# COMMUNITY GOVERNMENT SERVICE

# COST AND REVENUE PROJECTIONS

MINNESOTA ENVIRONMENTAL QUALITY BOARD
REGIONAL COPPER-NICKEL STUDY

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# Volume V, Chapter 13--COMMUNITY GOVERNMENT SERVICE COST AND REVENUE PROJECTIONS

## 13.1 INTRODUCTION AND SUMMARY OF FINDINGS

The fiscal impacts of development are a major issue to be faced by local government officials with regard to potential copper-nickel operations in the Study Area. Copper-nickel development is a labor intensive industry. If such development should occur in the Study Area, significant population changes at the local level will occur (see Chapters 1 and 7 on population and residential settlement). For example, should a large fully integrated copper-nickel operation be located in the central part of the copper-nickel resource zone, near Babbitt, between 2,000 and 2,500 mining-related jobs would be created and Babbitt's population could increase by almost 60 percent over 1976 levels. People who settle in a community for whatever reason (copper-nickel jobs, retirement, seasonal recreation, etc.) make demands on the roads, sewers, water systems and other services of the communities. In order to satisfy the demands of a growing population and to maintain a desirable level of services, a community must make expenditures to upgrade, extend, and add new functions to its infrastructure.

Estimation of community service expenditures which result from an expanding population in the Study Area is an essential part of assessing the impact of copper-nickel development. In conjunction with the revenue projections presented in Volume 5, Chapter 12 of this report, cost estimates allow examination of potential fiscal stresses which may occur among the local governments in the Study Area.

Based on information from the literature and available from state agency sources, community service cost data were developed which allow the projection of

community and school district expenditures resulting from population growth. The generalized annual per capita operating cost multiplier used in community cost analysis is $212.

In addition, a debt service multiplier which reflects the annual repayment of capital facilities cost, assuming a 20 year debt at 7 percent interest, of $334 per capita is used. For school districts of the study area, a per pupil unit operting cost of $1,477 is assumed, plus a debt service cost of $366 per pupil-unit for capital expansion. Data for each community service function used to determine these multipliers are listed in the references.

When compared with projectons of local revenues resulting from potential copper-nickel mining and the expanded population, service cost projections will aid in the estimation of fiscal impacts on communities. Analysis will draw attention to areas which may feel the grip of a tightening tax base in relation to growing service demands. Conversely, an area which receives a disproportionate share of mining-generated revenues yet bears little of the cost burden of development may be highlighted through analysis.

In order to assess the significance of these impacts, estimated revenues accruing to cities and school districts as a result of copper-nickel development are compared to the anticipated costs which must be incurred by local government to meet the demands of copper-nickel related population growth. It is at the local level of government where disparities between revenue and cost of development hit the hardest and are the most immediately apparent.

When faced with prospects of increased expenditures, forecasts of revenues become a valuable planning aid for local officials. The information presented in this chapter indicates that under certain circumstances local government will not receive adequate revenue to cover increased service expenditures associated

with growth stimulated by copper-nickel development, but that the distribution of revenues and expenditures from an areal perspective would be, with a few anomolies, relatively equitable. In addition, school district revenue is more responsive to changing conditions over time than is the flow of revenue to cities.

Most important to the 8 cities and 7 school districts of the Study Area is the indication that local government revenues generated by copper-nickel development are estimated to be insufficient to match the estimated expenditures which must be made to meet the demands of development-related population. Using relatively conservative assumptions about revenues and costs, in only one case among the 60 analyzed were annual revenues great enough to cover the total estimated annual costs of development. Further, in the majority of cases, revenue was insufficient to meet even the annual operating costs resulting from development. There were, however, instances where revenues exceeded operating costs, particularly among the primary development communities of several development scenarios studied.

The implications of this are straightforward. A community could refuse to accommodate growth which increases costs above revenues through adaption of policies which make it all but impossible to expand its population. But, if development occurs, its related population must locate somewhere, and such an approach only shifts the problem to some other location.

A community's expenditures on service functions are directly related to the size of its population--the greater its population, the greater its demand for services, and the more the community must make in service expenditures. However, this is not to say that per-capita expenditures automatically expand as population increases. Economies of scale certainly exist for many community service

functions; as population expands, the per-capita expenditure by a community may actually diminish. Many service expenditures grow in a step-wise manner. Thresholds in demand (population) may occur which periodically call for large capital expenditures, so that the community's cost curve over time resembles the steps of a stairway.

When faced with prospects of increased expenditures, a community must match its projected expenditure increase with an increase in revenue or face the prospect of incurring a deficit to be funded by greater taxes on the existing population, incurring debt, using fiscal surplus from previous periods or not providing increased services. If the option of not providing increased services is selected, then the existing population will experience a reduction in the services available to them. To match the growing increase in expenditures, the community can count on the increased assessed valuation it is certain to experience as new population expands the housing stock. However, it has been shown (Pattie 1973, Weber 1978) that single-family housing (which is desired by about 85 percent of the Study Area residents according to a survey of households conducted by the State Demographer) often contributes less in revenue to a community than is required for service expenditures.

If new development is found not to pay its own way, the existing mill rates of the city and school district could be raised to increase the levy necessary to maintain its existing level of services. The levy would have to be raised in an amount equal to the disparity between development related revenues and costs. For example, if a large combination open-pit and underground mine and mill (no smelter or refineries) were located in resource zone 4 near Babbitt, Babbitt could experience a projected $1.3 million per year short fall in revenues to meet projected costs. If Babbitt had to make up this deficit through an increase in its property tax mill rates, its 1976 mill rate (.0040) would have

to be increased by almost 40 times to 0.1538. In addition, the school district would have to increase its mill rate from 0.0037 to 0.1209, a 33-fold increase.

Minnesota's mineral tax laws exempt mining developments from local ad valorem taxes, the primary source of local government revenue. As a result, communities, if they do not adequately share in the distribution of state aids which were established to reimburse local governments for lost ad valorem revenues, will be forced to raise their mill rates in order to generate revenues sufficient to cover increased expenditures. An increase in mill rates would have the effect of placing part of the fiscal burden of expanded service expenditures on the existing population. Present residents would subsidize the services provided to new residents.

If the present population of the Study Area should not pay higher taxes to support new development, then, the flow of revenue to the Study Area must be increased, either by an increase in the tax rate of the copper-nickel production tax or alteration of the present distribution formula so that more revenue is funneled to the area of principal impact. An increase in the tax rate would benefit each of the recipients of the production tax equally, while a change in the distribution formula would benefit one account at the expense of another.

To offset the projected revenue short fall by increasing the production tax, the amount of the increase depends on the location of the mining operation and the level of annual ore production. For the three mine/mill development scenarios presented in this chapter, the production tax would have to be increased about tenfold, from its present 4.6¢ per ton of ore produced to something around 46¢ per ton of ore produced. The range for the required production tax in the three scenarios presented was from about 41¢ for the Open Pit mine near Hoyt Lakes to 53¢ for the Underground mine near Ely.

An alternative method of financing capital improvement projects, thus eliminating the debt service costs otherwise faced by these units of government, should be considered. By financing these projects through grants or interest free loans from other tax accounts, the Taconite Area Environmental Protection and Economic Development Fund, for example, the debt service cost faced by local governments could be eliminated or at least minimized. Copper-nickel development would contribute significant revenues to these funds (see Chapter 12). It is estimated by the Minnesota Department of Revenue that this fund will have annual receipts of about $20 million by 1985 from taconite production. By the year 2000, a single copper-nickel operation will contribute about $1.2 million annually.

Capital expansion costs to local government can be further reduced should there be significant unused capacity at the time of copper-nickel development. Recent reports by the Eveleth and Ely schools indicate that significant capacity will be available as a result of declining enrollments in the next 5 years. This is generally true across the state and will significantly reduce the capital costs necessary to meet the demands of development-related population growth.

The distribution of revenues among the units of government of the Study Area relative to the distribution of development-related costs is fairly equitable. In most instances the difference between a unit of government's share of revenue and its share of cost was very small, less than 5 percentage points. When deviations occur, they are among the principal cities of the scenario and in most cases represent a larger share of revenues for the principal city. The distribution of revenues and costs among school districts is very close, the only significant deviation is the case of Aurora-Hoyt Lakes under the Open Pit scenario.

Related to the areal distribution of revenues is the phenomenon witnessed in the case of the scenario which locates an underground mine/mill near Ely. In this case, it is shown that several cities may actually lose revenue as a result of development even though they are expected to experience a small amount of population growth. This occurs because the city does not maintain its share of total Taconite Area population when copper-nickel related population is concentrated in a small area, in this case the Ely area. This phenomenon also occurs for the Taconite Area as a whole. With a sizeable population growth occuring in a relatively small area (the Study Area) as a result of copper-nickel development, the remainder of the Taconite Area may well lose revenues it normally receives from taconite production tax distribution. As the population of the Study Area increases, the cities of the remainder of the Taconite Area will maintain smaller shares of the total Taconite Area population. They would then receive a smaller amount of taconite production tax revenue which will not change as a result of copper-nickel development.

A major problem in the fiscal affairs of expanding communities is the difference between the time when expenditures must be made for services to accomodate a growing population and the time at which revenues to the city (through taxes and state and federal aids) are available to pay for these new service facilities and programs. Revenues generally lag behind expenditures for many reasons. First, many city services must be provided in advance of population expansion if that growth is to occur in an orderly and efficient manner. For example, a city typically must lay out new streets, provide sewer and water connections, and perhaps add to its school building before the first house of a new community addition is even under construction. However, not until that house has been on the tax roll for two years will the city receive any property tax revenue from its new residents.

Another lag is peculiar to Minnesota's mineral tax laws. The production tax on taconite and copper-nickel ores exempts mineral operations from local property taxes and in their place establishes a distribution of production tax revenues to the local units of government. Revenue is tied directly to the production of ore. An operation incurs tax liability for production from the previous year. So, if an operation begins construction of its facilities in year 1, for example, and begins mining in year 4, it will not contribute to the revenues of local governments until year 5, or 4 years after the operation begins creating demands on the local governments.

Other state aids lag the original need for revenue by a year. In an expanding area, local revenues from various state aids are always "catching up" to the demand for revenue but never quite make it. Conversely, when population begins to fall, the communities receive a short-term windfall as the adjustments of state aid begin to take into account the declining population only after it has occurred.

Examination of the timing of costs and revenue receipts indicates that the school district revenues are more responsive to the changes in the estimated population and costs during the early construction years than are the revenues of the cities. School districts receive a large portion of their revenue in the form of aids from the state government, financed from state income and sales tax revenues. This provides a relatively responsive form of revenue distribution. City governments, on the other hand, still depend to a great extent on the property tax for revenue generation. The property tax is not as responsive to changes in population, requiring up to two years for a property to produce revenue to the city. Thus the lag shown in the cities.

In addition to the previously mentioned options available to state and local government to reduce the impacts of cost/revenue disparities, many others exist

which alter the extent and characteristics of new growth, the cost and level of expanded services, or the level and source of additional revenues.

The results presented below show that based on local government revenue and cost estimates of copper-nickel related development, the cities and school districts do not receive revenues large enough to cover the estimated costs of development-related services. In only one case (the Gilbert school district under the Smelter/ Refinery scenario) among the four development scenarios and 15 units of government evaluated do the estimated annual revenues exceed annual costs in a steady-state year of operation, and then only by $1,000. The largest estimated revenue shortfall occurs for the city of Ely under the Underground mine/mill scenario; in this case annual costs exceed annual revenue in the steady state year of operation by $870,000.

It is not possible in this report to present detailed examination of each unit of government over the life of each of the four development scenarios. To understand the general fiscal impacts of copper-nickel development, each unit of government (7 school districts and 8 cities) in the Study Area is evaluated at a point in time when the development scenario reaches a steady-state situation. In addition, the primary development city and school district in each sccenario will be examined over the life of the operation. This allows a look at city or school district revenue and cost curves over time in order to determine any fiscal impacts due solely to the timing of revenues relative to cost, regardless of any disparities in magnitude.

The "boom town" phenomenon often occurs in development projects such as those described here. It occurs when population growth and its associated demands during the early years of a project cannot be accommodated by the existing community infrastructure because the tax-generated revenues available to a com-

munity often lag behind the demands of its rapidly growing population. This is particularly evident during the construction phase of a project when the work force appears almost instantaneously and is often of much greater magnitude than the permanent operating work force.

Boom town types of impacts related to the development scenarios described here appear to be minimal. This is due primarily to two factors. One, the peak construction work force is of about the same magnitude as the permanent operating work force and there is no dramatic peak in the early years of the scenarios. Secondly, the system by which revenues are channeled to cities and especially school districts is relatively responsive to the changes in population and service demands. This is not to say the boom town phenomenon will not occur. Once a mining company decides to go ahead with a project, employment in a community and its related demands will change very rapidly and services and delivery systems will be unsettled until the development project reaches a steady-state level of operation. Housing shortages as occurred during the taconite expansion of the early 1970s are probably the most evident result of very rapid growth. The community can minimize these types of impacts by planning ahead and utilizing its service facilities in a flexible manner during the often chaotic early years of any development project. what does that mean?

Finally, it should be remembered that mining operations are usually considered high risk investments in the financial community. What can look like a sound, profitable venture on paper can often turn sour and fail. Copper-nickel development in Minnesota would be based on a low grade ore and will require high copper and nickel market prices in order to be profitable. If the developers of a new copper-nickel mine happen to guess wrong and experience a market slump during the initial production years, then the lack of profits and possible severe loss could result in the mine's failure. This recently happened in Arizona with Hecla's Lakeshore Mine.

The implications of the failure of a new mining operation on local governments and communities could be catastrophic. In addition to the severe social disruption of a community, its sources of revenue would rapidly decline while its costs and new debts would remain largely unchanged. Therefore, the economic viability of a new mining venture should be of utmost concern to any community which is largely dependent on that industry for its economic livelihood.

## 13.2 STUDY AREA

Government service expenditures are estimated in this chapter as generalized costs to local government within the Study Area (Figure 1). These include the following communities:

| | |
|---|---|
| Aurora | Eveleth |
| Babbitt | Gilbert |
| Biwabik | Hoyt Lakes |
| Ely | Virginia |

and school districts:

| | |
|---|---|
| Aurora-Hoyt Lakes | Eleveth |
| Babbitt | Gilbert |
| Biwabik | Virginia |
| Ely | |

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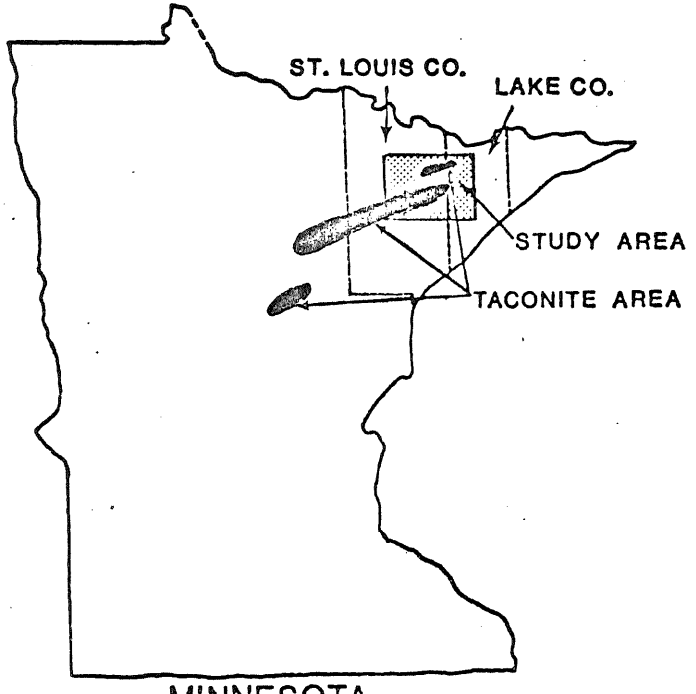
Figure 1 (map)

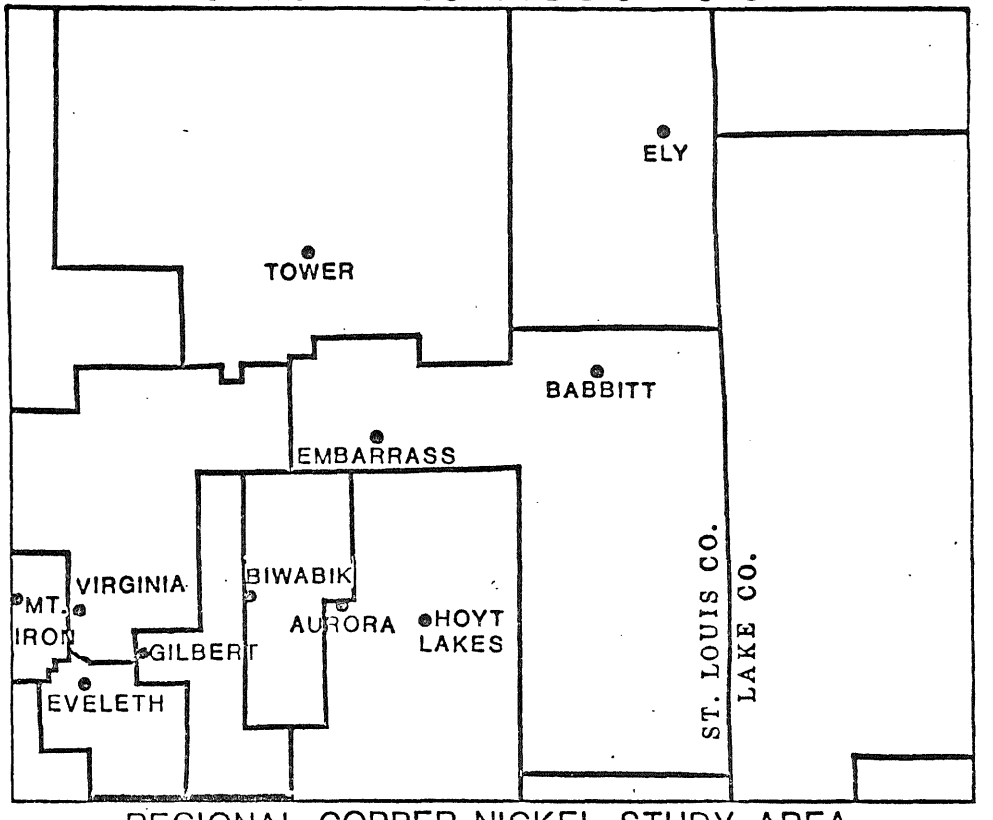
## 13.3 CHARACTERIZATION OF GOVERNMENT SERVICE COSTS

At the local level, units of government have relatively unique service functions. For community cost projections, these service functions are simplified




MINNESOTA

CITIES AND SCHOOL DISTRICTS




REGIONAL COPPER-NICKEL STUDY AREA

# STATE AND LOCAL UNITS OF GOVERNMENT

and the costs are assigned to a city or school district within the Study Area according to the population distribution described in Chapter 7 of this report. Most services demanded by new copper-nickel related population which locates within established communities will be provided by the municipal government. The county provides many services as well, but for residents of established communities most would duplicate the services of the city.

Services included in the municipal cost multiplier calculations are:

1) general government
2) public protection - police and fire
3) sanitation - sewer, water, refuse, and drainage
4) streets and roads
5) recreation - parks, open space, and library.

The school district, of course, provides the education function for the population within its boundaries.

Not included in the generalized community multiplier is an estimate for the cost of hospital services. This was omitted because only one community in the Study Area, Virginia, maintains a municipal hospital and Virginia is projected to receive only a small portion of the estimated population growth resulting from copper-nickel development (see Chapter 7 of this report). A seperate multiplier which reflects the cost of providing hospital services is used for making projections for the city of Virginia.

The costs of government services can be characterized as a function of many factors, including the size of population, the existing capacity of services, the present debt service of the community, a community's attitude toward growth and emphasis on particular functions, and its zoning philosophy.

Community service costs are certainly related to the size of the population within its service area. As population grows, service costs increase. Depending on the shape of a community's service cost curve, new per capita costs may be higher or lower than present costs.

Figures 2 and 3

A community may face a cost curve as shown in Figure 2. In this case, the community would have rising marginal per capita cost until it reaches point P on the curve, with costs of K and population of O. As population grows past O, the marginal per capita costs begin to decrease as economies of scale in service delivery are achieved.

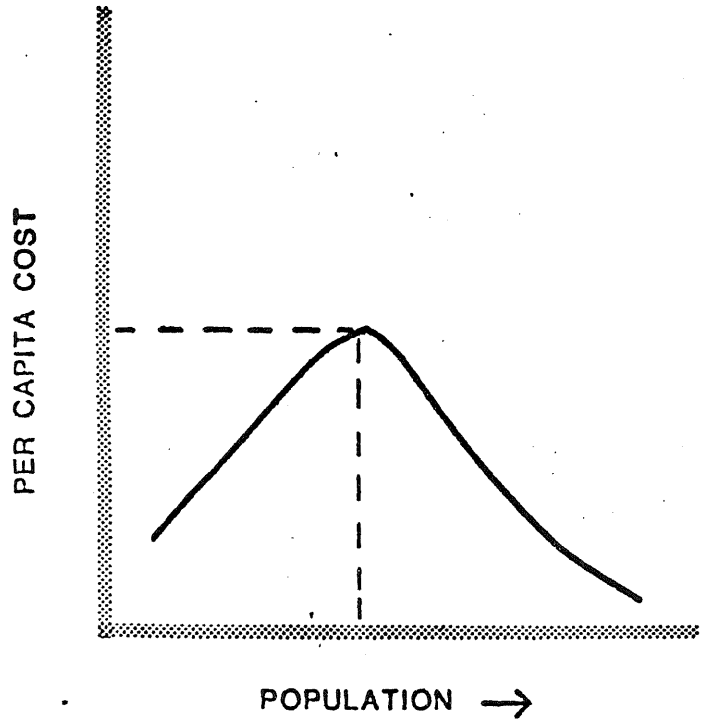
However, if a growing community has a cost curve similar to Figure 2 its marginal per capita costs will be continually greater than at previous smaller populations. This reflects a situation in which increased population makes it more difficult and more costly to provide services, or diseconomies of scale.

In Minnesota, per capita expenditures were found to have a curve as shown in Figure 4 (MIC 1976). Generally, per capita expenditures rise rapidly to a peak for communities of the 6,000-10,000 population level. From that point until cities reach the 20,000-30,000 level per capita expenditures are decreasing. Within the Study Area, Virginia (1976 pop. of 11,778) is the only city past the expenditure peak. The others are on the part of the curve which indicates rising per capita costs until substantial growth has occured.

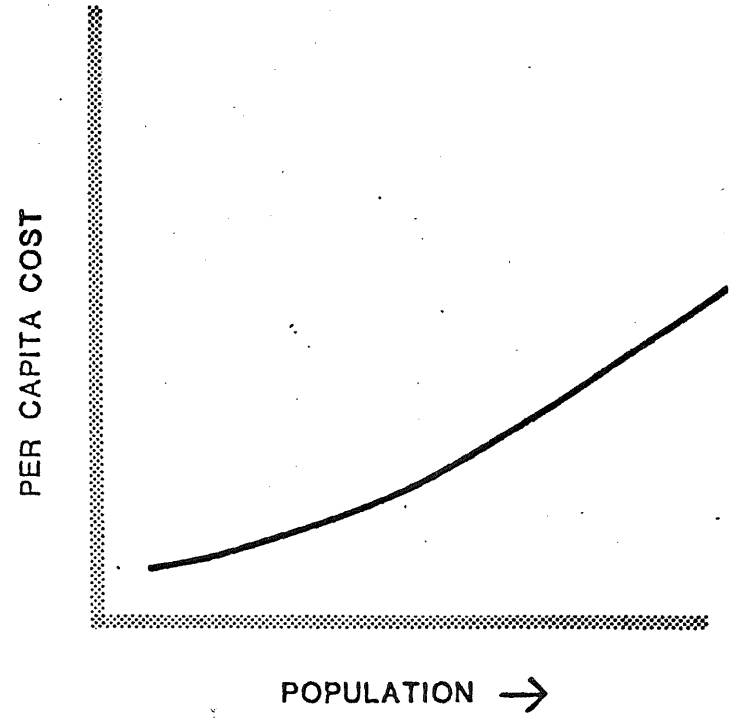
Figure 4

An important determinant in the cost of services is the amount of unused capacity a community may have for particular functions; its ability to absorb

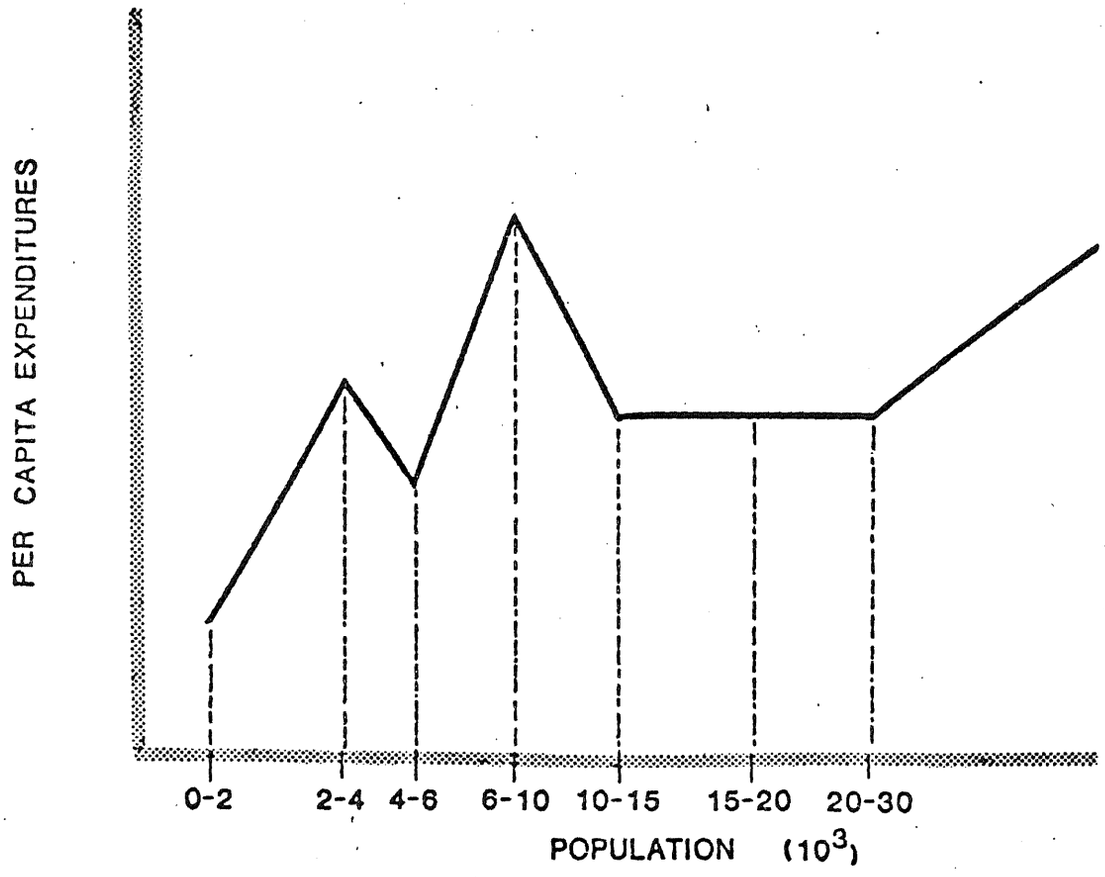
## HYPOTHETICAL PER CAPITA EXPENDITURES




## HYPOTHETICAL PEP CAPITA EXPENDITURES



# GENERALIZED MINNESOTA PER CAPITA EXPENDITURES



increased demand without major capital improvements. In the event of population growth, a community which is currently operating at 80 percent of its capacity would most certainly face a more pleasant future than would a community which is presently at or beyond its service capacity.

A community's ability to expand its service capacity, if it is necessary to do so, depends as well on its current level of outstanding debt. A community with no debt, such as Ely, and thus no debt service cost, is much freer to extend itself, incur debt, and expand its services than would a city which already has a high level of debt. At the same time, a city without debt may reflect the city's reluctance to incur debt and may seek other methods to provide capital expansion and services or forgo these increases.

Community attitude is also important in determining community service costs. A "slow growth" attitude in a community may place restrictions on development which in turn could result in higher service costs. As well, a community's reluctance to incur debt in order to expand services may preclude growth in any case. Differences in emphasis on the part of communities may lead to higher costs in some service functions and relatively lower cost in others. The city of Hoyt Lakes, for example, spends nearly three times the Study Area average on recreation. This is clearly a community policy and may be the result of a trade-off with other service functions.

Communities may also make zoning and development policy which affects the nature of its governmental service costs. It is commonly accepted that clustered and planned developments which minimize the spread of service areas can offer governmental services at a lower unit cost than development which is haphazard, unplanned, or more dispersed. Zoning can determine the density and type of housing, the length of sewer, water, and street extensions, etc. and therefore, impact directly on government costs.

— a function of technical & institutional factors

The factors mentioned above indicate that governmental costs are not an easy projection to make; nor will costs of a particular service function be consistent from community to community. Nonetheless, an estimate is necessary for impact assessment purposes.

A community is faced with three general types of cost. First, it must pay the current cost of operating its various service functions. Roads must be plowed, sewers repaired, employees paid, etc. Secondly, it must make capital outlays to expand or improve its present capacity. This investment in the future is most often beyond the financial capability of most communities, so debt is typically incurred to fund capital improvement projects. This creates a third governmental cost; that of debt service, the payment of principal and interest on loans used for capital outlays.

Methodology

Each of these costs can be presented as a per-capita cost (per-pupil unit in the case of school districts). Current operating costs are most easily adapted to per-capita terms and can generally be characterized as linear in nature. Capital outlay costs are a more difficult matter because major investments in service facilities occur only infrequently and only after thresholds in demand (population) are reached which make obsolete or overextend a community's existing service facilities. In order to develop per-capita capital cost figures, a scenario of hypothesized population growth must be developed which approximates a situation which would likely result in capital expenditures. For this, the literature has been examined.

The annual debt service cost per capita is determined by first summing the one-time per-capita capital outlays required to expand service capacity. This figure represents the total capital outlay which is required by the community for each new person in the city. Two assumptions must be made in order to

translate this figure to an annual cost multiplier for debt service. One, the entire capital outlay is assumed to be financed by debt, and two, the payback period for the repayment of principal and interest on all debt is assumed to be twenty years at a seven percent interest rate. This simplified methodology will set the annual per capita debt service multiplier at about 9.4 percent the per capita capital outlay multiplier (which is not an annual cost, but a one-time expenditure).

The annual debt service cost is calculated by annualizing the one-time capital cost figure. This is very similar to calculating the monthly mortage payment on a family home. Given the cost of the project, the length of the payback period, and the interest rate to be paid on the debt, amortization tables were consulted to find the annual payment of repay the debt incurred. A payback period of 20 years with an intrest rate of 7 percent for municipal government bonds is typical (Kruttila 1978).

The operating costs presented below are primarily from reports of the State Auditor. These reports present both operating and capital costs for each community in the Study Area. Because the population of the communities in the Study Area has been relatively stable since 1970 (see Chapter 1 of this report) the capital costs presented for the Study Area communities in the Auditor's reports do not represent an expansion of service capacity but merely show the cost of upgrading, replacing, and maintaining capital equipment and facilities. Therefore, capital outlays and operating costs as shown by the Auditor have been combined and presented for projection purposes as per capita operating costs. Per capita operating costs for 1977 among the cities of the Study Area ranged from $241 (Virginia) to $156 (Babbitt) and per capita capital outlays ranged from $93 (Virginia) to $7 (Ely). The average current operating cost plus capital expenditure for the cities is $239 per capita for 1977. The generalized

Auditor-reported operating costs presented below are three-year average (1975-1977) figures for the eight communities in the Study Area. Using recent data to project into the future necessitates the assumption that the present situation is normal and in equilibrium and that real per capita costs will remain approximately the same over time.

The capital cost multipliers presented below are estimates drawn from the literature. The primary source (with corrobartion from other sources) is The Costs of Sprawl (1974), a study completed for HUD, EPA and CEQ. In order to develop capital cost projections it is necessary to hypothesize development scenarios. In Costs of Sprawl two scenarios were developed, one for an expansion of 10,000 new dwelling units and another for 1,000 additional dwelling units. The smaller development scenario reflects the magnitude of expansion likely for any of the communities of the study area and is used whenever possible. However, due to the nature of service demands (many services require a greater threshold of demand than others) a larger population expansion is needed in order to project the capital costs of some services. When available, the per capita cost figures for the 1,000 dwelling units scenario are presented, otherwise the figures for the larger development are used.

## 13.4 MUNICIPAL SERVICE FUNCTIONS AND COST MULTIPLIERS

### 13.41 General Government

This category includes the general administration of city government such as the cost of a city manager's office, maintenance of community buildings and the cost of supporting city councils and other municipal offices. Data used to determine the annnual per capita operating cost are taken from reports of the State Auditor. The per capita capital outlay figure is from the Cost of Sprawl document, based on a scenario of 10,000 new dwelling units. Debt service is the

annualized capital cost based on the financing assumptions described above. All costs have been inflated to represent 1977 costs using the Implicit Price Deflators for State and Local Government (1978).

Table 1

The operating cost multiplier shown above is the average for the cities in the Study Area. This compares to an average of $22.02 for Minnesota cities with 2500-10,000 population and $21.44 for all Minnesota cities (Auditor 1978).

13.42 Public Protection

This category includes police and fire protection cost estimates. The operating cost estimate is from the State Auditor's reports, while the capital outlay multipliers are based on a 10,000 new dwelling unit scenario from the Cost of Sprawl.

Table 2

The Study Area average shown above is higher than the state average for cities 2500-10,000 population, $36.49, but less than the average for all Minnesota cities, $59.44.

13.43 Sanitation

Public utilities considered in this category include sewer, water, refuse collection, and drainage; each of which is typically offered by municipal governments. Operating cost data for sewer and refuse collection are taken from the Auditor's reports. Data for water is from the Costs of Sprawl. Drainage is assumed to have no annual operating cost. To develop the capital outlay multiplier, data from the Minnesota Pollution Control Agency were considered for

Table 1. General government cost multipliers for Study Area cities.

| Per Capita | | |
|---|---|---|
| Annual Operating Cost | Annual Dept Service | Single Capital Outlay |
| $24.44 | $2.14 | $22.68 |

Table 2. Public protection cost multipliers for Study Area cities.

| Per Capita | | |
|---|---|---|
| Annual Operating Cost | Annual Debt Service | Single Capital Outlay |
| $48.48 | $7.76 | $82.16 |

Table 3. Sanitation cost multipliers for Study Area cities.

| Per Capita | | |
|---|---|---|
| Annual Operating Cost | Annual Debt Service | Single Capital Outlay |
| $49.52 | $199.17 | $2110.00 |

sewer expansion. All other functions are from the Costs of Sprawl, assuming an expansion of 1,000 dwelling units.

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Table 3

The operating cost multiplier shown above is higher than both the state average for cities of 2500-10,000 population, $47.47, and all state cities, $42.48. This is because the Auditor's reports, source of the state average figures, consider only sewer and refuse collection in its data and not the cost of water and drainage services.

The per capita capital outlay for sanitation treatment is the largest among all the municipal services, accounting for 60 percent of total estimated per capita capital outlays. The cost to the city for this particular service expenditure can be greatly reduced through application of state and federal grants and aids. Quite commonly, the burden on the city amounts to only 10 percent of the total sanitation treatment project cost.

13.44 Streets and Roads

This category includes all public roads maintained by municipal government. The operating cost multiplier is taken from the State Auditor's reports, while the capital outlay multiplier is derived from data presented in Costs of Sprawl, based on an expansion of 1,000 dwelling units.

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Table 4

The operating cost multiplier for the Study Area is very close, but slightly higher than figures for Minnesota cities of 2,500-10,000 population, $51.28, and all Minnesota cities, $55.32.

Table 4. Streets and roads cost multipliers for Study Area cities.

| Per Capita | | |
|---|---|---|
| Annual Operating Cost | Annual Dept Service | Annual Capital Outlay |
| $56.42 | $112.80 | $1195.04 |

Table 5. Recreation cost multipliers for Study Area cities.

| Per Capita | | |
|---|---|---|
| Annual Operating Cost | Annual Dept Service | Single Capital Outlay |
| $32.71 | $12.39 | $131.25 |

Table 6. Hospital cost multipliers for Study Area cities.

| Per Capita | | |
|---|---|---|
| Annual Operating Cost | Annual Dept Service | Single Capital Outlay |
| $195.30 | $87.62 | $928.26 |

13.45 Recreation

This category includes cost estimates for parks, open space, and libraries. The operating cost multiplier is from the Auditor's reports. The capital outlay multiplier is from Costs of Sprawl, based on a 1,000 dwelling unit scenario for parks and open space and upon a 10,000 dwelling unit expansion for library costs.

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Table 5

The operating cost multipliers for the Study Area is higher than that for the Minnesota cities of 2,500-10,000 population, $26.62, and slightly less than the state average for all cities, $33.46.

13.46 Hospital

Though not included in the generalized projection multiplier figure, hospital cost estimates are presented for forecasting purposes. At present only one Study Area community, Virginia, has a municipally operated hospital facility. The multipliers are derived from data published by the Minnesota Department of Health and Hennepin County Medical Center.

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Table 6

The sum of the above service functions, without hospital, represents the general multiplier to be used for projecting the cost of population growth resulting from copper-nickel development. The operating cost multiplier is found to be $212 per capita. The Fiscal Impact Handbook (1978) uses a figure of $189 operating cost per capita for its municipal cost projections, 12 percent less than the multiplier presented for the Study Area.

The annualized capital outlay multiplier (presented as annual debt service) is $334 for the 20 year life of debt. As discussed above, use of this multiplier demands the assumption that there is no idle capacity in any of the service functions and that new service equipment and facilities must be purchased to meet the demands of development-related population.

The capital outlay multiplier more than likely represents the high end of the range of figures which could be used for projection purposes. It does not take into account the unused service capacity which is likely to appear in many of the communities, particularly among the school districts. It also does not account for the portion of development-related population which will come from the existing population of the area. These people, assuming supply and demand of services and facilities are in an equilibrium, would already have service facility provided to them and the projection multiplier would represent some double-counting (see Volume 5, Chapter 7 on residential settlement for a discussion on inmigration rates).

The inclusion of existing workers and costs in this analysis has the affect of raising total costs and total revenues received. If they could be excluded from the analysis so that only new costs and revenues are presented, the totals would decline, but the relationship between costs and revenues would remain approximately the same.

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Table 7

13.5 SCHOOL DISTRICT COST MULTIPLIERS

The cost of education is, of course, borne by the school district. The data presented is from the Minnesota Department of Education and represents the average operating costs PER PUPIL-UNIT for the Study Area. Capital costs are

Table 7. Summary of municipal cost multipliers for Study Area cities.

| | Per Capita | | |
|---|---|---|---|
| | Annual Operating Cost[1] | Annual Debt Service[2] | Single Capital Outlay[3] |
| General Government | 24.44 | 2.14 | 22.68 |
| Public Safety | 48.48 | 7.76 | 82.16 |
| Sanitation | 49.52[4] | 199.17 | 2110.00[5] |
| Streets and roads | 56.42 | 112.80 | 1195.04 |
| Recreation | 32.71 | 12.39 | 131.25 |
| TOTAL | $212.00 | $334.00 | $3541.00 |

[1]From State Auditor reports unless otherwise noted.
[2]Annualized capital outlay for 20 years at 7 percent interest.
[3]From Costs of Sprawl unless otherwise noted.
[4]Data from sewer and refuse collection from Auditor's reports, water from Costs of Sprawl and no operating cost assumed for damage.
[5]Data from MPCA for sewers, all other from Costs of Sprawl.

Table 8. Education cost multipliers for Study Area school districts.

| Per Pupil-Unit | | |
|---|---|---|
| Annual Operating Cost | Annual Operating Cost | Annual Operating Cost |
| $1477 | $366 | $3876 |

derived from Building Construction Cost Data (1977).

Table 8

The operating cost per pupil-unit for the Study area is 39 percent higher than the statwide average, $1059. All of the Study Area school districts, with the exception of Eveleth, rank above the 95th percentile in operating costs per pupil-unit.

The capital outlay, and thus the debt service cost, faced by any school district as a result of development will be greatly reduced if the school is presently operating at less than full capacity. This is the case for school districts across the state, and the Study Area is no exception. Eveleth and Ely have recently issued reports outlining the anticipated declining enrollment and resulting capacity through 1983. Facilities with unused capacity will reduce the need to expand schools and other service facilities and thus reduce the per capita capital outlay and debt service costs.

## 13.6 LOCAL GOVERNMENT COST PROJECTIONS

When the cost multipliers described above are applied to the population projections made in Chapter 7 of this report, the costs to municipalities and school districts resulting from copper-nickel related population are estimated. The scope of this report prevents examination of each taxing jurisdiction (8 cities, and 7 school districts) for each of the mining scenarios (underground, combination, open pit, and smelter/refinery) over the lifetime of each hypothesized mine model. Cost estimates are made for each community and school district for one equilibrium year of each mining scenario. In addition, estimates of costs over time are made for the principal development community and school district of each mining scenario.

Two assumptions are made to simplify the cost projections presented below. One, operating costs are allowed to vary directly according to the change in population in each community. This means that the cost estimate for a community will have a curve identically shaped to the change in copper-nickel population projected for that community. Two, it is assumed that in the first year communities and school districts accrue debt for capital outlays sufficient to meet the demands of the equilibrium population and enrollment resulting from copper-nickel development. This results in a debt service curve which is a straight line for a period of 20 years and then goes to zero.

13.61 Underground Mine/Mill Scenario

This mining development scenario has a 12,350,000 metric ton per year underground mine and mill located in northern Lake County (Resource Zone 2). Construction begins in year 1, with production beginning in year 5. Full production is reached in year 9 and continues until year 18 when the mine is gradually phased out so there is no production and no employment in year 31. Peak construction employment is reached in year 5 with 1,062 employees, while operating employees are phased in along with production and reach full employment of 1,857 in year 9. However, by the time the mining scenario reaches equilibrium there are no longer any construction workers. A family multiplier of 3 persons per household (as indicated in the State Demographer's household survey) is assumed to project population from employment data. Also, every copper-nickel related household generates 1.2 pupil units (from the household survey). A pupil-unit is a term used by the Minnesota Department of Education; a kindergarten student equals .5 pupil-units, and elementary student equals 1.0 pupil-units, and a secondary student equals 1.4 pupil-units.

These multipliers, determined from 1970 census data and a household survey conducted by the State Demographer's Office for the Regional Copper-Nickel Study,

are used to approximate total population and school enrollment changes resulting from each copper-nickel development scenario. Workers are distributed to residences in the cities and school districts of the Study Area by using a settlement model (described in Chapter 7 of this report) so that copper-nickel related population and enrollment are estimated for each of the 8 cities and 7 school districts in the Study Area.

Table 9 presents the underground scenario cost projections for each city and school district for a single year at full production.

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Table 9

Focusing on the city of principal growth, Ely, the table shows that the estimated copper-nickel related city expenditures are 73 percent the amount of Ely's 1976 municipal expenditures. Copper-nickel related school expenditures in Ely would amount to 98 percent of the Ely school's 1976 total expenditure. In any terms, this is a significant impact.

Other cities and school districts would be impacted much less, with copper-nickel related expenditures ranging from 43 percent of 1976 Babbitt city expenditures to less than 2 percent for 10 of the cities and school districts. This scenario represents the highest concentration of population and expenditure impacts in one city and school district among all the scenarios.

Table 9. Projected community development-related expenditures, underground scenario (mine/mill located on Resource Zone 2).

| | 1976 Population/ Pupil Units | 1976 Expenditures ($\$10^3$) | Copper-Nickel Population/ Pupil Units | Copper-Nickel Expenditures ($\$10^3$) |
|---|---|---|---|---|
| **Cities:** | | | | |
| Virginia | 11,728 | 6,087 | 84 | 70 |
| Gilbert | 2,604 | 623 | 11 | 6 |
| Eveleth | 4,667 | 1,829 | 28 | 15 |
| Ely | 4,961 | 1,849 | 2,485 | 1,357 |
| Biwabik | 1,483 | 421 | 17 | 9 |
| Babbitt | 2,892 | 561 | 440 | 240 |
| Aurora | 2,792 | 453 | 39 | 21 |
| Hoyt Lakes | 3,722 | 1,006 | 22 | 12 |
| TOTAL | 34,849 | 12,829 | 3,126 | 1,730 |
| School Districts: | | | | |
| Virginia | 3,318 | 5,030 | 49 | 90 |
| Gilbert | 968 | 1,414 | 8 | 15 |
| Eveleth | 2,029 | 2,374 | 14 | 26 |
| Ely | 1,807 | 2,609 | 1,384 | 2,551 |
| Biwabik | 999 | 1,387 | 10 | 18 |
| Babbitt | 1,935 | 3,309 | 311 | 573 |
| Aurora-Hoyt Lakes | 2,804 | 4,615 | 32 | 59 |
| TOTAL | 13,860 | 20,738 | 1,808 | 3,332 |

For the Study Area as a whole, the copper-nickel related expenditures for cities and school districts represent 13 percent and 16 percent of the respective 1976 expenditures. As with each of the base case scenarios, the projected expenditures related to copper-nickel employment, population, and school enrollment are not to be construed as representing the estimated change in community expenditures. Because some portion of each community's copper-nickel projected employment force will consist of persons who are presently residents of the area, the expenditures listed in Table 9 represent the role copper-nickel related demands will likely play in the school and city. The actual change in expenditures is likely to be less than those shown above. For the Study Area as a whole, the number of new immigrant families is expected to be 64 percent of the underground scenario production employment (see Chapter 7 for detailed discussion.

If this figure for adjusting employment projections to reflect the number of new families locating in a community is applied to Ely the increase in city expenditures is $868,000, an increase of 47 percent over the 1976 Ely level of expenditures. For the school district the increase in expenditures would be $1,633,000, or a 63 percent increase over 1976 expenditures.

Looking at the copper-nickel related expenditures over time indicates the difficulty communities may have in the early portion of a mineral development's life. Again focusing on Ely, the expenditures are depicted in the following figure.

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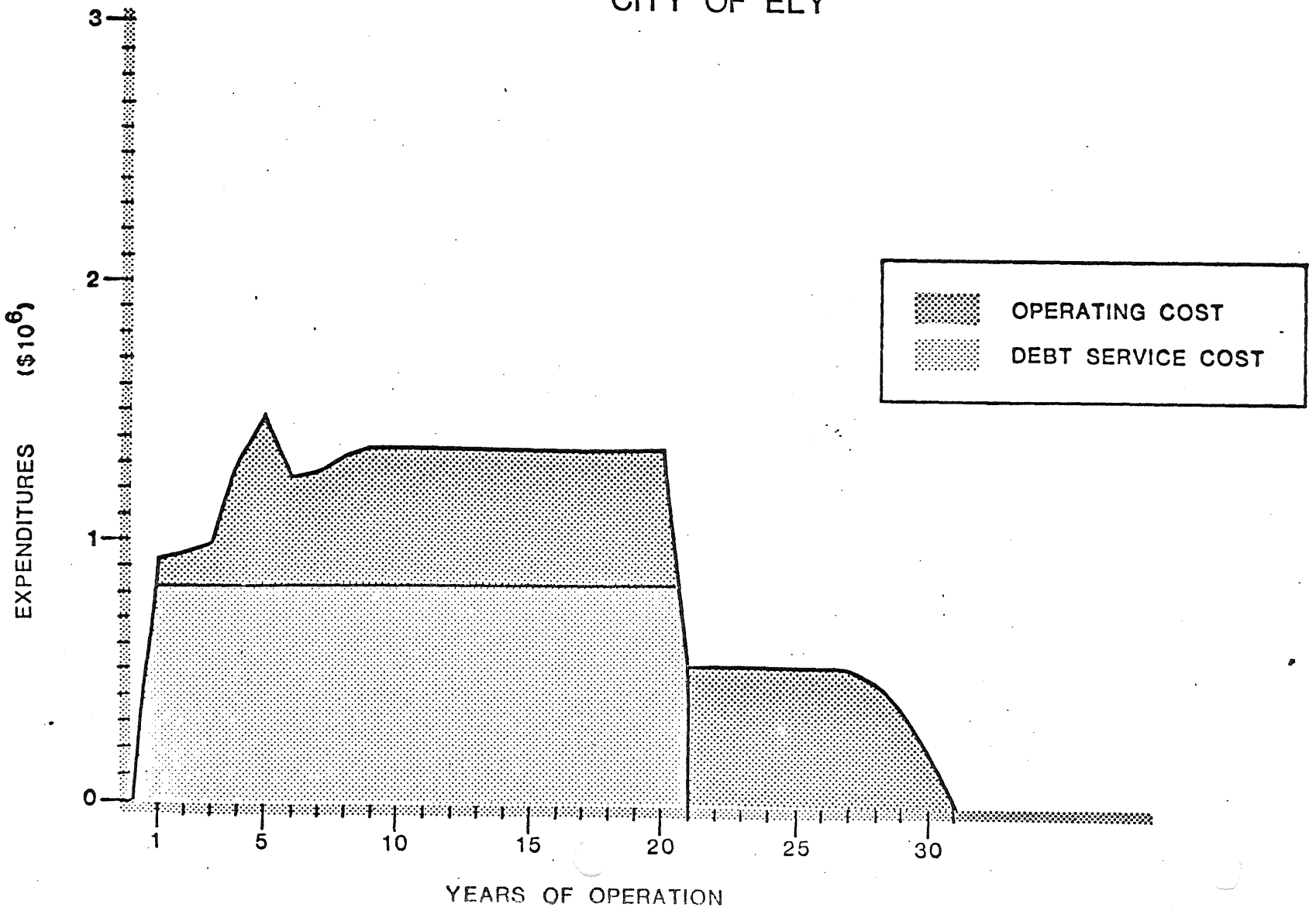
Figure 5

Figure 5 indicates the magnitude of the projected cost of capital facility expansion relative to estimated annual operating costs. It also shows the

# ESTIMATED EXPENDITURES
# RESULTING FROM COPPER-NICKEL UNDERGROUND SCENARIO
# CITY OF ELY



problems of front-end financing; due in part to the peak of employment in the early years of the operation, capital projects are often necessary before the revenues are available to finance these projects. It shows the debt service during the early years of a development project are considerable. This type of a cost curve is typical for all of the scenarios.

13.62 Combination Open Pit and Underground Mine/Mill Scenario

In this scenario a 16,680,000 metric ton per year combination open pit and underground mine and mill is located within the municipal boundaries of Babbitt, in the middle section of the Study Area mineralized zone (Resource Zone 4). Construction begins in year 1 and ore is produced in year 4.

Peak construction employment of 1,275 is reached in year 3 and construction is completed in year 5. Peak operation employment of 1,599 is reached in year 9. Family and student multipliers identical to those discussed above are assumed.

Table 10 presents the cost projections for each city and school district for a single year at full production under the combination scenario.

Table 10

The estimated copper-nickel related city expenditures for Babbitt, the city expected to experience the most growth under this scenario, are 142 percent the size of Babbitt's 1976 total city expenditures. This indicates that should Babbitt grow as projected here, the demands for city services by development-related population would represent approximately three-fifths the total city expenditures when this development scenario is at full production. The Babbitt school district would be impacted less severely, copper-nickel related expenditures projected to be about one-half the school's 1976 expenditures.

Table 10. Projected community development related expenditures, combination scenario (mine/mill located on Resource Zone 4).

| | 1976 Population/ Pupil Units | 1976 Expenditures ($\$10^3$) | Copper-Nickel Population/ Pupil Units | Copper-Nickel Expenditures ($\$10^3$) |
|---|---|---|---|---|
| **Cities:** | | | | |
| Virginia | 11,728 | 6,087 | 206 | 171 |
| Gilbert | 2,604 | 623 | 29 | 16 |
| Eveleth | 4,667 | 1,829 | 67 | 37 |
| Ely | 4,961 | 1,849 | 604 | 330 |
| Biwabik | 1,483 | 421 | 38 | 21 |
| Babbitt | 2,892 | 561 | 1,458 | 796 |
| Aurora | 2,792 | 453 | 106 | 58 |
| Hoyt Lakes | 3,722 | 1,006 | 53 | 29 |
| TOTAL | 34,849 | 12,829 | 2,561 | 1,458 |
| **School Districts:** | | | | |
| Virginia | 3,318 | 5,030 | 126 | 232 |
| Gilbert | 968 | 1,414 | 21 | 39 |
| Eveleth | 2,029 | 2,374 | 34 | 63 |
| Ely | 1,807 | 2,609 | 386 | 711 |
| Biwabik | 999 | 1,387 | 21 | 39 |
| Babbitt | 1,935 | 3,309 | 891 | 1,642 |
| Aurora-Hoyt Lakes | 2,804 | 4,615 | 81 | 149 |
| TOTAL | 13,860 | 20,738 | 1,560 | 1,778 |

Under this scenario, impacts on other cities would be less significant than the impacts on Babbitt, but more significant than the impacts on the cities (other than Ely) under the Underground scenario. While 10 cities and school districts in the underground scenario are estimated to have development expenditures less than 2 percent at 1976 levels, in this case all cities and school districts will have development expenditures greater than 2 percent of 1976 levels. The Ely school district is the highest of the secondary development cities with copper-nickel related expenditures estimated to be 27 percent of its 1976 expenditures.

For the Study Area as a whole, the development related expenditures for cities and school districts represent 11 and 14 percent, respectively, of the 1976 level of expenditures.

Again, these projections represent the expenditures necessary to meet the demands of all population directly related to copper-nickel development, including long-time residents who work for a copper-nickel opertion after leaving another job and new population coming to the Study Area because of a copper-nickel job.

For the Study Area, the number of new immigrant families is expected to be 62 percent of the combination scenario production employment. (see Chapter 7 for detailed discussion) Applying this figure to the development expenditures estimated for the city of Babbitt, the increase in expenditures is $494,000. This would be an increase of 88 percent over Babbitt's 1976 level of city expenditures. For the school district, the increase in expenditures would be $1,018,000, or a 31 percent increase over 1976 expenditures.

As with the underground scenario, the capital facilities necessary to handle the expected population growth will result in expenditures for debt service during the early years of the life of the development which are greater than operating

expenditures. This means that the burden on cities and school districts will be greater during the early years of development, while there is a debt service expenditure, than later on, when only operating expenditures must be made.

13.63 Open Pit Mine/Mill Scenario

In this scenario, construction begins in year 1 and is completed in year 4 with a peak employment at 1,515 in year 3. Operation employment reaches a peak of 1,378 in year 6. The mine/mill complex is located in the southern portion of the Study Area mineralized zone (Resource Zone 7), nearest the city of Hoyt Lakes and produces 20,000,000 metric tons of ore annually. Family and student multipliers identical to those discussed above are assumed.

Table 11 presents the cost projections for each city and school district in the Study Area for a single year at full production under the open pit scenario.

Table 11

This scenario results in the least concentrated population and expenditure impacts, due in large part to the transportation system and the location of cities in the southern part of the Study Area. Hoyt Lakes, which experiences the largest development related population and expenditure impact, is second to Aurora in terms of estimated expenditures as they relate to 1976 expenditure levels. Aurora's development related expenditures are projected to be 78 percent of its 1976 level, Hoyt Lakes' 45 percent. The Aurora-Hoyt Lakes school district would feel less impact, with copper-nickel related expenditures projected to be only 29 percent of the school district's 1976 expenditures.

Impacts of the open pit scenario are relatively significant for a number of other cities in the Study Area, particulary those along the southern transpor-

Table 11. Projected community development-related expenditures, open pit scenario (mine/mill located in Resource Zone 7).

| | 1976 Population/ Pupil Units | 1976 Expenditures ($\$10^3$) | Copper-Nickel Population/ Pupil Units | Copper-Nickel Expenditures ($\$10^3$) |
|---|---|---|---|---|
| **Cities:** | | | | |
| Virginia | 11,728 | 6,987 | 389 | 322 |
| Gilbert | 2,604 | 623 | 132 | 72 |
| Eveleth | 4,667 | 1,829 | 215 | 117 |
| Ely | 4,961 | 1,849 | 17 | 9 |
| Biwabik | 1,483 | 421 | 165 | 90 |
| Babbitt | 2,892 | 561 | 33 | 18 |
| Aurora | 2,792 | 453 | 645 | 352 |
| Hoyt Lakes | 3,722 | 1,006 | 823 | 449 |
| TOTAL | 34,849 | 12,829 | 2,419 | 1,429 |
| School Districts | | | | |
| Viginia | 3,318 | 5,030 | 186 | 343 |
| Gilbert | 968 | 1,414 | 117 | 216 |
| Eveleth | 2,029 | 2,374 | 134 | 247 |
| Ely | 1,807 | 2,609 | 10 | 18 |
| Biwabik | 999 | 1,387 | 93 | 171 |
| Babbitt | 1,935 | 3,309 | 78 | 144 |
| Aurora-Hoyt Lakes | 2,804 | 4,615 | 736 | 1,356 |
| TOTAL | 13,860 | 20,738 | 1,354 | 2,495 |

tation network. Ely and Babbitt, which are isolated from this network, will feel little impact from development in the Hoyt Lakes area. However, for cities along the southern edge of the Study Area, the copper-nickel related expenditures range from 21 percent of Biwabik's 1976 city spending to 5 percent of the 1976 expenditures of the city of Virginia.

For the Study Area as a whole, the development related expenditures for cities and school districts represent 11 and 12 percent, respectively, of 1976 level of expenditures.

As with the other scenarios, communities would be faced with the same sort of front end financing problems, though to lesser degree because of the smaller concentration of popultion in a single primary development community.

13.64 Smelter-Refinery Scenario

Located in the same area as the combination mine/mill (Resource Zone 4), the smelter/refinery is designed to accomodate the annual production from any one of the three mine/mill scenarios and produce 100,000 metric tons of metal annually. Construction begins in year 2 and is completed by year 4 with peak employment of 1,125. Operation begins in year 5 and reaches a peak employment of 621 in that year. Family and student multipliers indentical to those discussed above are assumed. The following table presents the cost projections for each city and school district for a single year at full production.

Table 12

The distribution pattern of population and expenditures resulting from a smelter/refinery development under this scenario would be identical to the pattern of the combination mine/mill scenario, though the magnitude of impacts is

Table 12. Projected community development-related expenditures, smelter/refinery (located in Resource Zone 4).

| | 1976 Population/ Pupil Units | 1976 Expenditures ($\$10^3$) | Copper-Nickel Population/ Pupil Units | Copper-Nickel Expenditures ($\$10^3$) |
|---|---|---|---|---|
| **Cities:** | | | | |
| Virginia | 11,728 | 6,087 | 80 | 66 |
| Gilbert | 2,604 | 623 | 11 | 6 |
| Eveleth | 4,667 | 1,829 | 26 | 14 |
| Ely | 4,961 | 1,849 | 235 | 128 |
| Biwabik | 1,483 | 421 | 15 | 8 |
| Babbitt | 2,892 | 561 | 566 | 309 |
| Aurora | 2,792 | 453 | 41 | 22 |
| Hoyt Lakes | 3,722 | 1,006 | 20 | 11 |
| TOTAL | 34,849 | 12,829 | 994 | 564 |
| School Districts | | | | |
| Viginia | 3,318 | 5,030 | 49 | 90 |
| Gilbert | 968 | 1,414 | 8 | 15 |
| Eveleth | 2,029 | 2,374 | 13 | 24 |
| Ely | 1,807 | 2,609 | 150 | 276 |
| Biwabik | 999 | 1,387 | 8 | 15 |
| Babbitt | 1,935 | 3,309 | 346 | 638 |
| Aurora-Hoyt Lakes | 2,804 | 4,615 | 31 | 57 |
| TOTAL | 13,860 | 20,738 | 605 | 1,115 |

significantly less. For the Study Area as a whole, the development related expenditures for cities and school districts represent 4 and 5 percent of the respective 1976 level of expenditures.

For the city of Babbitt the smelter/refinery related expenditures are estimated to be 34 percent of its 1976 expenditures. For the school district, the expenditures resulting from development are projected to be 12 percent of the school's 1976 expenditures.

A smelter/refinery located in or near Duluth is a distinct possibility. The aggregate city and school district costs resulting from this type of development would more than likely be of the same magnitude as those described in Table 12. However, the impact of a development this size on the city of Duluth (population about 100,000) would be significantly different than the impacts of the development were it located in or near Babbitt (population about 3,000). A city the size of Duluth would have the ability to absorb a smelter/refinery development with little disruption to its present service capabilities. Because of its larger size, Duluth would have the flexibility within its infrastructure (and quite likely the unused capacity) to accommodate the development-related growth with minimal impact.

In summary, three patterns emerge from the above analysis. First, as developments are moved from north to south, the degree of concentration of population and expenditures in a single community deminishes. Secondly, the size of development influences the magnitude of population and expenditure impacts with the growth resulting from the underground scenario being more severe than that of the open pit scenario because of its greater employment level. Third, while the population and expenditure impacts for the Study Area as a whole may be relatively small, less than 16 percent of 1976 expenditure levels for all scenarios,

the impacts on the individual primary development community are projected to be quite severe.

Regarding the distribution of population as it relates to development locations, a very distinct pattern emerges from analysis. For the underground mine/mill scenario, located near Ely in the northern part of the Study Area, 80 percent of the copper-nickel related population which locates in organized cities is projected to locate in Ely. This results in city expenditures for Ely representing 78 percent of all development-related city expenditures. The same pattern exists for the schools, with 77 percent of all development-related students and expenditures going to the Ely school district. For a development located in the southern part of the Study Area, the open pit scenario, the pattern is quite different. Hoyt Lakes receives the largest development impact among the cities, but only 34 percent of urban residents locate in Hoyt Lakes, resulting in 31 percent of the total development-related city expenditures. The impacts on the Aurora-Hoyt Lakes school district are larger due to its large consolidated area. It is estimated to receive 54 percent of total development-related school district students and expenditures.

As would be expected, the size of development influences the magnitude of impacts. The underground scenario has the highest level of employment while the open pit has the smallest employment among mine/mill scenarios. The smelter/refinery is significantly smaller than any of the mine/mill scenarios in terms of employment. Locating the underground model in a northern location results in a relatively large population distributed on a very concentrated pattern. Under this scenario, Ely would be the focus of very significant development pressures. On the other hand, the open pit scenario in the southern part of the Study Area results in a relatively small and more evenly distributed population and expenditure impact.

Perhaps the most important lesson to be learned from this analysis is that impacts which may be very significant when focus is on individual communities are often disguised when analysis is conducted on a more aggregated regional level. For example, if the city and school district expenditures for the Study Area as a whole are considered, the level of copper-nickel expenditures under the combination scenario are projected to be 11 and 14 percent, respectively, of 1976 expenditure levels. This is not an overwhelmingly large impact. However, under this scenario, the community of Babbitt will be significantly impacted. In the city, copper-nickel related expenditures are projected to be larger than the level of 1976 Babbitt expenditures. For the school district, development expenditures are estimated to be half the 1976 level.

This is a pattern which exists elsewhere in the socio-economic analysis. Impacts which seem relatively insignificant at the regional, county or Study Area level, when disaggregated to individual cities and school districts are very often formidable.

## 13.7 COPPER-NICKEL DEVELOPMENT-RELATED FISCAL IMPACTS ON LOCAL GOVERNMENTS

The fiscal impacts of development are a major issue to be faced by local government officials with regard to potential copper-nickel operations in the Study Area. In order to assess the significance of these impacts, estimated revenues accruing to cities and school districts as a result of copper-nickel development are compared to the anticipated costs which must be incurred by local government to meet the demands of copper-nickel related population growth. It is at the local level of government where disparities between revenue and cost of development hit the hardest and are the most immediately apparent.

Using the copper-nickel development scenarios and government cost estimates previously presented in this chapter and revenue estimates based on the information

presented in Chapter 12-Government Revenue/Taxes-comparison of costs and revenues can be made.

13.71 Open Pit Mine/Mill Scenario

This scenario has a 20,000,000 metric ton per year open pit mine and mill complex located in Resource Zone 7 near the city of Hoyt Lakes in the southern part of the Study Area. As discussed previously (community government cost estimates) this scenario results in the most evenly distributed population when compared to the other scenarios, with the city of Hoyt Lakes and the Aurora-Hoyt Lakes school district receiving the largest share of population among the Study Area units of government.

Table 13 summarizes the estimated development-related revenue and expenditures for a steady-state year of the mine/mill operation. It also shows the unit of government's share of total Study Area development-related revenue and expenditures and its estimated revenue on a per pupil unit and per capita basis.

Table 13

School districts of the Study Area are estimated to experience an annual combined revenue shortfall of $1.1 million in the steady-state development operation, with Aurora-Hoyt Lakes, the primary distict, responsible for 70 percent of the shortfall because of the concentration of population in the district. The cities of the Study Area as a whole are also estimated to receive $1.1 million less in revenues than costs incurred by development-related population. In this case, Hoyt Lakes represents 32 percent of the total shortfall and Aurora 25 percent.

In terms of distribution of revenues and costs across the Study Area, the cities seem to be fairly equitably treated with the difference between revenue and cost

Table 13. Study Area fiscal disparity/open pit scenario (mine/mill located in Resource Zone 7).

| | Development Related Pupil Units/ Population | Estimated Revenue ($\$10^3$) | Percentage of Study Area Total (%) | Estimated Cost ($10^3$) | Percentage of Study Area Total (%) | Net Fiscal Disparity ($\$10^3$) | Per Pupil Unit/Capita Revenue ($) |
|---|---|---|---|---|---|---|---|
| School Districts: | | | | | | | |
| Virginia | 186 | 259 | 18.6 | 343 | 13.7 | -84 | 1,392 |
| Gilbert | 117 | 164 | 11.8 | 216 | 8.7 | -52 | 1,402 |
| Eveleth | 134 | 178 | 12.8 | 247 | 9.9 | -69 | 1,328 |
| Ely | 10 | 15 | 1.1 | 18 | .7 | - 3 | 1,500 |
| Biwabik | 93 | 111 | 8.0 | 171 | 6.9 | -60 | 1,194 |
| Babbitt | 78 | 84 | 6.0 | 144 | 5.8 | -60 | 1,077 |
| Aurora-Hoyt Lakes | 736 | 578 | 41.6 | 1,356 | 54.3 | -778 | 785 |
| Total Study Area | 1,354 | 1,389 | | 2,495 | | -1,106 | 1,026 |
| Cities: | | | | | | | |
| Virginia | 389 | 69 | 20.3 | 322 | 22.5 | -253 | 177 |
| Gilbert | 132 | 26 | 7.6 | 72 | 5.0 | - 46 | 197 |
| Eveleth | 215 | 31 | 9.1 | 117 | 8.2 | - 86 | 144 |
| Ely | 17 | 0 | -- | 9 | .6 | - 9 | 0 |
| Biwabik | 165 | 31 | 9.1 | 90 | 6.3 | - 59 | 188 |
| Babbitt | 33 | 1 | .3 | 18 | 1.3 | - 17 | 30 |
| Aurora | 645 | 80 | 23.5 | 352 | 24.6 | -272 | 124 |
| Hoyt Lakes | 823 | 102 | 30.0 | 449 | 31.4 | -347 | 124 |
| Total Study Area | 2,419 | 340 | | 1,429 | | -1,089 | 141 |

distribution not exceeding 2.8 percentage points in any case. The situation for school districts is different. In this scenario, Aurora-Hoyt Lakes, the primary district, seems to suffer at the expense of all the other Study Area school districts, each of which receive a greater share of revenue than of development-related costs.

A look at the per capita and per pupil unit revenues estimated to be received by each of the units of government in relation to the per capita/pupil unit cost figures used to estimate government costs further reveals the disparities of the scenario. In only one case, the Ely school district, are revenues received great enough to cover just the operating costs involved in meeting the demands of its development-related population. For Aurora-Hoyt Lakes the per pupil unit revenue is just over half the estimated $1,477 per pupil unit operating cost. The range of per capita costs for cities is even greater, going from $0 for Ely to $197 for Gilbert. No city is estimated to receive revenue great enough to cover the estimated $212 per capita operating cost.

To summarize, the figures presented in Table 13 indicate that cities and school districts of the Study Area will be unable to meet the operating costs of maintaining their copper-nickel related populations. Not only will they need to raise additional revenue to meet the deficit in operating costs, at the possible expense of their existing population, debt service costs necessary to expand the city and school district capital facilities will not be met, whatsoever.

If the projected fiscal shortfall for local government occurs, the state could mitigate this situation by increasing the revenue distribution to Study Area local government at the expense of other areas or funds; or it could increase the total amount of production taxes collected and returned to local government. The $2.2 million annual revenue shortfall shown in Table 13 could be eliminated

by an additional 37¢ per ton increase in the copper-nickel production tax rate. Since only about 30 percent of the copper-nickel production tax would be distributed back to the Study Area cities and schools (the remainder going to county government, the remainder of the Taconite Area, the IRRRB, and other special funds) an additional $7.3 million would have to be raised through a tax against the 20 million tons of ore produced annually under this scenario.

If, on the other hand, the cities and schools raise their tax levies to offset the estimated deficit resulting from development, the existing population would have to generate additional revenues. Hoyt Lakes residents, for example, face a projected annual shortfall of $347,000 for the city plus $778,000 for the school district. Assuming the existing population shares its revenue shortfall equally with the development-related population, the existing population of the city would have to generate 82 percent of the deficit, or $285,000, while the existing population of the school district would have to generate about 80 percent of the shortfall, or $622,000. Using the latest available data, this increased burden would more than double the municipal tax levy ($231,000 in 1976) and result in a city mill rate of .0537 (.0240 in 1976). For the Aurora-Hoyt Lakes school district, the increased revenue needed for development would require a 190 percent increase in the local school district levy ($326,000 in 1976) or a mill rate of .0733 (.0252 in 1976).

Another alternative is the option of reallocating the estimated annual production taxes so that the Study Area cities and schools receive an additional $2.2 million, enough to offset the projected revenue shortfall. Under present law, about 30 percent of the $915,000 estimated production tax revenue returns to the Study Area. If the remaining $640,000 from this source was distributed to the Study Area cities and schools, the estimated revenue shortfall would be reduced to $1.56 million. Another $900,000 would be available from estimated

copper-nickel occupation tax revenue. Even if this was distributed to the Study Area, and thereby reducing the revenues that are normally available to other funds and accounts, there would remain a $660,000 difference between estimated development-related costs and development-generated revenues.

In addition, a way to finance the capital expansion projects other than increasing the property tax burden seems appropriate. For this, the Taconite Area Environmental Protection and Economic Development Fund is available, as are other state and federal sources.

Figures 6 and 7 show the estimated development related revenues and costs for the city of Hoyt Lakes and the Aurora-Hoyt Lakes school district, respectively. In both cases the development-related costs peak in year 3, the point at which construction activity for the project is greatest, before settling at the steady-state level in year 6. Though it is hardly important because of their relative magitudes, the revenue curve for the school district does an adequate job of reflecting the shape of the cost curve. The city revenue curve does not peak until year 5 and settles into equilibrium in year 8, a lag behind the cost curve.

The figures graphically show that estimated revenues are insufficient to meet estimated operating costs in both cases until the shutdown phase of the operation, when the decline in revenue lags behind the decline in costs. This decline in costs would only occur if the analysis assumption, that area population would decline back to pre-development conditions when the mine shuts down, holds true. Such a rapid decline is unlikely and local units of government will experience a period of large operating costs and no development-related revenues. This situation could be offset by payments to local government from the Northeast Minnesota Economic Protection Fund. The figures also show the rela-

tive proportion of debt-service to total estimated costs and the shorter period for the debt service costs.

For the city, annual estimated costs peak at $492,000 in year 3 and settle at 449,000 in year 6 until debt service costs are eliminated in year 21. From this point, total costs are $174,000 per year until the operation begins shut down in year 29. Revenues peak in year 6 at $108,000 and a $333,000 deficit before settling at $102,000. When debt service costs are eliminated, the deficit is $77,000 annually until shutdown begins.

School district costs and revenues both peak in year 3 at $1.6 million and $780,000, respectively, a deficit of $842,000. After debt service costs have been eliminated and both revenue and costs are steady, the deficit remains at $509,000 annually.

These figures indicate that the school district method of finance, depending in large part on direct per pupil unit state aids, is more responsive to the fluctuating pattern during the early years of development than is true for cities, which depend on the lagged property tax for much of their revenue.

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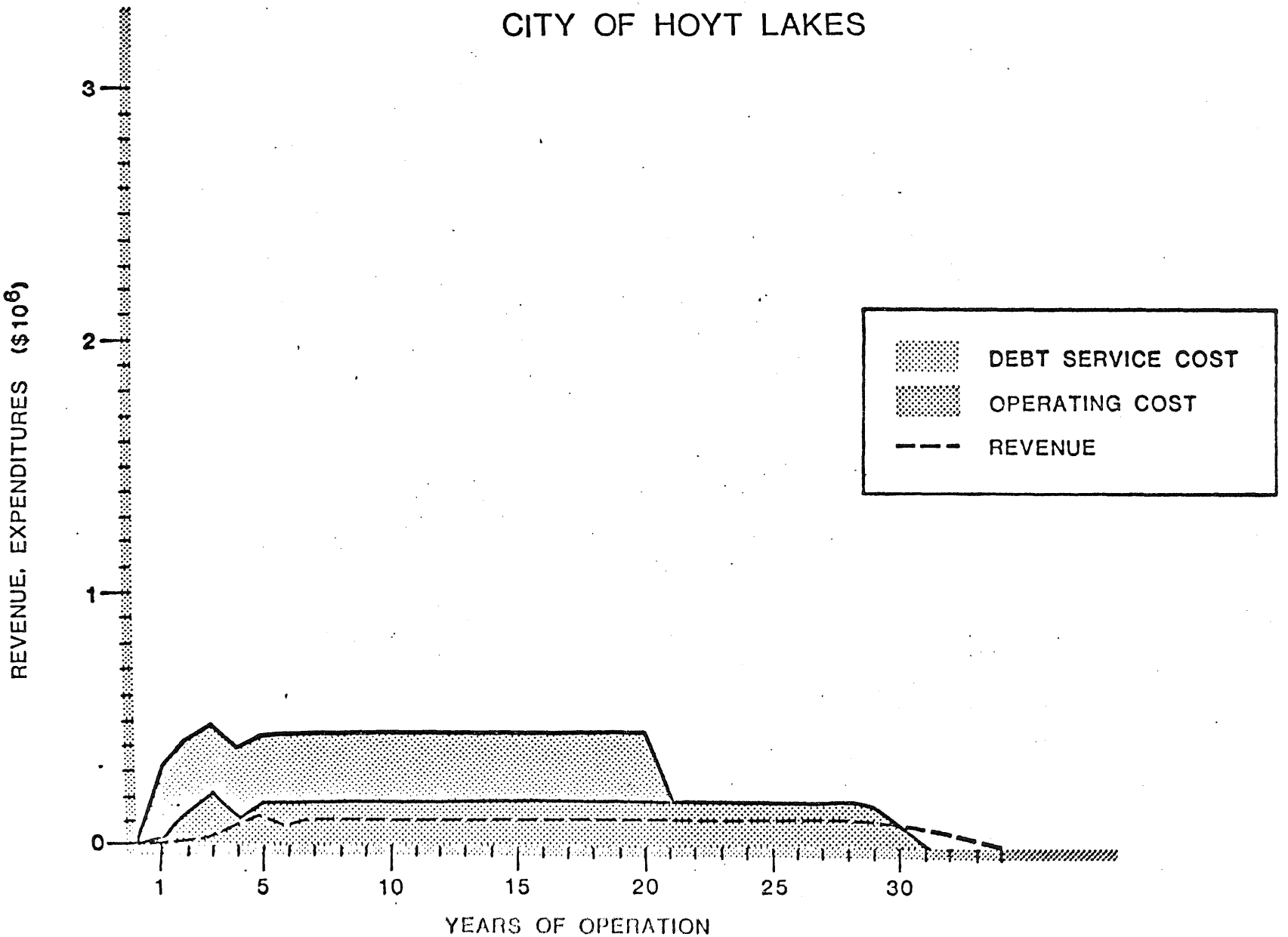
Figures 6 and 7

13.72 Combination Open Pit and Underground Mine/Mill Scenario

The combination scenario locates a 16,680,000 metric ton per year open pit and underground mine/mill complex within the municipal boundaries of Babbitt in the central portion of the Study Area (Resource Zone 4). This scenario results in the highest concentration of population locating in the Babbitt Area with additional significant growth in the Ely area.

# ESTIMATED REVENUES AND EXPENDITURES
# RESULTING FROM COPPER-NICKEL OPEN PIT SCENARIO
# CITY OF HOYT LAKES



# ESTIMATED REVENUE AND EXPENDITURES
# RESULTING FROM COPPER-NICKEL OPEN PIT SCENARIO
# AURORA-HOYT LAKES SCHOOL DISTRICT

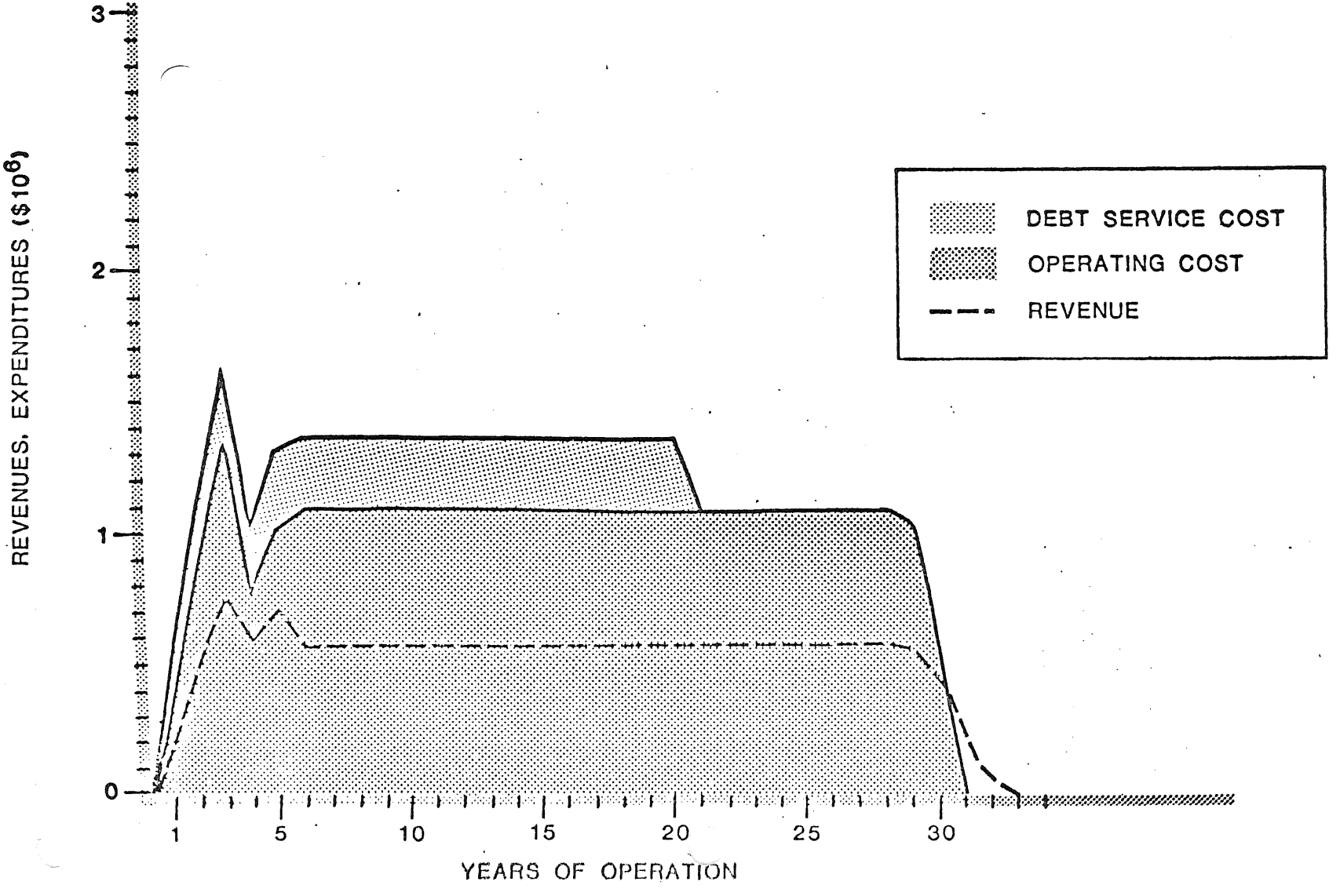


Table 14 summarizes the estimated copper-nickel related annual revenue and expenditures for a steady-state year of the mine/mill operation. Each unit of government's share of development-related revenue and costs and annual estimated per capita or per pupil unit revenue are also shown.

Table 14

The net fiscal disparity for school districts of the Study Area is estimated to be an $852,000 revenue shortfall for the year of analysis. The revenue shortfall for the Babbitt school district represents 68 percent of the total disparity because of its concentration of population. The cities of the Study Area feel a more significant deficit between revenues and estimated cost, a $1.2 million annual disparity for the year shown in Table 2. Babbitt, with 59 percent, and Ely, with 19 percent, bear the principal stress of the annual revenue shortfall; again, due to the distribution of population through the Study Area.

The revenues and costs of copper-nickel related development are shared relatively equitably among the school districts of the Study Area. Four districts receive a share of revenues greater than their share of total development-related costs, while three districts, including Babbitt, have cost shares greater than revenue. In no case does the difference between revenue and cost share exceed 5 percentage points. Among the cities there are significant disprities in two cases. The city of Ely receives a share of revenue nearly 20 percentage points greater than its estimated share of costs. Babbitt, on the other hand, is estimated to receive a share of development-related costs about 24 percentage points greater than its revenue share. This is a significant fiscal disparity; however, it in no way represents the cause for the sizable revenue shortfall for Babbitt or for the Study Area as a whole.

Table 14. Study Area fiscal disparity/combination scenario (mine/mill located in Resource Zone 4).

| | Development Related Pupil Units/ Population | Estimated Revenue ($\$10^3$) | Percentage of Study Area Total (%) | Estimated Cost ($10^3$) | Percentage of Study Area Total (%) | Net Fiscal Disparity ($\$10^3$) | Per Pupil Unit/Capita Revenue ($) |
|---|---|---|---|---|---|---|---|
| School Districts: | | | | | | | |
| Virginia | 126 | 172 | 8.5 | 232 | 8.1 | -60 | 1,365 |
| Gilbert | 21 | 30 | 1.5 | 39 | 1.4 | - 9 | 1,429 |
| Eveleth | 34 | 54 | 2.7 | 63 | 2.2 | - 9 | 1,588 |
| Ely | 386 | 601 | 29.7 | 711 | 24.7 | -110 | 1,557 |
| Biwabik | 21 | 25 | 1.2 | 39 | 1.4 | -14 | 1,190 |
| Babbitt | 891 | 1,065 | 52.6 | 1,642 | 57.1 | -577 | 1,195 |
| Aurora-Hoyt Lakes | 81 | 76 | 3.8 | 149 | 5.2 | -73 | 938 |
| Total Study Area | 1,560 | 2,023 | | 2,875 | | -852 | 1,297 |
| Cities: | | | | | | | |
| Virginia | 206 | 32 | 13.0 | 171 | 11.7 | -139 | 155 |
| Gilbert | 29 | 4 | 1.6 | 16 | 1.1 | -12 | 139 |
| Eveleth | 67 | 7 | 2.8 | 37 | 2.5 | -30 | 104 |
| Ely | 604 | 104 | 42.3 | 330 | 22.6 | -226 | 172 |
| Biwabik | 38 | 7 | 2.8 | 21 | 1.4 | -14 | 184 |
| Babbitt | 1,458 | 76 | 30.9 | 796 | 54.6 | -720 | 52 |
| Aurora | 106 | 12 | 4.9 | 58 | 4.0 | -46 | 113 |
| Hoyt Lakes | 53 | 4 | 1.6 | 29 | 2.0 | -25 | 75 |
| Total Study Area | 2,561 | 246 | | 1,458 | | -1,212 | 96 |

PRELIMINARY
SUBJECT TO REVIEW

The estimated per unit revenues show that only two school districts, Eveleth and Ely, and no cities receive revenues sufficient to meet the $1,477 (school district) and $212 (city) operating costs. The range in per pupil unit revenues is large. Aurora-Hoyt Lakes once again represents the bottom with $938 per pupil unit, while Eveleth, with $1588, receives the most revenue per pupil unit. The Study Area average for the schools is $1,297 per pupil unit, $546 less than total pupil unit costs and nearly $200 less than operating cost.

Revenues for Babbitt are exceedingly low, $52 per capita, due primarily to its small mill rate which results in small property tax levies. Because of the large portion of residential settlement in Babbitt, it has a strong influence on the average per capita revenues for the Study Area, $96. No city is estimated to receive revenue great enough to cover the estimated $212 per capita operating cost.

As is the case for the Open Pit scenario, the revenue shortfalls estimated for each of the school districts and cities are significant and could lead to significant fiscal impacts on the existing and copper-nickel development-related population of the Study Area.

If the $2.1 million revenue shortfall shown in Table 14 were to be offset by an increase in the copper-nickel production tax, a tax rate of about 47¢ per ton would be required. This is greater than that necessary as a result of the Open Pit Scenario, even though the revenue disparity is slightly smaller, because of the lower level of production (16,680,000 tons of ore annually) under this scenario.

For Babbitt, making up its estimated deficit through an increase in the local government mill rates would result in a city mill rate of .1538 (compared to the 1976 mill rate of .0040), almost 40 times the present rate. The school district would have to increase its mill rate from .0037 to .1209, a 33-fold increase.

Figures 8 and 9 show the estimated development-related revenues and costs for the city of Babbitt and its school district. The figures show the same pattern of costs and revenues as those for the Open Pit scenario, peaking very quickly during the construction phase of the operation and settling into equilibrium shortly thereafter.

The figures show the disparity between estimated revenues and costs, especially in the case of the city. Annual city cost estimates peak at $869,000 in year 4 before becoming steady in year 9 at about $800,000. Revenues, meanwhile, never exceed $76,000 per year, reaching that level in year 11 of the operation.

School district revenues closely match the shape of the cost curve, but fall $251,000 short of operating costs and $577,000 short of total estimated costs during the steady-state years of operation. At this point revenues are estimated to be $1,065,000 while total costs are $1,642,000. Steady-state operating costs are estimated at $1,316,000 annually.

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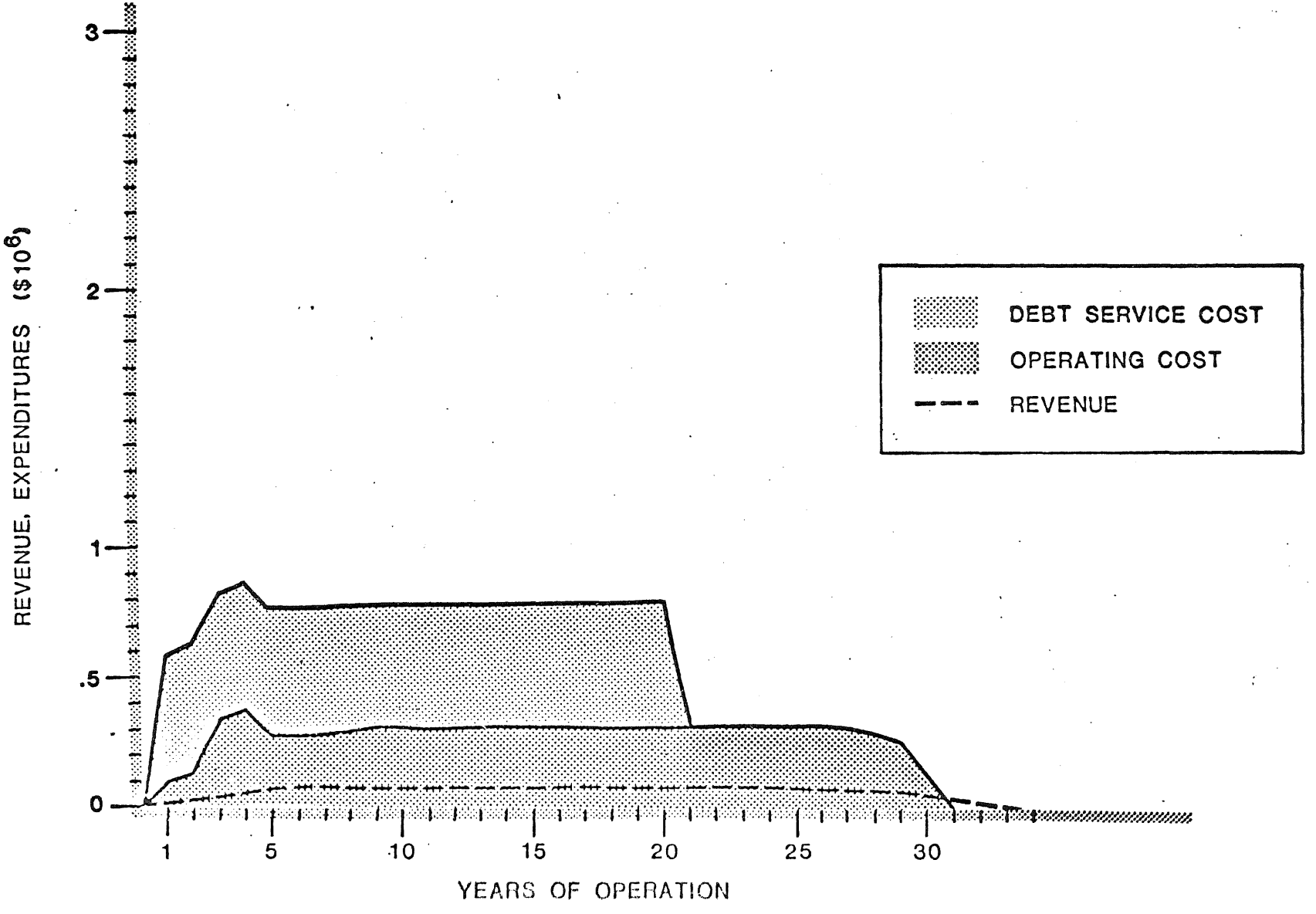
Figures 8 and 9

13.73 Underground Mine/Mill Scenario

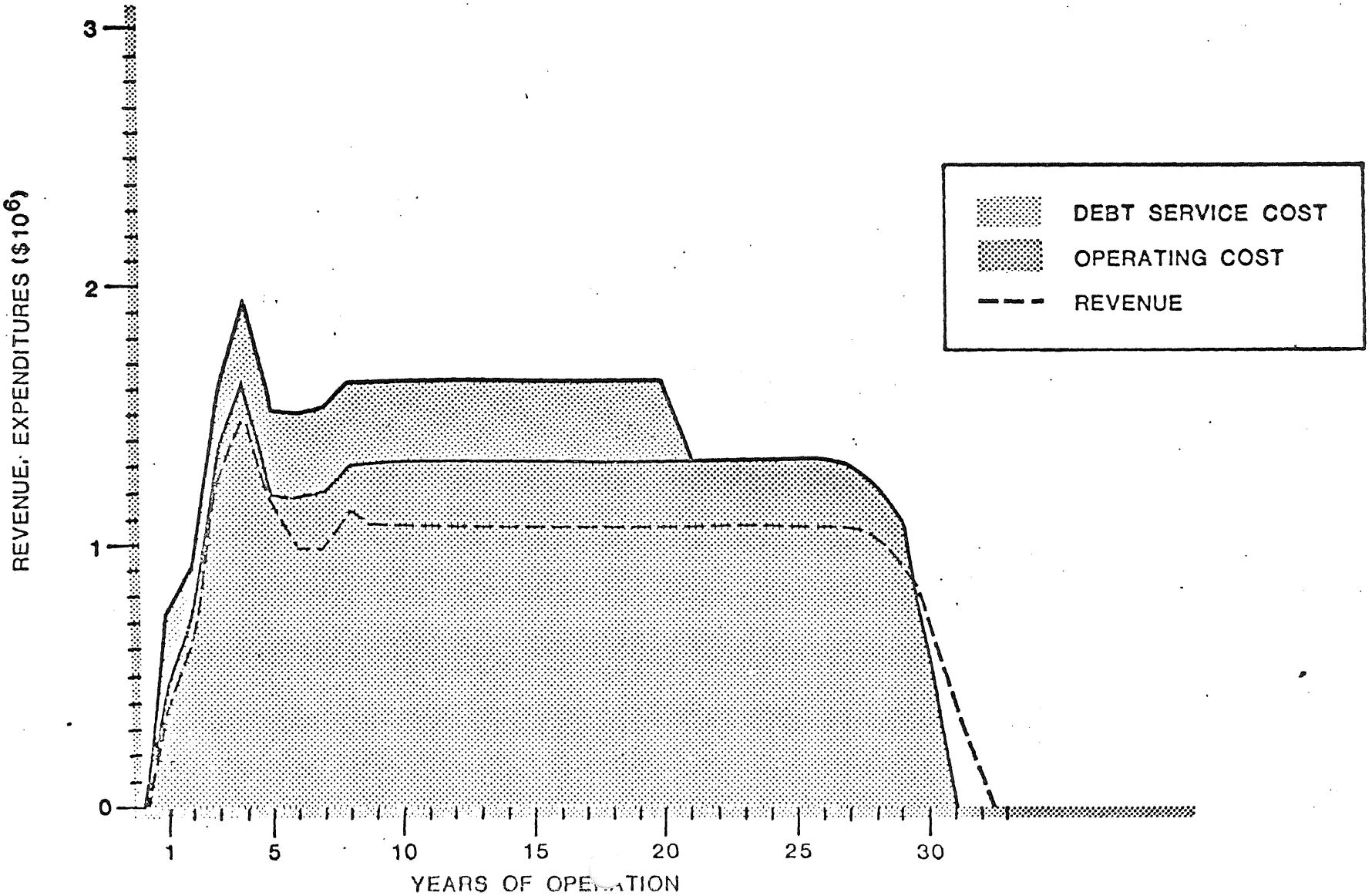
Located in Resource Zone 2 near the city of Ely in the northern part of the Study Area, the underground scenario has a mine/mill complex which, when operating at full production, produces 12,350,000 metric tons of copper-nickel ore annually. The residential settlement pattern associated with this scenario shows a very high concentration of population in the Ely area; the highest concentration of population among the four development scenarios.

The data presented in Table 15 show the estimated revenues and costs, the distribution of these revenues and costs among the units of government in the

# ESTIMATED REVENUE AND EXPENDITURES
# RESULTING FROM COPPER-NICKEL COMBINATION SCENARIO
# CITY OF BABBITT



# ESTIMATED REVENUE AND EXPENDITURES RESULTING FROM COPPER-NICKEL COMBINATION SCENARIO BABBITT SCHOOL DISTRICT



Study Area and the per unit (capita or pupil unit) revenues resulting from copper-nickel development-related population for a single, full production year of operation for an underground mine/mill complex.

Table 15

For the Study Area as a whole, the seven school districts are estimated to experience annual costs, at a steady-state level of mine/mill production, about $600,000 greater than the revenue produced by development and its related population. The Ely school district represents 62 percent of this disparity, the smallest share among the principal development school districts under the three mine/mill scenarios despite having the greatest concentration of population among the districts. The disparity for the cities of the Study Area is twice ($1.2 million) that of the school districts for the year of analysis. Among the cities, Ely represents 71 percent of the total revenue shortfall.

The distribution of costs and revenues among the school districts is very even, with no school having a difference greater than 3.2 percentage points. The pattern here shows Ely with a greater share of revenue than of costs while the other districts are just the opposite. As is the case with the school district, Ely is the only city to experience a revenue share greater than its share of costs. However, in this case the disparity is significant, with Ely recieving about 18 percentage points more revenue than cost and Babbitt experiencing about 10 points more cost than revenue.

The average per pupil unit revenues for the study area is, in this case, greater than the $1477 per pupil unit revenue necessary to match unit operating costs, even though Ely is the only district to individually exceed the operation cost estimate. Because it accounts for such a large percentage of total revenues

Table 15. Study Area fiscal disparity/underground scenario (mine/mill located in Resource Zone 2).

| | Development Related Pupil Units/ Population | Estimated Revenue ($\$10^3$) | Percentage of Study Area Total (%) | Estimated Cost ($10^3$) | Percentage of Study Area Total (%) | Net Fiscal Disparity ($\$10^3$) | Per Pupil Unit/Capita Revenue ($) |
|---|---|---|---|---|---|---|---|
| School Districts: | | | | | | | |
| Virginia | 49 | 65 | 2.4 | 90 | 2.7 | -25 | 1,327 |
| Gilbert | 8 | 11 | .4 | 15 | .5 | -4 | 1,375 |
| Eveleth | 14 | 18 | .7 | 26 | .8 | -8 | 1,286 |
| Ely | 1,384 | 2,178 | 79.8 | 2,551 | 76.6 | -373 | 1,574 |
| Biwabik | 10 | 12 | .4 | 18 | .5 | -6 | 1,200 |
| Babbitt | 311 | 418 | 15.3 | 573 | 17.2 | -155 | 1,344 |
| Aurora-Hoyt Lakes | 32 | 29 | 1.1 | 59 | 1.8 | -30 | 906 |
| Total Study Area | 1,808 | 2,731 | | 3,332 | | -601 | 1,511 |
| Cities: | | | | | | | |
| Virginia | 84 | 1 | .2 | 70 | 4.0 | -69 | 12 |
| Gilbert | 11 | -1 | -- | 6 | .3 | -7 | -91 |
| Eveleth | 28 | -1 | -- | 15 | .9 | -16 | -36 |
| Ely | 2,485 | 487 | 96.1 | 1,357 | 78.4 | -870 | 196 |
| Biwabik | 17 | 2 | .4 | 9 | .5 | -7 | 118 |
| Babbitt | 440 | 18 | 3.6 | 240 | 13.9 | -222 | 41 |
| Aurora | 39 | 2 | .4 | 21 | 1.2 | -19 | 51 |
| Hoyt Lakes | 22 | -1 | -- | 12 | | -13 | -45 |
| Total Study Area | 3,126 | 507 | | 1,730 | | -1,223 | 162 |

(nearly 80 percent), Ely pulls the Study Area average above the operating cost figure.

If the revenue shortfall for the Study Area as shown in Table 15, $1.8 million, occurs, the deficit could be offset by an increase in the copper-nickel production tax rate to about 53¢ per ton of ore produced. Again, the higher tax rate is brought about because of the lower level of production under this scenario relative to the Open Pit and Combination scenarios.

Table 15 indicates that the estimated fiscal impact for Ely is significantly less than the disparity experienced by Babbitt and Hoyt Lakes under the other two scenarios. In fact, Ely would receive revenue great enough to cover the estimated school district operating costs resulting from development. The revenue shortfall experienced by the city would require more than a threefold increase in the city mill rate from .0480 in 1976 to .1572 during the development period.

The school district, if it is necessary to generate additional revenue for capital outlay debt service as projected in Table 15, would require a 62 percent increase in its mill rate to .1223.

The declining enrollment projected for the next 5 years by the Ely school district (presented in a November, 1978, issue of Ely Echo) indicates the possibility of significant unused physical capacity on the part of Study Area school districts. For example, Ely is projected to have room for an additional 858 students in 1983. This would accommodate more than half the estimated development related students (even more if the assumption that a sizable percentage of development-related population will come from the existing population) and a concomitant reduction in capital expansion and debt service cost as estimated above could result. If this type of capacity is available throughout the Study

Area, the important figure for estimating ultimate fiscal impacts is then the relationship between estimated development-related revenue and projected operating costs. This is particularly true for the school districts which have recently experienced steady and significant declining enrollments.

The scenario results in a rather unusual situation for three of the cities in the Study Area. Gilbert, Eveleth, and Hoyt Lakes are estimated to actually lose revenue as a result of copper-nickel development even though each city gains a small amount of population. Because of the inordinate concentration of population in Ely, these three cities do not gain population in great enough numbers to maintain their share of total Taconite Area population and as a result would receive less taconite municipal aid. This is the reason their development-related revenues are actually revenue losses. For the Study Area as a whole, the average per capita revenue is $162 because Ely receives $196 revenue per development-related capita. This is still less than the $212 per capita operating costs.

Figures 10 and 11 show graphically the relationship between estimated cost and revenue resulting from copper-nickel development in the city of Ely and its school distict. These figures are different than those presented for the primary cities and school districts of the other two mine/mill scenarios. For the Ely school district, estimated revenues actually exceed estimated operating costs by $134,000 in each of the full production years of operation. The city revenues approach annual operating costs, falling short by only $40,000. Because of the lag between the revenue peak for the city and the time of the cost peak, the revenues even exceed operating costs for one year.

School district costs peak in year 3 at just over $3 million while revenue peaks in the same year at just over $2.4 million. Revenues stabilize at about $2.2

million and costs with debt service even off at over $2.5 million before dropping to less than $2.1 million after debt service costs have been eliminated. For the city, total estimated expenditures peak at nearly 1.5 million in year 5 of the operation, level off at $1,357,000 during debt service and drop off to $527,000 once debt service costs are eliminated. Revenues peak in year 7 at $527,000 and reach equilibrium at $487,000 in year 11 of the operation.

Figures 10 and 11

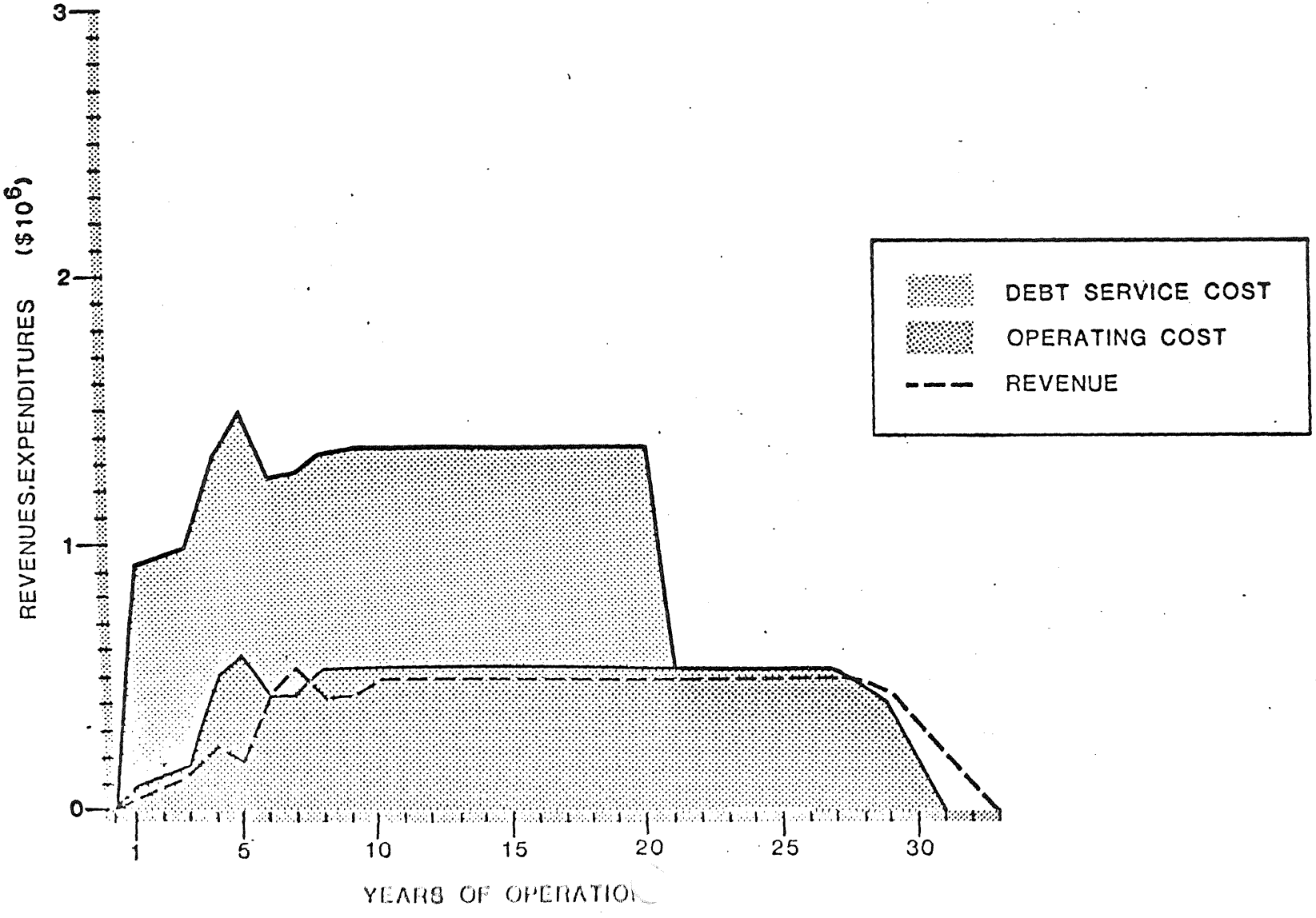
13.74 Smelter/Refinery Scenario

The smelter/refinery, which produces a marketable copper and nickel product from copper-nickel concentrate, is designed to handle the output from each of the three mine/mill scenarios, producing 84,600 metric tons of copper and 15,400 metric tons of nickel annually at full production. For this analysis, the smelter/refinery is located within the municipal and school district boundaries of Babbitt, in the central portion of the Study Area (Resource Zone 4). Thus, the population distribution to surrounding communities would be identical, though at a smaller scale, to that of the combination mine/mill scenario previously discussed.

Table 16, below, summarizes the estimated development-related revenue and expenditures for a steady-state year of operation for the smelter/refinery. It also shows the distribution of these revenues and expenditures among the cities and school districts of the Study Area and the per capita or per pupil unit revenue for each of the units of government.

Table 16

# ESTIMATED REVENUE AND EXPENDITURES RESULTING FROM COPPER-NICKEL UNDERGROUND SCENARIO CITY OF ELY



# ESTIMATED REVENUE AND EXPENDITURES RESULTING FROM COPPER-NICKEL UNDERGROUND SCENARIO ELY SCHOOL DISTRICT

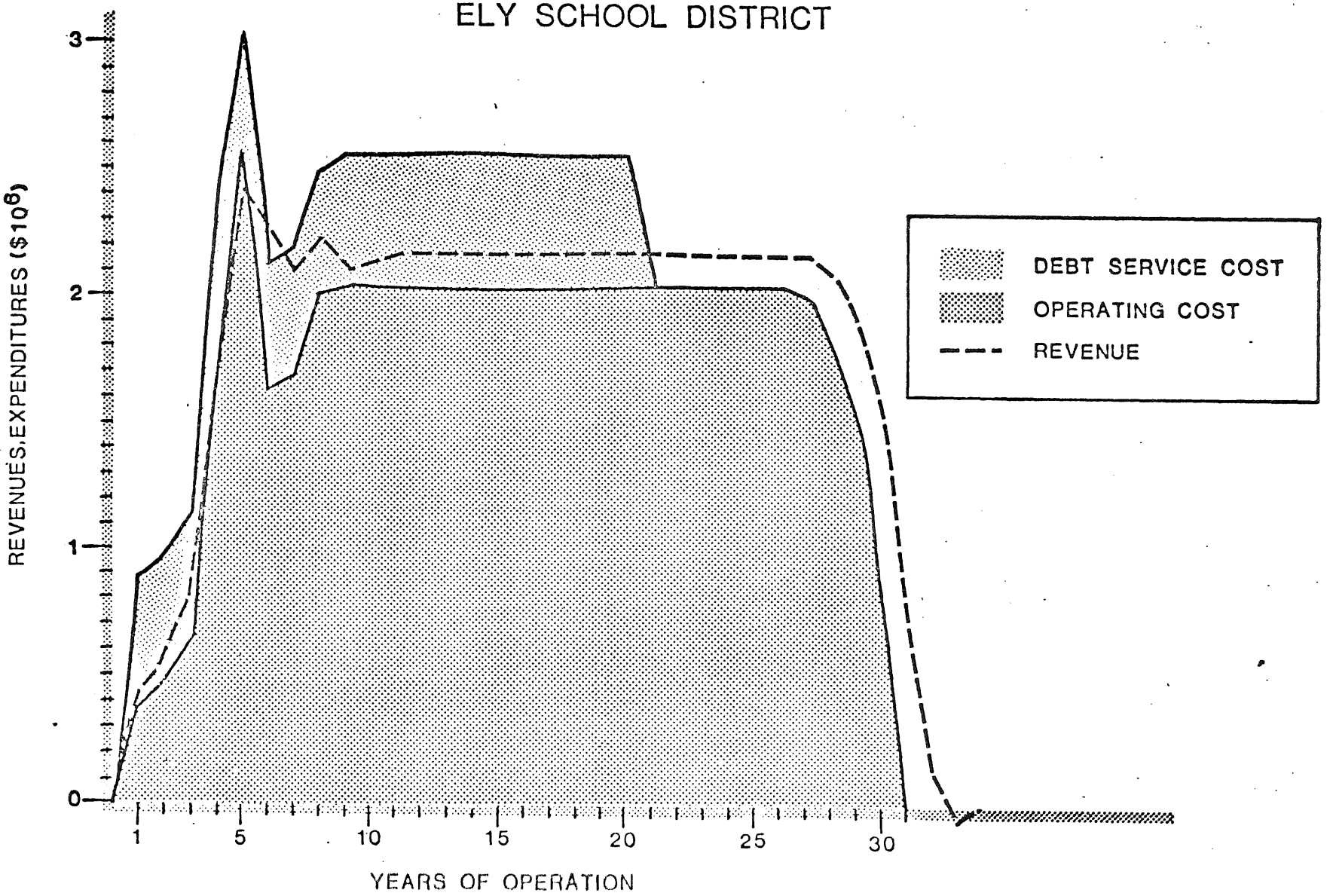


Table 16. Study Area fiscal disparity-smelter/refinery scenario (located in Resource Zone 4).

| | Development Related Pupil Units/ Population | Estimated Revenue ($\$10^3$) | Percentage of Study Area Total (%) | Estimated Cost ($10^3$) | Percentage of Study Area Total (%) | Net Fiscal Disparity ($\$10^3$) | Per Pupil Unit/Capita Revenue ($) |
|---|---|---|---|---|---|---|---|
| School Districts: | | | | | | | |
| Virginia | 49 | 72 | 7.3 | 90 | 8.1 | -18 | 1,469 |
| Gilbert | 8 | 16 | 1.6 | 15 | 1.3 | +1 | 2,000 |
| Eveleth | 13 | 19 | 1.9 | 24 | 2.2 | -5 | 1,462 |
| Ely | 150 | 256 | 25.8 | 276 | 24.7 | -20 | 1,707 |
| Biwabik | 8 | 11 | 1.1 | 15 | 1.3 | -4 | 1,375 |
| Babbitt | 346 | 585 | 58.9 | 638 | 57.2 | -53 | 1,691 |
| Aurora-Hoyt Lakes | 31 | 34 | 3.4 | 57 | 5.1 | -23 | 1,097 |
| Total Study Area | 605 | 993 | | 1,115 | | -122 | 1,641 |
| Cities: | | | | | | | |
| Virginia | 80 | 11 | 4.6 | 66 | 11.7 | -55 | 138 |
| Gilbert | 11 | 1 | .4 | 6 | 1.1 | -5 | 91 |
| Eveleth | 26 | 2 | .8 | 14 | 2.5 | -12 | 77 |
| Ely | 235 | 43 | 17.8 | 128 | 22.7 | -85 | 183 |
| Biwabik | 15 | 2 | .8 | 8 | 1.4 | -6 | 133 |
| Babbitt | 566 | 177 | 73.4 | 309 | 54.8 | -132 | 313 |
| Aurora | 41 | 4 | 1.7 | 22 | 3.9 | -18 | 98 |
| Hoyt Lakes | 20 | 1 | .4 | 11 | 2.0 | -10 | 50 |
| Total Study Area | 994 | 241 | | 564 | | -323 | 242 |

Compared to the impacts of the three mine/mill scenarios, the smelter/refinery analysis shows a relatively small negative fiscal impact for the school districts of the Study Area. In fact, the sole example of a positive fiscal impact is found here. The Gilbert school district is estimated to receive $16,000 in annual revenue while making $15,000 in expenditures, a net gain of $1,000 in the steady-state years of operation. For the school districts as a whole, the annual fiscal disparity is $122,000, with the Babbitt school district representing 43 percent of the revenue shortfall.

The cities are less fortunate, with an annual revenue shortfall estimated at $323,00. In this case the city of Babbitt represents 41 percent of the disparity between estimated revenue and expenditures.

The distribution of revenues and expenditures among the school districts is relatively equitable. The difference between a school's share of revenue and its share of expenditures in no case is greater than 1.7 percentage points. The districts which receive the largest shares of development-related population, Babbitt and Ely, receive revenue shares greater than their shares of expenditures.

For the cities, the fiscal disparities are much wider. Babbitt receives a revenue share nearly 20 percentage points greater than its share of expenditures, while two other cities have differences greater than 5 percentage points. Babbitt is the only city with a share of revenue greater than its share of total estimated municipal expenditures.

The per pupil unit revenue figures relate the closeness of school district fiscal impacts. Three districts and the Study Area average are above the figure necessary to cover estimated operating costs, $1,477. Two others are extremely close. However, only one district, Gilbert, receives revenues great enough to

cover debt service as well as operating costs during the first 20 years of smelter/refinery operation.

The per capita average revenue for the cities of the Study Area is above the operating cost figure, due primarily to the very high per capita revenue estimated for Babbitt (highest among all of the scenarios). Babbitt's high revenues can be attributed to the property taxes paid by the smelter/refinery operation. Though Babbitt's mill rate is exceedingly low, it does produce revenue which is not available to other cities and is quite sizable due to the large capital value of the smelter/refinery complex. Even though Babbitt receives property tax payments from the complex, it does not receive revenues sufficient to meet the estimated $546 per capita municipal expenditures.

Figures 12 and 13 graphically show the relationship between estimated revenue and expenditures for Babbitt and its school district over the life of the smelter/refinery operation. They show that for both units of government revenues are produced great enough to meet the operating expenditures resulting from the development-related population. However, debt service costs are not met.

The school district revenues match almost identically the shape of the cost curve, peaking during the early construction years before settling down to steady-state levels. The city revenue however, because it is more dependent on property taxes which are slow in coming on line, lags behind the early peak of expenditures by two years. This would result in extreme hardship for the city during the volatile construction period.

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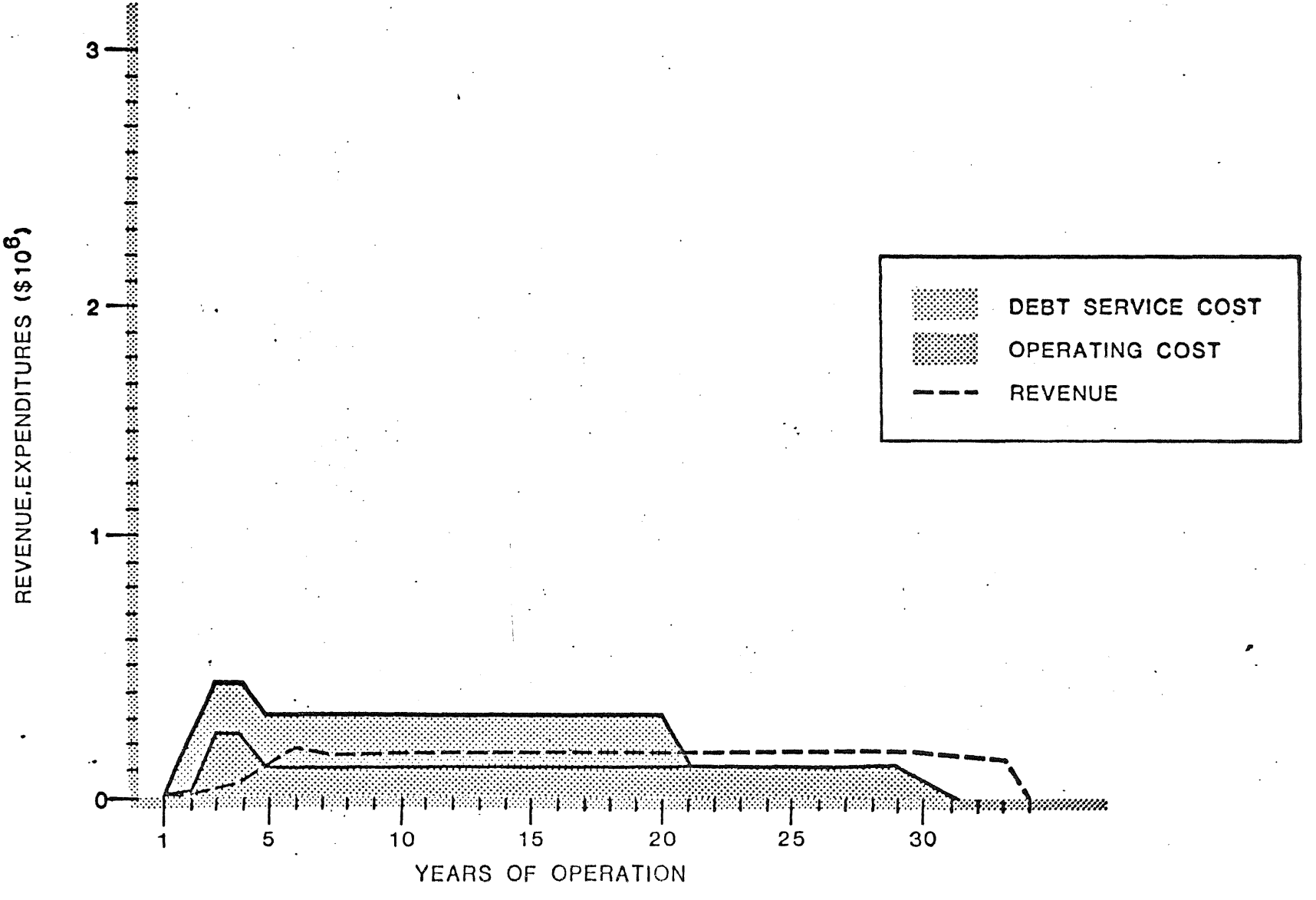
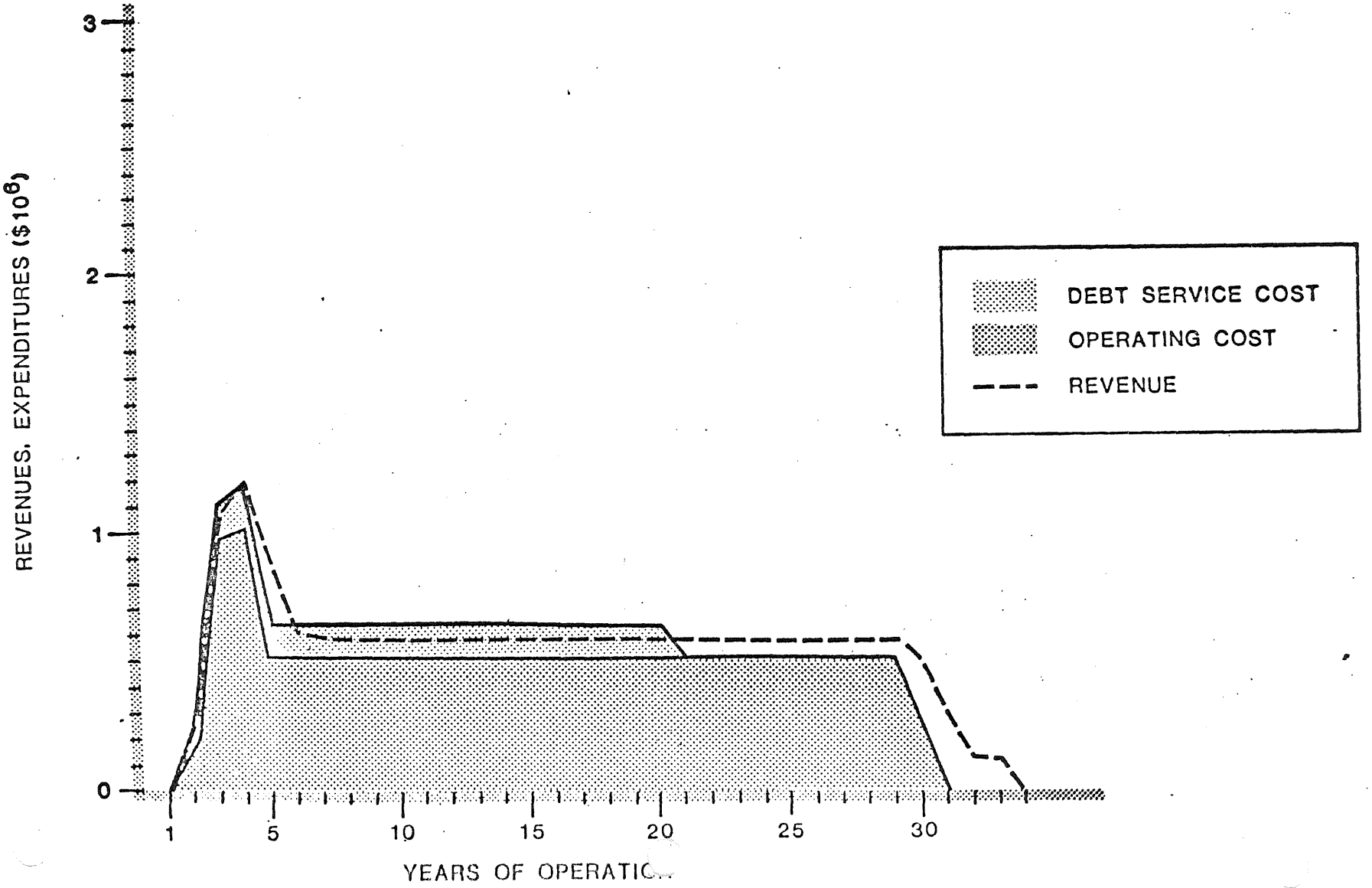
Figures 12 and 13

In summary, three points can be drawn from the preceeding analysis; one, estimated revenues are not sufficient to meet the demands of development-related

# ESTIMATED REVENUE AND EXPENDITURES RESULTING FROM COPPER-NICKEL SMELTER/REFINERY SCENARIO CITY OF BABBITT



# ESTIMATED REVENUE AND EXPENDITURES
# RESULTING FROM COPPER-NICKEL SMELTER/REFINERY SCENARIO
# BABBITT SCHOOL DISTRICT



population; two, the distribution of revenues and expenditures from an areal perspective is, with a few anomolies, relatively equitable; and three, school district revenue is more responsive to changing conditions than is the flow of revenue to the cities.

Most important to the 8 cities and 7 school districts of the Study Area is the indication that local government revenues generated by copper-nickel development are estimated to be insufficient to match the estimated expenditures which must be made to meet the demands of development-related population. Using relatively conservative assumptions about revenues and costs, in only one case among the 60 analyzed above were annual revenues great enough to cover the total estimated annual costs of development. Further, in the majority of cases, revenue was insufficient to meet even the annual operating costs resulting from development. There were, however, instances where revenues exceeded operating costs, particularly among the primary development community of several scenarios.

The implications of this are straightforward. If the present population of the Study Area should not pay higher taxes to support new development, then, the flow of revenue to the Study Area must be increased, either by an increase in the tax rate of the copper-nickel production tax or alteration of the present distribution formula so that more revenue is funneled to the area of principal impact. An increase in the tax rate would benefit each of the recipients of the production tax equally, while a change in the distribution formula would benefit one account at the expense of another.

As discussed above for each of the three mine/mill scenarios, the production tax would have to be increased about tenfold, from its present 4.6¢ per ton of ore produced to something around 46¢ per ton of ore produced. The range for the required production tax in the three scenarios presented was from about 41¢ for

the Open Pit scenario to 53¢ for the Underground scenario, the range resulting from different levels of production and different estimated revenue shortfalls among the various scenarios.

An alternative method of financing capital improvement projects, thus eliminating the debt service costs otherwise faced by these units of government, should be considered. By financing these projects through grants or interest free loans from other tax accounts, the Taconite Area Environmental Protection and Economic Development Fund, for example, the debt service cost faced by local governments could be eliminated or at least minimized. Copper-nickel development would contribute significant revenues to these funds (see Volume 5, Chapter 12). It is estimated by the Minnesota Department of Revenue that this fund will have annual receipts of about $20 million by 1985 from taconite production. By the year 2000, a single copper-nickel operation will contribute about $1.2 million annually.

Capital expansion costs to local government can be further reduced should there be significant unused capacity at the time of copper-nickel development. Recent reports by the Eveleth and Ely schools indicate that significant capacity will be available as a result of declining enrollments in the next 5 years. This is generally true across the state and will significantly reduce the capital costs necessary to meet the demands of development-related population growth.

The distribution of revenues among the units of government of the Study Area relative to the distribution of development-related costs is fairly equitable. In most instances the difference between a unit of government's share of revenue and its share of cost was very small, less than 5 percentage points. When deviations occur, they are among the principal cities of the scenario and in most cases represent a larger share of revenues for the principal city. The

distribution of revenues and costs among school districts is very close, the only significant deviation is the case of Aurora-Hoyt Lakes under the Open Pit scenario.

Related to the areal distribution of revenues is the phenomenon witnessed in the case of the underground scenario. In this case, it is shown that several cities may actually lose revenue as a result of development even though they are expected to experience a small amount of population growth. This occurs because the city does not maintain its share of total Taconite Area population when copper-nickel related population is concentrated in a small area, in this case the Ely area. This phenomenon also occurs for the Taconite Area as a whole. With a sizeable population growth occuring in a relatively small area (the Study Area) as a result of copper-nickel development, the remainder of the Taconite Area may well lose revenues it normally receives from taconite production tax distribution. As the population of the Study Area increases, the cities of the remainder of the Taconite Area will maintain smaller shares of the total Taconite Area population. They would then receive a smaller amount of taconite production tax revenue which will not change as a result of copper-nickel development.

The third and final point to be made here relates to the responsiveness of the revenue distribution methods applying to cities and school districts. Examination of the preceeding figures indicates that the school district revenues are more responsive to the changes in the estimated population and costs during the early construction years than are the revenues of the cities. School districts receive a large portion of their revenue in the form of aids from the state government, financed from income and sales tax revenues. This provides a relatively responsive form of revenue distribution. City governments, on the other hand, still depend to a great extent on the property tax for revenue

generation. The property tax is not as responsive to changes in population, requiring up to two years for a property to produce revenue to the city. Thus the lag shown in the cities analyzed above.

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