	2028	$0.035	6,371.406	222.999	$0.045	158.873	7.149	$0.050	7,267.564	363.378	$0.050	547.500	27.375	$0.045	250.329	11.265
28	2029	$0.035	6,504.199	227.647	$0.045	160.462	7.221	$0.050	7,630.943	381.547	$0.050	547.500	27.375	$0.045	262.846	11.828
29	2030	$0.035	6,639.701	232.390	$0.045	162.066	7.293	$0.050	8,012.490	400.624	$0.050	547.500	27.375	$0.045	275.988	12.419
30	2031	$0.035	6,777.967	237.229	$0.045	163.687	7.366	$0.050	8,413.114	420.656	$0.050	547.500	27.375	$0.045	289.787	13.040
31	2032	$0.035	6,919.054	242.167	$0.045	165.324	7.440	$0.050	8,833.770	441.688	$0.050	547.500	27.375	$0.045	304.277	13.692
32	2033	$0.035	7,063.017	247.206	$0.045	166.977	7.514	$0.050	9,275.458	463.773	$0.050	547.500	27.375	$0.045	319.491	14.377
33	2034	$0.035	7,209.916	252.347	$0.045	168.647	7.589	$0.050	9,739.231	486.962	$0.050	547.500	27.375	$0.045	335.465	15.096
34	2035	$0.035	7,359.809	257.593	$0.045	170.333	7.665	$0.050	10,226.193	511.310	$0.050	547.500	27.375	$0.045	352.238	15.851
35	2036	$0.035	7,512.757	262.946	$0.045	172.037	7.742	$0.050	10,737.503	536.875	$0.050	547.500	27.375	$0.045	369.850	16.643
36	2037	$0.035	7,668.821	268.409	$0.045	173.757	7.819	$0.050	11,274.378	563.719	$0.050	547.500	27.375	$0.045	388.343	17.475
37	2038	$0.035	7,828.065	273.982	$0.045	175.495	7.897	$0.050	11,838.097	591.905	$0.050	547.500	27.375	$0.045	407.760	18.349
38	2039	$0.035	7,990.552	279.669	$0.045	177.249	7.976	$0.050	12,430.001	621.500	$0.050	547.500	27.375	$0.045	428.148	19.267
39	2040	$0.035	8,156.348	285.472	$0.045	179.022	8.056	$0.050	13,051.501	652.575	$0.050	547.500	27.375	$0.045	449.555	20.230
40	2041	$0.035	8,325.520	291.393	$0.045	180.812	8.137	$0.050	13,704.077	685.204	$0.050	547.500	27.375	$0.045	472.033	21.241

Period		Revenue Summary			
Project Year	Calendar Year	Op Rev Subtotal	Non Op Revenue	Reserves Earnings	Gross Revenue
	Units	$	$	$	$
1	2002	51.517	0.515		52.032
2	2003	57.476	0.575		58.051
3	2004	64.085	0.641		64.726
4	2005	132.983	1.330	0.000	134.313
5	2006	150.891	1.509	0.548	152.948
6	2007	171.314	1.713	1.355	174.383
7	2008	194.804	1.948	2.465	199.217
8	2009	222.044	2.220	3.931	228.195
9	2010	277.216	2.772	5.818	285.806
10	2011	313.905	3.139	0.000	317.044
11	2012	333.894	3.339	0.000	337.233
12	2013	354.904	3.549	0.000	358.453
13	2014	376.991	3.770	0.000	380.761
14	2015	400.214	4.002	0.000	404.216
15	2016	424.637	4.246	0.000	428.883
16	2017	450.327	4.503	0.000	454.830
17	2018	477.355	4.774	0.000	482.128
18	2019	503.099	5.031	0.000	508.130
19	2020	524.728	5.247	0.000	529.976
20	2021	547.607	5.476	0.000	553.083
21	2022	566.651	5.667	0.000	572.317
22	2023	586.493	5.865	0.000	592.357
23	2024	607.168	6.072	0.000	613.240
24	2025	628.716	6.287	0.000	635.003
25	2026	651.177	6.512	0.000	657.688
26	2027	674.591	6.746	0.000	681.337
27	2028	699.003	6.990	0.000	705.993
28	2029	724.460	7.245	0.000	731.704
29	2030	751.009	7.510	0.000	758.519
30	2031	778.700	7.787	0.000	786.487
31	2032	807.588	8.076	0.000	815.664
32	2033	837.727	8.377	0.000	846.104
33	2034	869.175	8.692	0.000	877.867
34	2035	901.995	9.020	0.000	911.015
35	2036	936.248	9.362	0.000	945.611
36	2037	972.004	9.720	0.000	981.724
37	2038	1,009.332	10.093	0.000	1,019.425
38	2039	1,048.305	10.483	0.000	1,058.788
39	2040	1,089.002	10.890	0.000	1,099.892
40	2041	1,131.502	11.315	0.000	1,142.817

Period		Gross Revenue Taxes						
Project Year	Calendar Year	Gross Revenue	13% Tax	Credits Available	Credits Taken	Net 13% Tax Due	3% Tax Due	Total Tax Due
	Units	$	$	$	$	$	$	$
1	2002	52.032	-	-	-	-	-	0.000
2	2003	58.051	-	-	-	-	-	0.000
3	2004	64.726	-	-	-	-	-	0.000
4	2005	134.313	-	395.000	-	-	-	0.000
5	2006	152.948	-	395.000	-	-	-	0.000
6	2007	174.383	-	395.000	-	-	-	0.000
7	2008	199.217	-	395.000	-	-	-	0.000
8	2009	228.195	-	395.000	-	-	-	0.000
9	2010	285.806	-	395.000	-	-	-	0.000
10	2011	317.044	-	395.000	-	-	-	0.000
11	2012	337.233	-	395.000	-	-	-	0.000
12	2013	358.453	-	395.000	-	-	-	0.000
13	2014	380.761	-	395.000	-	-	-	0.000
14	2015	404.216	-	395.000	-	-	-	0.000
15	2016	428.883	-	395.000	-	-	-	0.000
16	2017	454.830	-	395.000	-	-	-	0.000
17	2018	482.128	-	395.000	-	-	-	0.000
18	2019	508.130	-	395.000	-	-	-	0.000
19	2020	529.976	-	395.000	-	-	-	0.000
20	2021	553.083	-	395.000	-	-	-	0.000
21	2022	572.317	-	395.000	-	-	-	0.000
22	2023	592.357	-	395.000	-	-	-	0.000
23	2024	613.240	-	395.000	-	-	-	0.000
24	2025	635.003	-	395.000	-	-	-	0.000
25	2026	657.688	-	395.000	-	-	-	0.000
26	2027	681.337	-	395.000	-	-	-	0.000
27	2028	705.993	-	395.000	-	-	-	0.000
28	2029	731.704	-	395.000	-	-	-	0.000
29	2030	758.519	98.607	395.000	98.607	-	22.756	(22.756)
30	2031	786.487	102.243	296.393	102.243	-	23.595	(23.595)
31	2032	815.664	106.036	194.149	106.036	-	24.470	(24.470)
32	2033	846.104	109.994	88.113	88.113	21.881	25.383	(47.264)
33	2034	877.867	114.123	-	-	114.123	26.336	(140.459)
34	2035	911.015	118.432	-	-	118.432	27.330	(145.762)
35	2036	945.611	122.929	-	-	122.929	28.368	(151.298)
36	2037	981.724	127.624	-	-	127.624	29.452	(157.076)
37	2038	1,019.425	132.525	-	-	132.525	30.583	(163.108)
38	2039	1,058.788	137.642	-	-	137.642	31.764	(169.406)
39	2040	1,099.892	142.986	-	-	142.986	32.997	(175.983)
40	2041	1,142.817	148.566	-	-	148.566	34.285	(182.851)

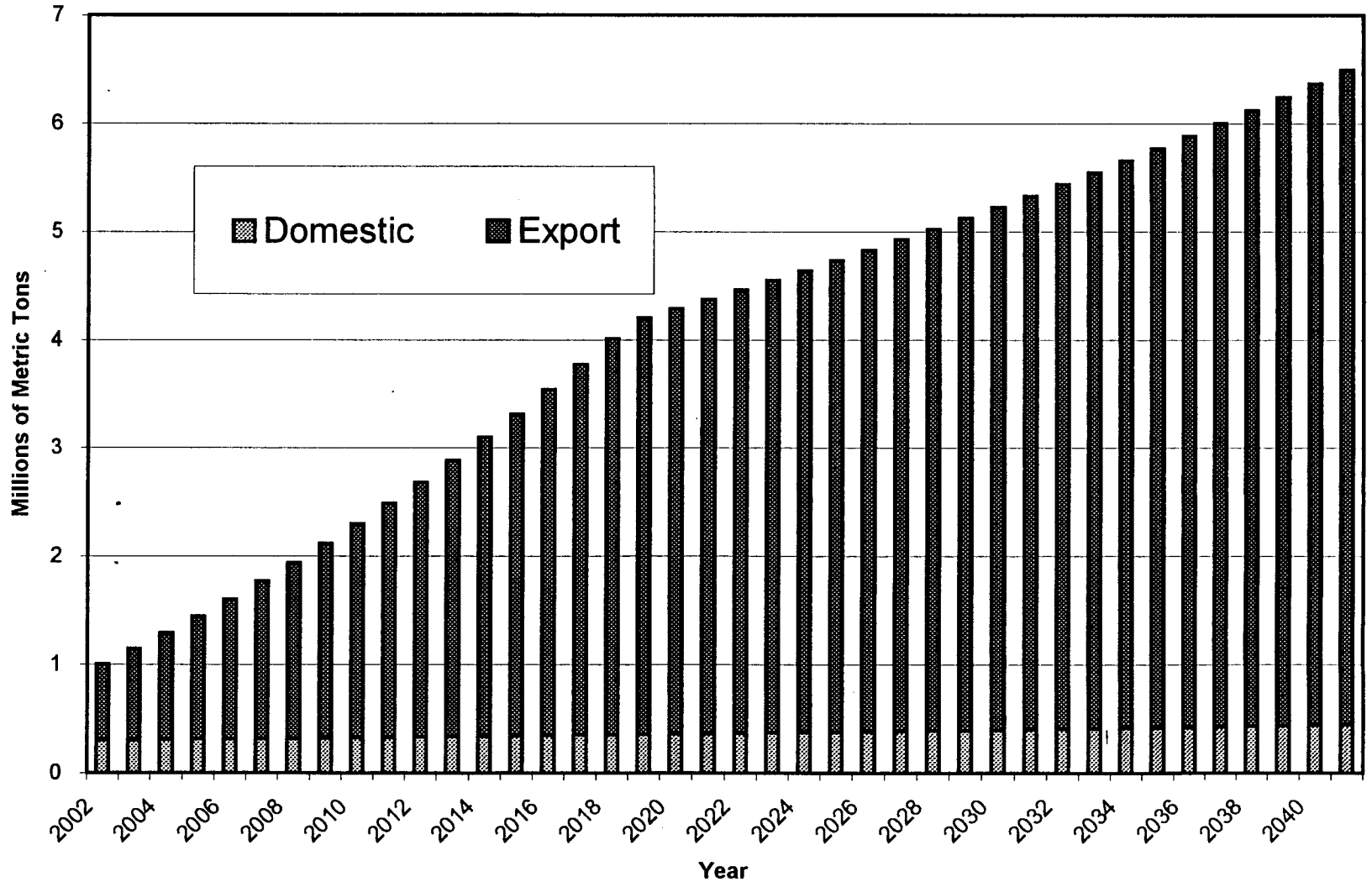
Period		Operating Costs - Base Traffic												
Project	Calendar	General			Base Beans			Base Intermodal			Base Minerals			Base
Year	Year	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Subtotal
	Units	$	ton-km	$	$	ton-km	$	$	ton-km	$	$	ton-km	$	$
1	2002	(0.019)	601.965	(11.437)	(0.019)	384.450	(7.305)	(0.020)	153.750	(3.075)	(0.019)	65.700	(1.248)	(23.065)
2	2003	(0.019)	632.063	(12.009)	(0.019)	461.115	(8.761)	(0.020)	192.188	(3.844)	(0.019)	65.700	(1.248)	(25.862)
3	2004	(0.019)	663.666	(12.610)	(0.019)	540.675	(10.273)	(0.020)	240.234	(4.805)	(0.019)	65.700	(1.248)	(28.935)
4	2005	(0.019)	696.850	(13.240)							(0.019)	65.700	(1.248)	(14.488)
5	2006	(0.019)	731.692	(13.902)							(0.019)	65.700	(1.248)	(15.150)
6	2007	(0.019)	768.277	(14.597)							(0.019)	65.700	(1.248)	(15.846)
7	2008	(0.019)	806.691	(15.327)							(0.019)	65.700	(1.248)	(16.575)
8	2009	(0.019)	847.025	(16.093)							(0.019)	65.700	(1.248)	(17.342)
9	2010	(0.019)	872.436	(16.576)										(16.576)
10	2011	(0.019)	898.609	(17.074)										(17.074)
11	2012	(0.019)	925.567	(17.586)										(17.586)
12	2013	(0.019)	953.334	(18.113)										(18.113)
13	2014	(0.019)	981.934	(18.657)										(18.657)
14	2015	(0.019)	1,011.392	(19.216)										(19.216)
15	2016	(0.019)	1,041.734	(19.793)										(19.793)
16	2017	(0.019)	1,072.986	(20.387)										(20.387)
17	2018	(0.019)	1,105.176	(20.998)										(20.998)
18	2019	(0.019)	1,138.331	(21.628)										(21.628)
19	2020	(0.019)	1,172.481	(22.277)										(22.277)
20	2021	(0.019)	1,207.655	(22.945)										(22.945)
21	2022	(0.019)	1,243.885	(23.634)										(23.634)
22	2023	(0.019)	1,281.202	(24.343)										(24.343)
23	2024	(0.019)	1,319.638	(25.073)										(25.073)
24	2025	(0.019)	1,359.227	(25.825)										(25.825)
25	2026	(0.019)	1,400.004	(26.600)										(26.600)
26	2027	(0.019)	1,442.004	(27.398)										(27.398)
27	2028	(0.019)	1,485.264	(28.220)										(28.220)
28	2029	(0.019)	1,529.822	(29.067)										(29.067)
29	2030	(0.019)	1,575.716	(29.939)										(29.939)
30	2031	(0.019)	1,622.988	(30.837)										(30.837)
31	2032	(0.019)	1,671.678	(31.762)										(31.762)
32	2033	(0.019)	1,721.828	(32.715)										(32.715)
33	2034	(0.019)	1,773.483	(33.696)										(33.696)
34	2035	(0.019)	1,826.687	(34.707)										(34.707)
35	2036	(0.019)	1,881.488	(35.748)										(35.748)
36	2037	(0.019)	1,937.932	(36.821)										(36.821)
37	2038	(0.019)	1,996.070	(37.925)										(37.925)
38	2039	(0.019)	2,055.952	(39.063)										(39.063)
39	2040	(0.019)	2,117.631	(40.235)										(40.235)
40	2041	(0.019)	2,181.160	(41.442)										(41.442)

Period		I/C Operating Costs (A)											
Project	Calendar	Export Soy Beans			Domestic Soy Beans			Intermodal			Mineral		
Year	Year	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	$/T-KM	Units	O&M Costs
	Units	$	ton-km	$	$	ton-km	$	$	ton-km	$	$	ton-km	$
1	2002												
2	2003												
3	2004												
4	2005	$0.019	1,559.176	(29.624)	0.019	126.374	(2.401)	$0.020	688.281	(13.766)	$0.019	0.000	0.000
5	2006	$0.019	1,773.358	(33.694)	0.019	127.638	(2.425)	$0.020	860.352	(17.207)	$0.019	0.000	0.000
6	2007	$0.019	1,995.441	(37.913)	0.019	128.914	(2.449)	$0.020	1,075.439	(21.509)	$0.019	0.000	0.000
7	2008	$0.019	2,225.655	(42.287)	0.019	130.203	(2.474)	$0.020	1,344.299	(26.886)	$0.019	0.000	0.000
8	2009	$0.019	2,464.236	(46.820)	0.019	131.505	(2.499)	$0.020	1,680.374	(33.607)	$0.019	0.000	0.000
9	2010	$0.019	2,711.425	(51.517)	0.019	132.820	(2.524)	$0.020	2,100.468	(42.009)	$0.019	547.500	(10.403)
10	2011	$0.019	2,967.472	(56.382)	0.019	134.149	(2.549)	$0.020	2,625.585	(52.512)	$0.019	547.500	(10.403)
11	2012	$0.019	3,232.632	(61.420)	0.019	135.490	(2.574)	$0.020	2,809.376	(56.188)	$0.019	547.500	(10.403)
12	2013	$0.019	3,507.166	(66.636)	0.019	136.845	(2.600)	$0.020	3,006.032	(60.121)	$0.019	547.500	(10.403)
13	2014	$0.019	3,791.342	(72.035)	0.019	138.214	(2.626)	$0.020	3,216.454	(64.329)	$0.019	547.500	(10.403)
14	2015	$0.019	4,085.436	(77.623)	0.019	139.596	(2.652)	$0.020	3,441.606	(68.832)	$0.019	547.500	(10.403)
15	2016	$0.019	4,389.731	(83.405)	0.019	140.992	(2.679)	$0.020	3,682.518	(73.650)	$0.019	547.500	(10.403)
16	2017	$0.019	4,704.516	(89.386)	0.019	142.402	(2.706)	$0.020	3,940.295	(78.806)	$0.019	547.500	(10.403)
17	2018	$0.019	5,030.089	(95.572)	0.019	143.826	(2.733)	$0.020	4,216.115	(84.322)	$0.019	547.500	(10.403)
18	2019	$0.019	5,289.686	(100.504)	0.019	145.264	(2.760)	$0.020	4,511.243	(90.225)	$0.019	547.500	(10.403)
19	2020	$0.019	5,400.385	(102.607)	0.019	146.716	(2.788)	$0.020	4,827.030	(96.541)	$0.019	547.500	(10.403)
20	2021	$0.019	5,513.347	(104.754)	0.019	148.184	(2.815)	$0.020	5,164.922	(103.298)	$0.019	547.500	(10.403)
21	2022	$0.019	5,628.617	(106.944)	0.019	149.665	(2.844)	$0.020	5,423.168	(108.463)	$0.019	547.500	(10.403)
22	2023	$0.019	5,746.244	(109.179)	0.019	151.162	(2.872)	$0.020	5,694.327	(113.887)	$0.019	547.500	(10.403)
23	2024	$0.019	5,866.273	(111.459)	0.019	152.674	(2.901)	$0.020	5,979.043	(119.581)	$0.019	547.500	(10.403)
24	2025	$0.019	5,988.753	(113.786)	0.019	154.200	(2.930)	$0.020	6,277.995	(125.560)	$0.019	547.500	(10.403)
25	2026	$0.019	6,113.735	(116.161)	0.019	155.742	(2.959)	$0.020	6,591.895	(131.838)	$0.019	547.500	(10.403)
26	2027	$0.019	6,241.269	(118.584)	0.019	157.300	(2.989)	$0.020	6,921.490	(138.430)	$0.019	547.500	(10.403)
27	2028	$0.019	6,371.406	(121.057)	0.019	158.873	(3.019)	$0.020	7,267.564	(145.351)	$0.019	547.500	(10.403)
28	2029	$0.019	6,504.199	(123.580)	0.019	160.462	(3.049)	$0.020	7,630.943	(152.619)	$0.019	547.500	(10.403)
29	2030	$0.019	6,639.701	(126.154)	0.019	162.066	(3.079)	$0.020	8,012.490	(160.250)	$0.019	547.500	(10.403)
30	2031	$0.019	6,777.967	(128.781)	0.019	163.687	(3.110)	$0.020	8,413.114	(168.262)	$0.019	547.500	(10.403)
31	2032	$0.019	6,919.054	(131.462)	0.019	165.324	(3.141)	$0.020	8,833.770	(176.675)	$0.019	547.500	(10.403)
32	2033	$0.019	7,063.017	(134.197)	0.019	166.977	(3.173)	$0.020	9,275.458	(185.509)	$0.019	547.500	(10.403)
33	2034	$0.019	7,209.916	(136.988)	0.019	168.647	(3.204)	$0.020	9,739.231	(194.785)	$0.019	547.500	(10.403)
34	2035	$0.019	7,359.809	(139.836)	0.019	170.333	(3.236)	$0.020	10,226.193	(204.524)	$0.019	547.500	(10.403)
35	2036	$0.019	7,512.757	(142.742)	0.019	172.037	(3.269)	$0.020	10,737.503	(214.750)	$0.019	547.500	(10.403)
36	2037	$0.019	7,668.821	(145.708)	0.019	173.757	(3.301)	$0.020	11,274.378	(225.488)	$0.019	547.500	(10.403)
37	2038	$0.019	7,828.065	(148.733)	0.019	175.495	(3.334)	$0.020	11,838.097	(236.762)	$0.019	547.500	(10.403)
38	2039	$0.019	7,990.552	(151.820)	0.019	177.249	(3.368)	$0.020	12,430.001	(248.600)	$0.019	547.500	(10.403)
39	2040	$0.019	8,156.348	(154.971)	0.019	179.022	(3.401)	$0.020	13,051.501	(261.030)	$0.019	547.500	(10.403)
40	2041	$0.019	8,325.520	(158.185)	0.019	180.812	(3.435)	$0.020	13,704.077	(274.082)	$0.019	547.500	(10.403)

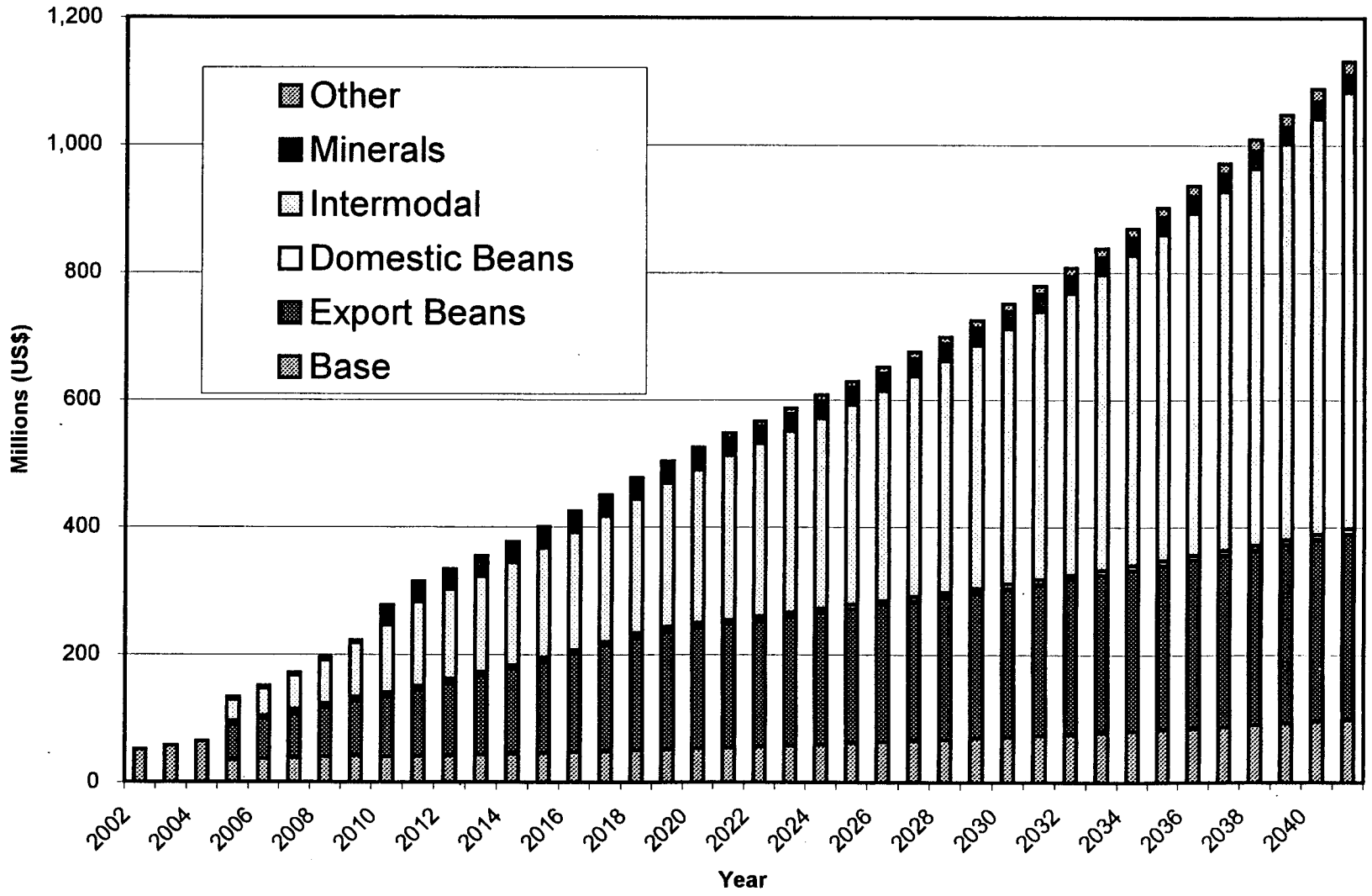
Period		I/C Operating Costs (B)					
Project Year	Calendar Year	$/T-KM	Other Units	O&M Costs	OM Cost Summary Base	I/C	Total
	Units	$	ton-km	$	$	$	$
1	2002				(23.065)	0.000	(23.065)
2	2003				(25.862)	0.000	(25.862)
3	2004				(28.935)	0.000	(28.935)
4	2005	$0.019	81.500	(1.549)	(14.488)	(47.340)	(61.828)
5	2006	$0.019	85.575	(1.626)	(15.150)	(54.952)	(70.102)
6	2007	$0.019	89.854	(1.707)	(15.846)	(63.579)	(79.424)
7	2008	$0.019	94.346	(1.793)	(16.575)	(73.440)	(90.015)
8	2009	$0.019	99.064	(1.882)	(17.342)	(84.809)	(102.151)
9	2010	$0.019	104.017	(1.976)	(16.576)	(108.429)	(125.005)
10	2011	$0.019	109.218	(2.075)	(17.074)	(123.920)	(140.994)
11	2012	$0.019	114.679	(2.179)	(17.586)	(132.763)	(150.349)
12	2013	$0.019	120.413	(2.288)	(18.113)	(142.047)	(160.161)
13	2014	$0.019	126.433	(2.402)	(18.657)	(151.795)	(170.452)
14	2015	$0.019	132.755	(2.522)	(19.216)	(162.033)	(181.249)
15	2016	$0.019	139.393	(2.648)	(19.793)	(172.785)	(192.578)
16	2017	$0.019	146.362	(2.781)	(20.387)	(184.081)	(204.467)
17	2018	$0.019	153.680	(2.920)	(20.998)	(195.949)	(216.947)
18	2019	$0.019	161.364	(3.066)	(21.628)	(206.957)	(228.586)
19	2020	$0.019	169.433	(3.219)	(22.277)	(215.557)	(237.834)
20	2021	$0.019	177.904	(3.380)	(22.945)	(224.650)	(247.596)
21	2022	$0.019	186.799	(3.549)	(23.634)	(232.202)	(255.836)
22	2023	$0.019	196.139	(3.727)	(24.343)	(240.066)	(264.409)
23	2024	$0.019	205.946	(3.913)	(25.073)	(248.256)	(273.329)
24	2025	$0.019	216.244	(4.109)	(25.825)	(256.787)	(282.612)
25	2026	$0.019	227.056	(4.314)	(26.600)	(265.675)	(292.275)
26	2027	$0.019	238.409	(4.530)	(27.398)	(274.935)	(302.333)
27	2028	$0.019	250.329	(4.756)	(28.220)	(284.585)	(312.805)
28	2029	$0.019	262.846	(4.994)	(29.067)	(294.644)	(323.711)
29	2030	$0.019	275.988	(5.244)	(29.939)	(305.130)	(335.068)
30	2031	$0.019	289.787	(5.506)	(30.837)	(316.062)	(346.899)
31	2032	$0.019	304.277	(5.781)	(31.762)	(327.462)	(359.224)
32	2033	$0.019	319.491	(6.070)	(32.715)	(339.352)	(372.067)
33	2034	$0.019	335.465	(6.374)	(33.696)	(351.754)	(385.450)
34	2035	$0.019	352.238	(6.693)	(34.707)	(364.692)	(399.399)
35	2036	$0.019	369.850	(7.027)	(35.748)	(378.191)	(413.939)
36	2037	$0.019	388.343	(7.379)	(36.821)	(392.278)	(429.098)
37	2038	$0.019	407.760	(7.747)	(37.925)	(406.979)	(444.905)
38	2039	$0.019	428.148	(8.135)	(39.063)	(422.326)	(461.389)
39	2040	$0.019	449.555	(8.542)	(40.235)	(438.346)	(478.581)
40	2041	$0.019	472.033	(8.969)	(41.442)	(455.073)	(496.515)

Period		Net Income									Equity Cash Flow Analysis				31%	
Project Year	Calendar Year	Net Oper. Income	Debt Service	DCR	Net Income	25% Income Tax	Credit Available	Credit Taken	Tax Paid	After-Tax Net Income	Equity Distributions	Contributions to Construction	Reserves Deposits	Project Reserves	Equity Cash Flow	Equity Payback
	Units	$	$		$	$	$	$	$	$	$	$	$	$	$	year
1	2002	28.967			28.967	0.000	-	0.000	0.000	28.967		(28.967)			(110.000)	-
2	2003	32.189			32.189	0.000	-	0.000	0.000	32.189		(32.189)			0.000	-
3	2004	35.791			35.791	0.000	-	0.000	0.000	35.791		(35.791)			0.000	-
4	2005	72.485	(50.560)	1.434	21.925	0.000	-	0.000	0.000	21.925	10.962		10.962	10.962	10.962	-
5	2006	82.846	(50.560)	1.639	32.286	0.000	-	0.000	0.000	32.286	16.143		16.143	27.105	16.143	-
6	2007	94.959	(50.560)	1.878	44.399	0.000	-	0.000	0.000	44.399	22.199		22.199	49.304	22.199	-
7	2008	109.202	(50.560)	2.160	58.642	0.000	-	0.000	0.000	58.642	29.321		29.321	78.625	29.321	-
8	2009	126.045	(50.560)	2.493	75.485	0.000	-	0.000	0.000	75.485	37.742		37.742	116.368	37.742	8
9	2010	160.801	(64.371)	2.498	96.430	0.000	-	0.000	0.000	96.430	212.798		(116.368)	0.000	212.798	8
10	2011	176.050	(64.371)	2.735	111.679	0.000	-	0.000	0.000	111.679	111.679		0.000	0.000	111.679	8
11	2012	186.884	(64.371)	2.903	122.513	0.000	-	0.000	0.000	122.513	122.513		0.000	0.000	122.513	8
12	2013	198.293	(64.371)	3.080	133.922	0.000	-	0.000	0.000	133.922	133.922		0.000	0.000	133.922	8
13	2014	210.309	(64.371)	3.267	145.938	0.000	-	0.000	0.000	145.938	145.938		0.000	0.000	145.938	8
14	2015	222.967	(64.371)	3.464	158.597	0.000	-	0.000	0.000	158.597	158.597		0.000	0.000	158.597	8
15	2016	236.305	(64.371)	3.671	171.935	0.000	-	0.000	0.000	171.935	171.935		0.000	0.000	171.935	8
16	2017	250.362	(64.371)	3.889	185.992	0.000	-	0.000	0.000	185.992	185.992		0.000	0.000	185.992	8
17	2018	265.181	(64.371)	4.120	200.810	0.000	-	0.000	0.000	200.810	200.810		0.000	0.000	200.810	8
18	2019	279.545	(64.371)	4.343	215.174	0.000	-	0.000	0.000	215.174	215.174		0.000	0.000	215.174	8
19	2020	292.141	(64.371)	4.538	227.771	0.000	-	0.000	0.000	227.771	227.771		0.000	0.000	227.771	8
20	2021	305.487	(64.371)	4.746	241.117	0.000	-	0.000	0.000	241.117	241.117		0.000	0.000	241.117	8
21	2022	316.481	(64.371)	4.917	252.110	0.000	-	0.000	0.000	252.110	252.110		0.000	0.000	252.110	8
22	2023	327.948	(64.371)	5.095	263.578	0.000	-	0.000	0.000	263.578	263.578		0.000	0.000	263.578	8
23	2024	339.911	(64.371)	5.281	275.540	0.000	-	0.000	0.000	275.540	275.540		0.000	0.000	275.540	8
24	2025	352.391	(64.371)	5.474	288.020	0.000	-	0.000	0.000	288.020	288.020		0.000	0.000	288.020	8
25	2026	365.414	(64.371)	5.677	301.043	0.000	-	0.000	0.000	301.043	301.043		0.000	0.000	301.043	8
26	2027	379.004	(64.371)	5.888	314.633	0.000	-	0.000	0.000	314.633	314.633		0.000	0.000	314.633	8
27	2028	393.188	(64.371)	6.108	328.817	0.000	-	0.000	0.000	328.817	328.817		0.000	0.000	328.817	8
28	2029	407.994	(64.371)	6.338	343.623	0.000	-	0.000	0.000	343.623	343.623		0.000	0.000	343.623	8
29	2030	400.695	0.000	na	400.695	100.174	22.756	22.756	77.418	323.277	323.277		0.000	0.000	323.277	8
30	2031	415.994	0.000	na	415.994	103.998	46.350	46.350	57.648	358.346	358.346		0.000	0.000	358.346	8
31	2032	431.970	0.000	na	431.970	107.992	70.820	70.820	37.172	394.797	394.797		0.000	0.000	394.797	8
32	2033	426.774	0.000	na	426.774	106.693	96.203	96.203	10.490	416.284	416.284		0.000	0.000	416.284	8
33	2034	351.959	0.000	na	351.959	87.990	122.539	87.990	0.000	351.959	351.959		0.000	0.000	351.959	8
34	2035	365.854	0.000	na	365.854	91.463	149.870	91.463	0.000	365.854	365.854		0.000	0.000	365.854	8
35	2036	380.374	0.000	na	380.374	95.094	178.238	95.094	0.000	380.374	380.374		0.000	0.000	380.374	8
36	2037	395.550	0.000	na	395.550	98.887	207.690	98.887	0.000	395.550	395.550		0.000	0.000	395.550	8
37	2038	411.412	0.000	na	411.412	102.853	238.272	102.853	0.000	411.412	411.412		0.000	0.000	411.412	8
38	2039	427.993	0.000	na	427.993	106.998	270.036	106.998	0.000	427.993	427.993		0.000	0.000	427.993	8
39	2040	445.328	0.000	na	445.328	111.332	303.033	111.332	0.000	445.328	445.328		0.000	0.000	445.328	8
40	2041	463.452	0.000	na	463.452	115.863	337.317	115.863	0.000	463.452	463.452		0.000	0.000	463.452	8

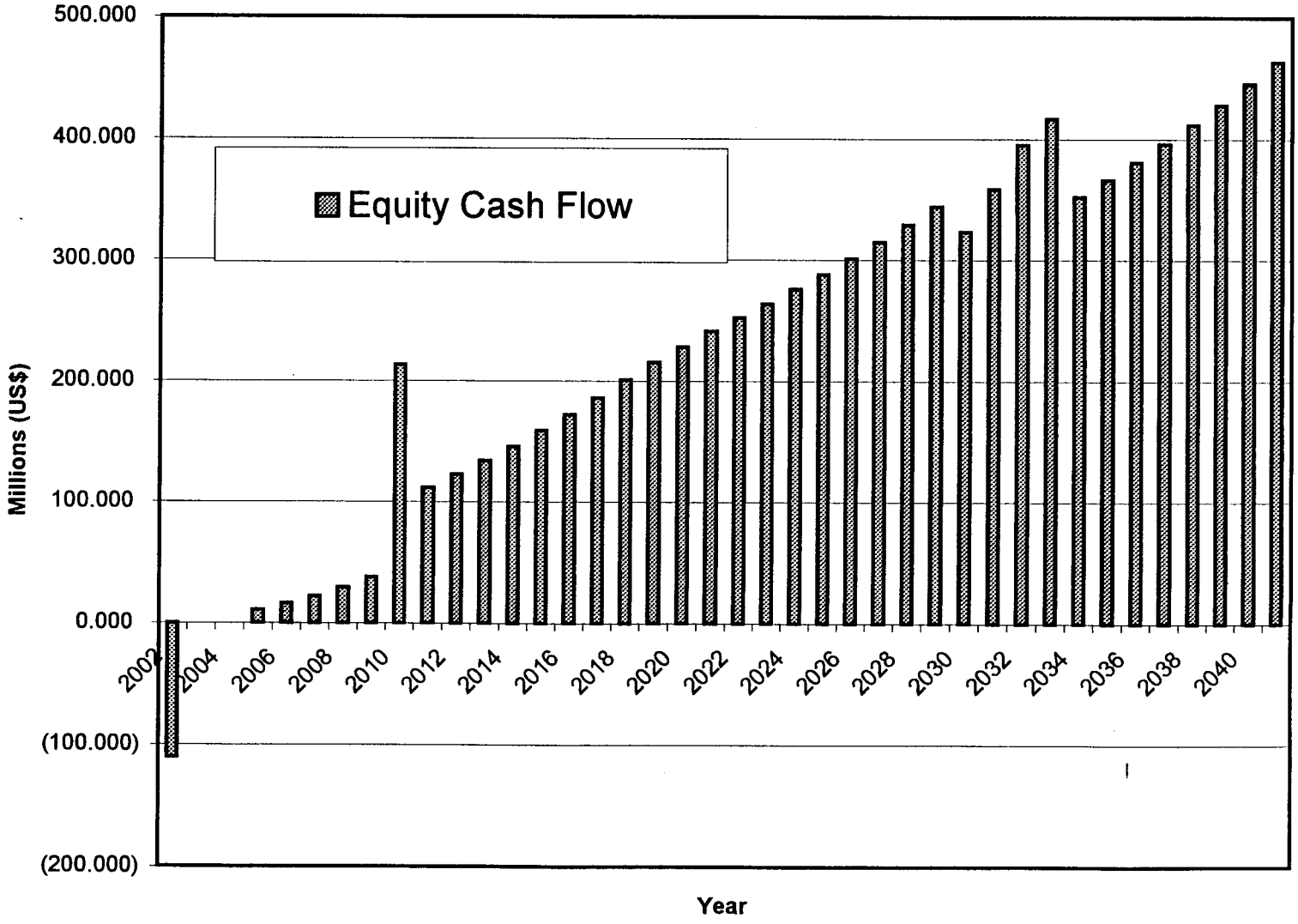
Soy Bean Production



Total Revenue



Equity Cash Flow



Case Results

Debt Coverage Ratio in 2010	1.43
Return on Concessionaire Equity	18.23%
Project NPV @ 20% (millions)	($18.27)
Equity Payback (project years)	11

Capital Structure Summary

(US$ in millions)

Construction Period Sources		
Bank Loan	632.000	70%
Government Support	75.000	8%
Interest Earnings	4.262	0%
Net Operating Funds	81.516	9%
Concession Equity	110.000	12%
Total Sources	902.778	
Construction Period Uses		
Construction Costs	790.000	88%
Finance Costs	25.280	3%
Construction Period Interest	96.064	11%
Surplus/(Deficit)	(8.566)	-1%
Total Uses	902.778	

Construction Costs	
Budget (millions)	$790.000
Construction Draws Year 1 (%)	20%
Construction Draws Year 2 (%)	50%
Construction Draws Year 3 (%)	30%
Construction Draws Year 4 (%)	0%
Construction Period (years)	3
Government Construction Contribution	
Contribution Amount (millions)	$75.000
Year 1 (%)	0%
Year 2 (%)	50%
Year 3 (%)	50%
Year 4 (%)	0%
Concessionaire Equity	
Investment Amount (millions)	$110.000
Equity Pay-in Year 1 (%)	100%
Equity Pay-in Year 2 (%)	0%
Equity Pay-in Year 3 (%)	0%
Equity Pay-in Year 4 (%)	0%
Bank Debt	
Share of Construction Costs	80%
Loan Amount (millions)	$632.000
Loan Draw Year 1 (%)	20%
Loan Draw Year 2 (%)	50%
Loan Draw Year 3 (%)	30%
Loan Draw Year 4 (%)	0%
Interest Rate	8%
Interest Only Period After Construction	5
Amortization Periods	20
Final Maturity (project year)	28
Costs of Issuance (% of loan amount)	4%
Last year prior to Amortization	8
Micellaneous Concession Terms	
Minimum Coverage to Free Reserves	2.00
Equity Distributions Prior to Debt Amortization	50%

I/C Export Soy Bean Traffic	
Production per Hectacre Growth	2.0%
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	1,376
I/C Domestic Soy Bean Traffic	
Share of Domestic Beans on Rail	50%
Growth (% per year)	1.0%
Tariff ($ per ton-km)	$0.045
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	815
I/C Intermodal Traffic	
2005 Traffic (millions, metric tons)	0.488
Growth (% per year) 2001-2005	10%
Growth (% per year) 2006-2010	10%
Growth (% per year) 2011-2020	7%
Growth (% per year) After 2020	5%
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.028
Average Haul (km)	1,000
I/C Mineral Traffic	
2005 Traffic (millions, metric tons)	0.250
Growth (% per year)	0%
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	1,250
I/C Other Traffic	
2005 Traffic (millions, metric tons)	0.100
Growth (% per year)	5%
Tariff ($ per ton-km)	$0.045
OM Costs ($ per ton-km)	$0.019
Average Haul (km)	815
Other Revenues	
Earnings Rate on Construction Funds	5%
Earnings Rate on Reserve Funds	5%
Non-operating Revenues % of Operating Rev	1%

Base General Traffic	
Base Traffic Growth before 2010	3%
Base Traffic Growth after 2010	3%
Average Haul (KM)	520
Tariff ($ per ton-KM)	$0.045
OM Costs ($ per ton-KM)	$0.019
Base Mineral Traffic	
2002 Traffic Level (millions, metric tons)	0.657
Base Traffic Growth	0%
Average Haul (km)	100
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Base Soy Beans Traffic	
Average Haul (km)	550
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.019
Base I/M Traffic	
2001 Traffic Level (millions, metric tons)	0.200
Traffic Growth through 2004	25%
Average Haul (km)	615
Tariff ($ per ton-km)	$0.050
OM Costs ($ per ton-km)	$0.028
Tax Rates	
Income Tax Rate During Loan Period	0%
Income Tax Rate After Loan Period	25%
13% Gross Revenue Tax During Loan Period	0%
13% Gross Revenue Tax After Loan Period	13%
3% Gross Revenue Tax During Loan Period	0%
3% Gross Revenue Tax After Loan Period	3%
13% Tax Credit - Percent Total Investment	50%

Results Snapshot	
Return on Equity	18.23%
Equity Payback	11
NPV @ 20%	($18.27)
Debt Coverage in 2010	1.43

Period		Construction Period Cash Flow														
Project Year	Calendar Year	Starting Balance	Equity Pay-In	Excess Op Funds	Govt Grant	Bank Debt	Total New Capital	Cumulative Debt	Average Balance	Interest Earnings	Total Available	Financing Costs	Construction Draws	C/P Interest	Total Outlays	Ending Balance
	Units	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
1	2002	0.000	110.000	24.903	0.000	126.400	261.303	126.400	33.955	1.698	263.000	(25.280)	(158.000)	(10.112)	(193.392)	69.608
2	2003	69.608	0.000	27.085	37.500	316.000	380.585	442.400	44.705	2.235	452.428	0.000	(395.000)	(35.392)	(430.392)	22.036
3	2004	22.036	0.000	29.529	37.500	189.600	256.629	632.000	6.571	0.329	278.994	0.000	(237.000)	(50.560)	(287.560)	(8.566)
4	2005								0.000							
5	2006															
6	2007	*Totals*	*110.000*	*81.516*	*75.000*	*632.000*	*898.516*			*4.262*		*(25.280)*	*(790.000)*	*(96.064)*	*(911.344)*	
7	2008															
8	2009															
9	2010															
10	2011															
11	2012															
12	2013															
13	2014															
14	2015															
15	2016															
16	2017															
17	2018															
18	2019															
19	2020															
20	2021															
21	2022															
22	2023															
23	2024															
24	2025															
25	2026															
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29	2030															
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31	2032															
32	2033															
33	2034															
34	2035															
35	2036															
36	2037															
37	2038															
38	2039															
39	2040															
40	2041															

Period		*Soy Bean Production*				
Project Year	Calendar Year	Hectares in Prod	Productivity per Hectare	Output (millions)	Output Domestic	Output Export
	Units	hectares	metric tons	metric tons	metric tons	metric tons
1	2002	500,000	2.000	1.000	0.301	0.699
2	2003	560,000	2.040	1.142	0.304	0.838
3	2004	620,000	2.081	1.290	0.307	0.983
4	2005	680,000	2.122	1.443	0.310	1.133
5	2006	740,000	2.165	1.602	0.313	1.289
6	2007	800,000	2.208	1.767	0.316	1.450
7	2008	860,000	2.252	1.937	0.320	1.617
8	2009	920,000	2.297	2.114	0.323	1.791
9	2010	980,000	2.343	2.296	0.326	1.971
10	2011	1,040,000	2.390	2.486	0.329	2.157
11	2012	1,100,000	2.438	2.682	0.332	2.349
12	2013	1,160,000	2.487	2.885	0.336	2.549
13	2014	1,220,000	2.536	3.095	0.339	2.755
14	2015	1,280,000	2.587	3.312	0.343	2.969
15	2016	1,340,000	2.639	3.536	0.346	3.190
16	2017	1,400,000	2.692	3.768	0.349	3.419
17	2018	1,460,000	2.746	4.009	0.353	3.656
18	2019	1,500,000	2.800	4.201	0.356	3.844
19	2020	1,500,000	2.856	4.285	0.360	3.925
20	2021	1,500,000	2.914	4.370	0.364	4.007
21	2022	1,500,000	2.972	4.458	0.367	4.091
22	2023	1,500,000	3.031	4.547	0.371	4.176
23	2024	1,500,000	3.092	4.638	0.375	4.263
24	2025	1,500,000	3.154	4.731	0.378	4.352
25	2026	1,500,000	3.217	4.825	0.382	4.443
26	2027	1,500,000	3.281	4.922	0.386	4.536
27	2028	1,500,000	3.347	5.020	0.390	4.630
28	2029	1,500,000	3.414	5.121	0.394	4.727
29	2030	1,500,000	3.482	5.223	0.398	4.825
30	2031	1,500,000	3.552	5.328	0.402	4.926
31	2032	1,500,000	3.623	5.434	0.406	5.028
32	2033	1,500,000	3.695	5.543	0.410	5.133
33	2034	1,500,000	3.769	5.654	0.414	5.240
34	2035	1,500,000	3.844	5.767	0.418	5.349
35	2036	1,500,000	3.921	5.882	0.422	5.460
36	2037	1,500,000	4.000	6.000	0.426	5.573
37	2038	1,500,000	4.080	6.120	0.431	5.689
38	2039	1,500,000	4.161	6.242	0.435	5.807
39	2040	1,500,000	4.245	6.367	0.439	5.928
40	2041	1,500,000	4.329	6.494	0.444	6.051

Period		*Revenues from Base Traffic*												
Project	Calendar	General			Soy Beans (Base)			I/M (Base)			Minerals (Base)			Total Base
Year	Year	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Revenue
	Units	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	$
1	2002	1.093	568.218	25.570	0.699	384.450	11.534	0.250	153.750	7.688	0.657	65.700	3.285	48.076
2	2003	1.126	585.265	26.337	0.838	461.115	13.833	0.313	192.188	9.609	0.657	65.700	3.285	53.065
3	2004	1.159	602.823	27.127	0.983	540.675	16.220	0.391	240.234	12.012	0.657	65.700	3.285	58.644
4	2005	1.194	620.907	27.941							0.657	65.700	3.285	31.226
5	2006	1.230	639.534	28.779							0.657	65.700	3.285	32.064
6	2007	1.267	658.720	29.642							0.657	65.700	3.285	32.927
7	2008	1.305	678.482	30.532							0.657	65.700	3.285	33.817
8	2009	1.344	698.837	31.448							0.657	65.700	3.285	34.733
9	2010	1.384	719.802	32.391										32.391
10	2011	1.426	741.396	33.363										33.363
11	2012	1.469	763.638	34.364										34.364
12	2013	1.513	786.547	35.395										35.395
13	2014	1.558	810.143	36.456										36.456
14	2015	1.605	834.447	37.550										37.550
15	2016	1.653	859.481	38.677										38.677
16	2017	1.702	885.265	39.837										39.837
17	2018	1.754	911.823	41.032										41.032
18	2019	1.806	939.178	42.263										42.263
19	2020	1.860	967.353	43.531										43.531
20	2021	1.916	996.374	44.837										44.837
21	2022	1.974	1,026.265	46.182										46.182
22	2023	2.033	1,057.053	47.567										47.567
23	2024	2.094	1,088.765	48.994										48.994
24	2025	2.157	1,121.427	50.464										50.464
25	2026	2.221	1,155.070	51.978										51.978
26	2027	2.288	1,189.722	53.538										53.538
27	2028	2.357	1,225.414	55.144										55.144
28	2029	2.427	1,262.176	56.798										56.798
29	2030	2.500	1,300.042	58.502										58.502
30	2031	2.575	1,339.043	60.257										60.257
31	2032	2.652	1,379.214	62.065										62.065
32	2033	2.732	1,420.591	63.927										63.927
33	2034	2.814	1,463.208	65.844										65.844
34	2035	2.898	1,507.105	67.820										67.820
35	2036	2.985	1,552.318	69.854										69.854
36	2037	3.075	1,598.887	71.950										71.950
37	2038	3.167	1,646.854	74.108										74.108
38	2039	3.262	1,696.260	76.332										76.332
39	2040	3.360	1,747.147	78.622										78.622
40	2041	3.461	1,799.562	80.980										80.980

Period		Revenues from Interconnection Traffic														
Project	Calendar	Export Soy Beans			Domestic Soy Beans			Intermodal			Minerals			Other Traffic		
Year	Year	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue	Tariff	Units	Revenue
	Units	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$	metric tons	ton-km	$
1	2002															
2	2003															
3	2004															
4	2005	$0.030	1,559.176	46.775	$0.045	126.374	5.687	$0.050	488.281	24.414				$0.045	81.500	3.668
5	2006	$0.030	1,773.358	53.201	$0.045	127.638	5.744	$0.050	537.109	26.855				$0.045	85.575	3.851
6	2007	$0.030	1,995.441	59.863	$0.045	128.914	5.801	$0.050	590.820	29.541				$0.045	89.854	4.043
7	2008	$0.030	2,225.655	66.770	$0.045	130.203	5.859	$0.050	649.902	32.495				$0.045	94.346	4.246
8	2009	$0.030	2,464.236	73.927	$0.045	131.505	5.918	$0.050	714.893	35.745				$0.045	99.064	4.458
9	2010	$0.030	2,711.425	81.343	$0.045	132.820	5.977	$0.050	786.382	39.319	$0.050	547.500	27.375	$0.045	104.017	4.681
10	2011	$0.030	2,967.472	89.024	$0.045	134.149	6.037	$0.050	865.020	43.251	$0.050	547.500	27.375	$0.045	109.218	4.915
11	2012	$0.030	3,232.632	96.979	$0.045	135.490	6.097	$0.050	925.571	46.279	$0.050	547.500	27.375	$0.045	114.679	5.161
12	2013	$0.030	3,507.186	105.215	$0.045	136.845	6.158	$0.050	990.361	49.518	$0.050	547.500	27.375	$0.045	120.413	5.419
13	2014	$0.030	3,791.342	113.740	$0.045	138.214	6.220	$0.050	1,059.687	52.984	$0.050	547.500	27.375	$0.045	126.433	5.689
14	2015	$0.030	4,085.436	122.563	$0.045	139.596	6.282	$0.050	1,133.865	56.693	$0.050	547.500	27.375	$0.045	132.755	5.974
15	2016	$0.030	4,389.731	131.692	$0.045	140.992	6.345	$0.050	1,213.235	60.662	$0.050	547.500	27.375	$0.045	139.393	6.273
16	2017	$0.030	4,704.516	141.135	$0.045	142.402	6.408	$0.050	1,298.162	64.908	$0.050	547.500	27.375	$0.045	146.362	6.586
17	2018	$0.030	5,030.089	150.903	$0.045	143.826	6.472	$0.050	1,389.033	69.452	$0.050	547.500	27.375	$0.045	153.680	6.916
18	2019	$0.030	5,289.686	158.691	$0.045	145.264	6.537	$0.050	1,486.265	74.313	$0.050	547.500	27.375	$0.045	161.364	7.261
19	2020	$0.030	5,400.385	162.012	$0.045	146.716	6.602	$0.050	1,590.304	79.515	$0.050	547.500	27.375	$0.045	169.433	7.624
20	2021	$0.030	5,513.347	165.400	$0.045	148.184	6.668	$0.050	1,701.625	85.081	$0.050	547.500	27.375	$0.045	177.904	8.006
21	2022	$0.030	5,628.617	168.859	$0.045	149.665	6.735	$0.050	1,786.707	89.335	$0.050	547.500	27.375	$0.045	186.799	8.406
22	2023	$0.030	5,746.244	172.387	$0.045	151.162	6.802	$0.050	1,876.042	93.802	$0.050	547.500	27.375	$0.045	196.139	8.826
23	2024	$0.030	5,866.273	175.988	$0.045	152.674	6.870	$0.050	1,969.844	98.492	$0.050	547.500	27.375	$0.045	205.946	9.268
24	2025	$0.030	5,988.753	179.663	$0.045	154.200	6.939	$0.050	2,068.336	103.417	$0.050	547.500	27.375	$0.045	216.244	9.731
25	2026	$0.030	6,113.735	183.412	$0.045	155.742	7.008	$0.050	2,171.753	108.588	$0.050	547.500	27.375	$0.045	227.056	10.218
26	2027	$0.030	6,241.269	187.238	$0.045	157.300	7.078	$0.050	2,280.341	114.017	$0.050	547.500	27.375	$0.045	238.409	10.728
27	2028	$0.030	6,371.406	191.142	$0.045	158.873	7.149	$0.050	2,394.358	119.718	$0.050	547.500	27.375	$0.045	250.329	11.265
28	2029	$0.030	6,504.199	195.126	$0.045	160.462	7.221	$0.050	2,514.076	125.704	$0.050	547.500	27.375	$0.045	262.846	11.828
29	2030	$0.030	6,639.701	199.191	$0.045	162.066	7.293	$0.050	2,639.779	131.989	$0.050	547.500	27.375	$0.045	275.988	12.419
30	2031	$0.030	6,777.967	203.339	$0.045	163.687	7.366	$0.050	2,771.768	138.588	$0.050	547.500	27.375	$0.045	289.787	13.040
31	2032	$0.030	6,919.054	207.572	$0.045	165.324	7.440	$0.050	2,910.357	145.518	$0.050	547.500	27.375	$0.045	304.277	13.692
32	2033	$0.030	7,063.017	211.891	$0.045	166.977	7.514	$0.050	3,055.875	152.794	$0.050	547.500	27.375	$0.045	319.491	14.377
33	2034	$0.030	7,209.916	216.297	$0.045	168.647	7.589	$0.050	3,208.668	160.433	$0.050	547.500	27.375	$0.045	335.465	15.096
34	2035	$0.030	7,359.809	220.794	$0.045	170.333	7.665	$0.050	3,369.102	168.455	$0.050	547.500	27.375	$0.045	352.238	15.851
35	2036	$0.030	7,512.757	225.383	$0.045	172.037	7.742	$0.050	3,537.557	176.878	$0.050	547.500	27.375	$0.045	369.850	16.643
36	2037	$0.030	7,668.821	230.065	$0.045	173.757	7.819	$0.050	3,714.435	185.722	$0.050	547.500	27.375	$0.045	388.343	17.475
37	2038	$0.030	7,828.065	234.842	$0.045	175.495	7.897	$0.050	3,900.156	195.008	$0.050	547.500	27.375	$0.045	407.760	18.349
38	2039	$0.030	7,990.552	239.717	$0.045	177.249	7.976	$0.050	4,095.164	204.758	$0.050	547.500	27.375	$0.045	428.148	19.267
39	2040	$0.030	8,156.348	244.690	$0.045	179.022	8.056	$0.050	4,299.922	214.996	$0.050	547.500	27.375	$0.045	449.555	20.230
40	2041	$0.030	8,325.520	249.766	$0.045	180.812	8.137	$0.050	4,514.919	225.746	$0.050	547.500	27.375	$0.045	472.033	21.241

Period		*Revenue Summary*			
Project Year	Calendar Year	Op Rev Subtotal	Non Op Revenue	Reserves Earnings	Gross Revenue
	Units	$	$	$	$
1	2002	48.076	0.481		48.557
2	2003	53.065	0.531		53.595
3	2004	58.644	0.586		59.230
4	2005	111.770	1.118	0.000	112.887
5	2006	121.715	1.217	0.051	122.983
6	2007	132.176	1.322	0.207	133.705
7	2008	143.186	1.432	0.476	145.094
8	2009	154.780	1.548	0.867	157.195
9	2010	191.086	1.911	1.389	194.386
10	2011	203.964	2.040	1.389	207.394
11	2012	216.254	2.163	1.389	219.806
12	2013	229.079	2.291	1.389	232.759
13	2014	242.465	2.425	1.389	246.279
14	2015	256.437	2.564	1.389	260.391
15	2016	271.023	2.710	1.389	275.122
16	2017	286.250	2.862	1.389	290.502
17	2018	302.149	3.021	1.389	306.560
18	2019	316.440	3.164	0.000	319.605
19	2020	326.659	3.267	0.000	329.926
20	2021	337.367	3.374	0.000	340.741
21	2022	346.892	3.469	0.000	350.361
22	2023	356.760	3.568	0.000	360.328
23	2024	366.988	3.670	0.000	370.658
24	2025	377.589	3.776	0.000	381.365
25	2026	388.579	3.886	0.000	392.465
26	2027	399.974	4.000	0.000	403.974
27	2028	411.793	4.118	0.000	415.911
28	2029	424.052	4.241	0.000	428.292
29	2030	436.769	4.368	0.000	441.137
30	2031	449.966	4.500	0.000	454.465
31	2032	463.661	4.637	0.000	468.298
32	2033	477.877	4.779	0.000	482.656
33	2034	492.635	4.926	0.000	497.562
34	2035	507.960	5.080	0.000	513.039
35	2036	523.875	5.239	0.000	529.114
36	2037	540.406	5.404	0.000	545.810
37	2038	557.580	5.576	0.000	563.155
38	2039	575.424	5.754	0.000	581.179
39	2040	593.969	5.940	0.000	599.909
40	2041	613.245	6.132	0.000	619.377

Period		Gross Revenue Taxes						
Project Year	Calendar Year	Gross Revenue	13% Tax	Credits Available	Credits Taken	Net 13% Tax Due	3% Tax Due	Total Tax Due
	Units	$	$	$	$	$	$	$
1	2002	48.557	-	-	-	-	-	0.000
2	2003	53.595	-	-	-	-	-	0.000
3	2004	59.230	-	-	-	-	-	0.000
4	2005	112.887	-	395.000	-	-	-	0.000
5	2006	122.983	-	395.000	-	-	-	0.000
6	2007	133.705	-	395.000	-	-	-	0.000
7	2008	145.094	-	395.000	-	-	-	0.000
8	2009	157.195	-	395.000	-	-	-	0.000
9	2010	194.386	-	395.000	-	-	-	0.000
10	2011	207.394	-	395.000	-	-	-	0.000
11	2012	219.806	-	395.000	-	-	-	0.000
12	2013	232.759	-	395.000	-	-	-	0.000
13	2014	246.279	-	395.000	-	-	-	0.000
14	2015	260.391	-	395.000	-	-	-	0.000
15	2016	275.122	-	395.000	-	-	-	0.000
16	2017	290.502	-	395.000	-	-	-	0.000
17	2018	306.560	-	395.000	-	-	-	0.000
18	2019	319.605	-	395.000	-	-	-	0.000
19	2020	329.926	-	395.000	-	-	-	0.000
20	2021	340.741	-	395.000	-	-	-	0.000
21	2022	350.361	-	395.000	-	-	-	0.000
22	2023	360.328	-	395.000	-	-	-	0.000
23	2024	370.658	-	395.000	-	-	-	0.000
24	2025	381.365	-	395.000	-	-	-	0.000
25	2026	392.465	-	395.000	-	-	-	0.000
26	2027	403.974	-	395.000	-	-	-	0.000
27	2028	415.911	-	395.000	-	-	-	0.000
28	2029	428.292	-	395.000	-	-	-	0.000
29	2030	441.137	57.348	395.000	57.348	-	13.234	(13.234)
30	2031	454.465	59.080	337.652	59.080	-	13.634	(13.634)
31	2032	468.298	60.879	278.572	60.879	-	14.049	(14.049)
32	2033	482.656	62.745	217.693	62.745	-	14.480	(14.480)
33	2034	497.562	64.683	154.948	64.683	-	14.927	(14.927)
34	2035	513.039	66.695	90.265	66.695	-	15.391	(15.391)
35	2036	529.114	68.785	23.570	23.570	45.215	15.873	(61.089)
36	2037	545.810	70.955	-	-	70.955	16.374	(87.330)
37	2038	563.155	73.210	-	-	73.210	16.895	(90.105)
38	2039	581.179	75.553	-	-	75.553	17.435	(92.989)
39	2040	599.909	77.988	-	-	77.988	17.997	(95.985)
40	2041	619.377	80.519	-	-	80.519	18.581	(99.100)

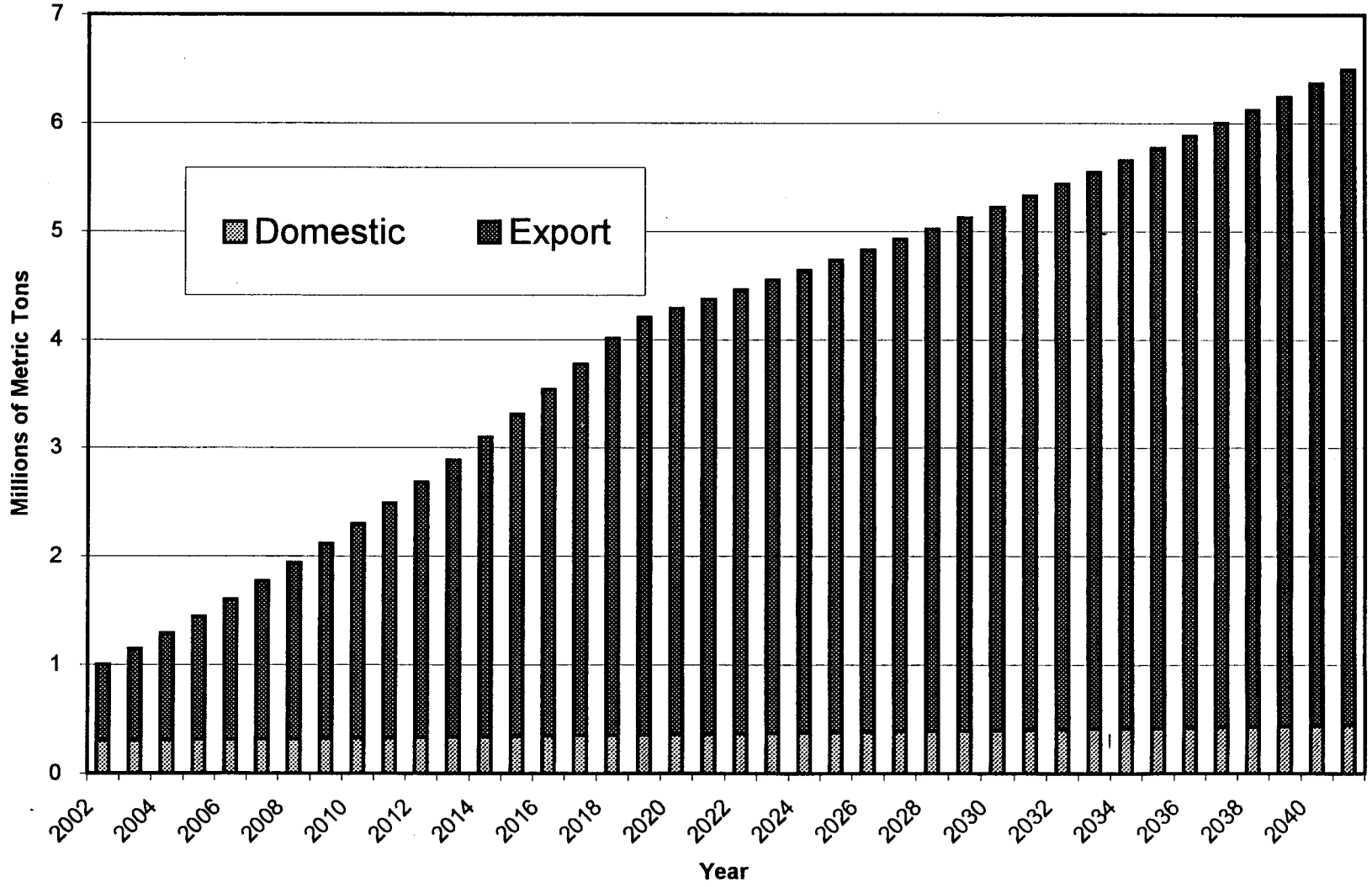
Period		*Operating Costs - Base Traffic*												
Project	Calendar	General			Base Beans			Base Intermodal			Base Minerals			Base
Year	Year	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Subtotal
	Units	$	ton-km	$	$	ton-km	$	$	ton-km	$	$	ton-km	$	$
1	2002	(0.019)	568.218	(10.796)	(0.019)	384.450	(7.305)	(0.028)	153.750	(4.305)	(0.019)	65.700	(1.248)	(23.654)
2	2003	(0.019)	585.265	(11.120)	(0.019)	461.115	(8.761)	(0.028)	192.188	(5.381)	(0.019)	65.700	(1.248)	(26.511)
3	2004	(0.019)	602.823	(11.454)	(0.019)	540.675	(10.273)	(0.028)	240.234	(6.727)	(0.019)	65.700	(1.248)	(29.701)
4	2005	(0.019)	620.907	(11.797)							(0.019)	65.700	(1.248)	(13.046)
5	2006	(0.019)	639.534	(12.151)							(0.019)	65.700	(1.248)	(13.399)
6	2007	(0.019)	658.720	(12.516)							(0.019)	65.700	(1.248)	(13.764)
7	2008	(0.019)	678.482	(12.891)							(0.019)	65.700	(1.248)	(14.139)
8	2009	(0.019)	698.837	(13.278)							(0.019)	65.700	(1.248)	(14.526)
9	2010	(0.019)	719.802	(13.676)										(13.676)
10	2011	(0.019)	741.396	(14.087)										(14.087)
11	2012	(0.019)	763.638	(14.509)										(14.509)
12	2013	(0.019)	786.547	(14.944)										(14.944)
13	2014	(0.019)	810.143	(15.393)										(15.393)
14	2015	(0.019)	834.447	(15.854)										(15.854)
15	2016	(0.019)	859.481	(16.330)										(16.330)
16	2017	(0.019)	885.265	(16.820)										(16.820)
17	2018	(0.019)	911.823	(17.325)										(17.325)
18	2019	(0.019)	939.178	(17.844)										(17.844)
19	2020	(0.019)	967.353	(18.380)										(18.380)
20	2021	(0.019)	996.374	(18.931)										(18.931)
21	2022	(0.019)	1,026.265	(19.499)										(19.499)
22	2023	(0.019)	1,057.053	(20.084)										(20.084)
23	2024	(0.019)	1,088.765	(20.687)										(20.687)
24	2025	(0.019)	1,121.427	(21.307)										(21.307)
25	2026	(0.019)	1,155.070	(21.946)										(21.946)
26	2027	(0.019)	1,189.722	(22.605)										(22.605)
27	2028	(0.019)	1,225.414	(23.283)										(23.283)
28	2029	(0.019)	1,262.176	(23.981)										(23.981)
29	2030	(0.019)	1,300.042	(24.701)										(24.701)
30	2031	(0.019)	1,339.043	(25.442)										(25.442)
31	2032	(0.019)	1,379.214	(26.205)										(26.205)
32	2033	(0.019)	1,420.591	(26.991)										(26.991)
33	2034	(0.019)	1,463.208	(27.801)										(27.801)
34	2035	(0.019)	1,507.105	(28.635)										(28.635)
35	2036	(0.019)	1,552.318	(29.494)										(29.494)
36	2037	(0.019)	1,598.887	(30.379)										(30.379)
37	2038	(0.019)	1,646.854	(31.290)										(31.290)
38	2039	(0.019)	1,696.260	(32.229)										(32.229)
39	2040	(0.019)	1,747.147	(33.196)										(33.196)
40	2041	(0.019)	1,799.562	(34.192)										(34.192)

Period		I/C Operating Costs (A)											
Project	Calendar	Export Soy Beans			Domestic Soy Beans			Intermodal			Mineral		
Year	Year	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	Unit Costs	Units	O&M Costs	$/T-KM	Units	O&M Costs
	Units	$	ton-km	$	$	ton-km	$	$	ton-km	$	$	ton-km	$
1	2002												
2	2003												
3	2004												
4	2005	$0.019	1,559.176	(29.624)	0.019	126.374	(2.401)	$0.028	488.281	(13.672)	$0.019	0.000	0.000
5	2006	$0.019	1,773.358	(33.694)	0.019	127.638	(2.425)	$0.028	537.109	(15.039)	$0.019	0.000	0.000
6	2007	$0.019	1,995.441	(37.913)	0.019	128.914	(2.449)	$0.028	590.820	(16.543)	$0.019	0.000	0.000
7	2008	$0.019	2,225.655	(42.287)	0.019	130.203	(2.474)	$0.028	649.902	(18.197)	$0.019	0.000	0.000
8	2009	$0.019	2,464.236	(46.820)	0.019	131.505	(2.499)	$0.028	714.893	(20.017)	$0.019	0.000	0.000
9	2010	$0.019	2,711.425	(51.517)	0.019	132.820	(2.524)	$0.028	786.382	(22.019)	$0.019	547.500	(10.403)
10	2011	$0.019	2,967.472	(56.382)	0.019	134.149	(2.549)	$0.028	865.020	(24.221)	$0.019	547.500	(10.403)
11	2012	$0.019	3,232.632	(61.420)	0.019	135.490	(2.574)	$0.028	925.571	(25.916)	$0.019	547.500	(10.403)
12	2013	$0.019	3,507.166	(66.636)	0.019	136.845	(2.600)	$0.028	990.361	(27.730)	$0.019	547.500	(10.403)
13	2014	$0.019	3,791.342	(72.035)	0.019	138.214	(2.626)	$0.028	1,059.687	(29.671)	$0.019	547.500	(10.403)
14	2015	$0.019	4,085.436	(77.623)	0.019	139.596	(2.652)	$0.028	1,133.865	(31.748)	$0.019	547.500	(10.403)
15	2016	$0.019	4,389.731	(83.405)	0.019	140.992	(2.679)	$0.028	1,213.235	(33.971)	$0.019	547.500	(10.403)
16	2017	$0.019	4,704.516	(89.386)	0.019	142.402	(2.706)	$0.028	1,298.162	(36.349)	$0.019	547.500	(10.403)
17	2018	$0.019	5,030.089	(95.572)	0.019	143.826	(2.733)	$0.028	1,389.033	(38.893)	$0.019	547.500	(10.403)
18	2019	$0.019	5,289.686	(100.504)	0.019	145.264	(2.760)	$0.028	1,486.265	(41.615)	$0.019	547.500	(10.403)
19	2020	$0.019	5,400.385	(102.607)	0.019	146.716	(2.788)	$0.028	1,590.304	(44.529)	$0.019	547.500	(10.403)
20	2021	$0.019	5,513.347	(104.754)	0.019	148.184	(2.815)	$0.028	1,701.625	(47.646)	$0.019	547.500	(10.403)
21	2022	$0.019	5,628.617	(106.944)	0.019	149.665	(2.844)	$0.028	1,786.707	(50.028)	$0.019	547.500	(10.403)
22	2023	$0.019	5,746.244	(109.179)	0.019	151.162	(2.872)	$0.028	1,876.042	(52.529)	$0.019	547.500	(10.403)
23	2024	$0.019	5,866.273	(111.459)	0.019	152.674	(2.901)	$0.028	1,969.844	(55.156)	$0.019	547.500	(10.403)
24	2025	$0.019	5,988.753	(113.786)	0.019	154.200	(2.930)	$0.028	2,068.336	(57.913)	$0.019	547.500	(10.403)
25	2026	$0.019	6,113.735	(116.161)	0.019	155.742	(2.959)	$0.028	2,171.753	(60.809)	$0.019	547.500	(10.403)
26	2027	$0.019	6,241.269	(118.584)	0.019	157.300	(2.989)	$0.028	2,280.341	(63.850)	$0.019	547.500	(10.403)
27	2028	$0.019	6,371.406	(121.057)	0.019	158.873	(3.019)	$0.028	2,394.358	(67.042)	$0.019	547.500	(10.403)
28	2029	$0.019	6,504.199	(123.580)	0.019	160.462	(3.049)	$0.028	2,514.076	(70.394)	$0.019	547.500	(10.403)
29	2030	$0.019	6,639.701	(126.154)	0.019	162.066	(3.079)	$0.028	2,639.779	(73.914)	$0.019	547.500	(10.403)
30	2031	$0.019	6,777.967	(128.781)	0.019	163.687	(3.110)	$0.028	2,771.768	(77.610)	$0.019	547.500	(10.403)
31	2032	$0.019	6,919.054	(131.462)	0.019	165.324	(3.141)	$0.028	2,910.357	(81.490)	$0.019	547.500	(10.403)
32	2033	$0.019	7,063.017	(134.197)	0.019	166.977	(3.173)	$0.028	3,055.875	(85.564)	$0.019	547.500	(10.403)
33	2034	$0.019	7,209.916	(136.988)	0.019	168.647	(3.204)	$0.028	3,208.668	(89.843)	$0.019	547.500	(10.403)
34	2035	$0.019	7,359.809	(139.836)	0.019	170.333	(3.236)	$0.028	3,369.102	(94.335)	$0.019	547.500	(10.403)
35	2036	$0.019	7,512.757	(142.742)	0.019	172.037	(3.269)	$0.028	3,537.557	(99.052)	$0.019	547.500	(10.403)
36	2037	$0.019	7,668.821	(145.708)	0.019	173.757	(3.301)	$0.028	3,714.435	(104.004)	$0.019	547.500	(10.403)
37	2038	$0.019	7,828.065	(148.733)	0.019	175.495	(3.334)	$0.028	3,900.156	(109.204)	$0.019	547.500	(10.403)
38	2039	$0.019	7,990.552	(151.820)	0.019	177.249	(3.368)	$0.028	4,095.164	(114.665)	$0.019	547.500	(10.403)
39	2040	$0.019	8,156.348	(154.971)	0.019	179.022	(3.401)	$0.028	4,299.922	(120.398)	$0.019	547.500	(10.403)
40	2041	$0.019	8,325.520	(158.185)	0.019	180.812	(3.435)	$0.028	4,514.919	(126.418)	$0.019	547.500	(10.403)

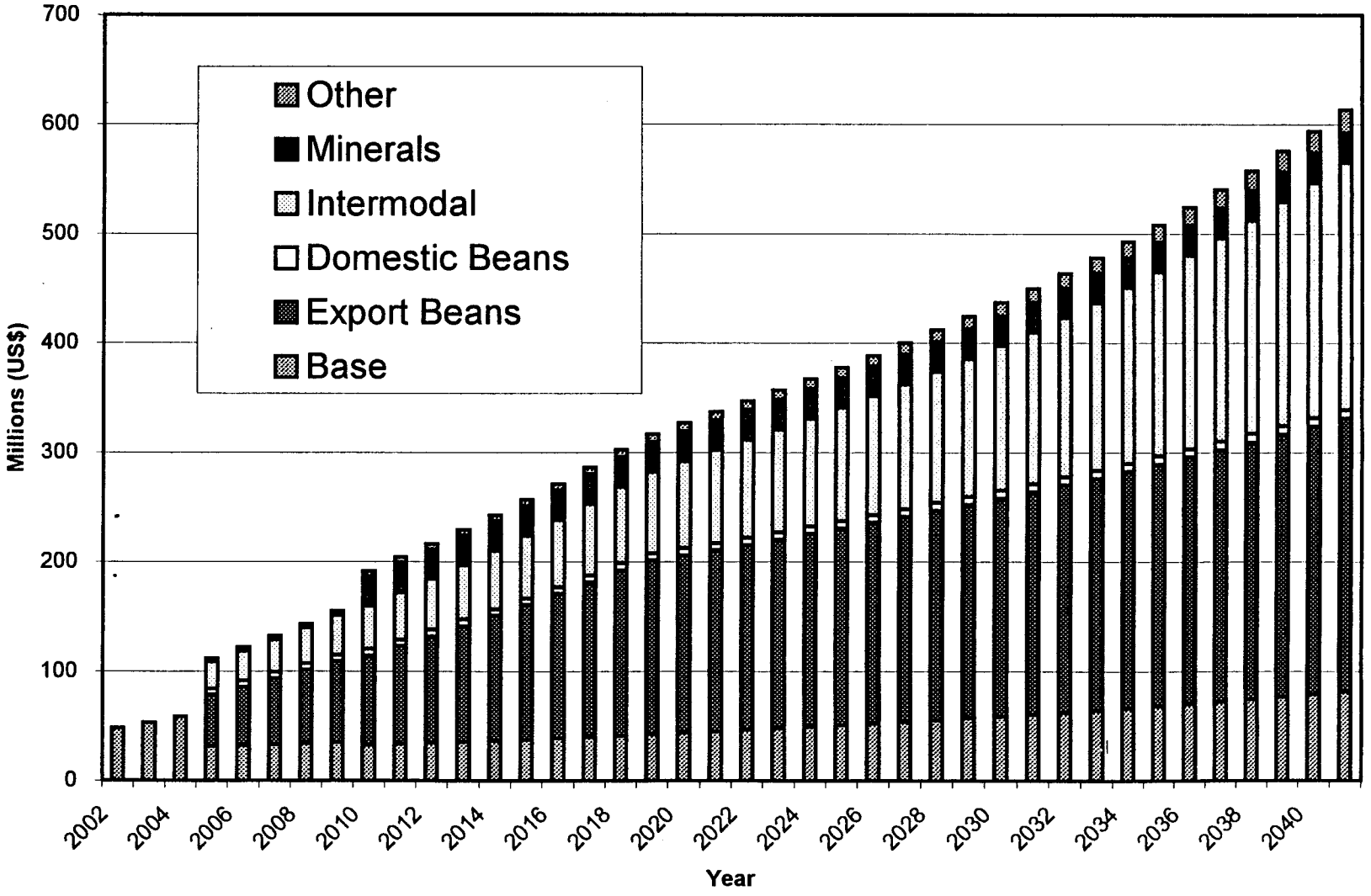
Period		I/C Operating Costs (B)					
Project Year	Calendar Year	$/T-KM	Other Units	O&M Costs	OM Cost Summary Base	I/C	Total
	Units	$	ton-km	$	$	$	$
1	2002				(23.654)	0.000	(23.654)
2	2003				(26.511)	0.000	(26.511)
3	2004				(29.701)	0.000	(29.701)
4	2005	$0.019	81.500	(1.549)	(13.046)	(47.246)	(60.291)
5	2006	$0.019	85.575	(1.626)	(13.399)	(52.784)	(66.183)
6	2007	$0.019	89.854	(1.707)	(13.764)	(58.613)	(72.377)
7	2008	$0.019	94.346	(1.793)	(14.139)	(64.751)	(78.891)
8	2009	$0.019	99.064	(1.882)	(14.526)	(71.218)	(85.744)
9	2010	$0.019	104.017	(1.976)	(13.676)	(88.438)	(102.114)
10	2011	$0.019	109.218	(2.075)	(14.087)	(95.629)	(109.716)
11	2012	$0.019	114.679	(2.179)	(14.509)	(102.492)	(117.001)
12	2013	$0.019	120.413	(2.288)	(14.944)	(109.657)	(124.601)
13	2014	$0.019	126.433	(2.402)	(15.393)	(117.138)	(132.530)
14	2015	$0.019	132.755	(2.522)	(15.854)	(124.949)	(140.803)
15	2016	$0.019	139.393	(2.648)	(16.330)	(133.105)	(149.435)
16	2017	$0.019	146.362	(2.781)	(16.820)	(141.623)	(158.443)
17	2018	$0.019	153.680	(2.920)	(17.325)	(150.520)	(167.844)
18	2019	$0.019	161.364	(3.066)	(17.844)	(158.348)	(176.192)
19	2020	$0.019	169.433	(3.219)	(18.380)	(163.545)	(181.925)
20	2021	$0.019	177.904	(3.380)	(18.931)	(168.997)	(187.928)
21	2022	$0.019	186.799	(3.549)	(19.499)	(173.767)	(193.266)
22	2023	$0.019	196.139	(3.727)	(20.084)	(178.709)	(198.793)
23	2024	$0.019	205.946	(3.913)	(20.687)	(183.831)	(204.518)
24	2025	$0.019	216.244	(4.109)	(21.307)	(189.141)	(210.448)
25	2026	$0.019	227.056	(4.314)	(21.946)	(194.646)	(216.592)
26	2027	$0.019	238.409	(4.530)	(22.605)	(200.355)	(222.959)
27	2028	$0.019	250.329	(4.756)	(23.283)	(206.276)	(229.559)
28	2029	$0.019	262.846	(4.994)	(23.981)	(212.419)	(236.401)
29	2030	$0.019	275.988	(5.244)	(24.701)	(218.794)	(243.494)
30	2031	$0.019	289.787	(5.506)	(25.442)	(225.409)	(250.851)
31	2032	$0.019	304.277	(5.781)	(26.205)	(232.277)	(258.482)
32	2033	$0.019	319.491	(6.070)	(26.991)	(239.407)	(266.398)
33	2034	$0.019	335.465	(6.374)	(27.801)	(246.812)	(274.613)
34	2035	$0.019	352.238	(6.693)	(28.635)	(254.503)	(283.138)
35	2036	$0.019	369.850	(7.027)	(29.494)	(262.492)	(291.986)
36	2037	$0.019	388.343	(7.379)	(30.379)	(270.794)	(301.173)
37	2038	$0.019	407.760	(7.747)	(31.290)	(279.422)	(310.712)
38	2039	$0.019	428.148	(8.135)	(32.229)	(288.390)	(320.619)
39	2040	$0.019	449.555	(8.542)	(33.196)	(297.714)	(330.910)
40	2041	$0.019	472.033	(8.969)	(34.192)	(307.409)	(341.601)

Period		Net Income									Equity Cash Flow Analysis				18%	
Project Year	Calendar Year	Net Oper. Income	Debt Service	DCR	Net Income	25% Income Tax	Credit Available	Credit Taken	Tax Paid	After-Tax Net Income	Equity Distributions	Contributions to Construction	Reserves Deposits	Project Reserves	Equity Cash Flow	Equity Payback
	Units	$	$		$	$	$	$	$	$	$	$	$	$	$	year
1	2002	24.903			24.903	0.000	-	0.000	0.000	24.903		(24.903)			(110.000)	-
2	2003	27.085			27.085	0.000	-	0.000	0.000	27.085		(27.085)			0.000	-
3	2004	29.529			29.529	0.000	-	0.000	0.000	29.529		(29.529)			0.000	-
4	2005	52.596	(50.560)	1.040	2.036	0.000	-	0.000	0.000	2.036	1.018		1.018	1.018	1.018	-
5	2006	56.800	(50.560)	1.123	6.240	0.000	-	0.000	0.000	6.240	3.120		3.120	4.138	3.120	-
6	2007	61.328	(50.560)	1.213	10.768	0.000	-	0.000	0.000	10.768	5.384		5.384	9.522	5.384	-
7	2008	66.204	(50.560)	1.309	15.644	0.000	-	0.000	0.000	15.644	7.822		7.822	17.343	7.822	-
8	2009	71.450	(50.560)	1.413	20.890	0.000	-	0.000	0.000	20.890	10.445		10.445	27.789	10.445	-
9	2010	92.271	(64.371)	1.433	27.901	0.000	-	0.000	0.000	27.901	27.901		0.000	27.789	27.901	-
10	2011	97.678	(64.371)	1.517	33.307	0.000	-	0.000	0.000	33.307	33.307		0.000	27.789	33.307	-
11	2012	102.805	(64.371)	1.597	38.434	0.000	-	0.000	0.000	38.434	38.434		0.000	27.789	38.434	11
12	2013	108.158	(64.371)	1.680	43.788	0.000	-	0.000	0.000	43.788	43.788		0.000	27.789	43.788	11
13	2014	113.749	(64.371)	1.767	49.378	0.000	-	0.000	0.000	49.378	49.378		0.000	27.789	49.378	11
14	2015	119.588	(64.371)	1.858	55.217	0.000	-	0.000	0.000	55.217	55.217		0.000	27.789	55.217	11
15	2016	125.687	(64.371)	1.953	61.316	0.000	-	0.000	0.000	61.316	61.316		0.000	27.789	61.316	11
16	2017	132.058	(64.371)	2.052	67.688	0.000	-	0.000	0.000	67.688	67.688		0.000	27.789	67.688	11
17	2018	138.716	(64.371)	2.155	74.345	0.000	-	0.000	0.000	74.345	102.134		(27.789)	0.000	102.134	11
18	2019	143.412	(64.371)	2.228	79.042	0.000	-	0.000	0.000	79.042	79.042		0.000	0.000	79.042	11
19	2020	148.001	(64.371)	2.299	83.630	0.000	-	0.000	0.000	83.630	83.630		0.000	0.000	83.630	11
20	2021	152.813	(64.371)	2.374	88.442	0.000	-	0.000	0.000	88.442	88.442		0.000	0.000	88.442	11
21	2022	157.095	(64.371)	2.440	92.724	0.000	-	0.000	0.000	92.724	92.724		0.000	0.000	92.724	11
22	2023	161.535	(64.371)	2.509	97.164	0.000	-	0.000	0.000	97.164	97.164		0.000	0.000	97.164	11
23	2024	166.140	(64.371)	2.581	101.769	0.000	-	0.000	0.000	101.769	101.769		0.000	0.000	101.769	11
24	2025	170.917	(64.371)	2.655	106.546	0.000	-	0.000	0.000	106.546	106.546		0.000	0.000	106.546	11
25	2026	175.873	(64.371)	2.732	111.502	0.000	-	0.000	0.000	111.502	111.502		0.000	0.000	111.502	11
26	2027	181.015	(64.371)	2.812	116.644	0.000	-	0.000	0.000	116.644	116.644		0.000	0.000	116.644	11
27	2028	186.352	(64.371)	2.895	121.981	0.000	-	0.000	0.000	121.981	121.981		0.000	0.000	121.981	11
28	2029	191.891	(64.371)	2.981	127.521	0.000	-	0.000	0.000	127.521	127.521		0.000	0.000	127.521	11
29	2030	184.408	0.000	na	184.408	46.102	13.234	13.234	32.868	151.540	151.540		0.000	0.000	151.540	11
30	2031	189.980	0.000	na	189.980	47.495	26.868	26.868	20.627	169.353	169.353		0.000	0.000	169.353	11
31	2032	195.767	0.000	na	195.767	48.942	40.917	40.917	8.025	187.742	187.742		0.000	0.000	187.742	11
32	2033	201.778	0.000	na	201.778	50.444	55.397	50.444	0.000	201.778	201.778		0.000	0.000	201.778	11
33	2034	208.022	0.000	na	208.022	52.006	70.324	52.006	0.000	208.022	208.022		0.000	0.000	208.022	11
34	2035	214.511	0.000	na	214.511	53.628	85.715	53.628	0.000	214.511	214.511		0.000	0.000	214.511	11
35	2036	176.039	0.000	na	176.039	44.010	101.588	44.010	0.000	176.039	176.039		0.000	0.000	176.039	11
36	2037	157.307	0.000	na	157.307	39.327	117.962	39.327	0.000	157.307	157.307		0.000	0.000	157.307	11
37	2038	162.338	0.000	na	162.338	40.585	134.857	40.585	0.000	162.338	162.338		0.000	0.000	162.338	11
38	2039	167.571	0.000	na	167.571	41.893	152.292	41.893	0.000	167.571	167.571		0.000	0.000	167.571	11
39	2040	173.014	0.000	na	173.014	43.253	170.290	43.253	0.000	173.014	173.014		0.000	0.000	173.014	11
40	2041	178.676	0.000	na	178.676	44.669	188.871	44.669	0.000	178.676	178.676		0.000	0.000	178.676	11

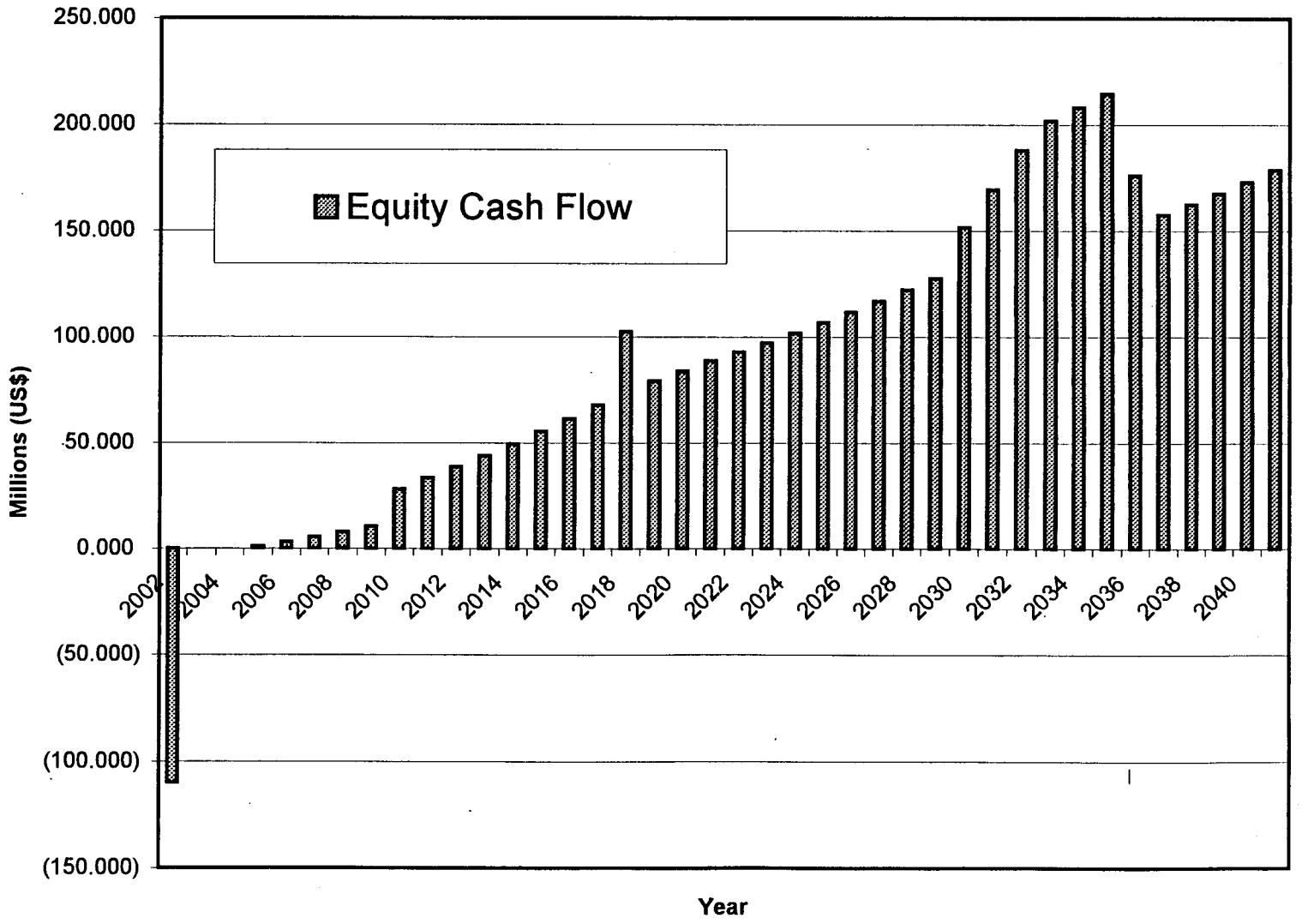
Soy Bean Production



Total Revenue



Equity Cash Flow



Company	Address	City, State, Zip Code	Phone	Products/Services
ABC-NACO Inc.	2001 Butterfield Rd., Suite 502	Downers Grove, IL 60515	630-852-1300	Wheels, couplers, and suspension systems
Alaska Railroad	P.O. Box 107500	Anchorage, AK 99510	907-265-2300	Rail operator
Amtech	19111 Dallas Parkway, Suite 300	Dallas, TX 75287-3106	800-923-4824	Wireless AVI and AEI systems
Anil Verma Associates, Inc.	444 S Flower Street, Suite 1688	Los Angeles, CA 90071	213-624-6908	Construction equipment
ARINC	2551 Riva Road	Annapolis, MD 21401	410-266-4717	Signaling/train control
Bechtel Civil Company	50 Beale Street, PO Box 193956	San Francisco, CA 94119 3965	415-768-0835	Car Yards, Construction
BNSF			800-809-2673	Rail operator
Booz, Allen & Hamilton, Inc.	8251 Greensboro Drive	McLean, VA 22102	215-496-8400	Communications equipment
BRW, Inc.	700 3rd Street S	Minneapolis, MN 55415	612-370-0700	Engineering
CAF USA, Inc.	1401 New York Avenue NW, Suite 600	Washington, DC 20005-6200	202-347-5772	Couplers and draft gear
CAGY Industries	PO Box 1109	Columbus, MS 39703	601-327-8664	Rail operator
CANAC	6163 Braeleigh Lane	Alexandria, VA 22315	514-399-5741	Motor rebuilding and supplies
CH2M HILL	6060 S Willow Drive	Greenwood Village, CO 80111-5142	303-771-0900	Project management
CSX Transportation			904-359-3100	Rail operator
Cummins Engine Company, Inc.	500 Jackson Street, Mail Code 60621, Box 3005	Columbus, IN 47202-3005	812-377-3915	Engine components
Diesel Power & Controls, LLC	503 N Walnut Road	Kennett Square, PA 19348	610-585-6119	Alternators
ESRI	380 New York Street	Redlands, CA 92373	909-793-2853	Geographic information services
Frederic R. Harris Transit Group	3840 Kilroy Airport Way, Suite 350	Long Beach, CA 90806	562-981-2950	Construction management
Gannett Fleming, Inc.	P.O. Box 67100	Harrisburg, PA 17106-7100	717-763-7212	Car yards
Greenbrier	One Centerpointe Dr., Suite 200	Lake Oswego, OR 97035	503-684-7000	Freight car building and leasing
HMMH	15, New England Executive Park	Burlington, MA 01803	781-229-0707	Noise and vibration control

Company	Address	City, State, Zip Code	Phone	Products/Services
Kansas City Southern Railway	114 West 11th St.	Kansas City, MO 64105	816-983-1303	Rail operator
Kosciusko and Southwestern	PO Box 278	Kosciusko, MS 39090	662-290-0200	Rail operator
L.B. Foster Company, Inc.	6455 Old Peachtree Road	Norcross, GA 30071	770-662-7774	Track and track accessories
Lord Corporation	2000 West Grandview Blvd.	Erie, PA 16514-0038	800-458-0456	Vibration, shock, motion, and noise solutions
Multimodal Applied Systems Inc	125 Village Blvd. Suite 270	Princeton, NJ 08540	609-419-9800	Scheduling and service design software
Norfolk Southern	Three Commercial Place	Norfolk, Va. 23510-9215	757-629-2740	Rail operator
Parsons Transportation Group	1133 15th ST, NW Suite 800	Washington, DC 20005	202-775-3363	Planning, engineering and design, program management, and construction management
Providence and Worcester				Rail operator
Rail America	5300 Broken Sounds Blvd., NW	Boca Raton, FL 33487	800-211-7245	Short line rail operators
STV Incorporated	225 Park Avenue South	New York, NY 10003	215-629-4004	Locomotives
Trinity Industries, Inc.	2525 Stemmons Freeway	Dallas, TX 75207	214-631-4420	Rail cars and freight equipment
UPSP	1416 Dodge Street	Omaha, NE 68179	402-271-5000	Rail operator
W.H. Miner Division	1200 East State Street	Geneva, Il 60134	630-232-3000	Spring packages, draft gears, side bearings, and discharge systems
Wisconsin Central	6250 N. River Road	Rosemont, Il 60018	847-318-4600	Rail operator