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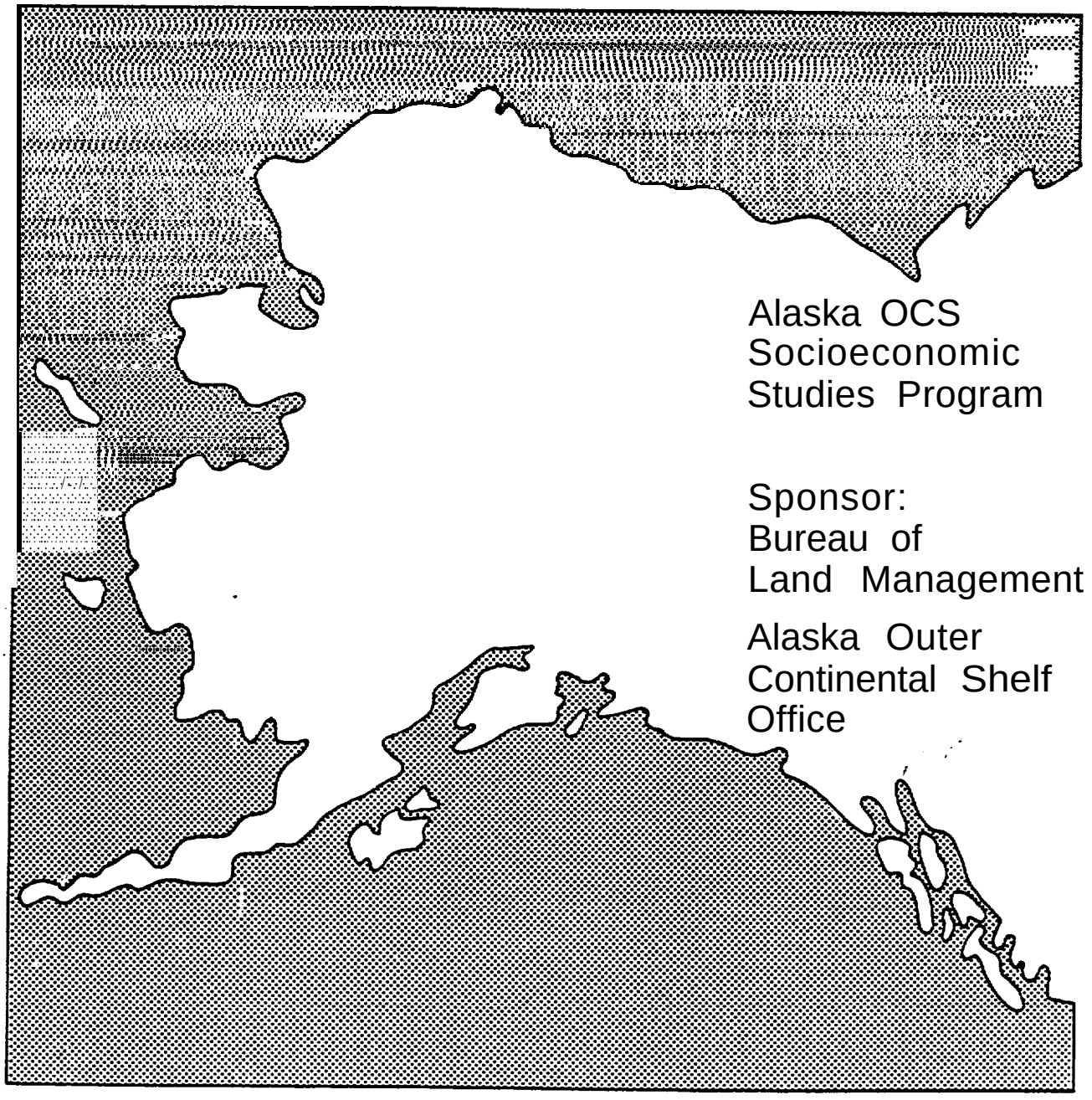

Alaska OCS
Socioeconomic
Studies Program

Sponsor:
Bureau of
Land Management

Alaska Outer
Continental Shelf
Office

Bering-Norton
Petroleum Development Scenarios
Local Socioeconomic Systems Analysis

The United States Department of the Interior was designated by the Outer Continental Shelf (OCS) Lands Act of 1953 to carry out the majority of the Act's provisions for administering the mineral leasing and development of offshore areas of the United States under federal jurisdiction. Within the Department, the Bureau of Land Management (BLM) has the responsibility to meet requirements of the National Environmental Policy Act of 1969 (NEPA] as well as other legislation and regulations dealing with the effects of offshore development. In Alaska, unique cultural differences and climatic conditions create a need for developing additional socioeconomic and environmental information to improve OCS decision making at all governmental levels. In fulfillment of its federal. responsibilities and with an awareness of these additional information needs, the BLM has initiated several investigative programs, one of which is the Alaska OCS Socioeconomic Studies Program (SESP).

The Alaska OCS Socioeconomic Studies Program is a multi-year research effort which attempts to predict and evaluate the effects of Alaska OCS Petroleum Development upon the physical, social, and economic environments within the state. The overall methodology is divided into three broad research components. The first component identifies an alternative set of assumptions regarding the location, the nature, and the timing of future petroleum events and related activities. In this component, the program takes into account the particular needs of the petroleum industry and projects the human, technological, economic, and environmental offshore and onshore development requirements of the regional petroleum industry.

The second component focuses on data gathering that identifies those quantifiable and qualifiable facts by which OCS-induced changes can be assessed. The critical community and regional components are identified and evaluated. Current endogenous and exogenous sources of change and functional organization among different sectors of community and regional life are analyzed. Susceptible community relationships, values, activities , and processes also are included.

The third research component focuses on an evaluation of the changes that could occur due to the potential oil and gas development. Impact evaluation concentrates on an analysis of the impacts at the statewide, regional, and local level.

In general, program products are sequentially arranged in accordance with BLM's proposed OCS lease sale schedule, so that information is timely to decisionmaking. Reports are available through the National Technical Information Service, and the BLM has a limited number of copies available through the Alaska OCS Office. Inquiries for information should be directed to: Program Coordinator (COAR), Socioeconomic Studies Program, Alaska OCS Office, P. O. Box 1159, Anchorage, Alaska 99510.

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ALASKA OCS SOCIOECONOMIC STUDIES PROGRAM

BERING - NORTON PETROLEUM DEVELOPMENT SCENARIOS

LOCAL SOCIOECONOMIC SYSTEMS ANALYSIS

Prepared by

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Prepared for

PEAT, MARWICK, MITCHELL & CO.

AND

BUREAU OF LAND MANAGEMENT

ALASKA OUTER CONTINENTAL SHELF OFFICE

June, 1980

NOTICE

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Alaska OCS Socioeconomic Studies Program
Bering - Norton Petroleum Development Scenarios
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TABLE OF CONTENTS

LIST OF FIGURES xviii

LIST OF TABLES xix

1. INTRODUCTION 1

11. NOME BASELINE DATA 3

Historical Background 3

Current Demographic and Economic Profile 10

Baseline Population Estimate 10

Individual Census Data 13

Age and Sex 13

Race 16

Education 16

Other Social Characteristics 19

Employment and Economic Activity 19

Regional Employment Status 19

Seasonality of Employment 23

Nome Employment Status 26

Unemployment 38

The Fishing Industry 38

Occupational Skills 40

Business Activity 41

Subsistence Economic Activity 42

Concentration of Regional Employment in Nome 44

Seasonality of Employment 44

TABLE OF CONTENTS - CONTINUED

Employment Participation Rates 45

Personal Income 49

Municipal Expenditures and Revenues 59

Education. 64

Primary and Secondary 64

Student Population 64

Personnel and Facilities 66

The Cost of Education 68

Regular and Special Programs 71

Nome School District and Its Relationship to Bering Straits Regional Education Attendance Area (REAA) . . 71

Postsecondary Education 72

Functions of Northwest Community College 72

Student Population 73

Personnel and Facilities 73

cost 75

Issues in Higher Education 75

Public Safety.. 78

Nome Police Department. 78

Departmental Organization 78

Incidence of Crime 79

Crime Clearance. 80

Property Loss and Recovery Rates 82

Profile of Offenders 86

TABLE OF CONTENTS - CONTINUED

Planning 86

Troopers 86

Organizational Context 86

Special Issues 87

Jails 88

Fire Protection Services 89

Recreation 92

Recreation Programs 92

Special Events 95

Facilities 95

Adult Recreation 96

Utilities 98

Water. 98

Water Issues 100

Sewer. 102

Issues 103

Regulatory Permits 104

Honeybucket Service 105

Electricity 105

Telephone 108

Solid Waste 108

Land and Housing 110

Industrial and Warehousing Uses 112

Land Ownership and Control 117

TABLE OF CONTENTS - CONTINUED

Outside of Nome Townsite 117

Ownership Patterns 117

Annexation 118

Coastal Zone Management 120

Within Nome Townsite 124

Development Constraints 126

Housing. 129

Health. 138

Overview 138

Norton Sound Heal th Corporation (NSHC) 138

Other Agencies 139

Facilities 139

Manpower 141

Health Status 143

Mortality (CDR) 143

Morbidity 146

Outpatient 146

Inpatient Admissions 147

Behavioral Health 147

Disability 150

Public Opinion 150

Health Care Services 152

Inpatient 152

Outpatient Department and Specialty Clinics 154

TABLE OF CONTENTS - CONTINUED

Medical Support for Inpatient and Outpatient Care . . 154

X-Ray. 155

Respiratory Therapy and Physical Therapy 155

Pharmacy 156

Family Services 156

Eye Care 157

Dental Care 157

Patient Travel 158

Health Education Services 158

Social Services 160

Income Assistance 160

United States Bureau of Indian Affairs 160

The State of Alaska, Department of Health and Social Services 163

The Division of Public Assistance 163

Employment Assistance 167

Housing Assistance 167

Child and Adult Protective Services 168

Division of Social Services 168

Bering Sea Women's Group 169

Other Services 171

Drug and Alcohol Abuse Services 171

Youth Services 174

Elderly Services 174

Other. 174

TABLE OF CONTENTS - CONTINUED

III. PROJECTIONS OF GROWTH - CONDITIONS WITHOUT PLANNED LEASE SALE. 177

Nome Community Forecasts.. 177

Introduction 177

Significant Factors Affecting Growth 177

The Nome Population and Employment in the Non-OCS Case . . 178

The Northwest Region Population and Employment in the Non-OCS Case 181

Results of Analysis 185

Education. 185

Primary and Secondary 185

Postsecondary and Career Vocational Training 186

Public Safety 187

Police 187

Jails 188

Fire 189

Recreation 190

Utilities 191

Electricity 191

Sewer 192

Water 193

Solid Waste 194

Telephone 196

Housing and Residential Land 197

Health 200

Acute CareBedNeed 200

TABLE OF CONTENTS - CONTINUED

Ratio of Physicians to Population 201

Special Service Needs 201

Social Services 203

Local Government Finances 205

Summary of Impacts 207

Iv. IMPACT ASSESSMENT OF BERING-NORTON OCS SCENARIOS. 211

Introduction 211

Community Population and Employment Forecasts . . . 212

Footnotes on OCS Forecasts 220

Overview of Economic Impacts 225

Introduction. 225

Employment Impacts. 227

Source and Industrial Classification 227

Participation by Local Residents 228

Seasonality 229

Unemployment 230

Impacts on Villages Economies 231

Public Sector Revenue 231

Personal Expenditures 233

Medium Find OCS Scenario 235

The Economy and the Community 235

Education 239

Primary and Secondary 239

Postsecondary Education 239

Public Safety 242

Police 242

TABLE OF CONTENTS - CONTINUED

Detention Facilities 245

Fire 247

Recreation 249

Utilities 249

Mater 249

Sewer 253

El ectri city 257

Solid Waste 259

Telephone 262

Housing and Land Use 264

Housing and Residential Land 264

Industrial Land Requirements 270

Health 273

Social Services 277

Public Sector Expenditures 279

High Find OCS Scenario 2.84

The Economy and the Community 284

Education 288

Primary and Secondary 288

Postsecondary Education 288

Public Safety 290

Police. 290

Detention Facilities 294

Fire. 296

Recreation 298

Utilities 298
Water 300
Sewer 304
Electricity 306
Solid Waste 308
Telephone 309
Housing and Land Use 313
Housing and Residential Land 313
Industrial Land Requirements 316
Health 318
Social Services 322
Public Sector Expenditures 324
Low Find OCS Scenario 330
The Economy and the Community 330
Education 332
Primary and Secondary 332
Postsecondary Education 335
Public Safety 335
Police. 335
Detention Facilities 339
Fire. 341
Recreation 343
Utilities 345
Water 345
Sewer 349
Electricity 351

Solid Waste. 353
Telephone. 356
Housing andLandUse 358
Housing and Residential Land 358
Industrial Land Requirements 360
Health. 363
Social Services 367
Public Sector Expenditures 369
Exploration Case OCS Scenario 374
The Economy and the Community 374
Assessment of Services and Community Infrastructure. . 375
V. Socioeconomic and Physical Baseline of the City of Kotzebue. . 381
Historical Background 381
Local Government. 382
Native Political Structure 383
Current Demographic and Economic Profile 385
Baseline population Estimate 385
Individual Census Data 388
Age and Sex. 388
Race 390
Education. 391
Household Composition 392
Length of Residence 393
Employment and Economic Activity 3g5
Regional Employment Status 395

Seasonality of Employment 398
Kotzebue Employment Status. 399
Employment Participation Rates. 405
Industrial Composition of the Workforce 407
Occupational Composition of the Kotzebue Workforce 410
Unemployment 412
Fishing Industry 412
Subsistence Activities. 414
Business Activity 415
Future Employment Considerations. 415
Personal Income. 418
Municipal Expenditures and Revenues 427
Education. 431
Primary and Secondary 431
Student Population 431
Personnel and Facilities. 434
The Cost of Education 435
Postsecondary Education 437
Functions of Chukchi Community College 438
Student Population 438
Personnel and Facilities 439
Funding. 439
Public Safety. 440
Kotzebue Police Department 440
Organizational Context 440
Incidence of Crime 440

TABLE OF CONTENTS - CONTINUED

Crime Clearance 442

Issues. 443

Detention Facilities. 444

Alaska State Troopers. 445

Fire Protection. 446

issues. 448

Recreation. 449

Community-wide Special Events 450

Facilities. 450

Other 452

Proposed Facilities 453

Utilities 454

Water. 454

Water Issues. 456

Sewer. 459

Issues. 460

Electricity. 462

Telephone. 464

Solid Waste. 465

Land and Housing. 466

Land Use 466

Industrial and Warehousing Uses 471

Commercial Uses 472

Residential Uses. 473

Streets. 474

Land Ownership and Control 476

Ownership Patterns. 476

TABLE OF CONTENTS - CONTINUED

Alaska Coastal Management Program (CZM). 478

Development Constraints 479

Housing 482

Health. 489

Overview. 489

Facilities. 489

Patient Care 492

Ambulatory Care. 493

Health Status 494

Crude Birth Rate 494

Infant Mortality Rate and Crude Death Rate . . . 495

Morbidity and Mortality. 496

Issues. 500

Alcoholism and Mental Health Counseling. 500

Dental Health Problems 500

Patient Load. 501

Hospital Geriatric Unit 501

Social Services. 502

Income Assistance 502

United States Bureau of Indian Affairs 503

State of Alaska, Department of Health and Social Services. 504

Employment Assistance 509

Housing Assistance 510

Child and Adult Protective Services 511

Divis on of Social Services. 51

TABLE OF CONTENTS - CONTINUED

Drug and Alcohol Abuse Services. 512

Youth Services 514

Elderly Services 514

Other. 515

APPENDIX. 517

Non-OCS Case Assumptions. 518

Economy and Population 518

Present Employment Estimates. 519

Forecast on Non-OCS Employment. 521

Present Population Estimates. 526

Forecast of Non-OCS Population 527

OCS Scenarios Assumptions. 529

Introduction. 529

Method for Deriving Employment Impacts. 531

Production Phase 531

Development Phase. 536

Exploration. 536

Method for Deriving Population Impacts. 537

Definition of Phases. 539

Overview of Infrastructure Standards 541

Education. 541

Primary and Secondary. 541

Postsecondary. 545

Public Safety 546

Police. 546

TABLE OF CONTENTS CONTINUED

Jails. 548

Fire 549

Recreation. 551

Ut lities 554

Water. 554

Sewer. 556

Electricity. 558

Telephone. 559

Solid Waste. 560

Land. 562

Oil Terminal 564

LNG Facility 565

Housing 566

Health. 567

Social Services 570

Financial Capacity and Capital Requirements 572

BIBLIOGRAPHY. 575

LIST OF FIGURES

1. Nome Age/Sex Pyramid 14

2. Non-Agricultural Wage And Salary Employment, Nome Census Division. 24

3. Nome Proper 111

4. Physical Location Of Nome Within The Norton Sound Area 115

5. Norton Sound Hospital 140

6. Hypothetical Seasonal Component of Employment 180

7. Nana Region Age/Sex Pyramid - 1970 389

8. Non-Agricultural Wage And Salary Employment, Kobuk Census Division. 400

9. Land Use Kotzebue 475

LIST OF TABLES

1. Nome Population Growth 1990-1979 12

2. Bering Straits Region, Births and Deaths Rates 15

3. Non-Agricultural Wage and Salary Employment in the Nome Census Division. 21

4. Change in Annual Monthly Average Non-Agricultural Wage and Salary Employment 1969 and 1978 22

5. 1977 Monthly Employment, Nome. 27

6. 1978 Monthly Employment, Nome 28

7. Turnover Analysis of Norton Sound Health Corporation-FY-78 . . . 31

8. Nome Employment Distribution - November 1979 33

9. Nome Employment by Industry, November 1979 35

10. Unemployment Rate for Nome Census Region - 1975-79 38

11. Gross Business Receipts, Nome, 1975-1977 41

12. Months Unemployed in Nome and Balance of Region, 1974-75 46

13. Estimated Employment Rates 48

14. Nome Census Division, Wage Payments 50

15. Nome Census Division Total Personal Income and Census Division Per Capita Income Compared to U.S. Per Capita Income, with Adjustments for Cost of Living Differences 52

16. Comparison of Per Capita Income Between Nome, Nome Census Division and Alaska 54

17. Racial Distribution of the Nome Region, Family Income-1970 . . . 57

18. Cost of Living in Nome Compared to Anchorage-1975 57

19. FY-1980 General Fund Budget, City of Nome 60

20. General Fund Expenditures, City of Nome, 1975-1980 61

21. Valuation, Population, and General Obligation Dept, 1978 City of Nome, Alaska Cities, Alaska Municipalities 62

LIST OF TABLES - CONTINUED

22. Education Expenditures and Revenue Sources - 1977-1979 69
23. Supplemental Program Funding in Nome 70
24. NWCC Student Population 74
25. Northwest Community College Funding 76
26. Part ICrimes,1978-1979 79
27. Crime Clearance Rates 81
28. Property Loss and Recovery Rate 82
29. Breakdown of Calls -1978. 83
30. Racial Breakdown - 1978ArrestReport 83
31. Age - 1978 Arrest Report 84
32. Juvenile Arrests by Age - 1978 Arrest Report 84
33. Selected Crimes Multiple Offenses Chart - 1978 85
34. Programs September 1978 - May 1979 92
35. Recreation Programs 93
36. Facilities Inventory. 96
37. Projected MaterDemands. 100
38. Generation Capacity 106
39. Existing Land Use City of Nome, Alaska 1967 113
40. Comparative Census Data, Nome, Alaska 132
41. Manpower Norton Sound - Bering Straits Region March 1979 142
42. CrudeDeathRate 144
43. Ranked Causes of Death 145
44. Deaths From Malignancies 145
45. Public Opinion of Health Problems or System Deficiencies 151
46. Norton Sound Regional Hospital Utilization 153
47. FY 79 Unduplicated Case Count of Bureau of Indian Affairs 162
48. General Assistance Dollars and Unduplicated Case Count 163

LIST OF TABLES - CONTINUED

49. Public Assistance - Nome Region 164

50. Food Stamp Recipients In The Nome Region 166

51. Caseload Categories - Nome Region 169

52. 1979 Usage Rates--Bering Sea Womens' Shelter 170

53. Norton Sound Family Services 172

54. Norton Sound Family Services Client Characteristics 173

55, Nome Area Population and Employment Non-OCS Base Case 179

56. Map Model Population and Economic Projections For Northwest Region Non-OCSBaseCase 184

57. Projection of Primary and Secondary School Manpower and Facilities - Non-OCS Case. 186

58. Postsecondary Student Enrollment Projections - Non-OCS Case . . . 186

59. Police Manpower Requirements 187

60. Detention Facility Requirements 188

61. Minimum Fire Flow Requirements 189

62. Recreation Facilities Requirement 190

63. Electrical Load Requirement 191

64. Wastewater Generation 192

65. Mater Requirements. 193

66. Solid Waste Generation and Total Fill Requirements 195

67. Capacity Requirements Telephone Service 196

68. Forecast of Net Change In Housing Demand Non-OCS Base Case, Nome 1980-2000. 198

69. Estimated Demand For Residential Land Non-OCS Base Case, Nome, 1980 - 2000 199

70. Projected Acute Care Bed Need - Non-OCS Case 200

71. Projected Primary Care Physicians Needs - Non-OCS Case 201

LIST OF TABLES - CONTINUED

72. General Fund Revenue-Forecast - Non-OCS Case (in $1,000's). . . . 206

73. Nome School District Revenues - Non-OCS Case (in $1,000's). . . . 207

74. Nome Operating Expenditures - Non-OCS Case (in $1,000's) 207

75. Nome Non-OCS Base Case Cumulative Ratio of Service Requirements to Population. 209

76. Nome Area Population and Employment Medium Find OCS Scenario . . 213

77. Nome Area Population and Employment High Find OCS Scenario . . . 215

78. Nome Area Population and Employment Low Find OCS Scenario . . . 217

79. Nome Area Population and Employment Exploration Case Scenario . . 219

80. Map Model Population and Employment Projections For Northwest Region Medium Find Scenario 221

81. Map Model Population and Employment Projections For Northwest Region High Find Scenario. 222

82. Map Model Population and Employment Projections For Northwest Region LowFind Scenario. 223

83. Map Model Population and Employment Projections For Northwest Region Exploration Case... 224

84. Estimates of Annual Personal Expenditures in Nome By Labor Force Directly Employed In OCS Activities Medium Find Scenario[a] ($000, 1979) 238

85. Additional Teacher and Classroom Needs Non-OCS Base - Medium Find Scenario (Cumulative) 240

86. Postsecondary Student Enrollment Projections Non-OCS Base - Medium Find Scenario (Cumulative) 241

87. Police Manpower Requirements Non-OCS Base - Medium Find Scenario (Cumulative) 243

88. Detention Facility Requirements Non-OCS Base Case - Medium Find Scenario (Cumulative) 246

89. Minimum Fire Flow Requirements Non-OCS Base Case - Medium Find Scenario (Cumulative) 248

90. Recreation Facilities Requirements Non-OCS Base - Medium Find Scenario (Cumulative) 250

LIST OF TABLES - CONTINUED

91. Water requirements - Liters Per Day Non-OCS Base - Medium Find Scenario (Cumulative) 251

92. Offshore Water Requirement Medium Find Scenario (Cumulative) . . . 254

93. Wastewater Generation - Liters Per Day Non-OCS Base - Medium Find Scenario (Cumulative) 255

94. KW Load Requirements Non-OCS Base - Medium Find Scenario Cumulative 258

95. Solid Waste Generation Quantity of Solid Waste Per Year 260

96. Landfill Requirements Non-OCS Base Case - Medium Find Scenario (Cumulative) 261

97. Capacity Requirements - Telephone Service Non-OCS Base Case - Medium Find Scenario (Cumulative) 263

98. Forecast of Net Change in Housing Demand Non-OCS Base Case - Medium Find Scenario 265

99. Estimated Demand for Residential Land Medium Find Scenario 266

100. Estimated Land Requirements for Oil Terminal and LNG Facility Cape Nome Medium Find Scenario 271

101. Additional Acute Care Bed and Primary Care Physician Need Non-OCS Base - Medium Find Scenario (Cumulative). 274

102. Estimated Total Assessed Value in Nome Medium Find Scenario Production Phase (1978 $)..... 280

103. Annual Property Tax Revenue for Operations, City of Nome During Production Phase of Medium Find Scenarios (1978 $) and Illustration of Debt Capacity and Repayment Obligation for City of Nome During Production Phase - Medium Find Scenario ($ million, 1979) 282

104. Revenue Projections for Nome Medium Find Scenario 283

105. Estimates of Annual Personal Expenditures in Nome by Laborforce Directly Employed in OCS Activites High Find Scenario ($000, 1979) 287

106. Additional Teacher and Classroom Needs Non-OCS Base - High Find Scenario (Cumulative) 289

LIST OF TABLES - CONTINUED

107. Postsecondary Student Enrollment Projections Non-OCS Base High Find Scenario (Cumulative) 291

108. Police Manpower Requirements Non-OCS Base - High Find Scenario (Cumulative) 292

109. Detention Facility Requirements Non-OCS Base Case - High Find Scenario (Cumulative) 295

110. Minimum Fire Flow Requirements Non-OCS Base Case - High Find Scenario (Cumulative). 297

111. Recreation Facilities Requirements Non-OCS Base - High Find Scenario (Cumulative) 299

112. Water Requirements - Liters Per Day Non-OCS Base - High Find Scenario (Cumulative) 301

113. Offshore Water Requirement High Find Scenario (Cumulative) . . . 303

114. Waste Water Generation - Liters Per Day Non-OCS Base - High Find Scenario (Cumulative) 305

115. KW Load Requirements Non-OCS Base - High Find Scenario (cumulative] 307

116. Solid Waste Generation Quantity of Solid Waste Per Year 310

117. Landfill Requirements Non-OCS Base Case - High Find Scenario (Cumulative) 311

118. Capacity Requirements - Telephone Service - Non-OCS Base Case High Find Scenario (Cumulative) 312

119. Forecast of Net Change In Housing Demand Non-OCS Base Case HighFindScenario. 314

120. Estimated Demand For Residential Land High Find Scenario 315

121. Estimated Land Requirements For Oil Terminal and LNG Facility Cape Nome High Find Scenario 317

122. Additional Acute Care Bed and Primary Care Physician Need Non-OCS Base - High Find Scenario (Cumulative) 321

123. Estimated Total Assessed Value In Nome High Find Scenario Production Phase (1978 $)..... 325

124. Annual Property Tax Revenue For Operations, City of Nome During Production Phase of High Find Scenarios (1978 $) and Illustration of Debt Capacity and Repayment Obligation for City of Nome During Production Phase - High Find Scenario ($ Million, 1979) 327

125. Revenue Projections for Nome High Find Scenario 323

126. Estimates of Annual Personal Expenditures in Nome by Laborforce Directly Employed in OCS Activities Low Find Scenario ($000, 1979) . . 333

127. Additional Teacher and Classroom Needs Non-OCS Base - Low Find Scenario (Cumulative) 334

128. Postsecondary Student Enrollment Projections Non-OCS Base - Low Find Scenario (Cumulative) 336

129. Police Manpower Requirements Non-OCS Base - Low Find Scenario (Cumulative) 337

130. Detention Facility Requirements Non-OCS Base Case - Low Find Scenario (Cumulative) 340

131. Minimum Fire Flow Requirements Non-OCS Base Case - Low Find Scenario (Cumulative) 342

132. Recreation Facilities Requirements Non-OCS Base - Low Find Scenario (Cumulative) 344

133. Water Requirements - Liters Per Day Non-OCS Base - Low Find Scenario (Cumulative) 346

134. Offshore Water Requirement Low Find Scenario (Cumulative) . , ... 348

135. Wastewater Generation - Liters Per Day Non-OCS Base - Low Find Scenario (Cumulative) 350

136. KW Load Requirements Non-OCS Base - Low Find Scenario Cumulative". . 352

137. Solid Waste Generation Quantity of Solid Waste Per Year 354

138. Landfill Requirements Non-OCS Base Case - Low Find Scenario (Cumulative) 4355

139. Capacity Requirements - Telephone Service Non-OCS Base Case - Low Find Scenario (Cumulative) 357

140. Forecast of Net Change In Housing Demand Non-OCS Base Case LowFindScenario. 3599

141. Estimated Demand for Residential Land Low Find Scenario 361

142. Estimated Land Requirements for Oil Terminal And LNG Facility Cape Nome Low Find Scenario 362

743. Additional Acute Care Bed and Primary Care Physician Need Non-OCS Base - Low Find Scenario 366

144. Estimated Total Assessed Value In Nome Low Find Scenario Production Phase (1978$) 370

145. Annual Property Tax Revenue for Operations, City of Nome During Production Phase of Low Find Scenario (1978 $) and Illustration of Debt Capacity and Repayment Obligation for City of Nome During Production Phase - Low Find Scenario ($ Million, 1979) 371

146. Revenue Projections for Nome Low Find Scenario . . . . . 373 *

147. Housing Requirements under the Exploration Case 378

148. City of Kotzebue and Nana Region Population Growth 387

149. Length of Residency in Kotzebue 394

150. Change in Annual Monthly Average Non-Agricultural Wage and Salary Employment 1969 and 1978 397

151. 1977 Monthly Employment, Kotzebue 402

152. 1978 Monthly Employment, Kotzebue . . . . . 403 *

153. Occupations of Employed Persons in Kotzebue 1978 411

154. Unemployment Rate for Kobuk Census Region - 1975-1979 413

155. Gross Business Receipts, Kotzebue, 1975-1977 . . . . . 416*

156. Kobuk Census Division, Wage Payments (Wage Totals in Thousands) . . 420

LIST OF TABLES - CONTINUED

157. Kobuk Census Division Total Personal Income And Census Division Per Capita Income Compared To U.S. Per Capita Income, With Adjustments For Cost Of Living Differences 421

158. Comparison Of per Capita Income Between Kotzebue, Kobuk Census DivisionAndAlaska 423

159. Total 1978 Household Income, Kotzebue And Balance Of The Region . 426

160. FY-1980 General Fund Budget, City Of Kotzebue 428

161. General Fund Expenditures, City Of Kotzebue, 1975-1980 Municipal Expenditures 430

162. Kotzebue School Enrollment Trends 432

163. Enrollment By Grade For Kotzebue Public Schools October 31, 1978. 433

164. Education Expenditures And Revenue Sources - 1977-1979' 436

165. Index Of Violent Crimes Less Unfounded 441

166. Crime Clearance Profile.. 443

167. Fire Alarms And Emergency Medical Responses 447

168. Facilities Inventory. 451

169. Possible Future Mater Sources Ranked According To Effectiveness. 458

170. Kotzebue Diesel Generators 462

171. KEA Residential And Commercial Rate Structures 463

172. Land Use City Of Kotzebue, 1976 470

173. Admission, Oct. 1977 - Jan. 1978 Selected PHS Hospitals 493

174. Specialty Clinics At Kotzebue Service Unit 494

175. Crude Birth Rate/1,000 495

176, Death Rates. 495

177. Deaths For Kotzebue 496

178. Kotzebue Hospital Leading Causes Of Hospitalization Ranked In Order Of Discharges FY 1975 - FY 1977 497

179. Leading Causes Of Death (Percent Of All Deaths - 1976) 498

180. External Cause Of Injury (1st Visits) 499

181, FY 79 Unduplicated Case Count Of Kotzebue Bureau Of Indian Affairs 505

182. Public Assistance - Kotzebue Region 506

183. Food Stamp Recipients In the Kotzebue Region 508

184. Caseload Categories - Kotzebue Region 512

185. Years of OCS Activity Phases 540

186. Required Fire Flow By Population 550

187. Recreational Facility and Park Standards 552

188. Optimum Recreational Standards 552

189. Criteria and Standards of a Level III Health Delivery System . . 569

1. INTRODUCTION

The purpose of this study is to provide a profile of the existing economy and infrastructure characterizing the communities of Nome and Kotzebue and forecast the expected service and infrastructure impacts on Nome both without and with projected OCS oil and gas development. The study examines historical trends and current data, identifies key issues or problems within specified sectors of both communities and where possible explores planning processes designed to respond to critical issues.

Descriptive indicators, beginning with an historical overview and community origin, examination of population and economic growth, and government institutions provide the framework for the profile of Nome and Kotzebue. Discussion of service support sectors in both communities indicate the ability to respond to community needs. investigation of health delivery, social service delivery, education, utilities, public safety and recreation comprise this section.

For the community of Nome, the report details the effect of future population growth on the community service sector and the economy with and without the planned Norton Sound OCS lease sale. Where quantifiable standards exist, actual demand for service is presented. In absence of adequate quantifiable standards, qualitative analysis of the effects of future population growth are discussed. The impact analysis, without

OCS development, is based on projected levels of population and employment anticipated in Nome through the year 2000. This section will provide the reader with a sense of the scope of services necessary to accommodate future growth through the end of the study period.

The effects of OCS development are projected within the framework of medium, high and low find scenarios. The scenarios are used to forecast the incremental effects of OCS development above the non-OCS base case. This approach permits analysis of the effects of OCS petroleum development in the Norton Sound region through the year 2000.

The body of the study is accompanied by a detailed discussion of the methods, assumptions and standards used in this report. These include the assumptions and methods used for the population and employment forecasts with and without a planned OCS lease sale, and the standards which provide the basis by which change in services and infrastructure can be measured over time.

II. NOME BASELINE DATA

Historical Background

Nome's origin stems back to the turn of the century with the discovery of rich gold deposits on the Seward Peninsula. Nome, originally named Anvil City, was the scene of a substantial gold discovery in July, 1898. Jafet Lindeberg, a Lapp reindeer herder from Norway, along with John Brynteson, a coal and iron miner from Michigan and Erick O. Lundblom, a San Francisco tailor were forced ashore in a storm where they made a substantial discovery of gold on Anvil Creek. Joined by friends from Golovin Bay, they organized the Cape Nome Mining District, and for the remainder of the season, the men mined $1,800 of coarse gold. Word was soon to spread of the discovery through the rest of the State and the outside world. Anxious prospectors began coming to Nome during the summer of 1899. Ships arrived in great numbers and cargo and supplies were piled as high as two story houses along Nome's waterfront. Lack of timber resources in the area created an immediate housing crisis. In 1899, Nome's population had grown to 3,000 and were sheltered in a few frame and galvanized iron buildings and hundreds of tents. Supplies were expensive with lumber shipped by ocean steamer at a cost of $150 per 1,000 feet, coal at $100 per ton, reindeer meat at $1.00 per pound, and eggs at $3.00 per dozen. (Grauman, 1977)

Many who arrived during the summer of 1899 found creeks staked by only a few with power-of-attorney from all their friends. Many of the early stakers were Scandinavian few of which were naturalized. The law at that time stipulated that no alien could stake a claim on American soil. However, no one was authorized to question such a claim except an appointee of the state itself. (Hulley, 1953) As a result, dissension began to grow among

the new arrivals resulting in demands to restake claims. Claim jumping was short to follow. Realizing the potential seriousness of the problem, Captain E. S. Walker at Fort St. Michael sent a troop of soldiers to attempt to reestablish some semblance of order. However, the problem finally rectified itself with the discovery of gold along the beaches of Nome. At summer's peak, 2,000 men mined the beaches yielding more than $1,000,000 in two months. (Graumann, 1977)

The discovery of gold along Nome's beaches was responsible for the tremendous influx of opportunists to the Nome area. Ground could not be staked along the beaches but a miner could pitch his tent and mine the ground ahead of it down to the water. Beach mining was accomplished for 30 miles extending from Cape Nome, 13 miles east of Nome, to Cape Rodney, 16 miles west. At the height of 1900, 8,000 prospectors lined the beaches.

The U. S. Census for 1900 placed the population of Nome at 12,488. With any population influx this great, life would be a bit chaotic and Nome's early history is no exception. Crime was rampant through the district. After considerable problems, residents elected a consent form of government in 1899 which included the first Mayor of Nome, T. D. Cashell, a chief of police and a fire chief. (McLain, 1968) However, the newly formed government had no power to enforce payment of taxes and by March, 1900 was out of funds. (Al aska Consultants, 1968)

Early in 1900, reports of the problems of crime and conditions reached Washington D. C. The territory of Alaska was subsequently divided into

three judicial districts with three judges. For the second judicial district, which included Nome, Judge Arthur H. Noyes was sent to help establish judicial order and settle mining claim disputes. However, Judge Noyes was an abominable failure in creating law and order over disputed mining claims and was, in reality, engaging in corrupt activities. He and his partner, Alexander McKenzie, commenced operation of a "receivership racket" which brought them both up on charges before the Ninth Circuit Court in San Francisco. (Hulley, 1953)

Also in 1900, many local residents started pushing for incorporation of the City of Nome in order to give the area some stability. Incorporation finally passed in April, 1901. In addition to incorporation, a city council was selected with a mayor chosen from among the council members. In addition, a city clerk, city treasurer, city assessor, city attorney, chief of police and a city health officer were also selected. (McLain, 1968)

By the end of 1906, Nome had become an established town. Schools and churches were built, three newspapers circulated the area and five fraternal societies had organized. The estimated gold production for the Seward Peninsula had reached $7,500,000. Other communities in the region had been established including Council, Teller, Dickson, Bluff, Solomon and Sullivan to serve as centers for expanding prospecting operations. (Graumann, 1977)

Overland transportation was both difficult and costly. In order to facilitate movement of goods, the Wild Goose Railroad was built from

Nome a distance of four miles to Anvil Creek at a cost of $5,000 per mile. (McLain, 1968) Additions to the rail road were made until it reached 85 miles into Kougarok area. In addition, most overland transportation ranged in cost between ten and sixteen dollars per ton per mile compared to water transportation which cost only seventy cents to a dollar and a half per ton per mile. (Graumann, 1977)

Communications in the area stabilized in the early 1900's from the erratic mail delivery which first characterized the region. By 1906, during the winter, dog teams or sled deer made monthly mail deliveries to the major supply centers. During the summer, ships brought mail on a regular basis. By 1903, Captain Leonard D. Wildman had modified the wireless radio to meet arctic requirements and his work was successful in connecting the arctic military stations to the rest of the world. (Graumann, 1977)

By 1906, all major placer deposits had been discovered. From 1898 to 1906, the placer mines of the Seward Peninsula had produced $37,247,000 in gold. In comparative terms, during the same years, the Klondike produced $118,000,000 and in two years, California produced $62,000,000. (Graumann, 1977)

From 1907 to 1914, the region saw a decline in gold production. However, in 1915 and 1916 conditions improved with the tendency toward large scale mining operations. Mining came to almost a standstill with the onset of World War I lasting until 1923. The war depleted labor supplies and raised

the cost of materials and equipment. From 1929 to 1934, through the midst of the depression, mining in the region held its own. By 1932, gold rose in price from $20.67 to $35.00 an ounce further stimulating operations. World War II haulted mining operations and following the war, rapidly rising costs forced many operations to remain closed. (Graumann, 1977)

Nome's dredges did eventually reopen in 1975 with mining operations continuing through today.

Following the initial gold rush in Nome, the population dwindled to 852 in 1920. The town's land use patterns were basically established and Nome has shown steady but modest growth since that time with the present population at 2,842.

Nome has had hospitals and a school system since almost its inception. In 1900, Catholic missionaries constructed Nome's first hospital. The Methodist Church assumed ownership in 1918. In 1977, the Norton Sound Health Corporation purchased the hospital facilities from the Women's Division of the Board of Global Ministries of the United Methodist Church.

Nome's first school was constructed in 1901 and was accredited early-on. Regional native education was largely funded through the Bureau of Indian Affairs and white education was through the territorial school system. After statehood, both levels of government continued to provide for education in the region. Regional high schools such as the William E. Beltz Regional

High School was constructed under the State Operated School System (SOS). In the mid-1970's the SOS was abolished and using the boundaries of regional corporations established under the Alaska Native Claims Settlement Act, the unorganized boroughs were divided into educational service areas called Regional Education Attendance Areas (REAA's). Although the Beltz regional high school is closed, the State of Alaska continues to use the facility as administrative headquarters for the Bering Straits REAA. The City of Nome continues to operate both a primary and secondary schools funded by both local taxes and state revenue. The secondary system is housed in the Beltz complex.

From the whiteman's Bonanza Town in the early 1900's, Nome has displayed a somewhat stagnant economy through present day. Although mining and commercial fishing activity have increased in recent years, the thrust of the economic activity is government service delivery and tourism.

The town's racial distribution has changed substantially since inception. Nome, once a predominantly white community, is now 60 plus percent Alaska native. However, political and economic control largely remains a function of the white community. Through general election, a mayor and city council form of government exists. In addition, a city manager s also appointed. Major present day city functions include water and sewer utilities, electricity, police, fire and schools.

In order to satisfy aboriginal land claims, PL92-203, the Alaska Native Claims Settlement Act was signed into law on December 18, 1971. Native

corporations were formed to manage the land and money allotted to the native people under the act. Bering Straits Inc. become the regional profit arm for Norton Sound. Kawerak Inc. is the regional nonprofit organized to meet social and economic needs through a variety of government funded programs; and Norton Sound Health Corporation organized to meet health and related needs. Sitnasuak and King Island are the two recognized village profit corporations and Nome Eskimo Community is the village nonprofit IRA (Indian Reorganization Act) Council. As land selections are granted, these corporations will play an increasing role in local politics and decision making.

In order to stimulate the economic tax base and increase planning and zoning powers in Nome, annexation of surrounding lands has been as issue since the 1960's. Attempts have been made to increase the incorporated boundaries but efforts have failed apparently due to technical procedure. Presently, the City of Nome is proposing additional annexation which would increase the Nome coastline from two to 38 miles and take in much of the land claimed by Sitnasuak under the Alaska Native Claims Settlement Act.

This overview is principally an institutional history of the community and does not reflect the complex social and cultural evolution that took place in Nome throughout its history. For a thorough analysis of this aspect of Nome's history, the reader should refer to Ellanna's work, "Norton Sound Sociocultural Systems Analysis." (1980).

Current Demographic and Economic Profile

The present population of Nome can be characterized as young, lacking in formal education, underemployed, and sharply split between an Alaska Native majority and a white minority. Nome has been a stable economic unit for quite some time with recent expansion in selected industries improving its limited employment base. Government spending continues to dominate the economic base of Nome; participation in the cash economy and personal incomes remain below U.S. and state averages; and the economic and cultural cleavages between the native and white communities continue to be severe. Subsistence activities continue to make an important contribution to the overall economic life of the community.

BASELINE POPULATION ESTIMATE

The population of Nome has shown a pattern of slow incremental growth with periods of stagnation since 1920. The permanent population has increased only 1.3 percent annually since 1960, and is estimated to be 2,842 in 1979. Population growth in recent years appears to have occured almost exclusively between 1975 and 1978 with an increase in economic activity and employment. The major factors included the revitalization of the gold industry by renewed activity at the Alaska Gold Company, and the extension of health and social services and corporate activity by Alaska Native profit and nonprofit corporations under ANSCA. This period also increased the size of a historically evident transient population which comes to Nome during the summer months filling temporary jobs. This group is estimated to be about 140 to 215 in 1978 and 1979. This number varies due to opportunities in contract construction which were low in 1978.

Contiguous populations outside of the Nome townsite are included in the permanent population estimates. The Icyview subdivision, Nome-Beltz complex, FAA, and Alaska Gold Company all have residents who contribute to the overall economic life of the area. A July 1978 census conducted by the City of Nome counted 272 residents in these non-city locations.

Table 1 describes the population trends and includes three independent numerations conducted between 1975 and 1978. While it is difficult to assess the accuracy of these efforts, a review of their consistency and the relationship of these data to employment trends suggest that the information is reasonable and acceptable in understanding the population trends of Nome. The 1979 Nome population estimate is given, and notes the probable difference between winter and summer, and city and non-city populations. Census data suggest that up to 1960 Nome grew somewhat faster than the rest of the region. At that point, Nome's population stagnated and natural population increases within the villages decreased Nome's proportion of the population. In 1970 the region's population stood at 5,749 with Nome constituting 43.3 percent of the total. By 1975, Nome's proportion of the region's population dropped to 39.8 percent with a region estimate of 5,978.

Increased economic activity due to reactivating gold mining and general statewide boost of economic activity due to pipeline construction, and other factors in the Nome area produced an increase in population after 1975 raising its proportion of the region's residents (an estimated 6,489 in 1979) to 43.8 percent. If the residents contiguous to the Nome townsite are included, this raises the proportion to 47.2 percent.

TABLE 1

NOME POPULATION GROWTH 1900-1979

YEAR	AREA		POPULATION
1900[1]	Nome, Town		12,488
1910	Nome, Town		2,600
1920	Nome, Town		852
1930	Nome Townsite, Inc.		1,213
1940	City of Nome		1,559
1950	City of Nome		1,876
1960	City of Nome		2,316
1970	City of Nome		2,488
1975[2]	City of Nome (March)		2,380
	(King Island Subtotal - 215)		
1976[3]	City of Nome (February)		2,605
1978[4]	City of Nome (July)	2892	
	Contiguous Areas	272	
	Total Nome Area		3,164
1979[5]	Winter - City	2842	
	Contiguous Areas	222	
	Total		3,064
	Summer - city	2932	
	Contiguous Areas	272	
	Total		3,204

[1]1900-1970 U.S. Census

[2]Linda J, Ellanna and Maureen C. Roche, Bering Strait Regional Census 1975 Kawerak, Inc., October, 1976.

[3]CH_2M-HILL

[4]City of Nome

[5]Estimate of authors

Outside of Nome, the region's population is scattered among 18 sites throughout the region ranging from 2 to 601 persons (in 1975). Unalakleet on the eastern end of Norton Sound is the second largest community. The average size for the sixteen villages with permanent populations is 224. (Ellanna, 1976)

INDIVIDUAL CENSUS DATA

Age and Sex

The Nome population in 1975 revealed slightly more males (51 percent) than females (49 percent). This is a more balanced distribution than the region as a whole which has had a 53 versus 47 percent split in both the 1970 and 1975 counts. Excluding Nome, the region had an estimated 54.3 percent males and 45.7 percent females in 1975. However, the male/female ratio in Nome was not balanced throughout all age groups. While those under 20 years of age were balanced (49.4 for males and 50.6 percent for females), the 26 to 50year age group had 53.7 percent males and 46.3 percent females.

As noted in Figure 1 these tendencies produce a somewhat skewed population age-sex pyramid. The figure also reveals the strong downward age distribution reflecting a very young population. The average age is 25 years and the median is only 21.6 years. Some 47 percent of the population is under 21 years, while 6 percent of the residents are over 60 years of age. This trend is below the rest of the region, which has 52 percent of the population below 21 years and 6 percent above 60 years of age. Only 40 percent of Anchorage's population was under 21 in 1977 with a median age of 25 years.

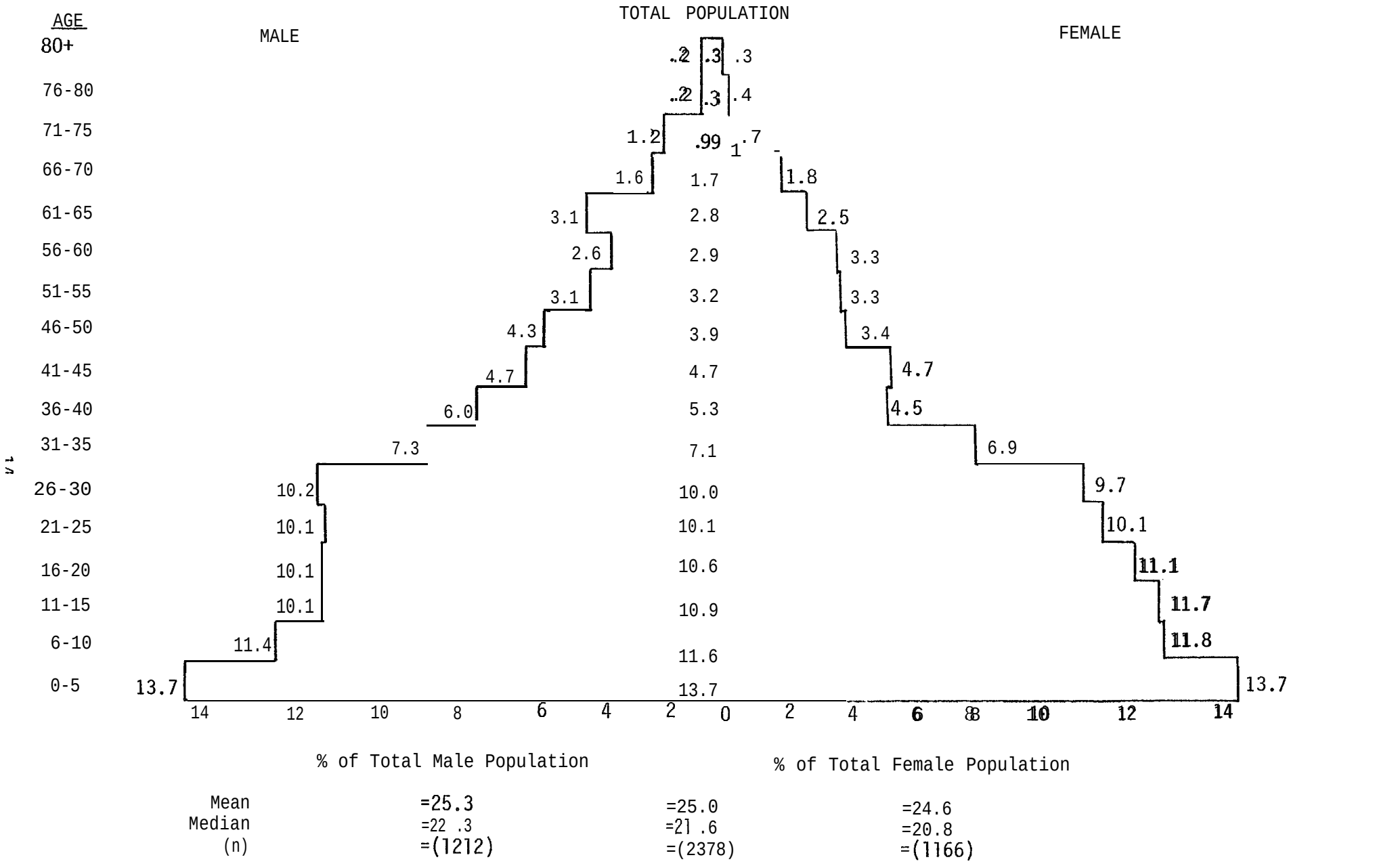


FIGURE 1

NOME AGE/SEX PYRAMID

The 1970 census, found 54 percent of the region's population below 21 years of age. The 1975 data suggests a four percent shift as the population ratio of under versus over 21 years changed in favor of the adult population. The reason for this shift appears to rest primarily on a change in the birth rate. While the data in Table 2 is regional, it is assumed that Nome has changed even more rapidly than the region as a whole which had an annual birth rate of 28.0 from 1970 to 1973, and 23.3 from 1975 to 1977. This shift reflects similar drops in the birth rate found in other areas of the state and nationally. It is assumed that Nome, because of its large white population, would lead any birth rate decline in the region. Recent school enrollment data tend to support this hypothesis. For a more complete discussion of household composition and racial differences see the section on housing and land use.

TABLE 2

BERING STRAITS REGION

BIRTHS AND DEATHS RATES[1]

YEAR	POPULATION	BIRTHS[3]	BIRTH RATE/1000	DEATHS[3]	DEATH RATE/1000
1970	5749	159	27.7	49	8.52
1971	5795	172	29.7	51	8.80
1972	5841	162	27.7	47	8.05
1973	5887	157	26.7	61	10.36
1974	5933	144	24.3	46	7.75
1975	5978	142	23.8	59	9.89
1976	6249	152	24.3	59	9.44
1977	6489	134	20.7	49	7.55
1978	6589	170	25.8	60	9.11

[1]
[2]Norton Sound Health Corporation, 1979.
[3]State of Alaska Vital Statistics.

Race

The racial composition of the City of Nome has been relatively stable in recent years. The 1975 census found that 60.6 percent of the population was Eskimo (at least one-quarter), .8 percent Indian, 37,5 percent white, .5 percent black, .4 percent Vietnamese, and .4 percent other. (Ellanna, 1976) The 1976 utility census found 63.6 percent of Nome households were Alaska native and 36.4 percent were non-native (primarily Caucasian).

The significant proportion of white residents found in Nome is not reflected in the region as a whole. The 1975 census noted that Unalakleet was the only significant population center with white representation above seven percent (11 percent). In the entire region, 81 percent were identified as Eskimo, 17.6 percent were white, .3 percent black, ..5 percent Indian, .2 percent Vietnamese, and .2 percent other. (Ellanna, 1976) This is a slight shift in favor of the Eskimo group. The 1970 census has found 20.5 percent white, .4 percent black, and 79.1 percent all other racial groups (U.S.Bureau of Census, 1'371).

Education

Formal educational data is quite weak for the Nome area. That which does exist suggests some severe shortcomings and marked achievement differences within the population. The 1970 census for the region found that 69.5 percent of adults 25 years or older had less than a high school education,

only 13.3 percent had a high school diploma, 7.7 percent had one to three years of post secondary education, and 9.5 percent had four or more years of post secondary education. The median education in 1970 was about eight years for adults over 25 years.

While these statistics are disturbing and suggest a serious failure of the past educational system, there have been some improvements. Nome has had a long history of locally available, primary and secondary schools, has a large non-native population with higher educational achievement, and has significant professional and managerial occupation groups which emphasize formal education. Extrapolated data from the more recent 1975 census estimates that only 31.5 percent of adults (18 years and older) have less than a high school education, and 36.5 percent have a high school diploma. In addition, 17.2 percent have one to three years of post secondary education, 10.9 percent have a bachelors degree and 3.9 percent have had more than four years of college. Of those with less than a high school education, 3.3 percent have had no formal education.

While Nome is better off compared to the balance of the region, it is still substantially below urban patterns. In Anchorage, for example, only 12.7 percent (compared to 31.5 percent) of adults have failed to achieve a high school education, while 22.7 percent have four or more years of post secondary education (compared to 14.2 percent for Nome), Anchorage's median educational attainment is 12.5 years (Municipality of Anchorage, 1978).

The main problem, however, are educational differences within the Nome population itself. While detailed breakdowns do not exist, observers agree that the native population in Nome disproportionately occupies the lowest levels of educational achievement, while non-natives occupy the highest levels. The only insight available is an analysis of the King Island subpopulation. This group's recent move to Nome should make its achievement levels correspond more closely to smaller villages and are indicative of the Eskimo's educational patterns. For this group, 73.8 percent (adults 18 years or older) had not completed high school, 23.1 percent have a high school diploma, and only 3.1 percent have post secondary education.

Of the 196 Nome adults in the 1975 census with a baccalaureate or higher degree, it is estimated that one-third are employed by the school district, 15 percent work for the rural education district or community college, and roughly 40 percent are employed by other government agencies. All but a small proportion of these jobs are occupied by non-natives. If these jobs are added to health, social service and other professionals (virtually all non-native), only five to ten percent of the college degree jobs are unaccounted for (estimates by Policy Analysts, Limited).

There are also differences in attainment between men and women. The disproportionately higher attainment for males over females is significant.

In Nome adults in 1975, 29.3 percent of the males had failed to complete high school compared to 33.9 percent for females. It is suspected that most of the male-female difference is occurring within the native population. While not conclusive, the King Island subpopulation suggests that this hypothesis is correct. For King Island adults, 64.3 percent of the males and 85 percent of the females failed to complete high school (a 20.7 percent difference).

Other Social Characteristics

Of the 577 Nome households enumerated in 1975, 65.3 percent were headed by a married couple and 34.7 percent were headed by a single adult.

EMPLOYMENT AND ECONOMIC ACTIVITY

Economic data on Nome tends to be misleading, statistically flawed, or unavailable. Despite these shortcomings, estimates were derived from existing data which portrays a sufficient if incomplete picture of the economic trends in Nome.

Regional Employment Status

The Research and Analysis Section of the Alaska State Department of Labor publishes on a quarterly basis monthly non-agricultural employment data by industry for the state as a whole and for each of 29 regions, Nonagricultural employment data is available only for the Nome region in this series; data pertaining to the City of Nome is not disaggregated from

the regional data. Despite this, Nome's historical role as the primary employment center in the region gives this information importance in describing general employment trends. Table 3 outlines total nonagricultural wage and salary employment in the Nome region. Historically, the region and Nome's employment was stagnant from 1960 to ?971 at or below 1,000 employees. In 1961, regional nonagricultural employment was 825, in 1964 it was 882, with a first quarter low of 708 and a third quarter high of 1,064 (Alaska Department of Labor). In 1965, it averaged 1,000. From 1972 to 1974 employment averaged just over 1,300. This was due to moderate growth in trade and services, and strong performance in TUC and state and local government.

From 1975 to 1977, the average monthly rate rose to 1,743. Mining and FIRE led the increase, but services and trade were also strong. A new high in regional employment (2,175 monthly average) was achieved in 1978. This was due to strong gains in the services and state and local government.

Table 4 shows the change in the industrial categories between 1969 and 1978, as well as the composition of the two selected years. The average workforce almost doubled during the 10 year period, but this is not due to consistent change in all industrial categories. Mining became an important component with the workforce concentrated in Nome and the reopening of the Alaska Gold Company's operations (formerly UV Industries and prior to that United States Smelting and Refining Company). Operations had ceased in 1962 but two dredges were reactivated in 1975.

TABLE 3

NON-AGRICULTURAL WAGE AND SALARY EMPLOYMENT IN THE NOME CENSUS DIVISION[a]

Year/Month	Tota 1 Non-Ag. Employment	Mining	Construction	Manufacturing	IUC[c]	Trade	FIRE[d]	Services	Federal Govt ,	State & Local Govt.	Misc.
1969	1060	(10)[b]	78	(20)	106	168	(6)	124	244	303	(1)
1970	938	(10)	39	(20)	115	128	(5)	94	187	339	(1)
1971	1025	(19)	38	(16)	110	129	(4)	84	223	401	(1)
1972	1213	(10)	74	(11)	123	141	(14)	138	214	486	(2)
1973	1327	(5)	62	(7)	178	153	36	183	209	493	(1)
1974	1370	(15)	49	(7)	187	173	63	230	197	448	(1)
1975	1704	(118)	(35)	(7)	204	211	132	341	187	469	(0)
1976	1877	(112)	192	(12)	175	231	182	298	201	474	(0)
1977	1649	(110)	117	(40)	124	241	138	266	178	434	(.5)
Jan	l - m	(42)	62	11	74	253	141	268	186	413	(1)
Feb	1408	(46)	72	13	89	240	107	259	178	403	(1)
Mar	1361	(51)	74	7	89	231		244	170	401	(1)
Apr	1360	(69)	71	(7)	105	219	1%	182	171	429	(0)
May	1454	(80)	86	30	114	234	133	204	170	403	(0)
Jun	1807	(186)	129	60	121	252	278	240	158	383	(0)
Jul	2125	(307)	177	(175)	179	244	247	237	172	387	(0)
Aug	1974	(188)	209	(110)	177	256	185	251	171	427	(0)
Sep	1839	(148)	211	(50)	174	245	91	263	178	479	(0)
Ott	1721	(103)	120	10	126	243	98	324	202	494	(1)
Nov	1710	(75)	106	6	126	239	91	367	192	507	(1)
Dec	1583	(25)	90	5	119	237	87	352	184	483	(1)
1978	2159	(99)	40	(38)	130	(272)	114	555	191	719	(1)
Jan	1860	(15)	49	(5)	97	(239)	111	483	193	667	(1)
Feb	1816	(13)	44	(6)		(237)	92	472	199	656	(1)
Mar	1827	(14)	44	(10)	1::	(245)	91	469	184	665	(1)
Apr	1890	(69)	35	(10)	120	261	78	432	193	692	(1)
May	2148	(111)	31	(30)	126	263	1 13	564	185	724	(1)
Jun	2446	(186)	34	(90)	150	299	101	620	175	790	(1)
Jul	2405	(190)	42	130	158	282	224	586	175	617	(1)
Aug	2415	(183)	41	100	158	298	161	632	191	650	(1)
Sep	2425	(138)	53	41	149	308		652	198	787	(1)
Ott	2370	(124)	42	(10)	139	332	1::	607	198	806	(1)
Nov	2209	(108)	37	(10)	135	243	101	579	200	795	(1)
Dec	2096	(37)	33	(10)	128	257	86	563	204	777	(1)

[a]Data derived from Alaska Department of Labor, Statistical Quarterly, 1969-1978.

[b]Parenthesis indicate undisclosed data which is estimated using techniques developed under the Alaska OCS labor statistics analysis project.

[c]Transportation, Utilities and Communications

[d]Finance, Insurance and Real Estate

Construction has had a very erratic pattern with employment up and down. Employment peaked in 1972 with 74 and again in 1976" with 192 monthly average. However, 1978 was a very slow year for the industry. Manufacturing increases are due almost exclusively to fish processing with employment concentrated outside of Nome, primarily in Unalakleet and Golovin.

TABLE 4

CHANGE IN ANNUAL MONTHLY AVERAGE NON-AGRICULTURAL WAGE AND SALARY EMPLOYMENT 1969 and 1978[a]

Category	n	1969 %	n	1978 %	% of Change
Mining	(10)	0.9%	(99)	4.6%	+890%
Construction	78	7.4	40	1.9	- 49%[b]
Manufacturing	(20)	1.9	(38)	1.8	+ 90%
TUC	106	10.0	130	6.0	+ 23%
Trade	168	15.8	272	12.6	+ 62%
FIRE	(6)	0.6	114	5.3	+1800;L
Services	124	11.7	555	25.7	+348%
Federal Government	244	23.0	191	8.8	- 22%
State and Local Gov't.	303	28.6	719	33.3	+137%
Miscellaneous	(1)	0.1	(1)	0.0	0%
Total Non-Agricultural	1060	100.0%	2159	100.0%	+ 94%

[a]Alaska Department of Labor
[b]As noted in the text, this is due to the erratic nature of this category than to a long-term decline.

Transportation, utilities, and communication has grown more slowly reflecting the movement of goods and services in the region, with employment in this category concentrated in Nome. The transfer of long distance communications (the White Alice system) from the U. S. Air Force to Alascom, a private corporation may have contributed to this increase. Trade has been almost exclusively retail with the

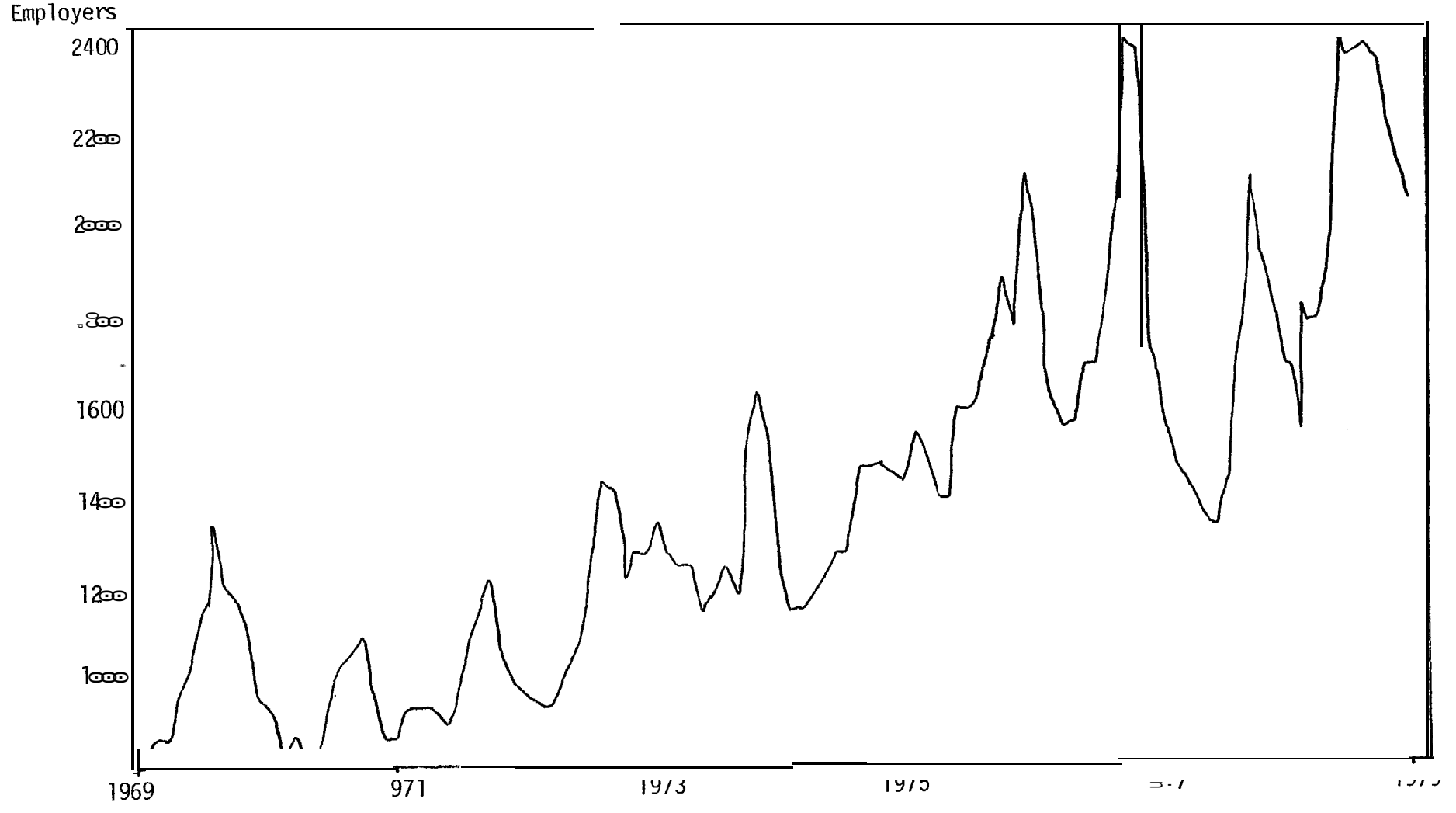
bulk of the employment in Nome. Finance, Insurance and Real Estate reflected dramatic growth from a small base, due primarily in the establishment of regional and village profit native corporations. Services also had strong performance due to the development of non-profit native corporations (regional, village and others like Norton Sound Health Corporation) designed to carry out social and health service functions under contract from the state and federal government.

While federal employment has remained relatively stable during the decade, state and local government employment has shown strong growth. This is due to the transfer of the rural education function to local boards and the development of educational opportunities (both primary and secondary) at the village level in the mid 1970's, and the development of CETA employment opportunities in both government and services. The latter is most apparent in the 1978 statistics.

These trends raised the role of mining, FIRE, services and local government while construction, federal employment, and TUC declined in relative importance as an employer.

Seasonality of Employment

Both 1977 and 1978 employment data show significant seasonal fluctuation. Seasonal swings have increased since 1975 though a consistent cyclical pattern is found historically in the data (see figure 2). Employment peaks in the summer and bottoms out in the first quarter of each year. In 1977, peak monthly employment was 56 percent above



F GURE 2

NON-AGRICULTURAL WAGE AND SALARY EMPLOYMENT, NOME CENSUS DIVISION[a]

[a]Alaska Department of Labor

the low month and 29 percent above the annual monthly average. For 1978, the peak was 35 percent above the low month and 13 percent above the average.

The seasonal shifts are most likely to occur in construction (when summer projects occur), TUC (water transport lightening is possible only during the ice free periods), mining and manufacturing (with summer peaks due to weather and the fishing seasons), and FIRE (probably due to increased economic activity of the profit native corporations). The low level of construction activity may be due to native corporation activity classified under FIRE rather than the construction SIC.

Nome Employment Status

Though state labor statistics do not disaggregate the community of Nome from regional data, the State Department of Labor, upon special request, broke out the Nome data from the regional totals. This nonagricultural employment data on the City of Nome includes only workers who are covered by the state's unemployment insurance (UI) law. On January 1, 1978, this insurance coverage was extended to many workers who were previously uncovered including most state and local government employees. The regular Department statistical series reports total nonagricultural employment (that is, workers covered and not covered by the state UI law). Workers not covered by state UI law in 1978 were in the state and local government category (about 13 to 22 percent of this group depending on the month), and services (about three percent of this group). This difference has complicated analysis of the community level data. The percent of regional workers covered by state UI law is shown to estimate the total community's employment. Reviewing the data on tables 5 and 6 there are several apparant and deceptive limits on the information. First, the total number of employed workers far exceed reasonable estimates of adult participation rates in the work force. The 1970 census noted that only 38.4 percent of the region's adult population 16 years and older were employed and the civilian labor force participation rate was 45.6 percent. In 1969, only 28.6 percent of the labor force was employed full-time throughout the year, while 47.7 percent worked less than six months. (U. S. Census, 1971).

TABLE 5

1977 MONTHLY EMPLOYMENT, NOME[a]

Employment (Workers Covered by State UI Law)

Industry	Jan	Feb	Mar	Apr	Nay	Jun	Jul	Aug	Sep	Ott	Nov	Dec	Average Mo.	% of Total
Mining	(50)[e]	(45)	(40)	(50)	(90)	(175)	(200)	(180)	(120)	(90)	(75')	(25)	(95)	10.8
Construction	58	63	56	56	71	111	128	147	135	80	64	52	85	9.7
Manufacturing	(4)	(4)	(4)	(4)	(4)	(7)	(10)	(10)	(4)	(4)	(4)	(4)	(5)	.6
TUC[b]	66	80	80	95	103	109	166	166	165	113	113	108	114	13.0
Trade	188	179	171	173	177	198	178	182	176	190	183	176	781	20.6
FIRE[c]	(72)	(52)	(52)	(64)	(49)	(66)	(96)	(67)	(55)	(55)	(39)	(41)	(59)	6.7
Services	225	215	201	135	156	187	199	220	220	287	329	313	224	25.5
Federal Govt.	86	84	86	80	88	96	101	105	106	114	108	108	97	11.1
State Govt.[d]	11	16	16	17	18	15	14	13	11	23	26	23	17	1.9
Local Govt.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Covered by State UI Law	760	738	706	674	756	964	1092	1090	992	956	941	850	(877)	100.0
Percent Covered by UI Law (Region)	72	72	71	72	75	81	83	81	76	74	73	72	76	
Est. Total Nome Non-Agricultural	(10515)	(1025)	(994)	(936)	(1008)	(1190)	(1316)	(1346)	(1225)	(1258)	(1272)	(1164)	(1118)	

[a] Alaska Department of Labor
[b] Transportation, utilities, communication
[c] Finance, insurance, real estate
[d] State and local government coverage began in 1978.
[e] Undisclosed data in parenthesis is estimated.

TABLE 6

1978 MONTHLY EMPLOYMENT, NOME[a]

Employment (Workers Covered by State UI Law)

Industry	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Ott	Nov	Dec	Average Mo.	% of Total
Mining	(30)[e]	(30)	(39)	(60)	(125)	(175)	(180)	(170)	(130)	(80)	(60)	(25)	(93)	(5.9)
Construction	40	40	4)	33	30	33	39	39	51	39	33	30	38	2.4
Manufacturing	(4)	(4)	(	(J)	(4)	(7)	(10)	(10)	(4)	(4)	(4)	(4)	(5)	(.3)
TUC[b]	81	80	88		111	134	143	143	134	123	118	113	115	7.3
Trade	173	173	182	186	191	212	191	200	196	198	169	175	187	11.8
FIRE[c]	(45)	(31)	(22)	(21)	(16)	(44)	(26)	(28)	(34)	(50)	(58)	(31)	(38)	(2.4)
Services	447	437	433	393	518	580	553	594	593	557	531	523	513	"32.4
Federal Gov't.	106	115	108	108	106	116	115	115	115	115	115	117	113	7.1
State Govt.[d]	136	135	138	145	141	172	188	180	182	181	178	166	162	10.2
Local Govt.[d]	316	317	308	344	397	376	200	215	336	342	348	337	320	20.2
Total Covered by State UI Law	1378	1362	1372	1403	1639	1849	1645	1694	1775	1689	1614	1521	1584	100.0
(Percent Covered by UI Law)	91	91	91	93	94	95	95	95	94	(93)	(92)	(91)	(93)	
Est. Total Non-Agricultural	(1531)	(1497)	(1508)	(1519)	(1744)	(1946)	(1732)	(1783)	(1888)	(1816)	(1754)	(1671)	(1703)	

[a] Alaska Department of Labor
[b] transportation, utilities, communication
[c] Finance, insurance, real estate
[d] State and local government coverage began in 1978,
undisclosed data in parenthesis is estimated.

The 1975 Kawerak census found that 41.4 percent of the Nome adults (21 years or older) were employed full-time in the past years, 26.9 percent were employed part of the year, and 31.7 percent were not employed at all. This suggests an employment base in the City of Nome of 41 percent and a ceiling of 73 percent. The state employment data of July and August of 1978 was compared to population estimates extrapolated from the 1978 City census. If the state data is correct, 85.4 percent of all residents 16 years and over were employed in July 1978. This can be compared to the much stronger labor market of Anchorage which has a 72.5 percent employment rate among adults 18 years or older. This conflictual information leads to a more detailed assessment of the Nome and regional data.

Analysis suggested three points:

- Because Nome acts as the regional center for the Bering Straits area, some reporting units pay their regional employees out of Nome and are counted in the Nome statistics. REAA classified as a local government unit is one example which is reporting regional employees out of its Nome headquarters.

- Upon discussion with selected employers, there is strong evidence that there is unusually high job turnover in certain job classifications due to turnover in professional occupations as people leave the area, and turnover in unskilled categories by generally permanent residents. The Norton Sound Health Corporation, for example, has reported a reduction in annual personnel turnover rate down to 72 percent. High turnover reduces the full-time

equivalent (FTE) employment since workers only employed for a week are counted in the monthly totals, or two workers counted in the same month for the same job due to turnover. With at least 43 percent of the workforce employed only part of the year thus turning over one or more times a year, the possibility of inflating the data above the FTE base is strong. An analysis of 237 workers employed by the Norton Sound Health Corporation (NSHC) in FY-78 is shown in table 7. During this year, NSHC had 125 full time employees positions to hire for. For the year 237 people were employed because there were 119 terminations. Those workers who were terminated in FY-78 only worked an average of 8.3 months compared to 19.6 months who did not terminate (even though many of the latter group were new hires to replace terminations). The less skilled occupations had the highest turnover while health aides had the lowest. Eskimos tended to hold the less skilled occupations which had the highest terminat on rates. However, the professiona category also had its problems with retention. In perspective, however, Eskimo and Indian termination rates were about the same as other races. About 52 percent of the jobs were generally held by Eskimos or Indians, while 52 percent of the terminations were from the same group.

Finally, there appears to be rates of underemployment and part-time employment above urban averages which tends to inflate data above the FTE employment base. This is characteristic of many small Alaskan towns. This tendency is exacerbated by an individual working two or more part-time jobs, or businesses, thus being double counted in the data.

TABLE 7

TURNOVER ANALYSIS OF NORTON SOUND HEALTH CORPORATION-FY-78[a]

	Number of Employees	Percent Terminating	Avg. Months Worked of Terminated	Avg. Months Worked of Non-Terminating
Medical Professionals	25	36%	18.4	9.4
Non-Medical Directors/ Supervisors	18	22%	13.7	28.7
Health Aides	23	13%	10.3	30.9
Clerical/Other Support	50	56%	9.7	16.0
Medical Technician/ Paraprofessional	55	58%	9.8	17.3
Blue Collar Support	66	65%	3.6	16.8
TOTAL	237	50.2%	8.3	19.6

[a]Norton Sound Health Corporation, 1978.

The patterns described thus far are due to a variety of factors. One important reason is the role of subsistence economic activity in the community. While specific data is not available as to the extent of or reliance on subsistence, data from other regions (see chapter on Kotzebue) suggest that Nome relies on subsistence at a much lower level compared to the villages in the region. Despite this, subsistence is still very important to large segments of the city (see Ellanna, [1980] for a thorough analysis of the subsistence patterns). In addition to subsistence, however, the lack of year round employment opportunities (especially for laborer occupations), the effects of alcoholism on employment continuity, lack of

skills to hold jobs and high turnover of some professional/technical jobs due to the transiency or mobility of non-natives recruited from outside the region contribute to this phenomeum.

Each of these points contributed to a misleading data base. To compensate for this weakness, an employee count of each business or agency located in Nome was carried out. The results were compiled to reflect the number of full-time equivalent employees during November 1979. The results are shown in Table 8. As can be seen, the 1979 canvass count is 39 percent below the November 1978 state estimate. This difference of 683 is estimated to be due to incremental changes in the employment patterns over time, not counting workers employed outside the City and the elimination of double counting due to turnover, part-time, etc.

Changes due to time are assumed to be minimal. Employer interviews suggested a relatively stable employment situation between 1978 and 1979. There is no evidence of large scale cutbacks in the workforce between the two years as suggested by the data. Reporting errors of non-Nome employers are assumed to be primarily the regional school district employment which, if removed from local government totals, makes the 1978 state and 1979 canvass figures equivalent. Federal employment is higher by 59 workers and is more difficult to explain, though a portion may be due to turnover and some employment reductions as social service functions are developed within the non-profit native corporations. Of greater importance is the discrepancy within the services total. This is almost 300 higher in the state UI data. Since virtually all the region data is reported in the

TABLE 8

NOME EMPLOYMENT DISTRIBUTION - NOVEMBER 1979[a]

Category	Units	F/T Employ-ment	P/T Employ-ment	Total FTE Employ-ment	Summer Seasonal Adjustment: Local Hire	Non-Local	Total
Mining	1	25	0	25	+50	+110	+160
Construction	3	10	0	10	Depends on Contracts[b]		
Manufacturing	2	2	3	3.5	---	---	---
TUC[c]	17	129	13	135.5	+ 3	+27	+30
Air Transport	(6)	(64)	(5)	(66.5)	---	---	---
Trade	32	148	24	160	+ 8	---	+ 8
FIRE[d]	6	24	1	24.5	No Reliable Information		
Services[e]	37	261	17	269.5	No Reliable Information		
Churches	(10)	(15)	(0)	(15)	Summer Camps		
Federal Government	9	66	0	66	0	+ 4	+ 4
BIA	(1)	(24)	(0)	(24)	---	---	---
FAA	(1)	(21)	(0)	(21)	---	---	---
Post Office	(1)	(8)	(0)	(8)	---	---	---
Natl. Weather Service	(1)	(6)	(0)	(6)	---	---	---
State Government	16	185	54	185	- 3	---	- 3
Transportation	(1)	(88)	(0)	(88)	(+10)	---	(+10)
Natl. Guard	(1)	(15)	(46)[f]	(15)	---	---	---
Correctional Ctr.	(1)	(13)	(0)	(13)	---		
NWC College	(1)	(13)	(8)[g]	(13)	(-13)	---	(-13)
Local Government	3	191	2	192	-114[h]	---	-114
City	(1)	(24)	(2)	(25)	---	---	---
B.S.School Dist.	(1)	(35)	(0)	(35)	(-15)	---	(-15)
Nome Public Sch	(1)	(132)	(0)	(132)	(-99)	---	(-99)
TOTAL	126	1041	114	1071	-56	+141	+85

[a] Data collected by an employment survey of all Nome businesses and agencies by George Sherrod and Susan Gorski, November 1979.

[b] Construction employment is very unpredictable with large scale employment tied to summer opportunities.

[c] Transportation, Utilities, Communications

[d] Finance, Insurance, Real Estate (Including profit native corporations)

[e] Services

[f] Uniformed weekend personnel not counted in civilian employment.

[g] Adjunct faculty primarily counted elsewhere as full-time employees, or not counted here.

[h] All counts here are school teachers who are considered full-time employees. They are noted here because a portion seek summer employment or pursue subsistence activities even though full-time equivalent.

Nome data, there is a possibility of some misreporting (for example, the village health aide program, and substantial CETA programs through the state and non-profit corporations found throughout the region). However, Nome is the social services center for the region, and the Norton Sound Health Corporation and Kawerak are the two largest employers in this category. High job turnover and use of part-time workers are also assumed to be a major contributor to the discrepancy. This could mean an estimated 30 percent inflation of the state's data in trying to measure FTE emp oyment in the social services and hotel services subcategories.

Rev ewing tables 8 and 9, full-time equivalent employment stand at approximately 1,071. Government still accounts for the major source of employment (41 .4 percent). If the largely government-funded health and social services are included, the employment rises to 60 percent. The three largest employers are the Nome Public Schools (132), Norton Sound Health Corporation (126), and State Department of Transportation [88). State and local government have grown in recent years faster than the general workforce while federal employment has been relatively stable and thus proportionally declined relative to the total.

Besides the health and social services, the services category includes hotels (important to tourism, the largest being the Nome Nugget Inn) and a variety of professional and technical services usually employing one or two people. There are also ten churches included.

Two other strong contributors are trade and TUC. Trade is almost all retail (one or two wholesale units occasionally are noted) and averages

TABLE 9

NOME EMPLOYMENT BY INDUSTRY[a]

NOVEMBER 1979

	Employees	Percent
Mining	25	2.3%
Construction	10	.9
Manufacturing	3.5	.3
TUC[b]	135.5	12.7
Trade	160	14.9
FIRE[c]	24.5	2.3
Services	269.5	25.2
Federal Govt.	66	6.2
State Govt.	185	17.3
Local Govt.	192	17.9
	1,071	100.0%

[a]1979 Survey of businesses and agencies by contractor. Ender, Community Contract, 1979.

[b]Transportation, Utilities, Communication

cFinance, Insurance, and Real Estate

five employees per reporting unit. The largest employers are Alaska Commercial, Polar Enterprises, the Board of Trade, and Bonanza gas station. Bars and liquor stores constitute a significant portion of this group. Trade also relies strongly on part-time employment. Transportation, utilities and communications have six units and almost one-half the TUC employees work in the air transport category. Arctic Lighterage is also an important employer in TUC though work is concentrated during the summer. Other transportation includes cab and trucking companies. Communications/utilities include General Telephone Company and Alascom. An important contributor to services, transportation, and trade is the tourist industry. In 1975 Alaska Tour and Marketing brought 9,306 visitors to Nome for an overnight stay and 2,049 people for a brief half day tour. In 1976, this dropped to 6,435 overnight visitors while 3,289 took the day only tour. In 1978-79, tourism appears to have fallen off even more for the Nome site, though the winter Iditarod celebration has brought tourists to Nome in greater numbers in the "off-season." (Olson & Associates, 1977)

Small but growing sectors include mining and FIRE. Mining almost exclusively involves the Alaska Gold Company which reopened two gold dredges in 1976. This company employs on a seasonal basis 25 to 185 workers w' th the most need occuring between May and October. The workforce varies depending upon the weather and corresponding scope of operat' ons with most engaged in ground thawing operations. During the 1979 season, the largest dredge (No. 5) was idle because of lack of thawed ground. The potential for future mining employment expansion

does exist, though they have reached optional employment within their present technology.

The finance, insurance and real estate (FIRE) industry includes a branch of the National Bank of Alaska, Bering Straits Federal Credit, one real estate business, and three native corporations -- the regional, the village and Bering Straits Housing. The native corporations have the most potential for expanded economic activity. A sizable seasonal employment swing appears to be due to activity by these corporations (though this occurs largely outside of Nome).

The two categories which contribute little to the present Nome employment base are manufacturing and construction. The former is made up of the two newspapers published in Nome, while construction is heavily dependent on the market. The past two seasons were slow for this industry, though some of this activity regionally may be under FIRE due to activities by the native corporations. As noted in Table 9, the construction activity reflected in tax receipts showed a strong contribution of construction in 1977. One element showing some construction activity are land claims settlement. The $5 million Nome airport construction scheduled for 1978 is presently stilled due to land problems as well as the $3.9 million reconstruction of a portion of the Nome-Council highway. The only major project begun in the past three years was the reconstruction of three bridges on the Nome-Teller road at an estimated cost of $3.1 million. The work was basically completed in 1979.

TABLE 10

UNEMPLOYMENT RATE FOR NOME CENSUS REGION - 1975-79[a]

Year	Unemployment Rate
1975	6.6%
1976	7.9%
1977	9.2%
1978	10. 1%
1st Quarter	10. 6%
2nd Quarter	11.0%
3rd Quarter	8.5%
4th Quarter	10. 3%
1979	8.6%[b]
January	11.2%
February	11.2%
March	11. 0%
April	8.3%
May	7.7%
June	8.3%
July	8.3%
August	6.4%
September	6.2%
October	6.9% (preliminary)

[a] 1975-78 from Alaska Department of Commerce and Economic Development, Numbers: Basic Economic Statistics of Alaska Census Division (Number 1979); and 1979 from Alaska Department of Labor, Anchorage Office.

[b] Based on an assumed November rate of 7.7 percent and December rate of 10.0 percent.

Unemployment

Alaska Department of Labor estimates unemployment using the Current Population Survey (a small sample interview) and defines it as a person who has actively sought work in the past four weeks. The data reflects an annual average increase from 1975 to 1978 and a decline in 1979. This occurs despite an increase in the employment participation rate during the same years. It is assumed that the unemployment data is misleading. One reason is the lack of employment opportunities. Unemployed not actively seeking work because of few real opportunities are not counted as unemployed. On the other hand, federal regulations concerning public assistance payments many times require able bodied workers to seek work pro forma in order to maintain eligibility. This could easily explain the three point five percentage points increase from 1975 to 1978, as more of these regulations were enforced. (see table 10)

The unemployment rate can be used in conjunction with the employment rate to estimate the labor force participation rate. This appears to have increased in Nome from 61.5 percent in 1975 to 68.1 percent in 1979. This compares to approximately 82.6 percent in Anchorage. The balance of the region increased from 35.1 percent in 1975 to 43.5 percent in 1979. The almost 25 percent difference is expected due to fewer employment opportunities which would stimulate greater participation in and greater reliance on subsistence lifestyles.

The Fishing Industry

A commercial salmon fishing industry exists in the Norton Sound area. The fishing is small in comparison with other areas of the state except

Kotzebue Sound, which is of similar size. In 1978, 531,948 salmon of all varieties were harvested for sale; 51,730 for subsistence. This compares with the previous five year average of 238,974 and 28,058 respectively. (Alaska Department of Fish and Game, 1978) Nome has not played a significant role in the fishing industry, which is centered in Unalakleet and Golovin. Of a total of 177 commercial salmon entry permit holders in the Norton Sound fishery, only 16 give a Nome address. (State of Alaska, Commercial Fisheries Entry Commission, 7979.) Other commercial fishing opportunities include herring which is in conflict with subsistence harvests and an effort to commercially harvest crab which was not successful. Again Nome plays only a minor role in this activity which is centered elsewhere in the Sound.

Occupational Skills

An inventory of labor skills found in Nome is not available. Studies have equated skills with present work activity It is possible that a few residents of Nome have occupational skills that are not utilized in Nome for lack of demand. These tend to be n the area of semi-skilled construction trades of which use is intermittent. However, on the whole, the current employment patterns are doubtless a good reflection of available occupational skills.

Nome offers a greater variety of positions for more diverse skills and in greater total number compared to the whole region. Nome is the Federal and State services provision administrative center for the

region and therefore has numerous white-collar office positions available for residents. The majority of professional positions, however, are still recruited from outside of the region and, most often, outside of Alaska. Nome also is a transportation center (air and sea) for the distribution of goods to smaller communities in the region--hence many seasonal and a few permanent laborer or skilled positions are available for conducting these activities. The larger population of Nome requires a heavier concentration of seasonal construction-related work for both building and highway construction and maintenance and a number of commercial enterprises (providing goods and services) requiring skilled and unskilled employees (e. g. store clerks, waitresses, mechanics, etc.). Tourism provides an outlet for Native arts and crafts but few direct salaried positions (most of which are held by non-Natives either as employees of tourist agencies or gift shop store owner/managers). Mining operations have been revitalized during the last few years and provide some seasonal work for unskilled or semi-skilled employees but also employ a large number of individuals (skilled and unskilled) who are not residents of the region. The economic development and expansion of both the larger communities and the villages are focal points of planning and activity for numerous public and private organizations. (Ellanna, October 1976)

Business Activity

Table 11 shows the gross income of Nome businesses between 1975 and 1977. This information is reported by the businesses to the Alaska Department

TABLE 11

GROSS BUSINESS RECEIPTS, NOME, 1975-1977

Business	Code	1975	1976	1977
Agricultural Services	07		3,597	
General Bldg. Construction	15	997,178	825,023	5,610,491
Heavy Construction	16	1,436,593	684,378	1,054,068
Special Trade Construction	17	1,229,897	830,675	1,823,125
Food & Kindred Products	20	125	306,876	
Apparel Manufacturing	23	8,564	8,176	
Lumber & Wood Products	24			75,590
Printing & Publishing	27	77,264	990	144,167
Miscellaneous Manufacturing	39	35,756		
Local & Urban Transportation	41	100,432	209,754	117,011
Motor Freight & Warehouse	42	17,509		22,426
Water Transportation	44	4,770	1,625,624	1,549,464
Air Transportation	45	608,985	1,723,784	2,774,585
Communication	48	748,467	711,153	795,316
Whlsl. trade-durable goods	50	267,133	81,717	149,869
Whlsl. trade-undurable gals.	51		170,058	38,923
General Retail Merchandise	53	3,939,306	909,301	3,040,155
Food Stores	54		2,123,769	1,021,955
Auto Dealer & Service Sta.	55	314,355	1,637,831	1,657,626
Retail Apparel	56	276,775	268,899	278,172
Retail Furniture	57		4,612	
Eating & Drinking Places	58	1,773,715	1,050,569	860,013
Miscellaneous Retail	59	5,848,175	7,987,733	4,433,185
Real Estate/ Rentals	65	267,318	1,322,941	1,256,081
Hotels	70	60,000	59,570	
Personal Services	72	25,000	138,227	
Business Services	73	1,318,369	645,613	3,044,599
Auto Repair	75	442	1,949	3,718
Miscellaneous Repair	76	99,613	32,846	5,415
Motion Pictures	78		107,259	103,906
Amusement & Rec. Services	79	171,884	79,862	
Health Services	80	127,403	228,154	240,938
Legs? Services	81		169,244	120,762
Social Services	82,83		14,665	127,963
Miscellaneous Services	89	241,418	375,496	291,747
TOTAL		19,998,655	24,423,170	30,641,270

Source: Alaska Department of Revenue

of Revenue for the purpose of paying sales taxes and state gross receipts taxes. Total gross business receipts were approximately $20 millon in 1975 and $24.4 million in 1976, an increase of 22 percent. In 1977, business receipts were $30.6 million, an increase of 25.2 Percent from the previous year. It should be noted that general price inflation accounts for a sizeable portion of these annual increases (10-15 percent). Nonetheless, business activity showed significant growth during this interval. It is interesting to note that the receipts of various categories of businesses experienced rather erratic fluctuation (i. e., Miscellaneous Retail, Business Services, and the construction businesses).

Subsistence Economic Activity

This thorough exploration of the cash economy in Nome is not designed to ignor the role of subsistence in the Nome economy. The design of the Alaska OCS Socioeconomic Studies Program attempts to demarcate a scope of work between a socioeconomic and sociocultural component within the lease sale area. In a sense, this division of labor must be arbitrary since the cash and subsistence economy are heavily interdependent and difficult to disaggregate. In order to obtain a balanced picture, one should refer to "Norton Sound Sociocultural Systems Analysis" by Linda J. Ellanna (1980) for an excellent description of the role of subsistence in the Norton Sound. A significant proportion of the Nome population maintains a subsistance food diet only supplemented by food available on the retail market. Even the non-Native population use the locally available food

sources. These foods include salmon (though this fishing is concentrated elsewhere and Nome's subsistence salmon catch is moderate), moose (47 percent of the moose harvested in 1978 on the peninsula were taken by Nome hunters), migratory fowl (especially in the rookeries east to Cape Nome), and sea mammals (especially among the King Island community). While data on the extent of reliance on subsistence is not available, other regional studies suggest that Nome would be using subsistence for less than half their diet needs compared to an almost total reliance in the villages. The cash economy has influenced subsistence in that those most proficient in gaining subsistence resources are those most successful in the cash economy. This is due to the cost of modern subsistance technology - boats, motors, snow machines, guns, etc. - which require a heavy investment by those participating.

Concentration of Regional Employment in Nome

Despite the weakness of the data base, it is obvious that a large share of the region's economic activity and accompanying employment is centered in Nome. Assuming adjustments for calculating FTE employment in the region and Nome, it is estimated that 62 to 66 percent of the region's employment is in Nome. In addition, much of the activity occurring throughout the region is supported or headquartered in Nome. Transportation, communications, services, governmental functions and a portion of trade uses Nome as the regional hub. The most concentrated industries are state government, services, TUC, and mining.

Seasonality of Employment

Both tables 5 and 6 show significant seasonal fluctuations. July 1977 employment was 143 percent of the previous January and July 1978 was 134 percent. Discussions of their seasonal hiring with Nome employers found significant summer hiring in mining and transportation but reductions in local government employment in the area of education. Teachers are employed full time even though they do not work summers. They are treated as seasonal only because a portion to seek summer jobs in their off time and therefore compete for seasonal opportunities. With additional fluctuations in construction, plus FIRE and services, there is a 115 to 120 percent summer peak over winter totals. It is assumed that seasonal swings are more severe in the rest of the region due primarily to manufacturing (fish processing), FIRE (native corporate activity), and construction. Therefore, it is

assumed that the larger year round employment base in Nome reduces its seasonality swing to a 115 to 120 percent average while the balance of the region could swing 150 percent or more. Disregarding the education data, the summer season produces 225 to 300 new jobs above the year around employment base.

Employment Participation Rates

Employment participation rates of Nome and the region can be expected to vary considerably by season and place of residence. Employment opportunities, and pursuit of subsistence activities outside the cash economy also vary. In addition, the calculation of labor force participation rates are impossible to derive because of the lack of definition and reliable data to measure it. As noted, the 1970 census, measuring regional winter rates, found 38.4 percent of the adults (16 years and older) employed, and a labor force participation rate of 45.6 percent. The 1975 Kawerak census provides an opportunity to compare Nome and the Region. (Table 12) While 41.4 percent of the Nome adult (21 to 70 years old) population was employed year around, only 15.4 percent of the village residents were. The large number of those unemployed 10 to 12 months a year suggests the proportion of those significantly outside the cash economy (Nome, 31.7 percent; and balance of the region 58.4 percent). Females have higher unemployment rates compared to males, though the difference is more apparant in Nome than in the rest of the region where unemployment is generally high.

TABLE 12

MONTHS UNEMPLOYED IN NOME AND BALANCE OF REGION, 1974-75[a]

Months Unemployed	Nome			Balance of Region			Total Region		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0	50.2%	31.8%	41.4%	18.3%	11.4%	15.4%	31.3%	20.7%	26.5%
1-3	10.4	5.1	7.8	6.0	8.5	7.1	7.8	6.9	7.4
4-6	10.9	12.1	11.4	10.6	4.1	7.8	10.7	7.6	9.4
7-9	8.3	6.8	7.6	15.6	5.6	11.3	12.6	6.2	9.7
10-12	20.2	44.2	31.7	49.5	70.4	58.4	37.6	58.5	47.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
(n)	(579)	(531)	(1110)	(847)	(638)	(1485)	(1426)	(1169)	(2595)

[a] Linda J. Ellanna and Maureen C. Roche, Bering Strait Regional Census (1975)
The data was seriously flawed by a high non-response rate, 17.3 percent. This non-response was strongly tied to location of the respondent. While Nome had 9.6 percent non-response while the balance of the region had 23.0 percent (25.9 percent among males). It is assumed that some of the non-response was due to refusal of personal information, but also a significant portion were those who did not consider themselves employed in the cash economy and the question was inappropriate, or were confused as to whether a subsistence hunter or fisherman was unemployed. This explanation is reasonable since village residents were less likely to answer the question than those living in Nome. To account for this phenomenon, the Nome non-response was removed and thus proportionately was allowed to distribute in the other categories. In the balance of the state, 62.2 percent of the male non-response and 51.0 percent of the female non-response were allocated to 10-12 months unemployed and the rest allowed to distribute proportionately.

This information can be compared to population data and employment statistics to estimate employment participation rates. Table 13 uses the March 1975 census to estimate participation rates. Two assumptions were made which should have found a higher rate. First, the average of the base and ceiling rate was used to estimate the March employment rate. This most likely errs on the high side because participation rates are usually at their lowest during this time of the year. Also, the participation rates of 18 to 20 year olds was assumed to average that of 21 to 70 year old adults. Since youth employment is usually higher, this could slightly overestimate the rate. Despite this, the estimated employment still fell 9.2 percent below the state non-agricultural employment totals for that month. Keeping the earlier discussion of state data in mind, this difference is reasonable and probably slightly understated.

Between 1975 and 1979, employment rose and seasonal swings increased. This increased the region's participation rate since population is estimated to have increased only 12.1 percent while employment rose 35.4 percent. The attraction of a greater proportion of the adult population into the cash economy leads to greater volatility, such as turnover, part-time employment, and job shifting. The estimated employment falls 19.8 percent below the state non-agricultural employment totals (using year old data increases the chance of error in this statistic). Again, considering the data discussion on full-time equivalent employment, this difference is reasonable. In any case, the adult employment rate is estimated to have risen to 60.4 percent (winter) in Nome and 35.8 percent in the balance of the region. This compares to 72'.5 percent in urban Anchorage. The balance of the region has grown due to CETA funding of government and service jobs and investment in fish processing in addition to construction and other opportunities.

TABLE 13

ESTIMATED "EMPLOYMENT RATESa

March 1975	NOME	BALANCE OF REGION	TOTAL REGION
Est. Population	2,380	3,598	5,978
Est. Adults (21-70 yrs)	1,228	1,643	2,871
Est. Adults (18-70 yrs)	1,379	1,935	3,314
Employment Base (21-70 yrs)	41 .4%	15.4%	26. 5%
Employment Ceiling (21-70 yrs)	68.3%	41 .6%	53.0%
Avg. Employment (21-70 yrs)	54.9%	28.5%	39.8%
Est. Employment (21-70 yrs)	674	468	1,142
Est. Employment (18-70 yrs)	757	551	1,308
State Non-Ag.Employment	n.a.	n.a.	1,441
November 1979			
Est. Population	3,064	3,636	6,700
Est. Adults (18-70 yrs)	1,774	1,956	3,730
Avg. Employment (18-70 yrs)	60.4%	35.8%	47. 5%
Est. Employment (18-70 yrs)	1,071	700	1,771
State Non-Ag. Employmenta	1,484 (Est)	725 (Est)	2,209

[a]Policy Analysis, Limited.

[b]November 1978 date used.

PERSONAL INCOME

A measure of current personal income in Nome is not available. Sources for data include wages reported to the Alaska Department of Labor and per capita income estimates.

The average monthly wage in the Nome region rose consistently between 1969 and 1975. In 1969, monthly wages averaged $620. Between 1970 and 1975 it averaged respectively $674, $759, $791, $854, $929, and $1,006. This was an 8.3 percent average annual increase. Between 1975 and 1976, the monthly wage rose to $1,281, a 27.3 percent increase. This slowed to a 7.8 percent rise from 1976 to 1977 ($1,381) and a drop of 15 percent to $1,174 in 1978. Reasons for this seems to be general wage increases across all industrial categories. Construction wages led the way and was primarily responsible for the 1976 jump. With a poor construction year in 1978 this category also led to the decline in wages in 1978. Between 1969 and 1978 monthly construction wages rose 128 percent ($1,206 to $2,749). The secondary wage leaders are government (all levels) and TUC. The latter increased 131 percent ($647 to $1,497), while federal government rose 127 percent ($635 to $1,359). Other categories have approximately doubled between 1969 and 1978, but still lag behind the industries noted. For example, trade rose 102 percent over this period but this represented a lower wage level with 1969 being $423 and 1978 being $855.

Wage data for the Nome Census Division is noted in table 14. Wage payments rose rapidly from 1975 to 1976, declined in 1977 and increased at a smaller

TABLE 14

NOME CENSUS DIVISION, WAGE PAYMENTS[a]
(Wage totals in thousands)

	1975	1976	1977	1978 1Q	1978 2Q	1978 3Q	1978 4Q	1978 Annual Totals
TOTAL WAGE PAYMENTS (Place of work basis)	22,177	30,503	29,275	6,812	7,932	9,285	8,224	32,253
Military & Related Fed.Civilian Wages	n.a.	n.a.	n.a.	429	421	461	421	1,732
Military Personnel Wages (Active Duty Only)	1,451	1,399	1,550	398	403	308	413	1,622
Military-related Fed.Civilian Wages	n.a.	n.a.	n.a.	31	18	53	8	110
PX & NAF (Largely part-time workers)[b]	n.a.	n.a.	n.a.	0	0	0	0	0
Other Military-related Federal Wages	n.a.	n.a.	n.a.	31	18	53	8	110
Federal Govt (except military-related 1978)	2,562	3,212	3,264	737[c]	841[c]	783[c]	834[c]	3,195[c]
State & Local Government	6,720	7,438	8,324	2,574	2,932	3,034	3,175	11,715
Mining	*	*	*	*	*	*	*	*
Construction	*	6,246	4,230	389	264	373	311	1,337
Manufacturing		*	*	13		201	*	*
Transportation-Communi cations-Utilities	3,011	2,886	2,115	437	524	733	652	2,346
Wholesale Trade	*	*		*	0	*	*	*
Retail Trade	1,745	2,223	2,:07	634	681	759	712	2,786
Finance-Insurance-Real Estate	1,286	1,988	1,108	209	216	405	254	1,084
Services	2,247	2,886	3,761	1,254	1,426	1,499	1,354	5,533
Farm Workers	0	0	0	0	0	0	0	0
Miscellaneous	149	*	*	*	*	43	43	*
TOTAL WAGE PAYMENTS INDEX (Annual Total in 1975=1 .00)	.00	1.38	1.32	.23	1.43	1.67	1.48	1.45
AVERAGE MONTHLY WAGE PER WORKER (Dollars)	1 000	1,264	1,364	1 150	1,150	1,213	1,161	1,170

n.a. - Not Available

[a] State of Alaska, Department of Commerce and Economic Development, November 1979.

[b] PX & NAF (Post Exchange, and Nonappropriated Fund activities including officers' clubs and enlisted men's clubs)

[c] Excludes military-related Federal civilian employees and their wages, shown Separately above.

* Information withheld under regulations protecting confidentiality of data for individual firms.

rate in 1978. Greatest gains were found in services, and state and local government, while construction, TUC and FIRE showed a decline.

For Nome, the total 1978 wages covered under UI law was $25,869,837. For total wages paid this can be adjusted to $27,817,029 (UI law represents about 93 percent). This constitutes almost 86 percent of all wages in the region and is due to reporting regional workers under Nome data. However, Nome is also assumed to have higher wage rates with the role of government employment. Thus, while Nome has about 60 percent of the FTE workforce, it is estimated to have about 70 percent of the wages paid in the region. ($22,577,000 in 1978)

In addition to wages, per capita income analysis has been carried out by the U. S. Bureau of Economic Analysis and the U. S. Bureau of the Census. Table 15 shows estimates of total personal income and per capita income. There are some weaknesses in the data. First, resident population is consistently overstated and more closely reflects summertime peaks then the average population throughout the year. This may have affected their model estimating total personal income though per capita income should remedy this by dividing the two figures (see table 15).

Based on the data between 1969 and 1978, the Nome Census Division showed a 228 percent increase in total personal income, and a 164 percent rise in per capita personal income. Personal income includes not only wages and salaries, but rents, dividends, proprietor income, and transfer payments. Transfer payments in rural Alaska are an important component of

TABLE 15

NOME CENSUS DIVISION TOTAL PERSONAL INCOME AND
CENSUS DIVISION PER CAPITA INCOME COMPARED TO U.S. PER CAPITA INCOME,
WITH ADJUSTMENTS FOR COST OF LIVING Differences

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1. Total Personal Income to Nome Division Residents (millions of $)	14.7	14,4	16.5	18.4	33.6	32.0	40.6	47.4	45.9	48.2
2. Resident Population - Nome Bureau Estimates: 1969-77 (thousands)	5.7	5.8	5.8	5.9	6.o	6.2	6.5	7.1	7.0	7.1
3. Nome Division Per Capita Personal Income ($) (Line I/Line 2 - unrounded figures)	2,575	2,511	2,819	3,126	5,630	5,16?	6,269	6,692	6,585	6,789
4. U.S. Per Capita Personal Income ($)	3,667	3,893	4,132	4,493	4,980	5,428	5,861	6,397	7,026	7,810
5. Ratio: Nome Division Per Capita Income to U.S.Per Capita Income (Line 3/Line 4)	0.70	0.65	0.68	0.70	1.13	0.95	1.07	1.05	0.94	0.87
6. Family Budget Required in Nome Division for a Moderate Standard of Living ($)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	38,155	39,515	43,389
7. Average U.S.Family Budget Required for a Moderate Standard of Living ($)	10,064	10,664	10,971	11,446	12,626	14,333	15,318	16,236	17,106	18,622
8. Ratio: Nome Division Family Budget Requirements to Average U.S. Family Budget Requirements (Line 6/Line 7)	n.a.	n.a.	n.a.	nos.	n.a.	n.a.	n.a.	2,35	2.31	2.33
9. Ratio: Family Budget Requirements for a Moderate Standard of Living - Nome Division Compared to Anchorage Census Division	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.652,	1.652	1.652
10. Ratio: Per Capita Income in Nome Division, Adjusted for Family Budget Requirements, to Anchorage Per Capita Income	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.39	0.35	0.34

[a]State of Alaska, Department of Commerce and Economic Development, November 1979.

personal income. As the employment base in the region expands and the employment participation rate rises, the role of transfer payments can be expected to diminish. Previous analysis noted the probable rise in the employment participation rate between 1975 and 1979. In 1975, 45.4 percent of the total personal income was derived from services other than wages and salaries. By 1978, this had declined to 33.1 percent. It can be assumed that the majority of this non-wage and salary category was made up of transfer payments. For comparison, the Anchorage census division has 22.3 percent of its personal income made up of non-wage and salary sources, with less than a majority of that being transfer payments.

When comparing the Nome division's per capita income to that of the U.S. average, Nome rose above the average only three of the ten years reviewed. In 1978, Nome stood at .87 (assuming U.S. average 1.00). This relationship is critical when one accounts for the substantial difference in the cost of living. Nome census division is estimated to have a family budget requirement for a moderate standard of living which is 2.33 times the U. S. average and 1.652 times Anchorage. When adjusting the per capita income data for this cost of living differential, the Nome region is .34 or one-third that of Anchorage in 1978. The relative purchasing power of Nome residents is substantially below that of urban Alaska.

Personal income also varies between the census division as a whole and the community of Nome. With employment opportunities concentrated in Nome

and also an increased dependence on the cash economy, it is expected that personal income in Nome is greater than that of the region as a whole. An analysis by the U. S. Census Bureau comparing 1969 and 1975 confirms the income differences (see table 16).

TABLE 16

COMPARISON OF PER CAPITA INCOME BETWEEN NOME, NOME CENSUS DIVISION AND ALASKA[a]

Location	1969	1975	% Change
Nome	$2,881	$6,709	132.9
Nome Census Division	$1,992	$4,461	123.9
Alaska	$3,725	$7,969	113.9
% Nome of Alaska	77	84	---
% Nome of Census Division	145	150	---

[a] U. S. Bureau of the Census, 1976 Population Estimates and 1975 and Revised 1974 per capita Income Estimates for Census Division, Boroughs, and Incorporated Places in Alaska, 1979.

This data shows that, on the average, Nome residents are roughly half again as prosperous as those of the region, but less prosperous than residents statewide. The real discrepancy between the three groups of residents is actually greater than these numbers show, however, because of cost of living differentials. Prices are higher, on the average, in the region than in Nome, and prices are higher in Nome than they are statewide (the population of Alaska is concentrated in Anchorage, Fairbanks, and Juneau, so statewide averages reflect to a high degree conditions in urban Alaska,

where prices are lower than rural Alaska). This data shows that relative to the rest of the state, personal income of Nome residents increased faster during the period 1969-1975 (132.9 percent vs. 113.9 percent). In 1969, Nome per capita income was 77 percent of the statewide average; in 1975 it had increased to 84 percent.

It is important to note that there is a substantial discrepancy between the Census and Bureau of Economic Analysis (BEA) data which tends to leave a question in both sources. Research in urban Alaska supports the information developed by BEA and therefore it is assumed that the gross level of income is more accurately shown in BEA data for the Nome area. However, the inflated population information of BEA leaves this conclusion tenuous. However, the relative position of Nome within the census division and within the state is considered to be as portrayed no matter what the gross level of income is. Disaggregating Nome from the region can lead to problems as was noted in the analysis of employment. While Nome does have about three-fifths of the employment and only 46 percent of the population, reporting problems accentuate this and thus wage and salary data. In addition, the balance of the region has improved its employment participation rate slightly faster than the City of Nome such that its rate rose from .519 to .593 in relationships to the city. Also, the increased emphasis on social services delivery has affected both Nome and the region. While an accurate figure of personal income is impossible with the information available, certain assumptions can be made which approximates the city and balance of region relationship. It is assumed that Nome has 60.4 percent of the employment and 70 percent of the wages and salaries in the region.

Analysis of adults not working can lead to an assumption concerning the distribution of non-wage and salary payments. This review produced an estimate that 35.9 percent of these payments occured in Nome and 64.1 percent were in the balance of the region. Using the BEA estimate of $6,789 per capita income in 1978, it is estimated that the city had a personal income of $28,302,000 and per capita income of $8,719, while the balance of the region had a personal income of $19,898,000 and per capita income of $5,472. If a figure of four persons per household is used, an average 1978 Nome household income would be $34,876. This is $8,513 below the family budget requirement for a moderate standard of living.

This information is more disturbing if an analysis of the income distribution is made. While specific information is unavailable, sufficient qualitative information exists to conclude that household incomes are maldistributed along racial lines. Non-natives hold the bulk of the better paying jobs in the community, have a higher wage earner per household ratio, have a lower unemployment rate, and have a lower labor force non-participation rate. All of these characteristics, tied to a smaller household sizes make the non-native household and per capita income substantially above that of natives.

One indirect indication of the income distribution is an 1970 census analysis of families income by race. As shown in table 17, while 76 percent of native families had incomes below $9,999, 77 percent of non-native families had income above $10,000. While change has occured in the past

TABLE 17

RACIAL DISTRIBUTION OF THE NOME REGION, FAMILY INCOME-1970

	Total Families[a]	% of Total Families	Native Families[b]	% of Native Families	Non-Native Families[c]	% of Non-Native Families
Less than $1,999	135	13.4	127	17.6	8	2.7
$2,000 to $5,999	315	31.2	277	38.5	38	13.1
$6,000 to $9,999	168	16.6	146	20.3	22	7.6
$10,000 to $14,999	216	21.4	110	15.3	106	36.6
$15,000 and Over	176	17.4	60	8.3	116	40.0
	1,010	100.0	720	100.0	290	100.0

[a]Bureau of the Census, General Social and Economic Characteristics, Alaska, 1971.
[b]Naremore, Bain, Brady and Johnson, A Study of Housing Requirements for Alaskan Natives-Report No.3, October 1975.
[c]Extrapolated

TABLE 18

COST OF LIVING IN NOME COMPARED TO ANCHORAGE-1975[a]

Budget Item	Anchorage	Nome	Index Anchorage=100
Total Budget	$15,222	$22,973	151
Budget Less Taxes	12,368	17,870	144
Consumption	11,812	17,314	147
Food	3,715	5,647	152
Housing	3,121	6,274	201
Transportation	1,113	1,554	137
Clothing and Personal Care	1,275	1,275	100
Medical Care	1,285	1,285	100
Other Family Consumption	1,280	1,280	100
Other Costs	556	556	100
Taxes	2,854	5,103	179
Social Security & Disability	868	868	100
Personal Income Taxes	1,986	4,235	213

[a]Robert R. Nathan Associates, Inc. The Cost of Living in Alaska and Federal Poverty Guidelines, September 9, 1976.

decade, it seems probable that the relative economic condition of the Alaska native population is similar to that shown in 1970.

A final factor on income and its relative purchasing power is the role that various items play in the budget. Table 18 compares the Nome and Anchorage family budget. The most expensive aspects of the Nome budget are income taxes and housing, while medical care, clothing and personal care and other consumption was considered equivalent to Anchorage.

Relating average retail food prices of a market basket of items, Nome stood at 168 in comparison to Seattle at 100. This dropped to 162 in 1963, climbed to 183 in 1971, dipped to 171 in 1973 and peaked in 1976 and 1977 at 197, almost double Seattle prices. (Department of Commerce and Economic Development, 1978).

Subsistence harvests are an important reason in explaining how households survive with household incomes well below what is necessary to maintain a moderate standard of living in the cash economy. This activity reduces family food budgets.

Municipal Expenditures and Revenues

Nome is a first class city located outside an organized borough, Title 29 of the Alaska Statutes grant first class cities limited authority to levy sales and property taxes, and this authority is exercised by the City of Nome. Nome exercises all of the powers of a first class city including education (educational services are not budgeted from the general fund).

Table 19 summarizes the budget for FY 1980 general fund expenditures and revenues for the City of Nome. During this budgetary year the city anticipates expenditures of approximately $624 for each resident. Police protection ($413,677) and city streets and buildings ($335,700) are the largest line items, and account for about 42 percent of the total anticipated expenditures. On the revenue side, taxes are the largest source of income to the city general fund. Property taxes, including payments from public agencies in lieu of property taxes, account for 33 percent of expected income. Sales taxes, including all tax penalties and interest on deliquent taxes, account for 25 percent of FY 1980 budgeted income, and intergovernmental transfers account for 26 percent (state and federal revenue sharing and federal programs).

Table 20 shows budgetary trends over the past six years. The fluctuations in spending do not indicate a growth trend. While spending in FY 1980 is about $500,000 over FY 1975 levels, it is below spending levels of FY 1977, 1978 and 1979. When the effects of inflation are considered, it is clear that Nome has not experienced real growth in public expenditures over the last serveral years.

TABLE 19

FY 1980 GENERAL FUND BUDGET, CITY OF NOME[a]

Expenditures

Account	Amount
Legislative	$ 74,320.00
Administrative	77,950.00
City Clerk	44,200.00
Finance	68,819.00
Police	413,677.00
Fire	64,477.00
Library	43,030.00
Museum	29,979.00
Planning Comm.	30,600.00
Harbor & Port Comm.	3,000.00
Roads & Buildings	335,700.00
Non-Departmental	617,932.30
Total	$1,803,684.30

Revenues

Account	Amount
Property Tax	$579,342.90
Sales Tax	450,000.00
Pints. in Lieu of Taxes	13,052.40
Tax Penalties	6,000.00
Fines	1,800.00
Permits & Licenses	8,500.00
Federal Shared Revenue	130,000.00
State Shared Revenue	175,089.00
Liquor License Refund	8,000.00
Interest	4,000.00
Rent	3,000.00
Property Sale	27,000.00
Federal Programs	168,600.00
Appropiration from Fund Balance	150,000.00
Utility Reimbursement	22,000.00
Airport Security	42,000.00
Other	14,700.00
Total	$1,803,684.30

[a]Ordinance 0-79-5-1,
City of Nome (Budget, FY1979-1980)

TABLE 20

GENERAL FUND EXPENDITURES, CITY OF NOME, 1975-1980

MUNICIPAL EXPENDITURES[a]

Year	Amount	% Change from Previous Year
1975	$1,301,592.00	
1976	$1,731,134.00	+33
1977	$2,157,701.00	+25
1978 (budget)	$2,033,219.51	- 6
1979 (budget)	$2,163,378.53	+ 6
1980 (budget)	$1,803,684.30	-17

[a] Financial Statements of the City of Nome, 1975-1977; Budgets, City of Nome, 1978-1980.

TABLE 21

VALUATION, POPULATION, AND GENERAL OBLIGATION DEPT, 1978

CITY OF NOME, ALASKA CITIES, ALASKA Municipalities

	Full Value Property Determination (Million$)	Civilian Population (Thousands)	G.O. Bonded Debt	Per Capita Debt	Per Capita Valuation	Debt % of Valuation
City of Nome	$ 35.87[b]	2.892	$ 770,000	$ 266	$12,402	2.14
Alaska Cities[c]	$ 1,968,892.8	28.95	$ 21,775,276	$ 752	$ 68,008 (12,232)[d]	1.11
Alaska Municipalities[e]	$ 17,352,800.6	383.7	$ 545,227,664	$1,421	$45,226	3.14

cl-l
3

[a] Alaska Department of Community and Regional Affairs
Alaska Taxable 1978; Municipal Property Assessments and Equalized Full Value Determination; Juneau, 1979

[b] Local assessed value is $29 Million

[c] Twenty-one cities with G.O. Debt

[d] Excluding Valdez

[e] Includes boroughs and cities (including Valdez and North Slope Borough)

Table 21 shows the full value assessment of private real property in Nome in 1978, and the extent of general obligation bonded debt of the city. Further, the table compares Nome with other cities and all municipalities in the state. The city of Valdez and the North Slope Borough, both of which have very high per capita valuations because of the presence of oil industry property, skew the statewide averages. In 1978, Nome had almost $36 million (full value determinedly the state, in contrast to $29 million local assessed value) of private real property, $12,402 per capita. This per capita wealth is quite similar to other cities ($12,232) in the state with a property tax if Valdez is included from the average. Nome has 5770,000 of general obligation bonded debt. This represents 2.14 percent of the city's assessed value (state law prohibits a city from encumbering C.P. debt in excess of 15 percent of its assessed value).

e

Education

PRIMARY AND SECONDARY

Most of Nome's kindergarten through twelfth (K-12) grade students attend public schools under the jurisdiction of the Nome School District. The district covers an area which is coterminate with the City of Nome boundaries. There are no private educational facilities serving this age group in Nome, though there is a private pre-school.

Student Population

The student enrollment in Nome has been fairly constant through the years except the loss of approximately 200 boarding school students who returned to their villages over a two year period with the establishment of the Bering Straits Regional Attendance Area (REAA) in 1975. Up to this time, a regional high school was located in Nome serving both a portion of village and all City and Nome students.

Enrollment in 1978-79 was approximately 779 of which 404 attended elementary grades and 375 attended junior or senior high school. This total represents a decline of about 30 students compared to 1977-78, which had about 810 students (560 in elementary and junior high school and 250 in senior high school).

The 1978 enrollment was about 27.4 percent of the total population while the school age population was estimated to be about 29.1 percent or 48 more than those attending school. The current average ratio of students to

population in selected southeast and southcentral Alaska boroughs is about 23 percent. For towns and villages composed largely of Alaska natives, the ratio averages 28 to 33 percent. Nome's intermediate position is due to its social mix. Though Alaska natives constitute about 60 percent of the population, they compose 72 percent of the student enrollment (Ender, Community Contact, 1979j). The district's fairly stable enrollment with some modest increases in population suggest that the national trend of a declining birth rate has begun to affect Nome in a modest way. The district's FY-80 enrollment projection was 800 students. As of November 1, 1979, the 79-80 student enrollment was 746 which indicates a drop from 1978-79. Elementary grades had 420 while the junior-senior high school had 326. Thus the loss of students are in the high school grades, suggesting retention problems more than changing demography as the reason for the decline.

A problem with student projections involve the changing enrollment during the school year. The drop out rate is high as is the movement of students from the city district to village schools. It is difficult many times to determine if a student left school or merely transferred. The small graduating classes, however, do emphasize the problem of non-completion. In 1979, 59 students graduated from the Nome High School.

The potential student population was noted as being 48 above enrollment. These students could be assumed to be virtually all senior high school age which would constitute 16.1 percent of this age group. Since achievement is not directly related to age, there are likely to be a significant number of 19 and 20 year olds who should be part of these numbers.

The district's projection of enrollments is generally tied to expected population growth. These estimates are optimistic of oil development (Ender, Community Contact, 1979j.) Without major development, however, enrollment is strongly tied to the incremental net in-migration and the natural increase in the population. The Nome Educational Report used the Water and Sewer Master Plan projections to forecast 862 school age children by 1980 and 1513 by 1997 (786, K-6; 295, 7-8; and 432, 9-12 grades), Since utility forecasts are understandably high, so are the attending enrollments. In addition, there are no adjustments for the changing demography of the community which affects projections (G.D.M. & Associates, Inc., 1978).

Personnel and Facilities

The school district presently maintains a student/teacher ratio of 11.6 in the elementary grades and 11.2 in the junior and senior high school grades. The number of students per teacher has declined the past three years (1977-1978 was 12.1) as enrollments fill modestly and faculty strength was maintained at approximately the same level. In 1979, the elementary grades have 37 certified teachers. These include 21 regular teachers and 16 resource teachers in areas of special education, music, art, etc. The junior and senior high program employs 29 regular teachers and three certified employees in counseling and library (not calculated into the ratio).

To accommodate the student enrollment, the school district maintains buildings at two sites. The three adjoining elementary buildings constituting 64,000 square feet, (grades K-6) are on the west end of the downtown in a crowded

land use location. The 1935 classroom and gymnasium is dilapidated but heavily used. The 1955 structure of reinforced concrete has experienced differential settlement, and structural distress is apparent. It contains classrooms and a cafeteria/multi-purpose space. The 1970 addition, a wood frame and structurally adequate facility, is composed of classrooms. (G. D.M. & Associates, Inc., 1978) Eventually, the district will be faced with replacement or extensive remodeling of this facility. (Ender, Community Contact, 1979j.) There are 31 classrooms, one resource center, one gymnasium, and one multi-purpose room in the elementary buildings and all are utilized due to the specialized program development. The junior and senior high school is located at the Nome-Beltz facility. The seventh and eighth junior high grades were moved to this location from the elementary site in 1978 and all these grades are administered by one principal. The high school has 11 general classrooms, biology lab, music room and studies, library, kitchen/dining, home economics, and administrative offices. The voc-tech facilities house a power mechanics shop; building trends; welding, metal and aviation mechanics; electronics shop, classroom, crafts room, drafting room, and office simulation area. Also, there are a gymnasium, cafeteria/kitchen, and a dormitory which include two horticulture classrooms. This space totals 62,700 square feet plus 11,700 square feet in the gymnasium. Remodeling could increase the space available, but presently all facilities are being utilized to some degree.

In planning for future facilities, the Educational Report calls for a new junior high facility and a swimming pool in 1980. The two older elementary buildings would be razed in 1985 and new elementary facilities would be

constructed on the present site and on dedicated land on the east side of town. The high school would be added onto by 1985. These additions are projected to meet needs through 1997 (G.D.M. &Associates, 1978). Presently there are no substantive actions that have been taken to carry out the plans except the moving to junior high facilities to Nome-Beltz.

Despite the high utilization of present space, the Superintendent believes that the present facilities are capable of handling substantial enrollment increases. Because of the small class sizes, this estimate appears to have some merit though it is more true of the Nome/Beltz complex than the elementary school building. (Ender, Community Contact, 1979 j)

The Cost of Education

Table 22 breaks down the cost and sources of primary and secondary education in Nome. In 1978-79, the district approved $3.7 roil" ion in expenditures or $4,771 per student. Though enrollments have slipped, costs continue to rise to maintain programs and cover the costs of inflation. These costs are not exceptional when considering the 1.65 cost differential with urban Alaska. When comparing Nome's expenditures with Anchorage, adjusting for cost of living, Nome is only about $150 per student above Anchorage with class size only one-half the size. This would suggest that the Nome system is relatively cost efficient in their service delivery. One reason for this may be that 53 percent of the 1978-79 budget was spent on direct instruction costs and only 14 percent on general support services.

TABLE 22

EDUCATION EXPENDITURES AND REVENUE SOURCES - 1977-79[a]

Categories	Amount	Percent	Amount	Percent
EXPENDITURES	1977 - 1978		1978 - 1979	
Regular Instruction	$1,307,912	37.9%	$1,433,647	38.6%
Vocational Education	224,840	6.5	212,940	5.7
Special Instruction	308,962	8.9	308,618	8.3
Supplemental Services - Pupils	120,620	3.5	126,711	3.4
Supplemental Services - Instruction	1,800	.0	12,500	.3
General Supplemental Services	430,373	12.5	508,746	13.7
Operation and Maintenance	924,743	26.8	966,516	26.0
Pupil Transportation	61,000	1.8	74,000	2.0
Non Program Charges	73,000	2.1	73,000	2.0
	$3,543,250	100.0%	$3,716,678	100.0%
SOURCES				
Local	$ 65,000	1.9%	$ 190,000	5.1%
State	2,962,290	85.8	3,079,047	82.9
Federal	15,000	.4	25,000	.7
Other	410,960	11.9	422,261	11.4
	$3,453,250	100.0%	$3,716,678	100.0%

[a]Nome Public Schools, Just the Facts, 1977-78, 1978-79

In terms of revenues, the vast majority of the money comes through state revenues (83 percent), while only five percent is derived from local taxation. The federal funding portion is misleading in that a number of federally funded categorical grants are transferred to local districts via state agencies. A significant portion of Nome's budget is composed of supplemental categorical funds derived from state and federal sources. In 1978-79, this accounted for 32 percent of all spending. Table 23 reviews supplemental program funding outside general revenue expenditures. These programs are critical in maintaining the present level of service, and provide the intensive teaching method developed within the system. A major negative change in the programs could adversely affect the education in Nome.

TABLE 23

SUPPLEMENTAL PROGRAM FUNDING IN NOME[a]

Programs	1978-79	1979-80 (Requested)
ESEA Title I	$ 35,258	$ 105,329
ESEA Title IV-B	3,314	3,000
ESEA Title VII Bilingual	141,384	161,400
ESEA Title IV-C&D	-0-	24,247
Bilingual/Bicultural	134,850	141,405
ESEA Title VII	204,054	-o-
Indian Education Acct	158,523	200,600
Johnson-O'Malley	275,280	270,200
Right to Read	43,555	48,249
VO/AC CIP	-0-	23,727
YEPT CETA Title III	88,545	75,000
St.Career and Vocational Education	-0-	15,000
Community Schools	60,000	66,000
TOTAL	$1,194,763	$1,134,157

[a]Nome Public Schools, Education Plan, FY-80

Regular and Special Programs

This funding mix provides for a variety of educational programs and curricula. Particular attention is focused on special education and/or modified primary programs. There are presently 30 students enrolled in these programs which is a significant portion of the student population. (Gorski, Community Contact, 1979s) Achievement data has suggested in past years that elementary students averaged 50 percent below the national average. Current information suggests that intensive readings programs have begun to pay off with rising scores. Math scores are still well below the national average.

Other special departments and programs complement the regular instructional program. The Special Instructional Program provides Resource Teachers working in grades K-12. A Vocational Educational program supplements regular instruction at the 9-12 grade levels. (Education Plans, FY-80)

A community schools program is available which provides a variety of adult, juvenile, and children's classes and programs after regular school hours. In addition, the school buildings are available to community organizations for classes, meetings and other activities.

Nome School District and Its Relationship to Bering Straits Regional Education Attendance Area (REAA). With the establishment of the regional school district in the Bering Straits, boarding school operations in Nome were terminated. While the REAA administers education in all areas in the region, except Nome, it is headquartered in Nome using space rented from

the local district. The regional district has about 35 administrative staff in Nome, and the two entities operate totally independently of each other. The Nome system provides some minor contractual services, but beyond that there seems little coordination or professorial contact.

POSTSECONDARY EDUCATION

Higher education, adult education and postsecondary career and vocational-technical training is provided by a number of agencies. The Northwest Community College (NWCC) is the largest delivery system of higher education in the region. In addition, Kawerak provides GED adult education through the Kawerak learning centers (see social services section). The Community Center and Community Schools offer a variety of community interest courses for both children and adults (see recreation section). The Norton Sound Health Corporation provides training for their village health aid program and the nonprofit regional and village corporations have management and board training grants. This section will focus on NWCC and its activities and programs.

Functions of Northwest Community College

The Northwest Community College serves the Bering Straits region through a main campus in Nome and through Learning Centers in fifteen villages outside Nome. NWCC has a campus president under the statewide community colleges chancellor. The president is advised by a Regional Policy Advisory Council. The College was established in 1975 building on the University of Alaska Cooperative Extension Service Office which operated from 1959.

Since its establishment in 1975, NWCC has experienced a growth both in number of students enrolled and credit hours.

Presently the College offers certificates and associate degrees through five divisions: business, education, general studies, health sciences, and vocational/technical. In addition, it operates the 15 learning centers in a cooperative arrangement with Kawerak teaching college level courses and ABE in a self-paced and individualized mode of instruction.

Student Population

Enrollment at the college has consistently risen in terms of number of credit hours taken but headcounts have been more variable. Table 24 outlines semester and annual counts and compares this with original projections of enrollments. The 1978-79 school year showed a decline in both students and credits, as the college actually expanded its outreach. This decline appears to be caused by the attendent problems of program expansion combined with organizational difficulties and conflicts occuring at the Nome campus. Staff cutbacks in 1979-80 is projected to generate only 3,183 credit hours for 651 students. This is an expected 20 percent decline. Presently there are about 16 full-time and 112 part-time students enrolled at the College.

Personnel and Facilities

The college employed 10 full-time instructors in 1978-79 and up to 32 part-time adjunct faculty. Six of the professional staff are funded on soft money

TABLE 24

NWCC STUDENT Population

Semester	Head Count	Credit Hours	Projection
1975 Fall	318	919	
1976 Spring	564	1,600	
Total	882	2,519	(646)
1976 Summer	136	451	
1976 Fall	358	975	
1977 Spring	599	1,837	
Total	1,093	3,263	{850)
1977 Summer	79	200	
1977 Fall	427	1,137	
1978 Spring	488	3,229	
Total	994	4,566	(1 ,200).
1978 Summer	78	245	
1978 Fall	277	1,347	
1979 Spring	459	2,380	
Total	814	3,972	
1979 Summer		316	
1979 Fall (Opening)	1;:	483	

[a]Nbrthwest Community College, 1979b and Ender, Community Contact, 1979d

leading to problems in program continuity. This is part of the problem for 1979-80 with only seven instructors funded and an estimated 28 part-time teachers. This reduced strength is projected to lead to further declines in credit hour production. (Northwest Community Col 1 ege, 1979a)

The program in Nome is housed in a 50x50 foot building with little room for job performance either administratively or academically. Additionally three smaller buildings serve for storage and classrooms. The major source of

instructional facilities is the Nome Public. The Nome-Beltz High School facility is used for office occupations and some vocational courses. Additionally, the college has cooperated with churches and other civic organizations to offer classes in their facilities. (NWCC, 1979a)

Construction began this fall on a new 70x70 foot central building for office space and classrooms.. The existing building will be converted to library and audio-visual functions. In addition a 20x40 foot classroom buiding is being constructed with four additional satellite classrooms building planned in the future. This initial construction should reduce the need for adequate space. Additional classrooms are a policy decision based on the philosophy of the college as an identifiable physical plant in one location, or a decentralized community outreach program. (Ender, Community Contact, 1979o)

cost

Table 25 outlines the funding of NWCC. The major change is the large infusion of grant monies in FY-79. The largest amount was soft money to establish the village learning centers. In additions, a number of students are on CETA training funds to support their education. This is primarily through Kawerak, but also from other non-governmental and governmental agencies. 3

Issues in Higher Education

NWCC expanded rapidly amid rising expectations in the community. Weaknesses in staffing made it impossible to meet needs or demands in the community. To assist in rapid outreach, the college required large amounts of soft money

TABLE 25

NORTHWEST COMMUNITY COLLEGE FUNDING[a]

	State	Grants Contracts	Tuition	Total
FY-76	$235,819	$ 20,000	$17,280	$ 273,099
FY-77	$432,730	$107,103	$25,611	$ 565,444
FY-78	$431,300	$40,118	$33,203	$ 504,621
FY-79	$458,900	$709,821	$32,000	$1,220,721
FY-80	$442,000			

[a]NWCC, 1979a

which it lacked staff to utilize in an efficient manner. In addition, a number of conflicts arose which interfered with the college's work, especially inside Nome. Conflicts between the College President and his staff, a number of agencies, members of his advisory boards and some residents increased such that these problems jeopardized the college's programs. A recent change of leadership may lead to a solution of these problems.

However, other prob" ems remain. The practice of offering large numbers of classes and canceling the greater proportion leads to unfulfilled expectations by prospective students. Also, an unusually high proportion of all students fail to complete the course work. This runs about 50 to 60 percent of all credits in any one semester. This problem is even worse in the village learning centers which lack sufficient structure to assure class completion. The center model is too new to judge its overall success, but

there is strong initial evidence that its overdependence on academic self-motivation in a village environment may make this effort unprofitable without major modifications.

To provide direction for future program development, a needs assessment was contracted for NWCC. A sample of about 250 residents were questioned. Priorities for the future included more depth in the general arts and sciences (with attention in the sciences), native courses (with native languages emphasized), business courses, and vocational training with interest in heavy equipment.

Public Safety

NOME POLICE DEPARTMENT

Departmental Organization

The Nome Police Department is presently housed in the same building as the fire department and is located in the downtown core area of Nome. The department employs seven sworn officers consisting of one chief of police, one lieutenant, one squad sargent, one investigative corporal and three patrol officers. In addition, the department employs two secretaries and three dispatchers. All requests for service for police, fire and emergency medical (ambulance) are currently processed through the Nome police dispatch. (Gorski , Community Contact, 1979p)

Day shift staffing consists of the police chief, the lieutenant and investigative corporal. Shifts are staggered so that ideally, two officers are on duty from 5:00 p.m. to 1:00 a.m., which is the department's most active period. In addition, two patrol officers are scheduled from 10:00 p.m. to 6:00 a.m. As well as performing normal duties, the Nome police department is responsible for airport security. For each commercial passenger jet operation out of Nome, the department dispatches one sworn officer to do security check in compliance with airport regulation. (Gorski , Community Contact, 1979P)

Incidence of Crime

Part I crimes are considered to be the most serious in terms of their impact on the victim and the community. There are seven classes of Part I crimes as determined nationally by the Uniformed Crime Reports. They are murder, forcible rape, robbery, aggravated assault, burglery, larceny, and auto theft. Crime statistics in these areas are a good barometer of the level of crime in a particular community. Part II crimes are less serious in nature and are classified as simple assault, forgery, fraud, embezzlement, vandalism, weapons possession, prostitution and disorderly conduct. Table 26 displays the crime index statistics from 1978 through the first half of 1979 for Part I crimes. Statistics prior to 1978 are unavailable.

TABLE 26

PART I CRIMES, 1978-1979[a]

Part I Crimes	1978		1979 (1st half)	
	Adults	Juveniles	Adults	Juveniles
Murder	1	0	0	0
Rape	3	0	5	1
Robbery	3	1	1	0
Assault	140 (110 simple)	4	73 (56 simple)	2
Burglery	73	10	26	3
Larceny	171	23	95	4
Auto Theft	84	5	37	5
TOTAL	475	43	237	15

[a]Source: (Gorski, Community Contact, 1979 q)

Examination of the actual number of Part I crimes reveals a ratio of 158 crimes per 1,000 in the population for 1978. Comparative analysis indicates that this is substantially higher than Anchorage with a ratio of 70.8 crimes per 1,000 people.

Several indications which might account for this difference are increased per capita alcohol consumption and increased reporting due to the smaller, more closely knit nature of the community.

Crime Clearance

Crime clearance is defined in two ways, either by the arrest of the perpetrator, or by knowing who committed the crime but for a particular reason, the suspect cannot be apprehended. Examples of the second clearance would be death of the suspected offender or apprehension of the offender in another jurisdiction. Table 27 displays the percent cleared for 1978 and the first six months of 1979.

Comparing these clearance rates to Anchorage for 1978 indicates a more successful crime clearance rate for the Nome police department. It is important to note, however, that there is a substantial difference in the general frequency of crimes in Nome and Anchorage which raises some statistical problems in comparative analysis. However, the one big difference that exists between the two areas is the level of citizenry interaction. The close knit nature of the Nome community has afforded the police department with better information channels than what might

otherwise exist in an urban area. Urban isolation tends not to permit an adequate flow of information to police thus hindering investigative capabilities. (Gorski, Community Contact, 1979f)

TABLE 27

CRIME CLEARANCE RATES[a]

Part I Crime	Nome 1978	Anchorage 1978	Nome 1979 (1st half)
Murder	100%	81.3%	---[d]
Rape	100%	9.9%	40%
Robbery	33%[b]	12.8%	0%[b]
Assault	94%	35.5%[c]	92%
Burglary	33%	10.2%	15%
Larceny	37%	27.9%	36%
Auto Theft	15%[e]	7.9%	32%[e]

[a]Gorski, Community Contact, 1979q)

[b]low percentage due to low N

[c]aggravated assault only

[d]no murders occurred in the first six months of 1979.

[e]low percentage due to joy riding.

Property Loss and Recovery Rates

Property loss and recovery rates are displayed in Table 28. Information on this area was available for 1978 and the first half of 1979.

TABLE 28

PROPERTY LOSS AND RECOVERY RATE[a]

Loss	1978	1979 (1st half)
Robbery	$ 183.00	$ 80.00
Burglery	22,249.02	7,417.76
Larceny	28,448.70	22,073.62
Auto Theft	$200,089.85	$ 108,055.00
	$250,970.57	$137,626.38
Recovered	1978	1979 (1st half)
TOTAL	$207,946.77	$119,328.03

[a]Gorski, Community Contact, 1979q

The recovery rate for 1978 was 82.9% and for the first six months of 1979 was 86.7%, an admirable accomplishment on behalf of the department and the community.

Profile of Offenders

In 1978, the Nome Police Department responded to 3,440 calls for service. The offender was typically male, Alaska Native, under the age of 35 and had a 37 percent chanceof being intoxicated. Table29 displays a break-down of the total calls for 1978.

TABLE 29

BREAKDOWN OF CALLS - 1978[a]

Total Calls	Total Adult Arrests		Total Juvenile Arrests		Non-Criminal Arrests		Non-Criminal Transport	Total Persons Intoxicated
	M[b]	F[b]	M	F	M	F		
3440	374	83	45	37	231	62	366	1,286

[a]Gorski, Community Contact, 1979q

[b]M = Male, F = Female

Table 30 displays a breakdown of number of arrests by race during 1978.

TABLE 30

RACIAL BREAKDOWN - 1978 ARREST REPORT[a]

White	22
Black	0
Indian	5
Chinese	0
Japanese	1
Alaska Native/Other	429

[a]Gorski, Community Contact, 1979 q

It should be noted that Nome is 60+ percent Alaska Native. The non-native members of the Nome community are typically employed by a government agency or private business and are socioeconomically at an advantage. These groups typically have little contact with law enforcement agencies.

Table 31 displays arrests for 1978 by age.

TABLE 31

AGE - 1978 ARREST REPORT[a]

Age	Number of Arrests
18-19	55
20-24	104
25-29	90
30-34	67
35-39	29
40-44	41
45-49	22
50-54	28
55-59	10
60-64	3
65+	8

[a]Gorski, Community Contact, 1979q

The most frequent arrests typically occur when the offender is under 35 years of age. This is representative of trends in crime displayed across the country. In addition, juvenile interaction with law enforcement is not uncommon in the community. Table 32 displays juvenile arrests by age.

TABLE 32

JUVENILE ARRESTS BY AGE - 1978 ARREST REPORT[a]

Age	Number of Arrests
10	1
11-12	0
13-14	8
15	19
16	32
17	22
TOTAL	82

[a]Gorski, Community Contact, 1979q

With the relative isolation of the community and the degree of darkness in the winter months, this level of interaction can be anticipated. Community efforts to increase participation in constructive recreational outlets such as those discussed under the recreation section of this report may alleviate some of the juvenile arrests. Of the total arrests for 1978, 15 percent occurred in the juvenile age bracket.

Perhaps the most critical issue tied in with law enforcement is the alcohol problem plaguing the community. In 1978 there were 3,440 calls for police service and of that total, 1,286 or 37 percent involved persons who were intoxicated. Table 33 displays selected crimes from the multiple offense chart for 1978 and indicates the number intoxicated in each category.

TABLE 33

SELECTED CRIMES MULTIPLE OFFENSE CHART - 1978[a]

	Number Reported	Number Unfounded	Actual Offenses	Cleared	Intoxicated
Rape	9	6	3	3	3
Assault	168	28	140	131	105
Larceny	188	17	171	64	27
Vandalism	137	10	127	42	13
Weapons	55	15	40	36	23
Offenses Against Family-Children	15	0	15	15	12
Traffic	430	12	418	397	31
Attempted Suicide	30	10	20	20	15
Domestic Disturbance	320	32	289	289	208

[a]Gorski, Community Contact, 1979 q

As noted in a special report on alcoholism, entitled Alcohol Problems in the Norton Sound Health Corporation, (Kelso, April 1979) about 54% of the more serious offenses--aggravated assault, larceny, weapons violations, etc., involved intoxicated persons. In addition, fights and domestic disturbances frequently involve alcohol. The report further states that public drinking and drunkenness, and crisis consequences associated with abusive drinking, tend to be more likely in the winter months. Also, in Nome, once the drinking starts, it goes on until some sort of external event ends the episode. There appears to be a great deal of social support to drink to get drunk. Although there are a number of agencies to assist with alcohol problems, it appears that police have the primary contact with alcohol offenders.

Planning

To assist in crime clearance, the Nome Police Department is in the process of setting up a photo lab. This will decrease the amount of time necessary for processing outside of Nome. The department recently added a patrolman to the force which has benefited the level of effectiveness. Ideally, with the workload that the department presently faces, an additional one to two more patrolmen could be utilized. (Gorski, Community Contact, 1979p)

TROOPERS

Organizational Context

The headquarters for F Detachment of the Alaska State Troopers, as well as the Nome Post are located in Nome. The Post provides law enforcement services

to all of the bush communities in the Nome region excluding Nome. To serve the area, the Alaska State Troopers employs five sworn troopers who serve in shifts of seven and one-half hours per day, five days per week. Functions, include law enforcement, search and rescue, transport of criminals, fire and arson investigations, and drivers licensing. The Nome post has an aircraft at its disposal to assist in these functions as well as 4 - four wheel drive vehicles. The troopers utilize the state jail facility in Nome for most of those cases requiring detention. (Gorski, Community Contact, 1979d)

Special Issues

As well as their regular duties, the Detachment is presently working on a new program with the nonprofit corporation for the region in training village police officers. The program is 12 weeks in length with a goal of imparting procedural skills for small misdemeanor cases. It is hoped that the officers can be awarded basic certificates which will help lend credibility to their jobs in each of their respective villages. The training should assist the troopers in their workload for the region by freeing them of the responsibility of the less serious misdemeanor cases.

Alcohol is a problem in the bush communities as well as in Nome. The troopers are presently involved in an alcohol program for villages in the region. The purpose of the program is to assist the villages in presenting an alcohol seminar to educate people on the use and abuse of alcohol.

Since the troopers' orientation is outside of the Nome area, any OCS development occuring in the region would fall under their jurisdiction. A complete discussion of the role of the troopers in the region is outside the scope of this paper but the level and type of interaction can be found in the Bering-Norton Petroleum Development Scenarios, Socio-cultural Systems Analysis.

Jails

The Nome Police Department and the Alaska State Troopers utilize the State jail system located in the downtown core area of Nome. The facility has one dormitory with ten beds, one dormitory with twenty beds and eight cell beds.

The jail is presently utilized to only one-ha" f of its capacity. One of the reasons attributed to the low usage is re" atively low prosecution rates in the region. In addition, because the City of Kotzebue has more limited detention services, any sentence over 30 days is sent to Nome.

The jail retains two cells for use in alcohol detention. The city presently has a twelve hour noncriminal law for detaining intoxicated persons until sober.

A number of programs have been developed to provide outlets for those detained within the system. Kawerak, the nonprofit arm of Bering Straits Native Corporation, has organized a recreational program and also provides adult basic education. Inmates are permitted to go to the armory to play

basketball twice a week, or weather permitting, baseball outdoors. Library visits are permitted once per week and inmates are allowed visitors three times per week. In the fall, Northwest Community College accepts some students for college credit. Norton Sound Health Corporation does mental health and alcoholism counseling. The Covenant Church has daily Bible study and both Catholic and Protestant services are held on Sunday. In addition, the system permits work release.

The Department of Health and Social Services is presently in the planning stage for new or upgraded correction facilities across the state. The masterplan has targeted Nome for a new facility between 19S3 and 1985. The sizing of a new jail is contingent on usage rates over the next several years.

FIRE PROTECTION SERVICES

The City of Nome presently prov des fire protection serv ce through a volunteer force of 35 members. The fire station is centrally housed in the downtown core area and presently has a response time of less than three minutes. (Gorski, Community Contact, 1979n)

Presently, the Insurance Service Office ratings for grading fire defenses for a community rates Nome as a class 7 and class 9. Equipment available for use in extinguishing fires are two multipurpose fire apparatus with a water capacity of 800 gallons a piece and a foam capacity of 50 gallons a piece. The department has recently acquired a snorkle which has a

water capacity of 500 gallons and a foam capacity of 50 gallons. Each truck has 1,000 feet of 2-1/2" diameter hose and two preconnected hoses. In addition, there are three large water tankers available with a total water capacity of 3,500 gallons (city water trucks). The department also owns and operates an emergency rescue vehicle which responds to traffic accidents with extrication equipment. In addition the city has a salt water fire suppression system which was rendered inoperative in the November, 1974 storm and is under repair. The system is targeted to be operational by the summer of 1980. The sysem capacity is approximately 7,570 lpm (2,000 gpm). In order to respond adequately to fire flow needs, it is important that this system be brought back on line. (Gorski, Community Contact, 1979n)

The department is authorized to have a volunteer force of 40. There are presently 35 trained firemen of which five are emergency medical technicians. Three of the five are licensed emergency medical technician instructors and the balance of the force is trained in first aid. The department holds one meeting per month and one training session per month. It is the general feeling that although the present volunteer status is effective, two full-time firemen would improve upon the present status by reducing response time even further. Presently, most calls for fire service occur between midnight and 5:00 a.m. (Gorski , Community Contact, 1979n)

The department can generally be classified as one with good morale and with a high level of effectiveness. Other than perhaps adding full-time

personnel, the department appears equipped to handle most emergency fire and rescue operations. The main deficiency lies in the relatively new task handled by fire departments across the country of emergency medical services. Presently, this is handled by a private industry in town with dispatch through the Nome Police Department. There are currently two ambulances serving the Nome area, responding to an average of 30 calls per month. Many of the calls are transports to and from the airport. Switching this function over to the fire department would increase the use of the trained emergency medical technicians and perhaps enhance Nome's emergency medical services.

A second deficiency in the traditional tasks of fire departments is the lack of a fire inspector. In the past, this was a full-time slot; however, city budget cuts eliminated the position and inspections are now handled on a volunteer basis. Some provision should be made for more formal inspections to enhance the integrity of the fire safety level of the community. (Gorski, Community Contact, 1979n)

Recreation

Although no formal program exists through the city, Nome Community Center and other organizations in town provide a variety of activities for adults and children. The following section is an inventory of facilities and activities available to the community.

RECREATION PROGRAMS

Table34 displays a series of programs organized through the Nome Community Center as extracted from a program summary from September 1978 through May 1979.

TABLE 34

PROGRAMS SEPTEMBER 1978 - MAY 1979[a]

Recreation Programs	Average Attendance
Preschool Recreation	6
Kindergarten - 4th Grade Recreation	32
5th and 6th Grade Recreation	27
7th and 8th Grade Recreation	17
Womens' Recreation	6
Womens' Basketball	12
Kindergarten - 4th Grade Recreation	4
5th and 6th Grade Eskimo Games	6
7th and 8th Grade Eskimo Games	14
Teen and Adult Eskimo Games	10
Teen and Adult Volleyball	23
Teen and Adult Recreation	15
Noon Conditioning	15
Jail Exercises	4

[a]Source: Nome Community Center Program Summary, 1979.

Table 35 displays additional programs offered in 1978 and 1979 by the Nome Community Center and other community organizations.

TABLE 35

RECREATION PROGRAMS[a]

Program	Average Attendance
Cross Country Ski Program	
. Clinic	23
● High School Outdoor Sports Physical Education Classes	24
● Iditarod Cross Country Ski Race	31
● Cross Country Ski Party	10
Playground Program	
● Sports and Games; Arts and Crafts	22
● Field Trips	8
Softball Program	
● Youth - Three Leagues	180
● Adult - Two Leagues	190

[a]Nome Community Center, Program Summary, 1979.

In 1979, Nome Adult Athletic Association, along with the City of Nome, constructed a new softball field for the adult softball leagues. There are now a total of two fields available for the adult and youth league games.

It is evident from the inventory displayed in Tables 34 and 35 that Nome has a wide variety of programs available to adults and children. Softball appears to be of prime importance as noted by the level of attendance in both the adult and youth leagues.

In addition, Nome Community Center sponsors a day camp program from June through August. Activities include competitive and noncompetitive sports and games, arts and crafts, drama, archery, swimming and canoeing, physical fitness, outdoor skills, cultural activities, environmental education and values clarification. Age range is the first through sixth grade with the past year's enrollment at 105,

An ice rink program is offered from January through April. This past year, opening day yielded a total of 80 participants. Supervised open skating had an average attendance of 20. Other activities noted in the program summary included speed, obstacle course and hockey races every Saturday, Iditarod games and races, April Fools' Day party, awards day party, hockey and broomball. Standards suggested by the National Recreation and Park Association is one ice rink per 5,000. Regardless of the standard, it is the judgement here that such a facility is conducive to northern climates and provides an excellent recreational outlet for the long winter months.

Nome also benefits from a community schools program which offers classes in arts and crafts and recreation.

SPECIAL EVENTS

Community-wide special events involving Nome Community Center and other organizations in town include the Iditarod in March, an annual dogsled race celebrating the 1,000 mile run from Anchorage to Nome; and the Midnight Sun Festival held in June, celebrating the summer solstice. Recreational programs include a parade, baseball and tennis tournaments. In July the community participates in the Fourth of July celebration with parade and street games. (Gorski, Community Contact, 1979aa)

Other community special events sponsored by or in part by the Nome Community Center this past year included a Volleyball Tournament with seven teams, a crosscountry ski race with 25 participants in March, the Midnight Sun Festival street games and softball tournament in June, and the ARCO Jessie Owens games with 120 participants in July.

FACILITIES

Table 36 displays the facilities available and their associated standards as suggested by the National Parks and Recreation Association.

Nome has allocated several acres for a park at the east end of town. The City is attempting to obtain a grant through the State Department of Recreation for use in development which would include a tennis court, volleyball court and fitness trail. In addition, the Alaska State Housing Authority is putting in a play lot in Beringview and the Methodist Church has play facilities on the church grounds. (Gorski, Community Contact, 1979aa).

TABLE 36a

FACILITIES INVENTORY

Facility	Available	Optimum Standard
Skating Rink	1	1/5,000
Tennis Court	0	1/2000
Community Centers	1	1/25,000
Basketball Courts	2	1/2000
Neighborhood Parks - Two hectares (five acres)	1 (proposed)	1/2000 - 1/10,000
Play Lots	2	1/500 - 1/2500
Softball Fields	2	1/3000

[a]NRPA Recommendations and Gorski, Community Contact, 1979aa

The teen center is a new facility which offers an open recreation room and an arts and crafts room. In addition the center runs a food concession and also offers a daily hot lunch for senior citizens.

ADULT RECREATION

As well as programs offered through the Nome Athletic Association and City League Basketball, many of Nome's residents enjoy outdoor recreation through subsistence type activities. Although subsistence for many is a necessary component for survival , it has also created a mode of life style for others in the form of hunting, fishing and berry picking which would be considered outdoor recreation. Winter months are the most difficult time with the arctic climate and the long hours of darkness. To alleviate cabin fever which often occurs this time of year, many residents do snow machining and cross-country skiing for a recreational outlet

Also, Nome Community Center is presently in the planning stage for a warm-up shack and downhill ski area with a rope tow. (Groski, Community Contact, 1979a)

Utilities

WATER

Nome's water system is a city owned and operated utility. The system was initially designed in 1963 and has subsequently developed to provide service to about one-half of the community. The remainder of Nome's residents have water delivered by Municipal owned trucks.

The present water source is an infiltration gallery located four miles north of town at Moonlight Springs. The maximum yield for this water source has been calculated at about 1,136 to 1,438 liters (300 to 380 gallons) per minute which is considerably greater than what is required for an adequate water supply. The water quality is considered excellent but is classified as hard water due to the calcium carbonate content.

The Nome Water and Sewer Masterplan, developed in 1976 by CH_2M Hill inventoried the system as summarized below.

Water from Moonlight Springs is transported via a steel transmission line by gravity to a storage reservoir located next to the municipal power plant. The tank is 12 by 24 meters (40 by 80 feet) and when filled to overflow can accommodate 1.2 million liters (320,000 gallons) of water. Based on the approximate town water use of 760,785 liters (201,000 gallons) per day, the reservoir has the capacity to provide a reserve of 1.5 days. Three days is considered a minimum amount for reserve purposes which indicates an inadequacy in this portion at Nome s water system. The present hydraulic capacity for gravity flow is 3,028 liters per minute (800 gallons).

A heat exchanger system is in operation as part of the power plant cooling system. This heated water is discharged into the reservoir at the same location as the main discharge from the Spring. As water flows through the reservoir, it is further heated by pipes running through the reservoir from the power plant cooling system. This is a mutually benefiting relationship in which cooling is provided for the power plant and water is heated to reduce the possibility of line freeze-ups in the distribution system. A chlorine solution is added to the water before it enters the reservoir. Two constant speed pumps pump water upon demand and maintain water pressure within the distribution system. The distribution system itself is looped and contains circulating pumps to maintain water velocity. Both water and sewer mains are housed in underground utilidors composed primarily of .9 meters wide by 1 5 meters high (3 foot wide by 5 foot high) boxes constructed of 7.6 cm (3 inch) and thicker planking. The subcommunity portion of the system of Bering View and King Island utilizes 5 percent elongated 168 cm (66 inch) diameter corrugated aluminum culvert pipe. Most of the utilidors are buried partially in permafrost; however, the warm sewerage pipes and heated water generally keeps the ambient air temperature above freezing.

Total water consumption is metered at the reservoir and is approximately 760,785 liters (201,000 gallons) per day or 253 liters (67 gallons) per capita per day (lpcpd[gpcpd]). For planning purposes, CH_2M Hill estimates that per capita usage will rise to about 303 lpcpd (80 gpcpd) as additional households are added to the system. This is based on the assumption that water consumption will increase as piped water becomes the more predominate

method of service. Table 37 displays projected water need through 1997 based on the increased per capita consumption.

TABLE 37[a]

PROJECTED WATER DEMANDS

Year	Population	Total Water Demand-Liters	Total Water Demand-Gallons
1975	2,550	662,375	175,000
1980	3,000	908,400	240,000
1990	4,000	1,211,200	320,000
1997	5,000	1,514,000	400,000

[a]Source: CH_2M Hill, Water and Sewer Masterplan

At its present yield Moonlight Springs can provide sufficient water to meet this demand through the year 2000 except possibly when the flow decreases during breakup time. If this begins to affect the service level, possible backup measures will have to be implemented to include conservation to restrict per capita use, or an alternative water source such as other springs, wells, or the nearby Snake River will have to be explored.

Water Issues

Several issues of community concern are discussed in this section. The issues listed are not all inclusive but serve to indicate some of the more major problem areas.

One potential problem is there is an incomplete understanding of the source of Moonlight Springs. As mentioned earlier, Moonlight Springs has an adequate water supply to provide service needs through the year 2000 except during breakup. However, it may be necessary at some future point to identify and develop a supplemental water source in order to insure an adequate water supply. The capacity of the system is adequate to meet the present and future demand for water in most all areas except for the storage reservoir capacity. As noted earlier, a reserve capacity of only two days exists when a three day supply is considered essential. As explained in the master plan, this in and of itself is not particularly critical except when considering that the reservoir has a marginal foundation, and the Moonlight Springs supply occasionally drops off. The Water and Sewer Masterplan proposes a 4.5 million liter (1.2 million gallon) storage reservoir to solve this problem.

A second issue of concern is the pumping capacity. Presently the two pumps provide 2,460 lpm at 293 kg5cm squared (650 gpm at 100 psi), which is considered adequate for residential fire flow but is not considered adequate for structures such as hospitals, schools or the central business district. One of the two pumps is considerably deficient in performance and should either be replaced or reconditioned.

Perhaps the most apparent issue facing the city is the extent of service. Only about one-half of the city presently receives piped water. As noted in the masterplan, there are many potential customers with mains available to them that lack the plumbing fixtures and service connections. At a

1976 dollar estimate of $3,000 per house to install such equipment, it becomes apparant that cost would be a prohibitive factor. In addition, there will be little economic incentive for customers to hook up to the system since with the present structure, piped water subsidized trucked operations. The present cost is extremely high to extend water mains $30.00 per .3 meter (linear foot) with hookup costs ranging from $35.00 to $100.00.

Delivered water is at a cost of .0128¢ per 3.8 liter (per gallon) (Edge, City Manager). A reassessment of costs to a more realistic level would help create the economic impetus to switch from trucked to piped water.

SEWER

The Nome sewer treatment and collection system presently serves about one-half the households in the community. The remainder utilize honey-buckets and private septic systems as the means of sewage disposal. Honeybucket service has recently been 'acquired by private industry from the City of Nome.

In 1976, the City of Nome authorized CH_2M Hill to proceed with planning and engineering studies necessary for the completion of Section 201 Wastewater Facilities Plan. Much of the data on this section has been extracted from this document.

The Nome sewer system shares underground utilidors with the water system. As noted in the Water section, the typical service utilidor is composed of 0.9 meters wide by 1.5 meters high (3 foot wide by 5 foot high), 7.6 cm (3 inch) and thicker planking. One such community, Bering View, is 5 percent elongated 168 cm (66 inch) diameter corrugated aluminum culvert pipe. Most of the utilidors are buried partially in permafrost, but with the warm sewage and the warm water from the paralleling water main, the ambient air temperature is generally above freezing. The sewer pipe hangers require annual adjustment to maintain suitable sewer gradients. Importantly, since Nome has a relatively dry climate and sewer lines are located in utilidors which drain, problems related to infiltration/inflow are almost nonexistent. Infiltration/inflow is defined as water, other than sanitary sewer, finding its way into the system.

With the exception of one lift station, the sewage collection system is gravity flow to the sewage treatment plant, a primary treatment facility designed to handle treatment, digestion of sewage solids and effluent disinfection. The plant is designed to accommodate average flows of 454 lpm or 654,048 liters (120 gpm or 172,800 gallons) per day.

Issues

Portions of the primary system are presently overloaded. The surface loading rate should not exceed 2,271 liters (600 gallons) per day per .09 square meters (square foot) for average flows, but the present average flows result in about 3,785 lpd (1,000 gpd) per .09 square meters (square foot) . In addition the plant design is inadequate to comply with federal law mandating at least secondary treatment.

Regulatory Permits

Federal mandates, as a result of the passage of PL 92-500 Federal Water Pollution Control Act Amendments of 1972, have declared national goals and established requirements to maintain the integrity of the nation's waters. In addition, the law provides financial assistance for construction of publicly owned waste treatment and planning. The goals of the federal mandate as displayed in the Wastewater Facilities Plan are as follows:

Compliance Date	Treatment Standard
July 1, 1977	Secondary Treatment
July 1, 1983	Best practical wastewater treatment technology
1985	Zero discharge of pollutants (goal--not regulation)

Nome is presently required to meet secondary wastewater treatment. In order to accommodate federal mandates as well as increase the capacity of their present system, CH_2M Hill has been secured to identify and develop the plans for a secondary lagoon system. Studies on the project were scheduled to begin in the fall of 1979.

A portion of the sewer mains added to the system in 1978 were financed and built by the Public Health Service. Due to alleged weaknesses in construction in the area along Fourth Avenue from the hospital to the community of King Island, the City of Nome will not take over operation and maintenance responsibilities. The City of Nome and the Public Health Service are presently negotiating over repair and operational responsibilities. (Gorski, Community Contact, 1979x)

Honeybucket Service

Presently, about one-half of the Nome community is without piped sewers. The majority of these residents handle sewage disposal through a private honeybucket collection system. The main problem with this mode of service is that it is not only unpleasant, but it is a health hazard. With several hundred gallons of water being delivered to households monthly and only a few gallons being retrieved, it appears that substantial amounts of wastewater are being discharged on the premises.

It is the goal of the City of Nome and the Indian Health Service that all residences and other facilities eventually be serviced by sewers within City limits. Although expensive, the health of the community and general standard of living makes this a viable goal to strive for. However, there are no actual facilities plans at this time for an all sewer hookup other than the wastewater facilities plan conducted by CH2M Hill in 1976. The study explores collection system expansion cost estimates and places the cost at $1.1 to $2.0 million in 1976 dollars.

ELECTRICITY

The primary type of fuel used for electrical generation in bush Alaska is diesel. Nome presently has seven diesel generators which are City owned and operated. Table 38 displays the breakdown by load.

TABLE 38[a]

GENERATION CAPACITY

Number	Generator Size (KW)[b]
3	600
1	300
1	1,250
1	1,050
1	1,450

[a]Source: Gorski, Community Contact, 1979u
[b]KW · Kilowatts

An eighth unit ·s due to come on line in the fall of 1979 with a KW capacity of 2,500 It is possible that several of the smaller generators will be retired and sold after the new one comes on line as the city will experience a surplus capacity of electricity. (Gorski, Community Contact, 1979u)

Virtually all structures within the city limits of Nome presently receive electric service. There is currently no rate difference between residential and commercial customers. All metered services pay 15¢ per kilowatt hour with a known actual cost of 9.5¢ per kilowatt hour. The rates have a built in escalating clause for increases in the cost of diesel fuel. The rate structure escalating clause permits the following: for every 1¢ raise in fuel prices the city may increase rates 1/10 of 1¢. The city generally increases rates by one-half cent raises. (Gorski, Community Contact, 1979u)

Nome can be considered in good condition with its present generation capabilities. The weaknesses in the system generally stem from age of equipment. Some of the equipment is as old as 30 years and it's the city's hope that some of the equipment will be sold. In addition, Nome has actually been upgrading the distribution system. Many of the service lines were on a lease basis with the Federal Aviation Administration and were built in the early 1930's. These lines, in particular, need to be replaced. (Gorski , Community Contact, 1979u)

In recent history, Nome's population has been relatively stable and yields a present approximate per capita load of 1.95 KW for all uses. It is important to note that home heating is predominately oil and not electric and therefore keeps the per capita load requirement at a lower factor. Historical and present usage rates have been stable at about 14 megawatt hours per year.

The Alaska Power Authority is presently conducting a study of power alternatives for the Nome and Kotzebue area. At first glance, it appears that there are alternatives available to the Nome area which are possibly more cost effective than diesel fuel. Such alternatives may include geothermal, hydroelectric and coal. Although any type of conversion which might be undertaken would be capital intensive, with oil prices on the rise, it may have long-term cost effective benefits.

TELEPHONE

Telephone service is presently provided by General Telephone to almost all residential and commercial establishments in the City of Nome. Presently there are 584 residential working stations with 134 extensions and 1,028 commercial working stations. To install, maintain and service telephones in the community , General Telephone employs one general manager, three plantmen/installers and two commercial/customer service representatives. (Gorski , Community Contact, 1979h)

Presently all calls except local ones are relayed directly to satellite through electromechanical switching equipment. In terms of capacity, the present switching equipment is in good condition. An additional 200 connections can be made on the present system before a new system would have to be installed. This is an adequate cushion to plan for expansion. At saturation of the present switching equipment, the probable move would be toward solid state equipment which would accommodate Nome's communications for many years to come. Approximately one year's lead time is necessary for this type of expansion. (Gorski, Community Contact, 1979h)

SOLID WASTE

Nome's solid waste collection has recently been acquired by Anderson Services, a local private company also providing honeybucket collection service for the community. Presently there are 350 residential

subscriptions and 52 commercial subscriptions for solid waste disposal. Solid waste is disposed of in a city owned fill. The city uses a D-7 Cat and a 13-F Cat for maintenance at the 30 acre site. The fill is usually covered once per day by a layer of earth, a standard operating procedure at formal landfills. There appears to be no real issues with service collection or fill operations with the president organizational structure. (Gorski, Community Contact, 1979u)

Land and Housing

Land use patternsin Nome were basically established during the gold rush era at the beginning of the 20th century. At that time, land use patterns developed parallel to the shoreline of Norton Sound. The commercial district developed along Front Street (see Figure 3), as it was convenient to receive goods and supplies lightered from ships anchored further from shore. (Because of shal low water off of the coast of Nome, cargo from ocean going vessels is lightered from about one mile offshore. This inefficient and costly method of delivering freight persists today). Residential areas grew behind (north) the commercial district, along the sand spit west of the Snake River, and on Belmont Point. Warehousing also developed along East Front Street, where supplies were easily landed from incoming ships. Although Nome did not have a zoning ordinance, land use patterns evolved which generally separated commercial, residential, and industrial uses. For a discussion of land use patterns in Nome until the late 1960's see Alaska Consultants, 1968 and table 39.

Nome has a tightly developed core area which reflects past development and platting efforts. Apparently, the first plat of Nome in 1905 was primarily an "as built" plat and no attempt was made to replat the tightly clustered, broken lot pattern which had developed north of Front Street. 'Where structures were not already constructed, the townsite was platted on a grid, with more attention given to mathematical detail than to topographical features. After the 1934 fire in Nome, the burned area was partia ly replatted, and in 1958, the Nome townsite was again replatted. This last effort enlarged streets and made areas more usuable where possible. But much of the

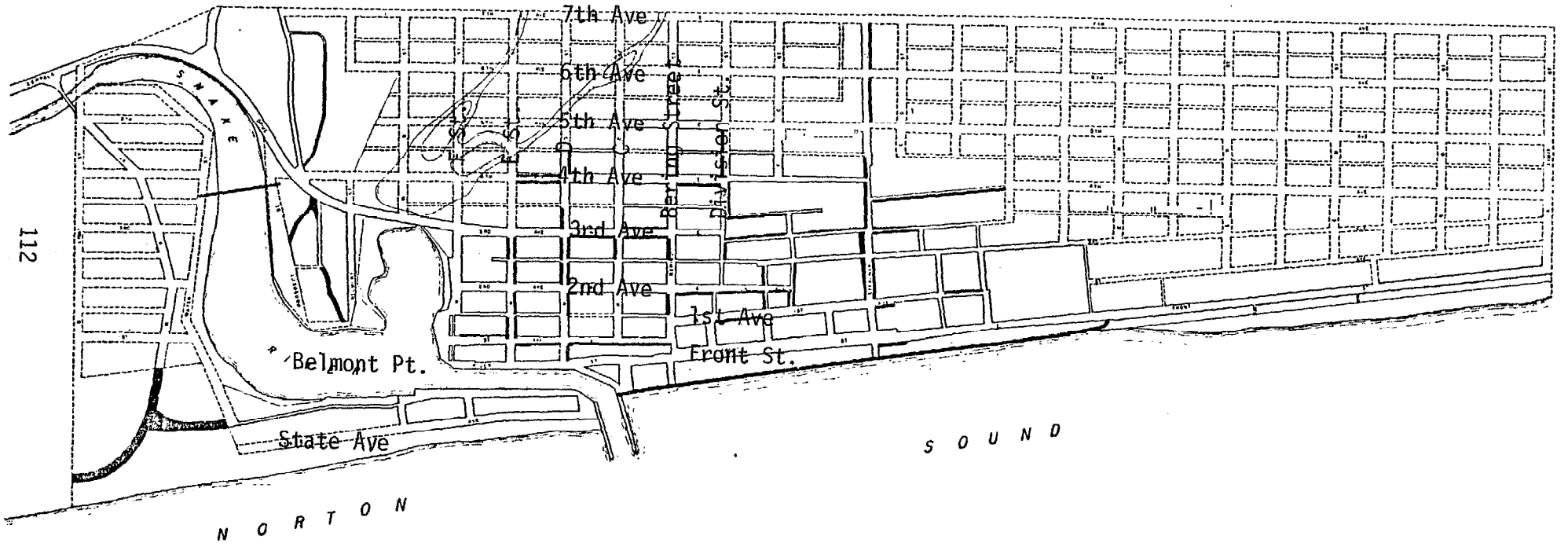


FIGURE 3

NOME PROPER

Source: Alaska Consultants, Comprehensive Land Use Plan

The port facilities are located on the west end of town. As explained above, cargo is lightered from deep draft vessels anchored further from shore. Thus, the Nome harbor is primarily navigated by small boats. This boat basin, located in the mouth of the Snake River, is subject to both coastal shoaling caused by storms and siltation from the Snake River and Burbon and Dry Creeks. Dredging is necessary to keep the channel and turning basin open. The public dock is owned by City of Nome. Warehousing (22,000 sq. ft.) and limited open storage is available near the terminal, with additional open storage available within a few miles (Anonymous, 1980).

The lighterage operation in Nome adds considerably to the transportation costs of freight coming into the community. Since cargo received in Nome is transported to smaller communities along the coast, these high freight costs are transferred to consumers in the whole region.

The City of Nome is interested in upgrading its port facilities and developing a deep draft port scheme. The most recent proposal calls for a gravel causeway to extend approximately 2,200 feet out from shore to a dock with 20 ft of water depth. This would result in a more efficient port. Handling of materials would be reduced, and the lighterage operation would probably be eliminated. Therefore, freight costs seemingly would be reduced.

The Nome airport, owned and operated by the State of Alaska, is located approximately two miles west of town (see Figure 4). The airport, which has two runways, serves as the air transportation center for the region. The FAA Ten Year Plan recommends the following improvements to be implemented

older residential area north of Front Street still has a fractured lot pattern and some lots were located within platted street rights-of-way. In addition, much of this area is still laid out in a haphazard manner, and it is often hard to determine property lines. Apparently, the 1905, 1936, and 1958 plats are all different, and the city only recently adopted the 1958 plat. This necessitated moving a street, and many problems still continue, (including numerous right-of-way infringements), but the ci ty will now build according to this plat.

Industrial and Warehousing Uses

With the exception of Alaska Gold Company's warehouses and equipment storage facilities located north of East Sixth Avenue, the port facilities and other industrial and warehousing uses are primarily located on the west end of town on both sides of the Snake River, from the Nome airport-down to its mouth near Front Street (see Figures 3 and 4). The boat basin near Belmont Point and the area to the west of the Snake River is included in this industrial use. Other industrial areas outside of town include the Nome airport and the smaller Nome Field, the Alaska Department of Highways district office and maintenance depot, and the Alaska Gold Company camp. Additional warehousing is located along East Front Street and scattered throughout the residential areas. Because ships can call at Nome for only a short time during each year (the ice free season is between June and October), a relatively large amount of acreage is devoted to warehousing and storage in Nome. In 1967, Alaska Consultants (1968) reported nearly 18 acres in Nome were utilized for warehousing and storage. (see table 39). More recent statistics are unavailable.

TABLE 39

EXISTING LAND USE

CITY OF NOME, ALASKA[a]
1967

	Land Area (Acres)	% of Total Developed Townsite Area	% of Total Townsite Area
Residential	43.79	28.2	7.8
Commercial	5.19	3.3	.9
Industrial	16.10	10.4	2.9
Warehousing and Storage	17.80	11.5	3.2
Public	4.58	3.0	.8
Semi-Public	4.50	2.9	.8
Improved Streets	63.24	40.7	11.3
Platted	(55.22)	(35.6)	(9.9)
Unplatted	(2.85)	(1.8)	(.5)
Other Uses	(5.17)	(3.3)	(.9)
Vacant	402.59		72.2
Unimproved Streets	(94.57)		(17.0)
Other	(307.82)		(55.2)
Total Developed Area	155.20	100.0±	27.8
Total Developable Area	532.80		95.6
Total Land Area	557.59		100.0±

[a]Includes U.S. Survey 451 and U.S. Survey 529, but exludes the area annexed by the City in 1968 except for 13.53 acres from Arthur 410.

Source: Alaska Consultants, 1968.

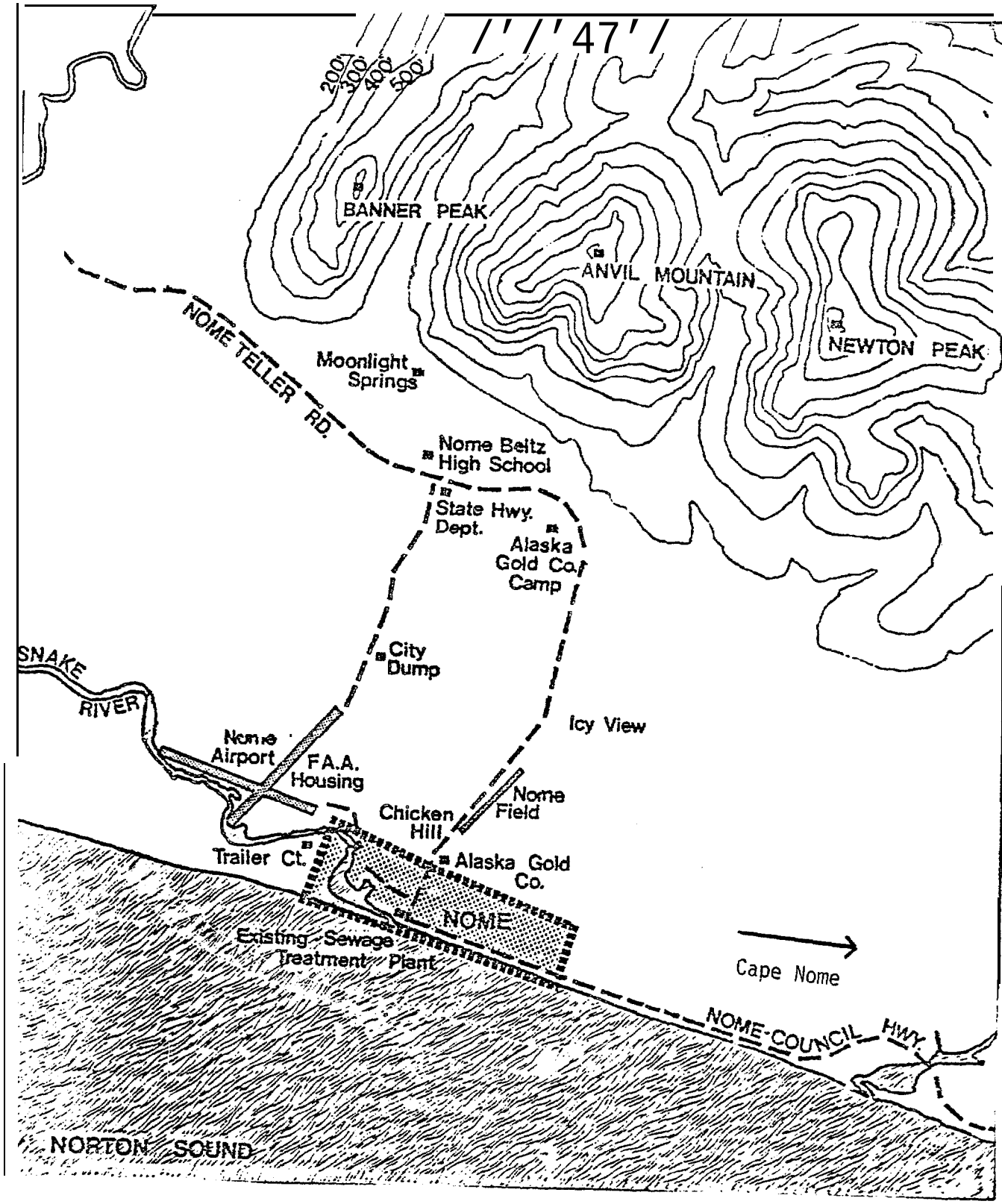


FIGURE 4

PHYSICAL LOCATION OF NOME WITHIN THE NORTON SOUND AREA

Source: CH2M Hill, 1976e.

by ?990: rebuilding one runway, providing new approach aids, expansion of the terminal facilities, as well as construction and fencing of new terminal access roads (Anonymous, 1980).

Freight which comes into Nome, either by air or sea, arrives on the west end of town. From there it is transported throughout the community along the road system (Figures 3 and 4). If an OCS related facility were located at Cape Nome (east of Nome), and either the Nome airport or port were used to bring freight into Nome for this facility, the cargo would have to be transported through the community. Presently, the main route from the airport or port to the east end of town is down Front Street, Nome's main commercial avenue. This could be a source of potential problems.

Recently, the City of Nome has sold residential lots as far as East "L" Street, six blocks further east than the old boundary.

With a few minor exceptions, all residential development in the Nome area is located within the curent city limits, which are also the boundary of the Nome townsite. Residential development located outside of the city limits includes the FAA housing situated near the Nome airport, the State Highways trailer court, the Beltz complex, the Alaska Gold Company 50 man camp, and Icy View. The latter is a recent subdivision located north of town. This 33 acre, 103 lot subdivision was developed from an old patented mining claim and is the first development of its kind in the Nome area. Over half of the lots have sold, and owners have constructed approximately 20 homes so far. Snow removal is

a problem as is water and sewer. Icy View's distance from the city prohibits it from connecting into the city's water and sewer system. Presently, water and sewer are hauled to and from this subdivision. Residential expansion to the east of the present core area will be encouraged by an up-coming drainage project on Sixth Avenue. In August, 1979, the City of Nome accepted a $375,000 EDA (Economic Development Administration) grant to extend Sixth Avenue from Steadman to East "N" Street, and then East "N" Street to Norton Sound. The purpose of this project is to drain the land on the northeast end of town. Much of this land is marshy, and rains and spring thaws often cause flooding problems in Nome. To alleviate this problem, the Alaska Division of Highways will administer the road extension and drainage program along Sixth Avenue. An extra benefit for Nome is that this project will open up additional residential land along Sixth Avenue.

LAND OWNERSHIP AND CONTROL

Outside of Nome Townsite

Ownership Patterns. Land ownership patterns outside of Nome townsite (currently city limits) are primarily the product of the mining history in the area and the Alaska Native Claims Settlement Act (ANCSA). With the exception of the airport, the State Highway Department facility, the Beltz complex, Icy View, the FAA housing, and the state trailer court. (see figure 4) virtually the entire area for miles around Nome is tied up in mining claims, both patented and unpatented. The major mining landowner in the area is the Alaska Gold Company, but many smaller

claims also exist. Additional land is patented as homesites and Native allotments.

Under the terms of ANCSA, Sitnasuak Native Corporation selected nearly all of the land in the area not already patented. This Nome village corporation also selected the surveyed but unpatented mining claims should they fail to become patented. Much of the land with mineral potential had already been selected in the past. Sitnasuak chose most of the available land along the rivers in the area (for subsistence purposes) and the land along the roads (for access). Sitnasuak selected about 22 miles of coastline on both sides of Nome, including Cape Nome. For comparison, the Nome townsite is approximately 525 acres, and Sitnasuak's land entitlement under ANCSA is 161,280 acres. Patented mining claims equal approximately 40,000 acres, and Native Allotments about 5,000 acres.

To date, Sitnasuak Native Corporation has not received patent to any of its selections because of easement problems. BLM wants to reserve easements through the Native selections, and apparently the Native corporations are unwilling to grant them. To get to the Native land one must first travel through many mining claims which do not have easement rights-of-way reserved through them. Thus, the Natives argue there is no reason to reserve easements through their land.

Annexation. A major issue in Nome today is city annexation. The City of Nome has attempted to annex and enlarge its corporate boundaries in

the past, but the effort failed for technical reason. In fact, Nome's Comprehensive Plan (Alaska Consultants, 1968) was written just after the city had annexed an area nearly 20 times larger than the Nome townsite. The plan included these new corporate boundaries, but subsequently the annexation attempt failed. Apparently, the city had violated technical procedure, and the local boundary commission disallowed annexation.

The Nome townsite of 525 acres also represents the city's current corporate boundaries (see Figure 3), and presently, the City of Nome is again attempting to enlarge these boundaries through annexation. The current city limits include approximately two miles of coastline on Norton Sound, but if annexation passes, Nome would control nearly 38 miles of coastline, including Cape Nome. This area is much larger than past annexation boundaries. Nome's tax base would increase substantially, as all of the development in the Nome area (including the mining claims) would be encompassed within the new corporate boundaries.

In addition to enlarging Nome's tax base, city officials consider annexation very important because it will provide the community with planning and zoning powers in the Nome area. Nome does presently have a planning commission, but zoning within the community is in infant stages. Building codes are beginning to become enforced, but areas are not yet zoned for commercial, industrial, or residential use. With broader planning and zoning jurisdiction through annexation, city officials feel that Nome will be better able to mitigate the impacts that

may result from pending development in the area. Potential OCS development in Norton Sound is one of the city's major concerns and a principal impetus for annexation. The inclusion in the proposed boundaries of Cape Nome, a potential deep water site for petroleum development, may well be because of OCS anticipation.

As the majority land owners in the Nome area will be the Native corporations (once the land is conveyed), annexation will potentially have a large effect on them. Annexation will basically encompass the majority of Sitnasuak's land selections, and the Nome Village Corporation opposes the city's annexation efforts. Future taxes on this land are viewed with displeasure by Sitnasuak Native Corporation. As one Native leader commented, "The city is trying to annex more land, and they cannot even provide services for the existing city now." Many Natives fear they will be taxed on their land and receive no services in exchange. Under ANCSA, village corporation land cannot be taxed until it is improved, leased to a third party, or at least until 1991. Therefore, if the city annexes Cape Nome, and if Sitnasuak leases some of the land to industry, the city can tax the land.

Coastal Zone Management. Furthermore, some local Native leaders feel that only pending OCS development caused the recent annexation attempt, but also annexation represents an effort by the City of Nome to enlarge its jurisdiction with reference to the Alaska Coastal Management Program (CZM). Under the Alaska Coastal Management Act, the state is to organize into coastal resource districts, each of which is responsible for

the preparation of a district coastal management program. By definition (AS 46.40.210), coastal resource districts include both first class cities of the unorganized borough and coastal resource service areas established and organized under (AS 29.03.020) and Sections 46.40.110-180 of the Alaska Coastal Management Act. As the City of Nome is a first class city in the unorganized borough, it qualifies as a coastal resource district.

In 1975, state legislation provided for the creation of special service areas to furnish public education in the unorganized borough. Using the boundaries of the regional corporations established under ANCSA as a guideline, the unorganized borough was divided into educational service areas called regional educational attendance areas (REAAs). Each REAA was delineated to contain a culturally, linguistically, and socio-economically homogeneous area. In addition, REAA boundaries took into consideration transportation, communication, geographic, and governmental systems.

The Alaska Coastal Management Act provides that in the unorganized borough the regional educational attendance areas (REAAs) established under state statutes may be organized as coastal resource service areas as they contain a part of the coastal area of the state. Thus, a coastal resource service area contains the area defined by one or more of the existing REAAs. Each coastal resource service area elects a seven member board which represents the population of the service area. The board members are elected at large by the qualified voters of the coastal resource service

area. The board assumes the responsibility for developing the district coastal management program in its area. Once a coastal resource service area is organized, it becomes a coastal resource district.

Thus, in the Bering Straits Region, both the City of Nome and the REAA qualify as coastal resource districts. Under its present corporate limits (525 acres), Nome would have only a couple of miles of coastline for which to prepare a management plan, but if the proposed annexation succeeds, Nome's jurisdiction would be expanded considerably. This expansion will potentially conflict with the larger resources service area.

Kawerak, Inc., the regional non-profit corporation with headquarters in Nome, is assisting in the organization of the Bering Straits into a coastal resource service area under Article 2 of the Alaska Coastal Management Program. AS 46.40.190(a) allows a city, for purposes of cooperative administration, to include itself within an adjacent coastal resource service area if it so chooses. Such an action would presumably remove a city from its status as a separate coastal resource district. Kawerak, Inc. offered to the City of Nome for the city to join the region and participate in the Bering Straits Regional Coastal Management Plan. If Nome participated at the regional level, it would retain its implementing authority, but the development of the coastal management program would be done jointly with the coastal resource district board. Based on population, Nome would have three representatives on the seven member board.

Available evidence indicates that the City of Nome will not elect to become part of the regional coastal management effort. Apparently, Nome desires to manage its own coast, and if annexation passes, Nome's jurisdiction will be large enough so that it does not have to deal with the regional corporations or the regional resource service area. Therefore, it appears that Nome will choose to act as a separate resource district.

An obvious concern of Natives in the area is that with annexation Nome will have planning, zoning, taxing, and coastal zone management jurisdiction over Native owned lands. One of the reasons Kawerak, Inc. offered for Nome to join the regional coastal management plan is because many King Island and Nome Natives will have ANCSA lands located outside of Nome, while they reside in Nome. Since they live in Nome, and if Nome acts as its own resource district, they will not be eligible to participate in the regional coastal management plan. As their lands are located in the region and not in Nome, they will therefore be excluded from participation in development of the coastal management plan affecting their lands.

Within Nome Townsite

Within Nome's corporate limits, there is very little publically owned land in the central densely developed area of town. The city owns numerous lots in Nome, but most of them are located in the undeveloped eastern end of town. Lands in private ownership are significant and wi 1 likely play an important role in future growth in Nome. The Alaska Gol(Company is a major landowner in Nome, and it has large mining claims within the Nome townsite (Alaska Consultants, 1968). As these mining claims apparently predate the Nome townsite survey, the Alaska Gold Company could theoretically initiate mining operations in some of the undeveloped portions of Nome (Alaska Consultants, 1968) .

Lands in Nome passed into private ownership primarily through the townsite act. Availab e evidence indicates that Nome's townsite survey was conducted in 1905, and patent was issued to the BLM townsite trustee in 1906. The townsite trustee currently holds no land in Nome as all of the lots and tracts have been deeded to private owners, the city, or other agencies long ago. Lands not sold in previous public auctions were deeded to the city, thus explaining the city's ownership of numerous platted, but undeveloped lots. As Nome was not a traditional Native community and therefore not a Native townsite, all of the deeds issued by the townsite trust were unrestricted deeds. As discussed earlier, the Nome townsite is 525 acres, which also represents the current corporate limits of Nome.

A map showing land ownership patterns in 1968 is available in Alaska Consultants report. Of significance is 1) the large amount of land in private ownership, _

2) the city's large holdings on the eastern end of town, and 3) numerous federally owned tracts just west of the city's holdings. A more recent, comprehensive land ownership map of Nome is not available, but some basic changes in the 1968 map are evident. Since 1968, nearly one-half (30 lots) of the federal land has transferred to one individual, the city has sold numerous lots to private parties, and 76 lots (30 privately owned and 46 owned by the city) were utilized in two federally funded housing projects (see Housing). Thus, in the past ten years even more land in Nome has passed into private ownership.

Recently, Nome adopted the 1958 townsite plat, and as a result, many legal problems may ensue. Apparently, there are hundreds of cases of right-of-way infringements, and the city will now have to settle with property owners in order to clear land titles. Nome's Comprehensive Plan (Alaska Consultants, 1968) recommended adoption of the 1958 plat since the city had used it as the basis for decision making for years, and the land ownership problems could be solved.

Though the Native corporations will be major landowners in the Nome area, they own a relatively small amount of land within Nome's corporate limits. Sitnasuak Native Corporation has minimum holdings in Nome (8 to 10 lots). Most of these lots were purchased by the corporation and not acquired as a result of ANCSA. Bering Straits Native Corporation, the regional profit corporation, only owns 2 lots in Nome. As discussed previously, the city, Alaska Gold Company, and a few individuals own most of the undeveloped land in Nome.

Development Constraints

Constraints to development in Nome are numerous and range from geologic hazards to land ownership patterns. The lack of available lots for residential construction is viewed by local residents as one of the primary problems in Nome. Since Nome is surrounded by patented mining claim, community expansion is difficult, and private lands are important for future development. As explained in the previous section, the vast majority of undeveloped land within the Nome townsite is owned either by the city or private parties. This land is primarily located on the northeastern end of town. Though the city has recently sold some lots here, most of them are inaccessible because of the lack of roads. Also, they are not served by water and sewer facilities. According to one city official, the city does not have plans to build streets to these lots, and "The people bought the land as is, where is." At the same time, the city does not plan to sell more land until services are provided to the land it has already sold.

The main complaint about the privately owned land in Nome is that the owners will not sell. The Alaska Gold Company, owner of considerable land in Nome, is apparently not interested in selling it off in small parcels. Other private landowners seem to be speculating and waiting for higher prices in the future. Research indicates that this land speculation in Nome is not new and has been going on for five or six years. Many people attribute the recent speculation by private landowners to the pending OCS development in Norton Sound. Anticipation of OCS development has apparently fueled land speculation and resulted in higher land prices and reduced land on the market. Whatever the cause, the fact remains that most private landowners in Nome are holding

onto their land and will not sell. This contributes to the acute shortage of available lots in Nome. Though most landowners in Nome are waiting for higher prices, many residents already feel that the undeveloped lots in Nome are too expensive. For example, the typical undeveloped lot in Nome measures 50 feet by 140 feet. The cost of such a lot (with water and sewer to the property line) is approximately $20,000 plus another $4,000 to $5,000 to hook up the utilities. Because of the lack of available property, many people are dividing lots in half and therefore getting two residential structures on one lot. As the building codes require five foot setback on lot lines and a ten foot setback from the roadway, these half-lots will still support a 40 foot by 55 foot building. Thus, the lack of available land and the high cost of land in Nome contribute to the crowded conditions in parts of the community.

Land speculation is further evidenced by lot sales in Icy View. According to Nome residents, the 10,000 square foot lots originally sold for around $1,000 in 1974-1975. Since that time, some lots have apparently resold for as much as $8,000 (informal discussion).

Housing will be discussed in the next section, but the critical housing shortage in Nome is also a development constraint for the community. It is virtually impossible to find a three bedroom house or apartment in Nome, and those housing units that are available are very expensive. Growth in Nome is hampered by the relative scarcity and high cost of housing (CH2M Hill,1976e).

Financing also presents a problem for the community. Generally, high interest rates and a lack of money hinder development in Nome. Nome's only bank is making very few loans for either business or housing. The bush program (for communities with a population under 4,500) of the Alaska House Finance Corporation is administered through the Bering Straits Housing Authority in Nome and the surrounding area. Long term mortgage money is available through this program. Interim financing still presents a problem, and often residents will utilize banks other than the one in Nome. Before making acommitment for long term mortgage money, Alaska House Finance Corporation requires a marketable title to the land, and if a person built on land with a clouded title, financing will not be forthcoming. Normally, this would not happen, but in Nome the title status to much of the land is questionable. Apparently, much land was transferred from individual to individual by such instruments as unrecorded quick claim deeds. In some cases, people would file deeds on land already owned by another party. These occurrences have led to many title problems in Nome. Since most lending institutions require clear title to the property, development in Nome is retarded by these title difficulties. A quiet title action is possible, and if no one comes forth to dispute the claim, the title problem is corrected. But this process takes time, and with Nome's short building season, a whole year may be lost because of title problems.

Right-of-way encroachments due to past survey problems adds to development constraints in Nome. In addition, much of the central developed core area of town is crowded and has a fractured lot pattern. Many interior lots do not have street access, and often property lines are hard to determine.

The topography of the Nome area is plains and lowlands. Much of the land is poorly drained, and except for a narrow strip along the coastline, most of the city is underlain by permafrost. The south side of Front Street is virtually free of permafrost, while on the north side the ground is permanently frozen. The most serious problems related to permafrost and seasonal freezing and thawing of the surface layers are related to construction, but most of these problems can be overcome. There is virtually no topographically unbuildable land within the Nome townsite or in the immediate area (Alaska Consultants, 1968) . Structures are built on piling, and the marshy areas are filled with grave 1. Most of the lots in Nome require gravel, which is hauled for $5.00 per yard. Additional problems are caused by the fall storms which produce large waves and erosion of the beach. Though the waterfront is protected by a seawall, often severe storms cause extensive damage in Nome.

HOUSING

A field survey conducted by Alaska Consultants (1968) the most recent data available on Nome's housing conditions, indicated over 70% of Nome's housing stock was substandard. These houses had either deteriorated beyond the point that repair was not economically feasible, or they were characterized by grossly inadequate original construction. Such housing units threatened the health and safety of their occupants. In many cases, age was not the sole cause of Nome's poor housing, but inadequate original construction and overcrowding within the structures contributed to their dilapidated condition. . Many Eskimos who migrated to Nome had neither the necessary skills to obtain employment nor sufficient money to build adequate housing. As a result, many of these people built makeshift housing out of packing crates or scrap

lumber or converted quonset huts into dwellings Much of this housing was constructed on land which the newcomers did not own. Lack of proper maintenance and sanitary facilities added to the blighted housing conditions.

Generally, the extremely poor housing in Nome had Native occupants, and the poor and standard housing existed side by side in the community. An exception was housing constructed for government employees in Nome. Governmental housing formed isolated enclaves of standard housing in Nome. The homes of Nome's permanent white residents were scattered throughout the central densely developed area of town.

The substandard condition of Nome's houses did not escape public notice, and in 1972 government money built 50 new homes in Nome. This low income rental housing managed by Alaska State Housing Authority (ASHA) was called Bering View. It took some of the pressure off of the community, but still many people lived in substandard housing. When the 1974 storm and flood destroyed most of the homes of the King Islanders living in Nome, HUD money provided 24 new houses for these people. These units were built in 1975. The 72 total units of government low income housing (two burned down) are almost exclusively occupied by Native families. In addition, these dwellings, though built in the early 1970's can hardly be described as meeting levels of "national" acceptability due to frequently disrupted utilities, gaps in houses which result from frost heave, the ability to regulate heat in houses where oil cooking stoves are also heating stoves, and general design and construction inappropriate for climatic and social conditions of the area (Ellanna, 1980, p. 386).

Generally, the condition of housing in Nome today is still poor. By and large, Native families still occupy most of the very substandard units. Many of the structures are very old and dilapidated. The harsh climate and lack of maintenance contribute to their deteriorating condition. According to the housing survey conducted by the City of Nome in 1976, there were approximately 120 vacant buildings in the community. Though some of these could be rehabilitated and occupied, most of them are beyond the point of repair.

Nome Eskimo Community, the village IRA, provides a housing improvement program through BIA funding. For 1979, the BIA contract award was $148,650 and is estimated to be $145,000 for 1980. The purpose of the program is to upgrade substandard housing to standard conditions. Projects include insulating, roofing, painting, plumbing, electrical, and heating. In the past year, 31 homes received funding out of 70 applications. Of the 31, ten of the recipients performed the improvements themselves and the remainder contracted for the services.

According to the 1970 census, Nome had 2,488 people who occupied 626 housing units for an average of 3.97 people per household (see Table 40). This was somewhat above the statewide average of 3.42 persons at that time. In December of 1975, Ellanna and Roche (1976) compiled a Nome census and identified a winter population for Nome of 2,380 persons who lived in 577 dwelling units (Table 40). This resulted in a household density of 4.12 persons per household. In February 1976, just three months after the Ellanna and Roche census, the City of Nome conducted a housing survey (see CH2M Hill, 1976e) which identified 2,510 persons living in 673 units. This yields a household density of approximately 3.72.

TABLE 40

COMPARATIVE CENSUS DATA, NOME, ALASKA

	Population			Occupied Units			persons Per Household		
	Native	Non-Native	Total	Native	Non-Native	Total	Native	Non-Native	Total
1967 [a]	---	---	est.2,700[e]	---	---	716[f]	5.63[g]	---	est.3.77
1970b	1,554	934	2,488	---	---	626	---	---	3.97
1975[c]	1,461[h]	919	2,380	---	---	577	6.6 [i]	---	4.12
1976[d]	1,571	939	2,510[j]	347	326	673[k]	4.5	2.9	3.72

SOURCES:

[a] Alaska Consultants, 1968

[b] U. S. Census

[c] Ellanna and Roche, 1976 (Survey conducted December, 1975).

[d] Based on City of Nome housing survey data in CH2M Hill, 1976e (Survey conducted February, 1976).

[e] Alaska Consultants, 1968, p.81.

[f] Alaska Consultants, 1968, p.100 (682 of these units were reported to be located within the city limits; the remaining 34 located outside the city limits.)

[g] Based on U. S. Public Health Service survey of 154 Native occupied homes, Alaska Consultants, 1968, p.103.

[h] Based on 61.4% of total population as Native.

[i] Ellanna, 1980, p.387, Based on random sample of 50 Native households surveyed in 1975.

[j] Does not include Receiving Home, Walk-In Center, or Day Care Center (approximately 76 people).

[k] Does not include 23 units identified in the City of Nome housing survey, which are not identified as vacant, but for which no occupants are listed.

A comparative analysis of these various household surveys reveals the following (see Table 40):

- A discrepancy exists in the average number of persons per household between the 1975 and 1976 surveys. Ellanna and Roche (1976) reported a household density of 4.?2, while the City of Nome data (CH2M Hill, 1976e), compiled just three months later, suggest approximately 3.72 persons per household.

- The non-Native population appears consistent in all census data. This suggest that part of the problem can be attributed to a dynamic Native population in Nome.

- Ellanna and Roche (1976) only show 577 occupied units. The City of Nome census data identified approximately 673 occupied dwelling units - nearly 100 units more. Since the surveys were conducted only three months apart, and both during the winter months, construction cannot account for the discrepancy.

- Based on a sample of50 Native households in 1965, Ellanna (1980) reports a 1975 Native household density of 6.6. This is nearly two persons per household higher than the City of Nome's survey, which yields a Native household density of 4.5. Though at first this seems significant, when one uses the city's data to compute the household density for the 48 Bering View homes occupied by Native families, 6.52 persons occupy each unit. Though this sample is consistent with the higher density suggested by Ellanna (1980), when all 347

Native occupied units identified by the city survey, are included, the Native household size falls to4.5.

- In the CH2M Hill (1976e) report, Nome's 1976 population is reported as 2,605 (p.2-8). The housing survey data located at the end of the document yields between 2,510 and 2,586 people (see Table 40). Thus, there is a small factor of error possible in the data. Ellanna and Roche also reported a 5 percent error factor.

- In summary, the difference between the two household sizes appears to result primarily because of the difference in the number of occupied dwelling units reported by Ellanna and Roche (577) and the city (673). The latter figure appears more consistent with community trends. The 1970 census reported 626 occupied units in Nome. Since then, and before the Ellanna and Roche survey, 74 federally subsidized low income units have been built in Nome. Additional dwellings were added in the private sector. The 673 occupied units reported in the city's data appears more accurate. Though it is impossible, and not necessarily fruitful, to determine which survey is correct, the city's figures will be used in this report. The raw data is readily available in published form, and the households are identified as being either Native or non-Native. By using the smaller household size (3.72) for Nome, the housing projections in the base case and various OCS scenarios will tend to show a demand for more units than would be the case if the larger household size were used.

The 1976 housing survey conducted by the City of Nome indicates that the average number of persons per household was 3.72 (4.5 Natives per household and 2.9 non-Natives per household). (Table 40) This decrease in household size is consistent with a national trend toward smaller family sizes, but in Nome, it may be due to a previous housing shortage and consequent crowding rather than a decrease in the number of family members.

The 1976 average of 4.5 Natives per household represents a decrease in the average number of Natives per household since 1967. According to the 1967 survey (Alaska Consultants, 1968), there were 5.63 Natives per household in Nome. At first it was thought that the reduction of this high household density by 1976 may be due to the 74 federally subsidized housing units built in Nome in the 1970's. Since most of these units are Native occupied, it seemed logical that extended families that were forced to live together in the past may have obtained more than one dwelling. But, an analysis of the housing data reported by the city's 1976 survey reveals that the household size in the 72 low income units (two burned down) is 5.8. This is, in fact, higher than the 1967 sample. Again, it is stressed that Nome's Native population appears to be very dynamic and difficult to represent in static numbers.

According to 1970 U.S. Census data, there were 618 one unit structures in Nome, 180 multi-family units, and four trailers for a total of 802 year-round housing units in 1970. More recent housing composition data for Nome is unavailable, but generally single family units continue to dominate the community. Because of the high cost and lack of available land, many multi-family units are being built in Nome today. In 1970, U.S. Census figures

indicate that the average number of people per unit was 3.3, lower than the state urban housing median of 4.3 rooms per unit in 1970.

Based on a current population for Nome of 2,892 persons (not including Icy View, the FAA facility, or Alaska Gold Company's camp) and the 1976 city housing survey which yielded an average of 3.72 persons (both Native and non-Native) per household, Nome has approximately 777 units today. This is consistent with estimates by city officials.

Though most of the housing is located within Nome's corporate boundaries, there are some units outside the city limits. The Alaska Gold Company has a 50 man camp near dredge number 5, and the FAA housing and Beltz complex are located outside of Nome. In 1974, some local residents, apparently responding to the land scarcity within the Nome townsite, subdivided a mining claim into 103 residential lots. Icy View is located a few miles from Nome, and over half of the quarter acre lots have sold. Approximately 20 single-family dwellings have been built in Icy View. Water, sewer, and snow removal are problems in this subdivision, which is located outside of the city's jurisdiction. Presently, water and sewage is hauled to and from Icy View.

According to local residents, Nome presently has a critical housing shortage. Many existing housing units are uninhabitable because of their dilapidated condition, and the land shortages, lack of available money, and high construction costs have hampered new construction. There are virtually no three bedroom houses for rent or sale in Nome. Bering View, the low income rentals constructed in 1972, had 60 applications on the waiting list for a

house in the fall of 1979. Teachers arriving for the winter were 15 units short in September, 1979. Residents talk about how people were living on the spit in tents because of the housing shortage. Also, trailers are more common than in the past. The state has a trailer park near the airport.

*

Seasonal and transient housing stock in Nome includes the Alaska Gold Company 50 man camp located near dredge number 5, and approximately 76 hotel and lodge rooms located in town. During the winter months, 14 of the 76 hotel rooms are rented out on a monthly basis as efficiency apartments. During the summer, when the tourist season is at its peak, these 14 rooms are converted back into hotel rooms.

Health

OVERVIEW

Nome provides health services to the Norton Sound region and is classified as a Level 111 Center as defined by South Central Health Planning and Development. The guidelines establishing the criteria for a Level III designation are noted in the appendix on standards. Though funding and responsibility for health care are found in a number of agencies and programs, the Norton Sound Health Corporation is the primary provider of health care through the Norton Sound Regional Hospital (NSRH).

Norton Sound Health Corporation (NSHC)

The corporation was founded in 1970 with funding through the Office of Economic Opportunity. The project's intention was to involve consumers in the planning and management of health programs and to provide primary management of health programs and to offer primary care to the villages. By 1972, NSHC had created a comprehensive health aide curriculum emphasizing a provider role. Eight new "village-built clinics" were constructed between 1972 and 1974. A feasibility study began in 1972 on the need for regional hospital facilities. In April 1977, the Corporation purchased the Maynard McDougal Memorial Hospital from the Women's Division of the United Methodist Church. A newly constructed Norton Sound Regional Hospital (an attached building to the older structure) opened its doors in April 1978. (12 percent under budget). NSRH has the distinction of being the first entirely native controlled hospital in Alaska. (Norton Sound Health Corporation, 1978 and 1979)

The Corporation is governed by a Board of Directors composed entirely of consumers. Service delivery is authorized by means of resolutions passed by tribal governments as defined by the Indian Self Determination Act. The organization of the Corporation is shown in figure 5.

Other Agencies

Other groups providing direct and indirect care include the State of Alaska which deliver public health services through the Public Health Division of the Department of Health and Social Services. These services are primarily delivered through NSHC facilities. The U. S. Public Health Service, through the Indian Health Service (IHS) provide dental services. IHS also provides a substantial portion of NSHC's funding. Besides limited private health services, other programs are discussed in the social services section. There are important conceptual overlaps in these two service areas, especially the behavioral health fields.

FACILITIES

Most health services in Nome are delivered out of the Norton Sound Regional Hospital. This is made up of two attached buildings with about 50,000 square feet of space (including the heating and maintenance space). The new hospital building has some 26,000 square feet and houses virtually all of the direct service delivery functions. The old hospital has approximately 24,000 square feet and is devoted mostly to office space functions.

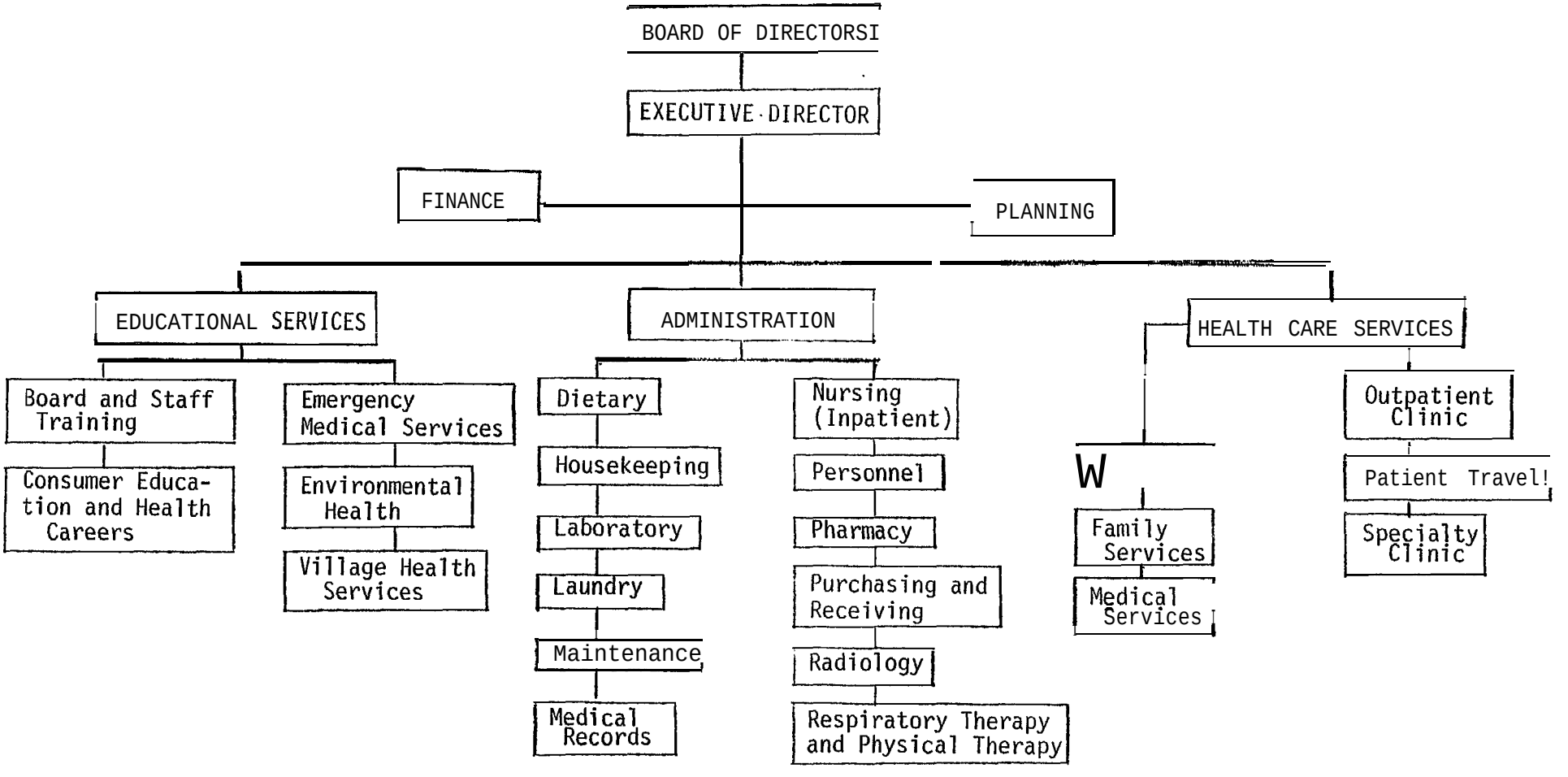


FIGURE 5

Source: Norton Sound Health Corporation, 1979

NORTON SOUND HOSPITAL

The Family Services Department operates out of both the hospital and an old converted structure in the downtown area. The Corporation also maintains twelve staff houses for professional providers.

Outside of Nome, all 16 villages have clinics, and Unalakleet opened a new subregional clinic in 1978. Fourteen of the clinics are village owned and maintained, and then leased by the Public Health Service (PHS). Two of the clinics are owned by the Indian Health Service. One to two of the clinics are not functional at any given time. This is due to inadequate maintenance, heating, meeting minimum lease requirements, and deteriorating foundations in a permafrost environment.

Other facilities are located in Nome and provide services primarily in the preventive care and behavioral health areas. These include the Nome Community Center, the churches, the Nome Walk-in Center, and the Women's Shelter.

MANPOWER

NSHC has about 125 full-time employees and 59 others classified as alternate, relief or temporary (See Table 41). Of this total, the corporation employs four physicians who provide services at the NSRH and travel to the villages in the region (two visits to each annually). There is one primary care physician for every 1,650 residents in the region. For day to day acute and chronic health care delivery in the villages, there are 21 community health aides in the 16 surrounding villages, and 20 alternate community health aides.

TABLE 41[a]

MANPOWER
NORTON SOUND - BERING STRAITS REGION
MARCH 1979

Function by Employer	Location: Nome	Location: Unalakleet	Location: Villages	# of field trips scheduled by profession to each village annually
NSHC				
Physician	4			2
Nurse practitioner	1			0
Registered Nurses	13			0
Licensed Practical Nurses[1]	2			0
EMT II	1			0
EMT I[1]	12			1
Coordinator/ Instructor	3	1		3
Community Health Aides[1]			21	0
Clinical Psychologist PhD	1			(total 4 Variable trips budgeted)
Psychologist (Master's level)	1			0
Counselor	1	1		2
Village Governments				
Alternate CHA's[b]			20	0
State of Alaska				
PHN	2	1		2
RN, Asst.	2			0
U.S.Public Health Service				
DDS	2			1
Private				
DDS	2			Variable

aNorton Sound Health Corporation, 1979

b3 RN's are from this region, 1 LPN, the majority of the EMT's, all the Health Aides, and alternates.

In Nome, the Corporation also has one nurse practitioner, 13 RN's, 2 LPN's, 13 EMT's (all but one Level I), three instructors, a clinical psychologist PhD, a psychologist MA, and one counselor. Acting as a subregional center, Unalakleet has one instructor and one counselor.

In addition to the Corporation, the State of Alaska employs three Public Health nurses, one registered nurse, and one community health aide who provide health care services. The U. S. Public Health Service through the Indian Health Service (IHS) employs two private dentists to serve the native people. In addition, there are two additional dentists who see private patients and also work under IHS dental contracts.

A critical problem in the manpower area is turnover. The total labor turnover for NSHC in FY-1978 was 98.4 percent. This problem adversely effected virtually every service. Areas especially hard hit due to the high turnover rate or direct care responsibilities were the nursing staff (90 percent), and consumer education (350 percent). While turnover has declined somewhat in 1979, it is still an important deterrent to continuity of care.

HEALTH STATUS

As noted in the Tribal Health Plan, descriptive indicators of health status include mortality, morbidity, social-behavioral, and disability.

Mortality (CDR)

The Crude Death Rate is a measure of the total number of deaths per 100,000 in the population for any given year. Table 42 comparatively displays the

CDR for Norton Sound, Southcentral Health Service Agency, Alaska, and the United States.

TABLE 42

CRUDE DEATH RATE[a]

Population	Years	Per 100,000
Norton Sound Native	1970-77	718
Norton Sound Total	1970-77	897
Southcentral HSA Native	1974	873
Southcentral HSA Total	1974	431
Alaska Total	1974	418
USA Total	1974	915

[a]Norton Sound Health Corporation, 1979.

As displayed in the table, Nome region has a substantially higher crude death rate when compared to Alaska but is below the U S. average. The leading causes of death are accidents-injuries (30%), heart disease (18%), and malignancies (12%). Because of the very young age structure of the Alaskan population compared to the U.S., Norton Sound should be expected to have a lower death rate. High accident deaths and other factors raise the rate to national standards well above white urban areas. Table 43 displays the ranked causes of death for the Norton Sound region and compares the percentages to Alaska and the U.S. as a whole. Suicide is consistently higher in Norton Sound when compared to the State and the U.S. as a whole. Infant mortality rates are also significantly higher for the region, averaging 31.9 deaths per 1,000 live births for 1970-1978 as compared to 17.6 deaths per 1,000 live births for the U.S. The majority of infant deaths are attributable to prematurity.

TABLE 43

RANKED CAUSES OF DEATH[a]

	Norton Sound 1970-76 (%)	Alaska Total 1977 (%)	U.S.Total 1977 (%)
Accidents-injuries	30	26	5
Circulatory disease	18	23	50
Malignancies	12	16	20
Suicides	8	6	1
Respiratory	7	5	3
Infancy-maternal	5	5	1
Homocides	4	2	unknown
Alcoholism	3	4	2
Other	13	19	18
	100	100	100

[a]Norton Sound Health Corporation, 1979.

Table 44 compares the cancer deaths for the region with the State of Alaska and the U. S. as a whole.

TABLE 44

DEATHS FROM Malignancies

Population	Number	Deaths/100 People
U. S. Total - 1976	377,312	1.75
Alaska Total - 1976	233	.56
Norton Sound	7	1.17

[a]Norton Sound Health Corporation, 1979.

Statistics indicate that people of this region die of cancer at twice the rate of the state. It is important to note that deaths may be skewed if malignancies occurring in Norton Sound are more often of the fatal variety.

Morbidity

Outpatient. Morbidity frequency, or the incidence of disease, is displayed below for the region as it relates to outpatient visits at Norton Sound Regional Hospital.

Frequency of outpatient visits by diagnostic category:

- Respiratory
- Accidents/injuries
- Signs, symptoms, Ill defined
- Skin
- Ear
- Circulatory/blood
- Exams
- OB/GYN
- Psychiatric
- Family planning

Of the total outpatient visits to Norton Sound Regional Hospital, 75% are composed of Nome residents and the remaining visits are made up of people seeking medical attention from the surrounding 16 villages. About 20 percent of the total encounters are non IHS beneficiaries.

Inpatient admissions. The inpatient diagnoses for 1978 are displayed below for Norton Sound Regional Hospital in order of frequency.

- Childbirth/delivery
- Signs, symptoms, Ill defined
- Accidents, injuries
- Respiratory
- Psychiatric
- Circulatory system
- Skin and subcutaneous tissue

Approximately 40 percent of the inpatients at NSRH are transferred to the Alaska Area Native Medical Center in Anchorage. Although no substantive data has been collected as to the diagnoses most frequently transferred, staff opinion indicates that trauma cases account for the bulk of the transfers.

Behavioral Health

Socio-cultural problems are reflected through the health delivery system by the high rate of alcohol related problems, child neglect and abuse, suicide and suicidal gestures, domestic violence, and school failures.

Alcohol use and abuse is one of the most commonly stated problems in the region. Staff opinion indicates that 60 percent of the families in the region are negatively impacted by alcohol. Dennis Kelso with Altam Associates recently completed a study on alcohol in the Norton Sound region, forming the basis for the following data. (Kelso, 1979)

There are presently eleven retail outlets for alcohol in the City of Nome, yielding a ratio of 1.67 retail outlets per 1,000 in the population for the region. When comparing just the City of Nome, the ratio jumps significantly to 3.59 retail outlets per 1,000. This latter figure is comparatively higher than the ratios for the State of Alaska and the United States, which are 2.9 and 1.2 per 1,000 respectively.

It is estimated that the drinking age population conservatively spends $838 per person for the yearon alcoholic beverages. This amounts to about $70 a month.

When examining indicators for alcohol problems, a special survey of deaths for a one year period indicated that 30 percent of the deaths in Nome were related to alcohol. All of the alcohol related deaths were of Eskimo people, whereas 82 percent of the non-alcohol deaths were Eskimo. Seventy-six percent were male, compared to 69 percent for non-alcohol-related deaths, and 70 percent were between the ages of 15 and 44, compared to 15 percent for the same age category for non-alcohol-related deaths. Alcohol was commonly found in conjunction with child and marital abuse cases, and most of the law enforcement complaints.

A special survey of NSHC hospital medical records was conducted from November 1977 to November 1978 to ascertain the frequency and extent of alcohol related health contacts. Analysis of the findings are highlighted by the following:

- Seventeen percent of the sample had one or more encounters with medical services during the study period that were directly involved with alcohol consumption.

- Those patients with alcohol related visits accounted for 21 percent of all visits, for an average of 6.28 visits per person.

- About 22 percent of the inpatient visits were alcohol related and accounted for by 19 percent of the total number of inpatients.

- About 21 percent of the outpatient clinic visits were alcohol-related which represents 18 percent of the total number of outpatients seen.

- About 33 percent of the visits to the emergency room were alcoho related represented by 32 percent of the emergency room patients

In the area of public safety, about 54 percent of the more serious offenses in 1978 involved intoxicated persons. For those offense categories that are typically considered alcohol -related--OMVI, liquor law violations, drunkness, simple assault, disorderly conduct, sex offenses, etc., police records indicate that 97 percent involved intoxicated persons. Police also responded to another 300 non-trim nal fights and domestic disturbances involving an intoxicated person. See the public safety section for further discussion.

A review of the records of the Norton Sound Family Services showed that over the past three years, 46 to 60 percent of the new cases mentioned alcohol abuse as a contributing factor to the client's problem.

Disability

National guidelines indicate that two percent of the school population could have learning disabilities. The Norton Sound region is comparatively higher with 8.9 percent of the children enrolled in school as having learning disabilities.

Public Opinion

For fiscal year 1978, the Norton Sound Health Corporation Board of Directors polled 280 people in the region and obtained the top 15 health problems as perceived by the sample. Table 45 displays the findings.

Analysis of the data indicated four major areas with unmet needs:

- People want more direct care (dental visits, 85%; EMS, 76%; eye clinics, 75%.)
- People want more preventive programs (overall, 70%; elderly, 64%; immunizations, 64%.)
- People want more health education.
- Alcohol and drug abuse are seen as major problems, especially among the young.

TABLE 45a

PUBLIC OPINION OF HEALTH PROBLEMS OR SYSTEM DEFICIENCIES

	Problem/Deficiency
1	Dental
2	Emergency
3	Eye
4	Ears, nose, throat
5	More doctor visits
6	Health screening program
7	Better communications
8	Health screening - elderly
9	Immunization program
10	Air ambulance
11	Arctic survival
12	Alcohol, drug abuse prevention
13	Alcohol, drug education
14	Health aidetraining
15	Teenage counseling

[a]Norton Sound Health Corporation, 1979

HEALTH CARE SERVICES

Inpatient

Inpatient facilities at NSRH include 11 acute care beds, two pediatric beds, two intensive care beds and four bassinettes. One wing is used as a long term care facility and six additional beds are licensed to accommodate that purpose. Table 46 outlines the care and services performance of the NSRH. Occupancy ranges from 30 percent for newborn beds to 39 percent for other inpatients, and 79 percent for long term care. Except for long-term care beds, these figures suggest a relative surplus of beds within the region. Bed occupancy of 80 percent is considered optimal for an efficient facility. However, because of the small population and numbers of total beds, the month to month variation in occupancy can be quite severe making it difficult to predict both average and peak requirements. In March 1979, adult and child beds had a 52 percent occupancy, while January 1979 had 30 percent.

The actual number of patients discharged was down to 760 for FY-79. These were 629 adults and children, and 131 infants. In FY-78, there were 878 discharged patients. The average length of stay was 3.4 days in FY-78 and 3.4 days in FY-79. This was 3.4 days for adults and children and 3.2 days for infants. The removal of difficult cases to Anchorage or Fairbanks permits this short stay. Historically, when inpatient days were tied to third party payment by the government, the average length of stay was significantly higher.

TABLE 46

NORTON SOUND REGIONAL HOSPITAL Utilization

	FY-78[b]	FY-79[c]	% Change
Total Days of Care	4,025	4,365	8.4%
Adult-and Child Days	2,549	2,256	-11.5%
% Occupancy	39%	39%	.0%
Newborn Days	339	383	13.0%
% Occupancy	27%	30%	11.1%
# of Deliveries	160	129	-19.4%
Long Term Care Days	1,137	1,726	51 .8%
% Occupancy	54%	79%	46.3%
# Surgeries	245	142	-42.0%
# Outpatient Visits	12,917	14,116	9,3%
Emergency Room	1,925	1,688	-12.3%
Outpatient Clinic	10,992	12,428	13.1%
# Specialty Clinic	d	916	n.a.
Cardial		105	·
Chest		0	
ENT		256	-
Internal Medicine		126	
OB/GYN		78	
Orthopedics		223	
Pediatric		7	
Radiology		41	
Surgery		80	
# Laboratory Procedures	12,142	13,216	8.8%
Inpatient	3,255	3,573	9.8%
Outpatient	8,887	9,643	8.5%
# X-Ray Procedures	3,635	3,373	- 7.2%
Inpatients	862	482	-44.1%
Outpatients	2,773	2,891	4.3%
# ECG's	247	195	-21.1%
Respiratory Therapy	e		n.a.
Hrs. Inpatient O_2 Mist		1,095	
Hrs. Outpatient O_2 Mist		1,075	
# Respiratory Procedures	e	416	·
Inpatient	-	296	·
Outpatient	·	120	
Physical Therapy	e	685	·
Inpatient Procedures		168	-
Clinic Procedures		517	
Dietary (#Meals)	31,334	20,814	-33.6%
Long Term Care	6,090	5,187	-14.8%
Inpatient	11,508	5,821	
Dietary Employee	3,170	2,689	
Cafeteria	10,566	7,117	
Laundry (lbs.)	56,065	63,500	

[a]Gorski, Community Contact, 1979w. Norton Sound Health Corporation, 1978 .

[b]October 1977 to September 1978

[c]October 1978 to September 1979

'A total of 34 specialty clinics were held in fiscal year 1978: orthopedics-3, internal medicine-3, surgery-5, radiology-4, OB-GYN-3, Otolaryngology-4 (3 were ENT surgery clinics), ophthalmology-6, pediatrics-5, urology-1.

'Services were not set up until midway through FY-78 and statistics available for FY-79 only.

Inpatient services are provided by a nursing director, nine registered nurses, two LPN's and 4 nursing assistants. Also, the four primary care physicians are available for non-continuous care. Surgery is limited to emergency and diagnostic work with much of it occurring through the outpatient clinic as specialty clinics (primarily ENT surgery). Emergency surgeries include Ceasarian sections, appendectomies, etc.

Outpatient Department and Specialty Clinics

The outpatient department is staffed by a clinic nurse, an LPN, a nursing assistant and usually two physicians and one midlevel practitioner-, As the system has focused more of its service using an outpatient model of delivery, the outpatient clinic showed a greater increase in use than inpatient days. This can be seen by comparing the decline in adult and children in inpatient days and emergency room care with the outpatient clinic visits.

The outpatient department has responsibility for specialty clinics held at the hospital. In FY-1978, 34 specialty clinics were held, while in FY-1979, 916 patients were served with 256 patients in ENT and 223 in orthopedics.

Medical Support for Inpatient and Outpatient Care

Laboratory Procedures. The Laboratory Department is staffed by three employees and provides services in areas of chemistry, hematology, urinalysis, serology, blood banking and microbiology.

Approximately 200 tests are mailed out each month to laboratories in Anchorage and Seattle including thyroid, drug analysis, blood, hepatitis, and STS tests, all tissues for pathology, and selected specimens for consultation. A "Gemini" chemistry analyzer was installed in July 1978 and new automation equipment is on order. In FY-79, the laboratory carried out 13,216 procedures, 27 percent for inpatients, and 63 percent for outpatients.

X-Ray. The Radiology Department went from a one-room manual processing service to a four-room department with automatic film processing and the capabilities of fluroscopy. There were 3,373 billed procedures in FY-79 for the department, 14 percent for inpatients and 86 percent for outpatients. The primary limitation is that almost all radiographs are sent outside the region for reading by a radiologist. This results in delays in diagnosis and treatment. While patients served increased from FY-77 to FY-79, the number of X-Rays declined as the procedure became more selective.

Respiratory Therapy and Physical Therapy. Respiratory and physical therapy were initiated in March 1978. Respiratory therapy is a paramedical specialty that aids in the diagnosis and treatment of patients with lung problems. This is important because of extensive chronic lung diseases, mostly due to tuberculosis scarring. Physical therapy was instituted due to the high number of orthopedic problems in the region and also treats frostbite and burn injuries as well.

This means care closer to home and shorter stays in facilities outside the region because followup care is available in Nome. In FY-79, respiratory therapy had 416 procedures (71 percent inpatient), and physical therapy had 685 procedures (75 percent outpatient).

Pharmacy. Pharmacy services were upgraded in October 1978 with the addition of a full-time staff pharmacist. This has enhanced control, monitoring and upgrading of the flow of pharmaceuticals for the entire Norton Sound Region.

Family Services

The Family Services Department is the primary delivery point for mental health and alcohol treatment efforts. The department is staffed by one clinical psychologist, one program administrator, a Master's level psychologist, and two counselors. Though there is some outreach to the villages, most of the program is delivered in Nome. This includes direct group and individual treatment, a court/jail program, psychological testing, evaluation and consultation, a day treatment program for long-term care patients and some chronic alcoholic and mental health patients, and a social center "Upstairs" and an alternative to the bars.

The past two years of the Family Services operations were disrupted by high personnel turnover, and staff reductions. This has limited the achievement of objectives and focused the department on program maintenance

and staff training. Village outreach has not been very successful. The Family Service Representatives concept was dropped in favor of Health Aide training in mental health and alcoholism treatment. There seems to be evidence that these therapeutic responsibilities have been difficult for the aides to deal with.

Eye Care

The eye care department employs an eye care technician. Turnover in the past effectively stops services which was the case from March to September 1978. Despite the five month loss in service during FY-78, 645 patients were seen and six of the sixteen villages were provided with eye care services. With uninterrupted care in FY-79, 1,313 patients were served in Nome, 994 in the villages, and 305 through specialty clinics.

Dental Care

Dental care is provided by the U.S.Public Health Service through the Indian Health Service. IHS employs two dentists, plus there are two additional dentists in Nome who work both privately and under contract to IHS.

Dental care for the region, although not formally substantiated, is considered inadequate. Norton Sound Health Corporation will begin an empirical analysis on this problem in the fall of 1979. Present data indicates that for fiscal year 1978, the public health service dentists who serve the region provided 71,588 service minutes. These health professionals indicate that a total of 318,556 minutes, or an additional 445 percent, goes unmet.

In addition, the 1978 public opinion poll indicated that the leading problem most mentioned were “more dentist visits”.

Patient Travel

NSHC pays one way travel for patients coming in from the villages, and round trip travel for patients referred to Nome for specialty clinic services. Patients coming into Nome may stay in one of 20 private boarding homes on contract to the Corporation. In FY-78, 850 persons traveled in from the villages to be seen at the outpatient clinic, 312 at specialty clinics, and there were 321 inpatient transfers to Anchorage facilities, mostly ANMC.

HEALTH EDUCATION SERVICES

The Educational Services Division of NSHC provide board of directors development and training. Inservice training for the nursing staff and other staff is provided through cooperative arrangement with NWCC, University of Alaska, Anchorage’s School of Nursing, and Kawerak's Adult Learning Center. Development of local manpower was carried out through the CETA program, though administrative problems have hampered these efforts.

Village health services are designed to upgrade and monitor health services delivered by the health aides in each village. By 1978, there were 14 certified Community Health Aides. Health aide turnover is down but the coordinator-instructor turnover has impacted the program.

The Office of Environmental Health was created to control or eliminate the spread of disease through the environment. Their work focuses on development and operation of village systems in conjunction with Public Health Service Sanitaria. Nome is not part of the program assure" ng the City utility system is capable of controlling sanitation problems The City of Nome sends out water samples to the state for testing and have been consistently good. Forty percent of the homes still do not have piped water or sewer, and the main problem is consistent sanitary disposal of waste. The wide difference between the volume of water used and having bucket pickup suggest potential problems. Other areas of work by the office include community injury control and a rabies program.

Another function of the division is emergency medical services. The private ambulance services were discussed in the public safety section. The corporation's EMS activities involve first aid and CPR training, clinical training workshops, and training in the high schools. The division is just beginning to look at the possibility of a Hospital-based ambulance system to improve the efficiency of the ground transportation.

A final area is the consumer education and health careers area which employs a Consumer Education Coordinator. Limited funding and staff lim· t the work, but most occurs in the areas of school health and health careers Patient teaching is more limited but improved in FY-1979.

Social Services

Social service delivery in Nome is available through both the public and private sector, Services are offered in the following areas:

- Income Assistance
- Employment Assistance
- Housing Assistance
- Child and Adult Protective Services
- Drug and Alcohol Abuse Services
- Youth Services
- Elderly Services

Delivery of social services is not coordinated among various agencies and an organized information and referral system would be useful. However, most programs are targeted to a specific need within a given target population. The following section is a discussion of social service delivery within the public and private sector by type of delivery.

INCOME ASSISTANCE

Income assistance is available through both the public and private sector. Predominant agencies are the Bureau of Indian Affairs, and the State of Alaska Department of Health and Social Services Public Assistance Division.

United States Bureau of Indian Affairs

The U. S. Bureau of Indian Affairs (BIA) is a federal agency whose target

Table 49 displays race, caseload, and dollars paid for September and March, 1978 and 1979 for various programs under the Division of Public Assistance. The two separate points in time are presented for comparative purposes.

TABLE 49

PUBLIC ASSISTANCE - NOME REGION[a]

		White		Native		Black		Other	
		9/78	3/79	9/78	3/79	9/78	3/79	9/78	3/79
Old Age Assistance	Cases	1	1	118	122	---	---	1	2
	$	96	96	13,037	12,737	---	---	116	367
Aid to the Blind	Cases	---	---	6	7	---	---	---	---
	$	---	---	648	744	---	---	---	---
Aid to the Permanently Disabled	Cases	1	---	62	57	1	---	---	---
	$	553	---	7,751	6,731	180	---	---	---
AFDC[b] (Adult Included)	Cases	1	1	106	99	---	---	10	10
	$	155	303	37,405	34,208	---	---	3,544	3,743
AFDC[b] (Adult Not Included)	Cases	1	---	50	59	---	---	2	1
	$	144	---	10,108	11,380	---	---	350	350

[a]Public Assistance Recipient and Expenditures Study, Volume one and two, March 1979, May 1979.

[b]AFDC - Aid to Families with Dependent Children

Trends displayed above reflect little variation when comparing the two points in time. In all categories of public assistance, Natives are by far the predominant users. The modal category for native users for both September and March is old age assistance. This can, in part, be attributed to a subsistence lifestyle which characterizes the method of economy

popu ation is all residents of Alaska who are one quarter Native. There are four main areas of assistance as discussed below:

- General Assistance - BIA's general assistance helps provide financial aid to those of native background when no other aid is available. When resources are unavailable or insufficient, general assistance can be furnished to meet unmet needs or supplement available resources.

- Services to Children - BIA provides child welfare services including identification of children of neglect, abuse, abandonment, out of wed-lock or handicapped and identify needs and provide services where necessary. BIA cannot exercise powers of guardianship or custody and must refer to the State of Alaska for protective jurisdiction.

- Services to Families and Adults - BIA provides services emphasizing family unity, stability, and economic security of the fami 1 y.

- Community Organization - BIA works with established councils to develop and strengthen community services in order to more effectively meet social welfare needs of communities.

The agency compiles an annual report of user statistics by region. The following table breaks down unduplicated case count by type of assistance for the Norton Sound region.

TABLE 47

FY 79 UNDUPLICATED CASE COUNT OF

BUREAU OF INDIAN AFFAIRS

General Assistance

Age	Under 21		21-34		35-49		50-64		65+ Over		Total	
	cs.[a]	prs.[b]	cs.	prs.	cs.	prs.	cs.	prs.	cs.	prs.	cs.	pr
Unemployable												
Male Heads	1	1	1	1	--	--	6	17	2	2	10	
Female Heads	-	-	1	1	1	5	3	4	-	-	5	1
Employable												
Male Heads	1	2	74	207	82	365	41	178	3	14	217	76
Female Heads	7	15	21	55	16	53	9	26	2	4	55	15
Pending Public Assistance												
Male Heads	--	--	4	13	3	8	6	27	4	20	17	6
Female Heads	1	1	2	4	2	7	2	3	-	-	7	1
TOTAL	10	19	103	281	104	438	67	255	11	40	311	10

Child Welfare

Age	Under 6	6-11	12-17	18-20	21+ over	Total
Foster Care	---	---	---	---	---	---
Institutional Care						
Mentally retarded	---	---	---	---	---	---
Blind and deaf	---	---	---	---	---	---
Dependent	---	---	1	1	---	2
Delinquent	---	---	---	---	---	---
Maternity	---	---	---	---	---	---
Other	---	---	1	3	---	4
Special Needs	---	---	---	---	---	---
TOTAL	---	---	2	4	---	6

[a] cs.= cases
[b] prs.= persons

Table 48 displays general assistance by fiscal year for 1975 through 1979 for Nome and for the Norton Sound region.

TABLE 48[a]

GENERAL ASSISTANCE

DOLLARS AND UNDUPLICATED CASE COUNT

	FY 1975		FY 1976		FY 1977		FY 1978		FY 1979	
	Amt.	Case	Amt.	Case	Amt.	Case	Amt.	Case	Amt.	Case
Name	18,118	81	57,762	98	72,172	111	45,129	107	34,337	77
Norton Sound Region	237,937	263	284,645	281	347,639	354	353,691	357	398,686	311

[a]Gorski, Community Contact, 1979b

The State of Alaska, Department of Health and Social Services

The State of Alaska has offices in the Nome area to provide social service delivery to the region's population. Area offices include the Division of Public Assistance, Division of Public Health, and Division of Social Services. A discussion of the Division of Public Health is included under the health care delivery section of this report.

The Division of Public Assistance. The Division of Public Assistance provides financial aid to families who meet eligibility criteria. Programs include:

- Aid to families with dependent children
- Adult public assistance - includes aid to the blind, aid to the disabled, and old age assistance.
- General relief
- General relief medical and medicaid

utilized by this age group. Unable to pursue traditional methods of food gathering, accompanied with rapid acculturation into the Western economic mode, public assistance has become the only recourse available. The other significant category is Aid to Families with Dependent Children, with and without adult included. A major eligibility requirement under this service specifies that children be deprived of the support and care of one or both natural or adoptive parents as a result of death, continued absence, or physical or mental incapacity. While there is little available information, the 1970 census noted that 25 percent of the children under 18 years of age in the Nome census region were not living with both parents (Bureau of the Census, November 1971). While this is not broken down by race, public assistance data and the fact that the majority of the resident population is native suggests that natives would constitute most of the single or no parent households. Another problem is the abandonment and/or mistreating of children for periods of time due to alcoholism. Qualitative information suggests that this is a serious problem in Nome.

Under aid to families with dependent children, recipients can receive up to $500 per month for four children and one adult. Each additional child beyond four children qualifies the recipient for an additional $50. The average payment per recipient for the State of Alaska is approximately $123. Persons qualifying for aid to the blind, aid to the disabled and old age assistance as a couple can receive up to $553 per month. Persons qualifying for general relief who have an unmet need in one or more subsistence items

can receive up to $80 per month. It is evident from the above that when considering cost of living in Alaska, those qualifying for public assistance programs would most probably need to subsidize this income with another source(s). On the other hand, public assistance might be viewed as a means of subsidizing a subsistence lifestyle.

In addition to the above relief programs, the Division of Public Assistance also administers food stamps. Table 50 displays total recipients, and total households receiving food stamps by month for 1978 and 1979.

TABLE 50

FOOD STAMP RECIPIENTS IN THE NOME REGION[a]

	1978		1979	
	Total Households	Total Persons	Total Households	Total Persons
Jan	71	246	144	591
Feb	66	270	166	737
Mar	103	426	189	821
Apr	82	362	181	781
May	75	388	159	682
Jun	80	351	188	832
Jul	75	338	195	878
Aug	59	270	177	801
Sep	87	368	*	*
Ott	99	428	*	*
Nov	103	445	*	*
Dec	123	510	*	*

* Unavailable

[a]Gorski, Community Contact, 19792

There is a significant increase in number of recipients when comparing 1978 to 1979. Although no one specific item has been attributed to this shift, program eligibility standards were relaxed and probably account for the bulk of the increase.

EMPLOYMENT ASSISTANCE

The main job training program in the region is through the Comprehensive Employment Training Act (CETA) for which there are two prime sponsors. Kawerak the nonprofit arm of Bering Straits Native Corporation, employs between 60 and 125 people in CETA positions. The range is due to the seasonal summer youth jobs. Kawerak employs a staff of six fulltime to administer the program. The positions are targeted toward the hire of local people to assist with management of village affairs. The State of Alaska, Community and Regional Affairs, Division of Manpower has 60 public service positions and 76 youth positions. These CETA jobs are to accommodate needs in the region as a whole. (Gorski, Community Contact 1979 b and 1979 k)

In addition to the above, the State of Alaska, Department of Labor, Employment Division and the University of Alaska Talent Search provide career counseling, job training information and referral, and job placement.

HOUSING ASSISTANCE

Housing assistance is provided through BIA funding and Nome Eskimo Community (NEC). NEC's housing improvement program conducted under a

grant from BIA is described under the section on housing. They also provide workers for a RURAL CAP weatherization program. NEC also has had an interest in developing a credit and finance program for the financing of housing and small businesses. Presently only study funds are available and they act as a referral office in this area. (Ender, Community Contact., 1979e)

CHILD AND ADULT PROTECTIVE SERVICES

Soc al service delivery in this area is provided through both the public and private sector. The State of Alaska, Department of Health and Soc al Services, Division of Social Services handles complaints pertaining to child and adult protection. The Bering Sea Women's Group, a local non-profit corporation, provides a shelter for battered women in the region. In addition referrals are identified and made to the State of Alaska through the Bureau of Indian Affairs.

Division of Social Services

The division has investigative, custody and placement abilities if deemed necessary. About three fourths of the caseloads involve complaints of child neglect and abuse with the remainder pertaining to adult abuse. The average caseload per month is 348. For fiscal year 1978-1979, July through June, the unduplicated case count was 676. Table 51 displays the average allocation for a one month period. To accommodate the caseload six caseworkers are employed by the division.

TABLE 51

CASELOAD CATEGORIES - NOME REGION[a]

Type	Percent
Child Protection	70.7
Adult Protection	15.8
Information and Referral or Counseling	13.5
	100.0

[a]Gorski, Community Contact, 1979 g

Bering Sea Women's Group

This organization is relatively new with incorporation in July 1978. The nonprofit group's main thrust is targeted toward addressing women's needs in the region with emphasis on providing support services to those who are victims of physical abuse, specifically intra-family violence and rape. The corporation opened a shelter for abused women seeking refuge in September 1978. Funding for the shelter is $40,000 this year with funding sources through the Law Enforcement Assistance Agency, Alaska State Legislature, the Methodist Board of Global Miniseries, Women's Division and private donations. Funding has allowed for service delivery at no direct cost to the client. The shelter is staffed twenty-four hours a day and employs one program director and one shelter director, and has five CETA positions. (Ender, Community Contact, 1979P)

In addition, there are five to six volunteers donating approximately 50

hours per month. Table 52 displays usage rates since the program's inception.

TABLE 52

1979 USAGE RATES--BERING SEA WOMENS' SHELTER[a]

1979	Number of Cases	Percent Native
Jan-March	27	est. 75%
April-June	31	est. 95%
Total cases since shelter opened	109	---

[a]Ender, Community Contact, 1979 p

As noted in the Norton Sound Health Corporation Long Range Plan, of the first 47 clients having contact with the shelter, five of the clients were rape victims and 42 were battered. Approximately 80 percent were from Nome with the remainder from the surrounding villages. The average age was 29 and the average educational level was 10.7 years. 74 percent of the clients were married or living as married. (Norton Sound Health Corporation, 1979)

In addition, when examining local police statistics, it is evident that the shelter is an essential service. As displayed in Table 33 under the public safety section, in Nome alone there were 15 reported offenses against family and children, nine reported rapes and 320 domestic disturbances for 1978. Sixty-five percent of the above categories involved the use of alcohol. (Gorski , Community Contact, 1979q)

As well as providing refuge, the shelter also functions in an advisory capacity making referrals to legal, medical or long-term counseling. There has been initial work in expanding the program to the region's villages. Ten villages have volunteer shelter representatives. Training session in Nome are planned.

Other Services

The Nome Baptist ministries operate the Christian Counseling Center, a receiving home for children of all ages having problems. The Nome Community Center runs a "Division Program" for youth referred to the Center by the courts, and a "Girls Only" counseling program for status offenders.

DRUG AND ALCOHOL ABUSE SERVICES

Through Norton Sound Health Corporation, the family service department is the focal point for most of the region's mental health and alcohol treatment. The department is staffed by one clinical psychologist, one program administrator, a masters level psychologist and two counselors. In consideration of high incidence of alcoholism in the community, the following tables reflect user demographics. As displayed in Table 54, in 1978 a majority of the clients were male (63 percent); natives were the predominant race (79 percent) followed by whites (20 percent); and fifty-five percent of the caseload fell between the ages of 20 and 34. Income is an interesting indicator. During fiscal year 1976 and 1977, the majority of cases had clients with incomes of less than $8,000. In 1979, however, 41 percent had incomes of less than $8,000, 19 percent had incomes of between $8,000 and $20,000, and a significant 29 percent had incomes of $20,000 plus. Since 1978 is the first year this income variation has occured, it is difficult to tell if a trend toward a more broad clientele is emerging.

TABLE 53

NORTON SOUND FAMILY SERVICES[a]

CASELOAD STATISTICS

	FY 76	FY 77	FY 78
Number of cases opened (N)	87	117	76
Number of cases closed (N)	19	48	99
Number of caseload - year end (N)	68	121	117
Percent alcohol abuse	46%	60%	51%
Percent mental illness	28%	19%	15%
Percent life crisis	25%	27%	38%
Percent drug abuse	2%	2%	---
Percent mental retardation	---	---	3%

[a]Altam Associates, 1979.

TABLE 54

NORTON SOUND FAMILY SERVICES

CLIENT CHARACTERISTICS

Sex	FY 76	FY 77	FY 78
Percent Male	51%	54%	63%
Percent Female	47%	44%	36%
Percent N/I	2%	2%	1%
Race			
Caucasian	12%	15%	20%
Indian	1%	1%	
Eskimo	87%	80%	79%
Aleut			
Black			
Oriental		1%	
Spanish American			
Other		1%	1%
N/I		3%	
Age			
Under 5		1%	
5-9			1%
10-14	3%	3%	4%
15-17	7%	8%	7%
18-19	15%	17%	11%
20-24	29%	26%	20%

TABLE 54

(CONTINUED)

Age (Con't)	FY 76	FY 77	FY 78
25-34	26%	21%	33%
35-44	14%	15%	17%
45-54	3%	6%	5%
55-64		1%	
65+	1%	2%	
N/I	1%	2%	2%
Family Income			
Under $4,000	35%	35%	28%
$4,000-$7,999	29%	25%	13%
$8,000-$11,999	13%	9%	7%
$12,000-$15,999	7%	5%	7%
$16,000-$19,999	3%	3%	5%
$20,000+	5%	13%	29%
N/I	9%	9%	12%

[a]Altam Associates, 1979.

YOUTH SERVICES

Youth services are available in the region through Nome Community Center and the teenage "Walk-in-Center". A detailed presentation o· programs at Nome Community Center is available under the recreation sect" on of this report.

Kawerak nonprofit corporation also runs a Headstart Program with six employees accommodating approximately 25 students.

ELDERLY SERVICES

Financial assistance is available through the State of Alaska, Department of Health and Social Services, Division of Public Assistance. In addition, the Nome Community Center also offers a daily hot lunch for seniors.

OTHER

Kawerak, the nonprofit arm of Bering Straits Native Corporation, hosts a number of other programs related to social service delivery.

The corporation administers an adult basic education program offering GED diplomas to those that complete requirements. Kawerak employs 30 people for delivery of this service which includes village teachers. In 1978 there were 754 students enrolled in the program and a total of 65 GED diplomas awarded. (Gorski , Community Contact, 1979k)

To assist the fifteen reindeer herdsmen in the region, Kawerak also runs a reindeer herding program. The corporation works closely with the Reindeer

Herdsmen's Association to provide research and assistance in husbandry, herding techniques, range management, disease and parasite control, etc. The corporation employs three people to deliver this service. (Gorski, Community Contact, 1979k)

Kawerak also runs a subsistence section which has two divisions: subsistence and marine mammal research. The Subsistence Division is responsible for developing subsistence priorities, proposing regulation for fish and game and assisting in developing related advisory committees within the community. The Marine Mammal Research Division is the result of a $60,000 grant from the State of Alaska to do research on management of large marine mammals. Related to these activities is the Alaska Eskimo Walrus Commission to which Kawerak is the prime mover. The commission addresses resource management of the walrus patterned after the Alaska Eskimo Whaling Commission. (Gorski, Community Contact, 1979k)

In addition to the above, Kawerak handles several other grants and research projects dealing in such areas as EDA planning, OCS activities, CZM, and a local fisheries.

The Family Resources Center is a newly established private group acting as an information and assistance source. It maintains a small library and is designed as a self-help program. Evening group discussions and/or short courses are planned to provide social outlets and reduce family problems in the community.

III. PROJECTIONS OF GROWTH - CONDITIONS WITHOUT PLANNED LEASE SALE

Nome Community Forecasts

INTRODUCTION

The purpose of this chapter is to project the population and employment of Nome, Alaska assuming that the planned lease sale would not occur. This projection is designed to act as a base case of forecasted change in order to display the incremental effects of OCS development above the base. To capture the change or effects of OCS development, the base case forecast is used to project a set of infrastructure impacts. These impacts are based on standards developed to capture the effects of growth on selected community services (see appendix).

SIGNIFICANT FACTORS AFFECTING GROWTH

Change in the base case is incremental rather than dramatic. The factors affecting growth are generally noted in the appendix, but include assumptions on employment, changing conditions in the public and private sectors, and demographic shifts in the population over time. It is assumed that Nome will remain the center for the Norton Sound-Bering Straits Region. In the non-OCS case, government and government contractual services in health, social services, and construction will continue to dominate the economy.

THE NOME POPULATION AND EMPLOYMENT IN THE NON-OCS CASE

Table 55 outlines the population and employment projected for Nome between 1979 and 2000. These projection figures have to be made within a given framework within the following considerations:

- The Nome data is based on Nome and its environs. Approximately 90 percent of the population and subsequent economic activity occur within the Nome townsite. In addition, there are four concentrations of population presently outside of Nome, but contiguous to it, and part of an overall local economic unit. These areas include Alaska Gold, Nome-Beltz, FAA, and Icy View. Future growth outside of but contagious to the present townsite are included in the projections.

- The projections given are considered the permanent year around population. Nome has a significant seasonal component to its population which adds from 150 to 250 people during the summer months. These seasonal swings vary on the strength of the mining, transportation, and construction industries. The construction industry has been the most volatile in recent years, subject to wide differences in demand from year to year. The expected relationship between the base case and seasonal employment is noted in Figure 6.

TABLE 55

NOME AREA POPULATION AND EMPLOYMENT

NON-OCS BASE CASE

	Population	Employment
1979	3,064	1,071
1980	3,125	1,094
1981	3,188	1,116
1982	3,252	1,171
1983	3,317	1,194
1984	3,383	1,218
1985	3,451	1,277
1986	3,520	1,302
1987	3,590	1,328
1988	3,662	1,392
1989	3,735	1,419
1990	3,810	1,448
1991	3,829	1,493
1992	3,848	1,501
1993	3,867	1,508
1994	3,886	1,477
1995	3,905	1,484
1996	3,925	1,492
1997	3,945	1,499
1998	3,965	1,507
1999	3,985	1,514
2000	4,005	1,522

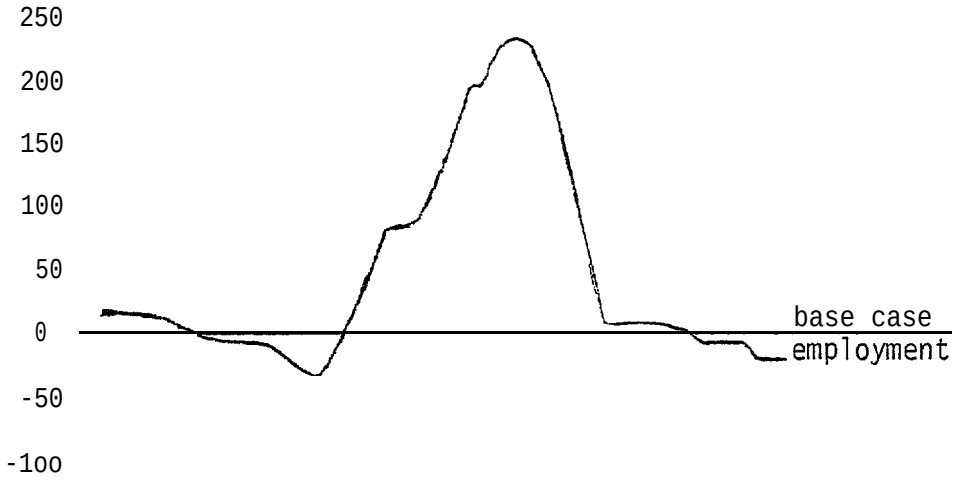


Figure 6. Hypothetical Seasonal Component of Employment

Employment also varies by season and the number shown is considered the October to April average. Summer employment is substantially higher with an increase in the participation rate of the permanent population and the influx of transient workers who take jobs on a seasonal basis. In addition, it is assumed that the average participation rate will increase from 35 percent in 1979 to 39 percent in 1991. In 1992, it will drop back to 38 percent and stablize until 2000. To estimate summer peaks add 20 to 30 percent to the projected data.

While the forecast suggests a very stable pattern, these figures, especially employment mask the swings that are likely to occur within an economic unit the size of Nome's. A bad construction year or a good one, harsh weather, or a fall off in air service could severely alter the projection in any one year. It is assumed that employment will rise and fall but the trend is

reflected in the following projections.

- It is estimated that relative role of the industries in the economy will remain the same throughout the study period with the following qualifications. Services and government should outperform the average over the long-term. Construction should continue to have high variability, being a strong economic component on a cyclical basis. FIRE, TUC, Trade and Mining employment should increase slowly in the 1980's and stabilize thereafter. This growth rate would be below that of government and services. Manufacturing should remain stagnant.

THE NORTHWEST REGION POPULATION AND EMPLOYMENT IN THE NON-OCS CASE

Table 56 outlines the MAP model forecasts of the Northwest region of which Nome is a part. The two forecasts were independently derived but the conclusions are similar. The Northwest region basically includes the Bering Straits and Wade Hampton census divisions.

In comparing the two forecast the following points should be considered:

- Nome's role in the Northwest region remains at about 25 percent of the population and 28 percent of the employment throughout the study period.

- The rates and timing of growth do occur differently. The Nome projection expects the greatest gains in population and employment to occur in the 1980's with a slowdown in the 1990's. The MAP model suggests just the opposite for the region with slow or negative growth throughout the 1980's and the rate improving in the late 1980's and 1990's. This occurs because the MAP model is a disaggregate state model and regional analysis is highly related to state conditions. The Nome forecast is made under the assumption that local and regional conditions are more important to growth than state effects. The opportunities for modest growth is sufficient in Nome to expect a pattern different from the state in the 1980's.

- In analyzing the specific employment sectors, the following differences in expectations were noted. While mining is projected to be stagnant in the regional forecast, the Nome forecast expects modest growth in the region, both at Nome and new areas of investment, (primarily in the Kobuk area). In manufacturing, the annual average in the region already exceeds the year 2000 forecast. While prospects are limited and have little effect on Nome, it does underestimate this industry. TUC and endogenous construction do have potential for growth, however, it is expected these categories will grow slower than what is projected by ISER. The reason is the highly volatile construction industry which varies widely from year to year and produces few trends. Also TUC is not expected to show sufficient growth to overcome the erratic construction

pattern. Trade, Services, and FIRE have been seriously underestimated by the model. Trade has been a consistent if slow growing sector. Services, however, have been a leader with the expansion of health and social services contract services. FIRE also have been a growth sector since the profit native corporations are in this category. If any sector can be expected to outperform overall employment, it should be trade, services and FIRE. Government employment growth has a rate of growth similar to that made for Nome.

TABLE 56

MAP MODEL POPULATION AND ECONOMIC PROJECTIONS FOR NORTHWEST REGION

NON-OCS BASE CASE[a]

Year	Population	Total Employment	Mining/ Exogenous Construction	Manuf./ Ag-Forest-Fishery	TUC[b]/ Endogenous Construction
1980	12,297	3,869	136	27	418
1981	12,227	3,842	136	27	442
1982	11,963	3,751	136	28	467
1983	12,203	3,822	136	28	499
1984	12,857	4,016	136	29	513
1985	12,976	4,048	136	29	508
1986	12,968	4,047	136	29	514
1987	13,007	4,077	136	30	527
1988	13,141	4,145	136	31	551
1989	73,337	4,236	136	31	578
1990	13,559	4,333	136	32	607
1991	13,743	4,419	136	32	635
1992	13,945	4,512	136	33	664
1993	14,133	4,604	136	33	694
1994	14,360	4,710	136	34	726
1995	14,556	4,808	136	35	756
1996	14,742	4,906	136	35	"788
1997	14,941	5,013	136	36	823
1998	15,158	5,131	136	37	861
1999	15,400	5,260	136	38	899
2000	15,591	5,377	136	38	936

Year	Trade/ Service/ FIRE[c]	Government	Total Wages[d]	Real Disposable Pers.Inc me (1978$)[d]	Real Per Capita Disposal Income (1978$)[d]
1980	1,396	1,892	56.934	57.725	4694.27
1981	1,341	1,895	60.429	60.537	4951.09
1982	1,250	1,970	64.931	63.778	5331.38
1983	1,207	1,952	68.614	67.304	5515.37
1984	1,256	2,082	69.592	69.113	5375.66
1985	1,228	2,148	69.212	68.915	5310.93
1986	1,190	2,178	70.337	69.846	5385.91
1987	1,167	2,217	72.569	71.841	5523.41
1988	1,162	2,265	75.799	74.777	5690.48
1989	1,166	2,324	79.343	78.066	5853.46
1990	1,171	2,387	83.014	81.498	6010.42
1991	,171	2,445	86.614	84.807	6171.05
1992	,173	2,505	90.482	88.351	6335.80
1993	,174	2,566	94.451	91.973	6507.66
1994	,178	2,635	98.430	95.585	6656.50
1995	,178	2,703	102.414	99.221	6816.49
1996	,178	2,769	106.856	103.231	7002.38
1997	,181	2,837	111.760	107.682	7206.96
1998	,186	2,911	116.922	112.321	7409.92
1999	,192	2,994	121.961	116.875	7589.32
2000	,194	3,072	127.206	121.532	7794.97

[a]Institute of Social and Economic, Statewide and Regional Population and Economic projections: Bering-Norton Bering Case, 1979.

[b]Transportation. Utilities. Communications

[c]Finance, Insurance and Real Estate

[d]Millions of dollars

Results of Analysis

Reviewing the existing service infrastructure, the following additional needs for education, public safety, recreation, utilities, land use and housing, health, social services, and financial capacity are required to the year 2000 in the case of a non-OCS scenario.

EDUCATION

Primary and Secondary

Requirements of future facilities and manpower, as discussed in the overview of infrastructure standards, involve the maintenance of a minimum of 13 students for each teacher and .9 classrooms per teacher. Table 55 displays the projected student population through the year 2000, number of teachers required, and number of classrooms necessary to accommodate the projections in the non-OCS case.

These projections suggest that the district's present plans for expansion substantially exceed the base case projection. The facilities demands under the non-OCS case would include replacement of aging facilities and the addition of nine new classrooms. Even the needs for additional space are not necessary until 1985, and growth is projected to slow considerably after 1990.

TABLE 57

PROJECTION OF PRIMARY AND SECONDARY SCHOOL

MANPOWER AND FACILITIES - NON-OCS CASE

Year	Projected Student Population	Number of Teachers	Number of Classrooms
1980	847	65	58
1985	883	68	61
1990	918	71	63
1995	937	72	65
2000	961	74	66

Postsecondary and Career Vocational Training

Applying the ratios as described in the standards section, table 58 displays Nome's projected student population and credit hour production through the year 2000. The data are cumulative. During the study period, the number of students and credits almost double. It is assumed that this participation in higher education will be achieved due to the number of groups (the largest being NWCC) offering opportunities in education. Also, these numbers just project Nome's postsecondary participation. In most cases, most of these opportunities are regional in their orientation. It is also assumed that enrollments will vary dramatically and these figures are averages of any example period.

TABLE 58

POSTSECONDARY STUDENT ENROLLMENT PROJECTIONS - NON-OCS CASE

Year	Semester Student Population	Semester Credit Hours
1980	313	1,722
1985	431	2,373
1990	571	3,143
1995	586	3,222
2000	601	3,304

PUBLIC SAFETY

Police

Using the standards as discussed in the overview of infrastructure standards of one sworn officer for every 500 people added to the community, table 59 displays the manpower required in the non-OCS case at five year intervals through the year 2000. A minimum of six officers are necessary as a base to provide 24 hour police service. The base population requiring 24 hour protection is 1,500.

TABLE 59

POLICE MANPOWER REQUIREMENTS

Year	Non-OCS Base Case
1980	9
1985	10
1990	11
1995	11
2000	11

According to the above standards, the department is presently deficient in personnel necessary to accommodate a population of 3,125 projected for 1980. The department currently employs seven sworn officers, two below minimum requirements as established by the standards.

Ideally, a total of four sworn officers should be added to the force over the period under study to adequately meet manpower requirements. This increase might be slightly offset by the incidence of Part 1 crimes and city budgetary capability.

Jails

Standards necessitate a minimum of one cell per 500 with a minimum of three cells to allow for separation of male, female, and juvenile offenders. Table 60 displays facility requirements in the non-OCS case at five year intervals through the period under study. The data has been adjusted to reflect a regional need. (See Overview of Infrastructure Standards section)

TABLE 60

DETENTION FACILITY REQUIREMENTS

Year	Non-OCS Base Case
1980	13
1985	14
1990	15
1995	16
2000	16

Since the state jail provides detention for both Nome, and for the Kotzebue region for sentences over 30 days, the facility has a greater number of beds (28 total) than would be ordinarily required. Population growth under the non-OCS case is not anticipated to impact the present facility's capacity sufficiently to warrent expansion.

Fire

Fire flow requirements, as discussed in the overview of infrastructure standards, at a minimum presently dictate pumping capability of 2,525 liters per minute (667 gallons per minute) - 1,893 lpm (500 gpm) for minimum fire flow and 632 lpm (167 gpm) to maintain an adequate water supply. The 632 lpm (167 gpm) assumes that all residents are receiving water through the city's distribution system. In actuality, only a little over one-half presently receive water through this method. However, it is anticipated that expansion of the present system will eventually result in water hookups to virtually all structures in Nome. Table 61 displays fire flow requirements for the non-OCS case based on the minimum fire flow and water supply requirements through the year 2000.

TABLE 61

MINIMUM FIRE FLOW REQUIREMENTS

Year	Mini mum Fire Flow		Minimum Water Requirement		Total Pumping Capability	
	lpm	gpm	lpm	gpm	lpm	gpm
1980	1,893	500	659	174	2,551	674
1985	1,893	500	727	192	2,619	692
1990	1,893	500	802	212	2,694	712
1995	1,893	500	821	217	2,714	717
2000	1,893	500	844	223	2,737	723

Present pumping capability is 2,460 liters (650 gallons) per minute (CH2M Hill, 1976e). As noted in the baseline section on the water system, this is not sufficient to meet fire flow for large structures such as schools and hospitals.

In order to maintain a minimum requirement as discussed, Nome will have to upgrade present pumping capability in the existing system. This will become more critical as additional structures are added to the water distribution system.

Manpower and equipment requirements, as presented in the standards section, are adequate to meet population growth under the non-OCS case through the period under study.

RECREATION

Table 62 displays recreation facilities requirements for the non-OCS case through the forecast period.

TABLE 62

RECREATION FACILITIES REQUIREMENT

	Non-OCS Case				
Year	1980	1985	1990	1995	2000
Play Lots	1-6	1-7	2-8.	1-8	1-8
Neighborhood Parks	2	2	2	2	2
Basketball Courts	2	2	2	2	2
Tennis Courts	2	2	2	2	2
Softball Fields	1	1	1	1	1
Skating Rinks	0	0	0	0	0
Community Centers	0	0	0	0	0

Nome presently meets or exceeds facilities requirements for play lots, basketball courts and softball fields. If the proposed neighborhood park is constructed, as discussed in the baseline section,

facility requirement would be satisfied through 1990. There are presently no tennis courts constructed at this time. In addition to the above, Nome has an ice rink and a community center, both of which are facilities not commonly found in smaller communities. In addition, the school district has preliminary examined the feasibility of a swimming pool, however, there are no facility plans at this time.

UTILITIES

Electricity

Table 63 displays load requirements at five year intervals over the period under study. The standard in use is a per capita rate of 2.0 kilowatts (kw)

TABLE 63

ELECTRICAL LOAD REQUIREMENT

Year	KW
1980	6,250
1985	6,902
1990	7,620
1995	7,810
2000	8,010

Total generation capability is presently 5,850 kw. The city has plans to add an eight unit with a firm capacity of 2,500 kw bringing total generation capability to 8,350 kw. This capacity would accommodate all growth projected under the non-OCS case. However, several of the smaller generators will probably be retired due to the surplus generating capability indicating a possible shortfall between 1990 and 2000. If such a shortfall is forseen, lead time will be sufficient to add additional diesel generators.

It is important to note, however, that with the rising fuel prices, alternative forms of electrical generation such as hydroelectric or geothermal are being considered. Sufficient lead time in constructing an alternative form of generation could therefore become a significant factor in meeting future requirements.

Sewer

Wastewater generation closely approximates water consumption, and for the purpose of assessing impact, it is assumed that the two are equal. Water consumption is estimated for planning purposes at 303 lpcpd (80 gpcpd) and will be employed as the standard to assess effluent quantities. Table 64 displays amounts generated at five year intervals over the period under study.

TABLE 64

WASTEWATER GENERATION

Year	Quantity	
	Lpd	Gpd
1980	946,875	250,000
1985	1,045,653	276,080
1990	1,154,430	304,800
1995	1,183,215	312,400
2000	1,213,515	320,400

Nome handles effluents through a primary treatment facility which is presently operating at capacity. However, federal mandates are necessitating the installation of secondary treatment systems, and as a result, the city has contracted for a facilities plan. The study projects a

population for the Nome area of 5,000 by the year 2000 and recommends several secondary treatment alternatives. Under serious consideration is a 4.9 hectare (12 acre) lagoon which would be sized sufficiently to accommodate wastewater generation under the non-OCS case. If constructed as planned, additional facilities would not be warranted over the forecast period. However, if the city chooses to not proceed, the present facilities will definitely be inadequate to meet forcasted loads.

Honeybuckets will undoubtedly continue as a method of wastewater disposal throughout the study period. As revenues become available, however, it is assumed that many of the dwellings will begin receiving city sewer services and honeybuckets will become a less prevelent method of dealing with wastewater generation.

Water

Per capita water consumption has been estimated at 303 lpcpd (80 gpcpd) for planning purposes and will be used as the standard to assess water requirements under the non-OCS case. Table 65 displays water need at five year intervals through the year 2000.

TABLE 65

WATER REQUIREMENTS

Year	Liters Per Day	Gallons Per Day
1980	946,875	250,000
1985	1,045,653	276,080
1990	1,154,430	304,800
1995	1,183,215	312,400
2000	1,213,515	320,400

Nome's water source has the potential to yield 1.9 million liters (489,600 gallons) of water per day which is sufficient to meet water demand through the forecast period.

Storage facilities should ideally accommodate a three day reserve, Present storage capability is 1.2 million liters (320,000 gallons) which is not sufficient to meet reserve requirements. However, plans are proposed to build a 4.5 million liter (1.2 million gallon) storage facility which would be adequate to meet the three day requirement through the end of the study period.

Improvements to the distribution system are assumed through the forecast period until all reasonable hookups have been made. There are some structures in Nome to which adding piped water would not be cost effective due to the substandard condition of the buildings.

Expansion of the distribution system is capital intensive and will require additional revenue sources to supplement local financing. City revenues are not sufficient for major additions to the present system.

Solid Waste

Solid waste generation for Nome has not actually been calculated; however, national standards indicate an estimated per capita solid waste generation rate of 2.3 kilograms (5 pounds) per capita per day. As per standards, utilizing a fill depth of 2.1 meters (7 feet) of which two-thirds is solid waste material, .08 hectares (.21 acres) per year per 1000 peopleis

required to accommodate a sanitary landfill. Table 66 displays quantities of solid waste and fill requirements by year through the forecast period.

TABLE 66

SOLID WASTE GENERATION AND TOTAL FILL REQUIREMENTS

Year	Quantity of Solid Waste Per Year		Estimated Fill Area-Acres Per Year		
	Metric Tons	Tons	Hectares	Acres	
1980	2,587	2,852	.27	.66	
1981	2,638	2,909	.27	.67	
1982	2,691	2,967	.28	.68	
1983	2,745	3,026	.28	.70	
1984	2,800	3,087	.29	.71	
1985	2,856	3,149	.29	.72	
1986	2,913	3,212	.30	.74	
1987	2,971	3,276	.30	.75	
1988	3,031	3,342	.31	.77	
1989	3,091	3,408	.32	.78	
1990	3,154	3,477	.32	.80	
1991	3,169	3,494	.32	.80	
1992	3,184	3,511	.32	.80	
1993	3,201	3,529	.33	.81	
1994	3,216	3,546	.33	.82	
1995	3,232	3,563	.33	.82	
1996	3,249	3,582	.33	.82	
1997	3,265	3,600	.34	.83	
1998	3,282	3,618	.34	.83	
1999	3,298	3,636	.34	.84	
2000	3,315	3,655	.34	.84	
	63,888	70,439	6.6	16.19	Total Acres

Based on the above standard, 63,888 metric tons (70,439 U.S.tons) of solid waste will be generated with a total fill requirement 6.6 hectares (16.19 acres). This standard assumes that the waste is compacted as part of the operating procedure.

At a minimum, the city should maintain at least one collection vehicle through the forecast period.

Telephone

Communications for Nome are provided by General Telephone Company. The present system will reach service capacity with the addition of 200 more connections. Table 67 displays number of service connections anticipated through the end of the study period.

TABLE 67

CAPACITY REQUIREMENTS

TELEPHONE SERVICE

Year	Main Station Cumulative Demand
1980	1,656
1985	1,898
1990	2,172
1995	2,304
2000	2,443

As noted above, the present system will reach saturation with the addition of 200 more main stations. Therefore, sometime before 1985 implementation of solid state switching equipment would be anticipated. In all, there will be a demand for an additional 787 main stations (a 48 percent increase) over the forecast period. The ratio between commercial and residential (64/36) is expected to remain approximately the same.

HOUSING AND RESIDENTIAL LAND

Based on the anticipated population growth for Nome, the housing forecast estimates indicate that there will be a demand for 266 new housing units by the year 2000 to accommodate the additional residents (see Table 68). As shown in Table 68 this projection for net housing units is based on a modest decline in household size over the forecast period. Reasons for this assumed decline in household size include historic patterns in Nome and a slowdown in the birthrate and its effect on the general age distribution. The demand for 266 additional housing units in Nome represents an increase of approximately one-third over existing housing stocks.

According to the 1970 census, approximately 22 percent of Nome's housing stock was multifamily. This figure does not take into account the 176 vacant units in town and is therefore suspect. Based on information contained in the 1976 housing survey conducted by the City of Nome, approximately 17 percent of the housing units were multifamily or duplex units. Because of the lack of available land and the high costs of services, a modest trend toward multi-family units is anticipated for the forecast period. Though the ratio of multifamily to single family units will steadily increase, it is foreseen as doing so mildly because of potential cultural constraints. Over 60 percent of Nome's forecast population is native, and it is unknown how well these people will adapt to apartment living. Considering these factors, approximately 25 percent of the new units are expected to be multifamily or duplex units. Trailers are expected to comprise a relatively small portion of new housing units.

TABLE 68

FORECAST OF NET CHANGE IN HOUSING DEMAND

NON-OCS BASE CASE, NOME 1980-2000

	Net Population Increase	Assumed Household Size	Net Change Demand for Housing Units	Cumulative Housing Stock By End Date
1979-1980	61	3.72	16	793
1981-1985	326	3.6	91	884
1986-1990	359	3.5	103	987
1991-7995	95	3.5	27	1,014
1996-2000	100	3.5	29	1,043
Total	941		266	

Because of the substandard condition of existing housing in Nome, some of the present housing stock might drop out of the market over the forecast period. But, because of the shortage of available housing, many of the substandard units may continue to be occupied, and consequently remain on the market. Since the forecast (Table 68) only addresses the demand for new dwellings for additional residents, it therefore does not include housing constructed to replace or maintain the existing housing stock.

During the base case period, BIA funding of a housing improvement program is assumed to continue. This program is designed to upgrade substandard housing. High costs of materials, the harsh climate, modest funding

levels, and numerous substandard homes in Nome will make the problem of substandard housing in Nome continue. Residents will more than likely do as they always have done; live in substandard housing.

Residential land requirements necessary to meet the housing demand by 2000 are shown in Table 69. The table is divided into two parts, within and outside of Nome's existing corporate limits. Each category represents the amount of land required for all 266 new housing units. In reality, the new units will probably be constructed in both areas, but it is difficult to allocate where. Development constraints within Nome (adverse drainage and land ownership patterns) will necessitate some development outside of Nome. The land requirements within Nome are based on current average lot sizes of 7,000 square feet, while requirements outside of the city are based on the 10,000 square foot lots in a recent subdivision. Depending upon where the new units are built, between 42.8 and 84.9 acres would be required for residential use.

TABLE 69

ESTIMATED DEMAND FOR RESIDENTIAL LAND
NON-OCS BASE CASE, NOME, 1980-2000

	Within Existing Corporate Limits		Outside Existing Corporate Limits		
	Net New Housing Units	Net New Residential Land Use (acres)[1]	Net New Residential Land Use (acres)[1]	Public Rights-of-way (acres)[1]	Gross New Residential Land Use (acres)[1]
1979-80	16	2.6	3.7	1.4	5.1
1981-85	91	14.6	20.9	8.1	29.0
1986-90	103	16.6	23.7	9.2	32.9
1991-95	27	4.3	6.2	2.4	8.6
1996-2000	29	4.7	6.7	2.6	9.3
TOTAL	266	42.8	61.2	23.7	84.9

[1]Multiply by .40469 to obtain hectares.

HEALTH

Nome and regional needs in the area of health cannot be disaggregate. Because of this, all standards will be applied to regional estimates of population.

Acute Care Bed Need

Applying the ratio of three acute care beds per 1,000 people, Table 70 projects the acute care bed needs of the region. The present mix of 19 acute care beds including adult, pediatric, infant and critical care meets the current needs. The low occupancy rates suggest that there is some excess capacity in the acute care area. However, the available number of beds would have to be able to accommodate peaks, With a small population, the variation of bed occupancy is quite high. The data suggests that needs will result in a 47 percent increase in beds over the 20 year study period. While standards have not been developed for intermediate care, the high occupancy rate suggests that these beds would have to be increased by approximately the same amount.

TABLE 70

PROJECTED ACUTE CARE BED NEED - NON-OCS CASE

Year	Bed Need
1980	20
1985	22
1990	24
1995	26
2000	28

Ratio of Physicians to Population

The 1979 primary care physician to population was about 1 per 1,500 residents. Using a standard of 1 physician to 2,000 population with a minimum of four, the manpower needs of the region are presently being met and should be satisfactory until the late 1990's. The larger problems are maintenance of staff continuity by reducing turnover, and the development of other professional and paraprofessional manpower to support the overall health delivery system.

TABLE 71

PROJECTED PRIMARY CARE PHYSICIAN NEEDS - NON-OCS CASE

Year	Physician Needs
1980	4
1985	4
1990	4
1995	4
2000	5

Special Service Needs

Specialized manpower needs which exist now or will emerge during the study period include the following:

- There is a strong need for eye care in the region and the services of an optometrist will be needed at some point in time.

- The dental health of the region is so poor that even though standards are presently met, there are real unmet needs. This

could mean addition of one or more dentists, inclusion of dental care under the Norton Sound Health Corporation to work toward comprehensive health care and development of dental assistants and technicians to attack the problem of self-care and village level work.

- While the volume of x-ray procedures is unlikely to produce a demand for a radiologist, procedures and technologies will have to be reviewed to produce better patient care by reducing the time involved in sending x-rays out for reading.

- While no attempt has been made to project the number of alcoholics and alcohol abusers over the study period, one can assume that the level of abusers will remain proportionately the same without a drastic change in the environment. Increased program efforts (focused within the family services division of NSHC) may be effective in relieving the most visible inebriate problems. However, the predominant causes for alcohol abuse will likely remain, e.g. remoteness, long dark winter syndrome, unemployment, cultural incompatibility, etc. Because of the seriousness of this problem and other addressed by Family Services, there are strong needs for facilities and manpower to deal with them.

SOCIAL SERVICES

Though no formal quantitative standards exist for the delivery of social services, the following points are made to provide a qualitative framework for future service needs in this area.

- As noted in the section on health, behavioral health and social services related to these problems is expected to remain a chronic and serious community problem. Alcoholism and other substance abuse, spousal and child abuse, and general cross-cultural adjustment are assumed to remain at levels comparative to the present throughout the study period. Since the present system is inadequate in reversing the problem, additional approaches and resources will have to be committed to this area.

- Employment opportunity is expected to remain limited. The 35 percent average participation rate is expected to increase to 39 percent by 1991 and stabilize at 38 percent in the mid-1990's. This change will not be sufficient to alter the basic problem of high unemployment, underemployment, and seasonal employment. This limited opportunity to participate in the cash economy will continue demands for unemployment support, and income assistance to relieve poverty among important segments of the population.

- The provision of decent housing is expected to be an important issue during the study period. While immediate problems have been mitigated

to some extent in recent years, a substantial portion of the stock remains substandard. The cost of new housing and the limits of the existing stock make people very reluctant to take substandard units off the market. However, the proportion of this stock is expected to decline relative to the total as new units are added and rehabilitation programs improve the quality of marginal units.

LOCAL GOVERNMENT FINANCES

Nome draws the majority of its general fund revenues from local sources. Property taxes account for 32 percent of revenues, sales taxes for 25 percent, and miscellaneous for 17 percent. The balance covers from intergovernmental transfer of funds from state and federal sources (26 percent).

Using assumptions outlined in the appendix, marginal shifts are expected to occur decreasing the relative weight of property taxes and miscellaneous sources while enhancing the role of sales tax and intergovernmental revenues. With a built in six percent inflation rate, total revenues grow by 283 percent and actual uninflated revenues grow by 30.5 percent (See Table 72).

School revenues grow by 248 percent (13.5 percent, discounted for inflation). State and federal sources presently account for 85 percent of all revenues and are expected to be 90 percent the end of the study period (See Table 73) .

The base case forecast of general fund operating expenditures explicitly assumes that the City will be providing approximately the same level, range and quality of services throughout the study period. The operating budget varies with the population growth adjusted for inflation (See Table 74). Because of that the operating budget and revenue grow at about the same rate. This kind of linear trend is not necessarily

reflective of the options available to the City, In recent years, the City has been able to cut expenses and maintain service levels, However, they do appear to have reached the minimum of revenues for the present services, It would be cliff" cult to continue cost cutting without affecting the quality of services to decline.

Even more speculative is the mix of revenues available to fund future expenditures. The role of state government in meeting local government expenses have the potential of increasing in the coming years. Despite that, Nome is not expected to have revenue surpluses available for new capital improvements or debt service without increasing revenues beyond those projected. Nome presently carries $770,000 in bond indebtedness which is 2.14 percent of assessed valuation. While the community has been somewhat successful in upgrading its facilities using state and federal funds, there are still serious shortfalls, especially in their utilities. To meet future demands for improvements of services because of existing shortfalls, it will be necessary for the city to seek out additional sources of revenue beyond those projected.

TABLE 72

GENERAL FUND REVENUE FORECAST - NON-OCS CASE
(in $1,000's)

Year	Property Tax	Sal es Tax	Intergovern-mental Revenues	Other	Total	Total Discounted for 6% Inflation Rate
1980	$ 591	$ 459	$ 485	$ 306	$1,841	$1,841
1985	886	658	729	416	2,689	2,074
1990	1,271	969	1,046	564	3,850	2,286
1995	1,723	1,314	1,418	765	5,220	2,343
2000	$2,329	$1,776	.$1,918	$1,035	.$7,058	$2,403

TABLE 73

NOME SCHOOL DISTRICT REVENUES - NON-OCS CASE
(in $1,000's)

		Estimated Revenues by Source				
Year	Enrollment	Local Taxes	State/ Federal	Other	Total	Total Discounted for 6% Inflation Rate
1980	847	$206	$3,419	$416	$ 4,041	$4,041
1985	883	281	4,771	561	5,613	4,213
1990	918	385	6,791	541	7,717	4,380
1995	937	522	9,292	626	10,440	4,470
2000	961	$704	.$12,670	$704	$14,078	$4,585

TABLE 74

NOME OPERATING EXPENDITURES - NON-OCS CASE
(in $1,000's)

	City Operations		School Operations	
Year	Total	Discounted for 6% Inflation	Total	Discounted for 6% Inflation
1980	$1,841	$1,841	$4,041	$4,041
1985	2,707	2,033	5,613	4,213
1990	3,875	2,244	7,717	4,380
1995	5,252	2,300	10,440	4,470
2000	$7,085	$2,359	$14,078	$4,585

SUMMARY OF IMPACTS

Table 75 displays the services likely to be impacted through the period under study. Where quantifiable standards exists to assess service needs, the actual figures generated are listed in the matrix. When qualitative standards were the only means of determining impact for a particular service,

the conditional qualifiers are discussed in the overview of infrastructure standards and chapter, Projections of Growth-Conditions Without Planned Lease Sale.

In summary, there appears to be no major problems in most service areas in providing projected needs. Most service difficulties occur in the utilities, primarily water and sewer. This is due to the inadequacy of the present systems, high operation and maintenance cost, and expensive capital requirements to complete the system. These problems have an impact of financial capacity and local revenues and normal growth in general services are expected to be inadequate in meeting existing service deficiencies.

TABLE 75

NOME NON-CCS BASE CASE

CUMULATIVE RATIO OF SERVICE REQUIREMENTS TO POPULATION

	1980	1985	1990	1995	2000
Education: No. Students-Primary/Secondary	3,125	3,451	3,810	3,905	4,005
Primary/Secondary-No. of Manpower/Facilities	847	883	918	937	961
Public Postsecondary-No. of Credits	65	68	71	72	
	1,722	2,373	3,143	3,222	3,3::
Public Safety: Police - Manpower	9	10	11	11	11
Detention Cells	6	7	8	8	8
FIRE - Total Pumping Capability (liters per minute)	2,551	2,619	2,694	2,714	2,737
Recreation: Play lots	1-6	1-7	1-8	1-8	1-8
Neighborhood Parks	1	1	2	2	2
Basketball Courts	1	1	2	2	2
Tennis Courts	1	1	2	2	2
Softball Fields	1	1	1	1	1
Skating Rinks	0	0	0	0	0
Community Centers	0	0	0	0	0
Utilities: Electricity (kilowatts)	6,250	6,902	7,620	7,810	8,010
Sewer (thousand liters per day)	946.9	1,045.7	1,154,4	1,183.2	1,213.5
Water (thousand liters per day)	946.9	1,045.7	1,154.4	1,183.2	1,213.5
Solid Waste (metric tons per year)	2,587	2,856	3,154	3,232	3,315
(hectares per year area)	.27	.29	.32	.33	.34
Telephone	1,656	1,898	2,172	2,304	2,443
Housing: Total number of Units	793	884	987	1,014	1,043
Heal th: Acute Care Bed Needs	20	22	24	26	28
Primary Care Physicians	4	4	4	4	5
Social Services: (See appendix, *Overview* of Infrastructure Standards)					
Government Finances: General Fund Revenues (in $1,000's)	1,841	2,689	3,850	5,220	7,058
School District Revenues (in $1,000's)	4,041	5,613	7,717	10,440	14,078

IV IMPACT ASSESSMENT OF BERING-NORTON OCS SCENARIOS

INTRODUCTION

The purpose of this chapter is to assess impact on specific indicators in the Nome community commensurate with OCS petroleum development in the Bering-Norton lease sale area.

As discussed in the baseline analysis, Nome's infrastructure is certainly tenuous while serving a relatively stable population. Major population growth and rapid economic expansion can be expected to severely impact specific community services. One mitigating consideration is the residential placement of incoming workers due to OCS development. The accompanying scenarios assume the presence of an enclave approach in providing services for a significant portion of the onshore direct employment. While this does not eliminate impact, this assumption does reduce certain types of impacts. The methods discussion found in the appendix reviews these assumptions in more depth.

To describe and project the infrastructure impacts expected due to OCS, indicators were selected to measure service demand. Education, public safety, recreation, health, social services, housing, utilities, and financial capacity and capital requirements are the service areas selected for analysis.

COMMUNITY POPULATION AND EMPLOYMENT FORECASTS

To assess the impact from the Bering-Norton OCS lease sale, three scenarios were developed. The forecasts of population and employment (measured as change from a specified base case) are shown in tables 76 through 79. In addition to the community projections for Nome on which the impact analysis is based, tables 80 through 83 describe the Northwest regional population and employment projections. The region is substantially larger than the community of Nome, and generally includes the Bering-Norton and Wade-Hampton regions. In addition to the variation in geographic perspective, there are conceptual differences. The regional MAP model is a statewide forecast disaggregated to the regional, Regional employment has a SEAR factor which allocates direct employment back to the region of residence. The local estimates are built from the bottom up through an assessment of the base economy and change caused by OCS development. The focus is on identification of employment and population totals expected to be found within an assumed government jurisdiction. This information, whether residential or enclave, is necessary to project infrastructure impacts, local government revenues, and local economic implications of development.

Despite the differences in approach and scope, it is still important to note the significant gap between the MAP model and community forecast. Differences in scope and concept does not appear to be sufficient in explaining this. In evaluating this, the reader should review the methods section in the appendix. In summary, the community model assumes that OCS development tends to be concentrated on thus localized within the

TABLE 76

NOME AREA POPULATION AND EMPLOYMENT
MEDIUM FIND OCS SCENARIO

Year	OCS Employment			Residential Primary Employment		Secondary Employment		Employment Increment			Population Increment	
	Total	Onshore	Onsite Onshore	Total	Due to Immigration	Total	Filled by In Immigration	Residential	Enclave	Total	Total Residential	Total
1983	363	38	28	6	0	6	[illegible]	12	22	34	13	35
1984	873	90	66	14	0	15	13	29	52	81	32	84
1985	1,043	105	77	16	0	17	14	33	61	94	34	95
1986	1,118	389	337	213	45	124	105	337	263	600	689	952
1987	1,443	851	762	274	58	195	166	469	600	1,069	963	1,563
1988	2,415	428	378	347	97	182	155	529	317	846	1,081	1,398
1989	2,150	430	267	336	86	177	150	513	200	713	1,046	1,246
1990	3,555	874	664	392	142	244	207	636	568	1,204	1,300	1,868
1991	3,378	563	377	385	135	266	226	651	313	964	1,335	1,648
1992	3,085	529	343	373	123	255	217	628	279	907	1,288	1,567
1993	2,597	525	339	354	104	248	211	602	267	869	1,235	1,502
1994	2,386	516	330	345	95	240	204	585	255	840	1,202	1,457
1995	2,387	513	327	345	95	240	204	585	253	838	1,202	1,455
1996	2,447	513	327	345	95	240	204	585	255	840	1,202	1,457
1997	2,447	513	327	345	95	240	204	585	255	840	1,202	1,457
1998	2,447	513	327	345	95	240	204	585	255	840	1,202	1,457
1999	2,447	513	327	345	95	240	204	585	255	840	1,202	1,457
2000	2,447	513	327	345	95	240	204	585	255	840	1,202	1,457
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(lo)	(11)	(12)

See Accompanying Footnotes.

TABLE 76, Continued

NOME AREA POPULATIONAND EMPLOYMENT
MEDIUM FIND OCS SCENARIO

Year	Secondary Employment		
	Local Construction and Transportation	Trades, Service and F.I.R.E.	Government
1983	5	1	0
1984	14	1	0
1985	15	2	0
1986	109	15	0
1987	166	29	0
1988	146	36	0
1989	142	35	0
1990	183	61	0
1991	196	67	3
1992	189	61	5
1993	184	57	7
1994	175	58	7
1995	175	58	7
1996	175	58	7
1997	175	58	7
1998	175	58	7
1999	175	58	7
2000	175	58	7

See Accompanying Footnote

TABLE 77

NOME AREA POPULATION AND EMPLOYMENT
HIGH FIND OCS SCENARIO

Year	OCS Employment			Residential Primary Employment		Secondary Employment		Employment Increment			Population Increment	
	Total	Onshore	Onsite Onshore	Total	Due to Immigration	Total	Filled by In Immigration	Residential	Enclave	Total	Total Residential	Total
1983	352	37	27	6	0	6	5	12	21	33	13	34
1984	756	77	57	12	0	13	11	25	45	70	28	73
1985	1,372	128	96	19	0	21	18	40	77	117	45	122
1986	1,761	613	531	320	70	189	161	509	420	929	1,043	1,463
1987	2,651	1,544	1,375	356	106	296	252	652	1,168	1,820	1,344	2,512
1988	3,514	1,148	1,018	391	141	271	230	662	890	1,552	1,363	2,253
1989	4,736	1,020	734	439	189	278	236	717	925	1,642	1,467	2,392
1990	4,971	1,096	803	449	199	290	246	739	997	1,736	1,512	2,509
1991	5,276	858	584	461	211	356	303	817	509	1,326	1,680	2,189
1992	5,085	836	554	453	203	349	297	802	480	1,210	1,649	2,129
1993	4,405	818	537	426	176	332	282	758	458	1,216	1,557	2,015
1994	3,959	825	540	408	158	329	280	737	455	1,192	1,516	1,971
1995	3,902	814	529	406	156	324	275	730	444	1,174	1,500	1,944
1996	3,869	813	528	405	155	324	275	729	442	1,171	1,498	1,940
1997	3,900	810	525	406	156	324	275	730	440	1,170	1,500	1,940
1998	3,900	810	525	406	156	324	275	730	440	1,170	1,500	1,940
1999	3,930	810	525	407	157	325	275	732	441	1,173	1,502	1,943
2000	3,930	810	525	407	157	325	276	732	441	1,173	1,502	1,943
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

See Accompanying Footnotes.

TABLE 77, Continued

NOME AREA POPULATION AND EMPLOYMENT
HIGH FIND OCS SCENARIO

Year	Secondary Employment		
	Local Construction and Transportation	Trades, Service and F.I.R.E.	Government
1983	5	1	0
1984	12	1	0
1985	19	2	0
1986	166	23	0
1987	252	44	0
1988	217	54	0
1989	222	56	0
1990	218	72	0
1991	263	89	4
1992	258	84	7
1993	246	76	10
1994	240	79	10
1995	236	78	10
1996	236	78	10
1997	236	78	10
1998	236	78	10
1999	237	78	10
2000	237	78	10

See Accompanying Footnote

TABLE 78

NOME AREA POPLILATION AND EMPLOYMENT
LOW FIND OCS SCENARIO

Year	OCS Employment			Residential Primary Employment		Secondary Employment		Employment Increment			Population Increment	
	Total	Onshore	Onsite Onshore	Total	Due to Immigration	Total	Filled by In Immigration	Residential	Enclave	Total	Total Residential	Total
1983	235	25	18	3	0	4	3	7	15	22	8	23
1964	405	40	30	5	0	6	3	11	25	36	8	33
1985	575	55	41	6	0	8	5	14	35	49	13	48
1986	809	80	57	9	0	12	7	21	48	69	17	65
1987	422	112	96	80	17	43	37	123	74	197	252	326
1988	883	232	205	167	35	90	77	257	161	418	526	687
1989	1,350	387	348	257	54	142	121	399	274	673	816	1,090
1990	1,376	241	152	261	55	152	129	413	106	519	845	951
1991	1,274	228	141	242	51	143	122	385	97	482	790	887
1992	992	234	147	189	40	122	104	311	102	413	639	741
1993	786	224	137	149	31	104	88	253	95	348	518	613
1994	756	222	135	143	30	101	86	244	93	337	500	593
1995	846	222	135	161	34	108	92	269	93	362	553	646
1996	846	222	135	161	34	108	92	269	93	362	553	646
1997	846	222	135	161	34	108	92	269	93	362	553	646
1998	846	222	135	161	34	108	92	269	93	362	553	646
1999	846	222	135	161	34	108	92	269	93	362	553	646
2000	846	222	135	161	34	108	92	269	93	362	553	646
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(lo)	(11)	(12)

See Accompanying Footnotes,

TABLE 78, Continued

AREA POPULATION AND EMPLOYMENT
LOW FIND OCS SCENARIO

Year	Secondary Employment		
	Local Construction and Transportation	Trades, Service and F.I.R.E.	Government
1983	3	0	0
1984	5	0	0
1985	5	1	0
1986	8	1	0
1987	68	12	0
1988	142	25	0
1989	206	51	0
1990	195	63	3
1991	181	58	3
1992	142	43	4
1993	109	36	4
1994	105	34	4
1995	117	39	5
1996	117	39	5
1997	117	39	5
1998	117	39	5
1999	117	39	5
2000	117	39	5

See Accompanyin

TABLE 79

NOME AREA POPULATION AND EMPLOYMENT
EXPLORATION CASE SCENARIO

Year	OCS Employment			Residential Primary Employment		Secondary Employment		Employment Increment			Population Increment	
	Total	Onshore	Onsite Onshore	Total	Due to Immigration	Total	Filled by In Immigration	Residential	Enclave	Total	Total Residential	Total
1983	118	13	0	2	0	6	5	19	0	19	27	27
1984	288	28	0	4	0	13	11	41	0	41	58	58
1985	170	16	0	2	0	6	5	22	0	22	30	30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

	Local Construction and Transportation	Trade, Services and F.I.R.E.	Government
1983	5	1	0
1984	12	1	0
1985	5	1	0

See Accompanying Footnote

Footnotes on OCS Forecasts

(1) (2) (3) Dames and Moore, Tables 6-18, 7-18, 8-18

(4) [.15 x Column 2 for exploration period; .15 x column up to a maximum of 250 during development and production phases] + column 5

(5) 0 for exploration; .04 x column 1 for development and production phases

(6) [Column 4 x .4] + [Column 2 x .1] + [Column 2 x .1 for production phase; otherwise 0]

(7) Column 6 x .85

(8) Column 4 + Column 6

(9) Column 3 - [Column 4x (Column 2 ÷ Column l)], except exploration which is column 3 - column 4

(10) Column 8 + Column 9

(11) [Column 4x 2, except for exploration phase which is 0] + [(Column 7 x .67) x 2] + [(Column 7 x .33) x3.5]

(12) Column 11 + Column 9

Secondary Employment Note:

Four categories of secondary employment were defined. One (manufacturing, agriculture, forestry, and fisheries) was assumed not to be impacted by OCS over the non-OCS case. The other three compare the total secondary employment above the base case due to the effects of the OCS scenario. Local Construction and Transportation included employment of public facilities. Trade, Services and F. I.R.E. includes health, social services and profit Native corporations.

TABLE 80 [a]

MAP MODEL POPULATION AND EMPLOYMENT PROJECTIONS FOR NORTHWEST REGION

MEDIUM FIND SCENARIO

Year	Population	Employment	Mining and Exogonous Construction	Manufacturing and Agriculture, Fisheries and Forestry	Local Construction and Transportation	Trade, Service and F.I.R.E.	Government	Wages and Salaries	Real Disposable Personal Income	Per Capita Real Disposable Personal Income
1983	289	144	67	o	69	7	0	2,812	2,766	97,977
1984	673	343	158	0	167	16	-o	5,991	5,967	181,121
1985	1,048	508	194	0	287	22	2	8,094	8,080	187,645
1986	942	542	311	0	202	24	-2	10,624	10,572	410,594
1987	998	694	524	0	133	33	-9	16,662	16,520	813,695
1988	1,832	998	487	0	454	47	4	19,500	19,269	610,758
1989	1,534	978	627	0	281	53	4	19,424	19,152	706,301
1990	4,473	3,094	2,207	0	701	159	-9	64,243	63,191	2,065,480
1991	5,310	3,731	2,659	0	822	204	4	78,692	77,191	2,387,360
1992	5,018	3,539	2,475	0	806	201	14	75,908	74,258	2,291,520
1993	4,146	2,927	1,987	0	713	171	18	63,685	62,135	1,968,480
1994	3,729	2,659	1,776	0	674	155	15	58,492	56,915	1,814,960
1995	3,683	2,664	1,777	0	679	154	13	59,490	57,749	1,829,780
1996	2,756	2,754	1,837	0	701	160	14	62,869	60,854	1,907,990
1997	3,785	2,811	1,867	0	720	166	17	65,681	63,407	1,968,98
1998	3,761	2,828	1,867	0	731	169	19	67,515	64,981	2,000,390
1999	3,726	2,842	1,867	0	741	171	19	68,808	66,062	2,013,250
2000	3,688	2,853	1,867	0	748	173	21	70,308	67,297	2,036,660

[a]University of Alaska, Institute of Social and Economic Research, 1979b

TABLE 81a

MAP MODEL POPULATION AND EMPLOYMENT PROJECTIONS FOR NORTHWEST REGION

HIGH FIND SCENARIO

Year	Population	Employment	Mining and Exogonous Construction	Manufacturing and Agriculture, Fisheries and Fores try	Local Construct ion and Transportation	Trade, Service and F.I.R.E.	Government	Wages and Salaries	Real Disposable Personal Income	Per Capita Real Disposable Personal Income
1983	283	140	64	o	69	7	o	, 2,731	2,687	93,848
1984	578	295	136	0	143	14	-o	5,168	5,146	158,277
1985	1,206	601	248	0	322	26	1	9,840	9,822	251,535
1986	1,536	877	492	0	340	39	-3	17,084	16,999	624,094
1987	2,000	1,342	965	0	308	64	-14	31,651	31,377	1,399,900
1988	2,708	1,599	923	0	582	79	1	34,518	34,095	1,216,030
1989	3,504	2,051	1,124	0	793	105	13	40,239	39,660	1,170,090
1990	7,015	4,773	3,328	0	1,147	250	6	98,831	97,185	2,735,090
1991	8,597	5,964	4,182	0	1,381	326	27	126,091	123,645	3,223,850
1992	8,874	6,198	4,295	0	1,459	351	42	133,534	130,580	3,320,630
1993	7,916	5,553	3,776	0	1,355	323	48	121,578	118,574	3,099,210
1994	7,140	5,027	3,338	0	1,296	294	45	110,943	107,916	2,862,120
1995	6,961	4,961	3,282	0	1,293	289	43	111,073	107,787	2,855,670
1996	6,847	4,938	3,249	0	1,300	290	45	112,824	109,171	2,885,930
1997	6,857	5,006	3,280	0	1,327	297	49	117,074	112,985	2,965,180
1998	6,816	5,036	3,280	0	1,347	302	52	120,314	115,762	3,017,680
1999	6,811	5,100	3,310	0	1,372	308	52	123,655	118,681	3,063,330
2000	6,747	5,121	3,310	0	1,366	312	56	126,382	120,930	3,104,930

[a]University of Alaska, Institute of Social and Economic Research, 1979b

TABLE 82[a]

MAP MODEL POPULATION AND EMPLOYMENT PROJECTIONS FOR NORTHWEST REGION

LOW FIND SCENARIO

Year	Population	Employment	Mining and Exogonous Construction	Manufacturing and Agriculture, Fisheries and Forestry	Local Construction and Transportation	Trade, Service and F.I.R.E.	Government	Wages and Salaries	Real Disposable Personal Income	Per Capita Real Disposable Personal Income
1983	189	94	43	o	46	5	o	1,820	1,791	63,027
1984	294	152	72	0	71	7	-o	2,690	2,678	87,293
1985	524	259	105	0	141	11	1	4,204	4,197	109,715
1986	759	37?	149	0	208	16	2	6,100	6,073	150,926
1987	308	180	103	0	064	09	1	3,529	3,501	140,434
1988	700	389	199	0	170	17	0	7,729	7,641	274,059
1989	926	586	373	0	180	28	-3	12,546	12,367	503,500
1990	2,265	1,558	1,102	0	361	81	-lo	31,696	31,185	1,143,430
1991	2,211	1,557	1,110	0	338	86	-3	32,398	31,794	1,170,330
1992	1,718	1,206	828	0	285	7	2	25,440	24,898	920,367
1993	1,337	941	621	0	243	55	4	20,092	19,611	725,086
1994	1,262	902	592	0	239	52	2	19,530	19,010	697,602
1995	1,402	1,021	682	0	261	58	-1	22,569	21,916	794,918
1996	1,392	1,028	682	0	265	60	1	23,195	22,459	807,793
1997	1,382	1,034	682	0	269	61	2	23,891	23,071	822,727
1998	1,371	1,040	682	0	274	62	3	24,562	23,648	835,086
1999	1,356	1,045	682	0	277	63	2	25,038	24,047	839,379
2000	1,341	1,049	682	0	280	63	3	25,591	24,503	848,262

[a]University of Alaska, Institue of Social and Economic Research, 1979b

TABLE 83[a]

MAP MODEL POPULATION AND EMPLOYMENT PROJECTIONS FOR NORTHWEST REGION

EXPLORATION CASE

Year	Population	Employment	Mining and Exogonous Construction	Manufacturing and Agriculture, Fisheries and Forestry	Local Construction and Transportation	Trade, Service and F.I.R.E.	Government	Wages and Salaries	Real Disposable Personal Income	Per Capita Real Disposable Personal Income
1983	95	47	21	0	23	2	0	91	895	31,730
1984	198	104	51	0	47	5	-o	1,856	1,848	62,520
1985	108	58	3	0	24	3	0	1,017	1,015	35,324
1986	6	1	0	0	0	0	0	27	27	-199
1987	4	1	0	0	0	0	0	11	11	-727
1988	3	Q	o	0	0	0	0	6	6	-836
1989	3	0	0	0	0	0	0	5	4	-891
1990	2	0	0	0	0	0	0	4	4	-875
1991	2	0	0	0	0	0	0	4	3	-879
1992	2	0	0	0	0	0	0	4	3	-855
1993	2	0	0	0	0	0	0	4	3	-824
1994	2	0	0	0	0	0	0	3	3	-832
1995	2	0	0	0	0	0	0	3	3	-832
1996	2	0	0	0	0	0	0	3	3	-836
1997	2	0	0	0	0	0	0	3	3	-801
1998	2	0	0	0	0	0	0	3	2	-813
1999	2	0	0	0	0	0	0	3	3	-789
2000	2	0	0	0	0	0	0	2	2	-801

[a]University of Alaska, Institute of Social and Economic Research 1979b

Northwest region. Nome, Cape Nome and their environs are expected to contain a substantial portion of all primary and secondary employment. Direct employment is expected to be located in largely self-sufficient operating enclaves. Most workers on the balance will be located offshore Although an important service and facilities base will be located onshore at Cape Nome. Offshore employment is especially self-sufficient with minimal impact on local population. SEAR factor analysis should have removed virtually all this group from regional totals. Secondary employment multiples vary depending on the location of the direct employment (residential or enclave). Because of these assumptions, there appears to be some incomparability with the two forecasts.

Overview of Economic Impacts

INTRODUCTION

Discovery and development of petroleum resources on federal leases in Norton Sound would have profound economic impacts on the city of Nome if shore facilities were built within a short distance of town and within the city limits. For the sake of this impact analysis, it is assumed that onshore facilities are built at Cape Nome and that city jurisdiction reaches them. However, it is also assumed that the facilities would be self contained to a large degree, and that workers would reside outside the Nome region rotating on a regular one or two week basis. Dormatory housing and meals would be provided at the camp, just as they are at Prudhoe Bay.

This assumption greatly limits certain potential impacts on the City of Nome, because most of the permanent workforce would presumably choose to live in Anchorage rather than Nome.

Despite the fact that Nome would not be the place of residence for the entire petroleum related workforce, substantial short-term and long-term growth in employment and personal income is foreseen. Also predicted are a decline but not elimination in seasonality of employment and income, and a major improvement of the social infrastructure (city utilities, streets, public buildings, and recreational facilities). There is no reason to expect, however, that unemployment will be eliminated, especially during the winter months.

A general set of economic changes will occur under all three development scenarios, although the magnitude of these changes will vary with the scale of development. Below is a discussion in qualitative terms of the general impacts common to all the scenarios. A quantitative description of certain impacts associated with each scenario is found under each scenario's impact assessment.

EMPLOYMENT IMPACTS

Source and Industrial Classification

Employment will be generated in Nome from three main sources: direct OCS labor requirements (primary employment); spending by local residents directly employed in OCS activities and by transient workers (secondary employment); and by spending of public property tax revenue (public sector employment).

Most of the incremental primary OCS employment will be associated with the producing platforms (platform operation and workover/stimulation drilling). Under the Standard Industrial Classification System (SIC), this employment is considered mining, oil and gas extraction. Workmen employed by contractors engaged in major repair and fabrication activity will-be classified in the construction industry. Helicopter pilots and mechanics, supply boat crews, freight handlers, and pipeline and oil terminal employees will be classified in the transportation industry; and LNG plant operators will be classified in the manufacturing industry. Dames and Moore estimate that roughly 60 percent of the direct OCS labor-force will be in the mining industry, 10 percent in construction, 20 percent in transportation, and 10 percent in manufacturing.

Secondary employment in Nome will serve full-time residents and transient workers. Secondary employment serving the resident workforce will be distributed among the various retail trade divisions (building materials, general merchandise, food stores, and eating and drinking places), services,

and local government, while secondary workers serving the transient workforce will be concentrated in the retail industry, primarily eating and drinking establishments. There is no reason to assume that industries not presently in Nome will emerge (wholesale trade, for example). A general increase in local employment and income could affect some federally funded programs in Nome, such as the Comprehensive Employment Training Act (CETA) program. However, most federally funded programs serving the local and regional native population will probably be unaffected by an increase in local private spending. Indeed, if the social impacts of OCS related growth on Native people is severe, federal spending on social programs could increase.

Public sector employment generated by the spending of property tax revenue would be in the construction trades and in local government. That is, the property tax wealth of Nome would be spent on major capital improvements built by private construction contractors, and on direct municipal employment, the need for much of which would result from the capital expenditures (for example, a municipal swimming pool and gym would require maintenance, a physical education staff, etc.).

Participation by Local Residents

Although construction and operation of petroleum facilities will require a substantial number of skilled workers who will be hired from outside Alaska, it is expected that there will be ample opportunity for local people to obtain primary employment in OCS related activities. Both

on and offshore, during construction and operation, a significant number of semi-skilled jobs will be available for which local people are qualified. These include clerical positions, equipment operators, weather observers, communication jobs, supply boat crews, freight handling, warehouse and store room personnel, laborers and construction tradesmen. Also, local residents would have access to training programs for offshore jobs. While there is not a state law that requires hiring preference be given to Alaskans generally or local residents in particular, it is assumed that the operators would focus recruitment efforts on the local and regional population. This would not be done just to reduce costs but to give the various groups in the community and region a reason to support OCS development.

Seasonality

Employment created by OCS activity will tend to be seasonal during the exploration and development phases. During exploration, seismic work and most exploratory drilling will occur during the late spring, summer, and early fall (ice breakers will be used to extend the drilling season for conventional rigs to 6 months per year). However, winter construction of gravel pads and winter drilling from these pads may also occur.

Construction employment during the development phase will tend to be seasonal, especially in the early years before indoor work is possible. Pipe laying and pipe coating will be summer and fall activities. However, development drilling will occur year around after platforms are in place.

Seasonal fluctuations of employment will be minimized but not eliminated during the production phase. Operation and routine maintenance of the platforms, pipelines, oil terminal, and LNG plant will generate stable monthly employment. However, large construction projects and platform maintenance will be seasonal. Also, winter supplies (drill pipe and other supplies for workovers; fuel, water, provisions for crews, etc) will be stockpiled on the platforms to the greatest extent possible during the ice free months. Thus, construction, maintenance, and re-supply requirements will create a seasonal fluctuation in annual labor demand.

Also, construction activity in Nome that is an indirect result of petroleum activity, such as private housing and commercial development and public capital improvement projects, will continue to be highly seasonal.

Unemployment

No quantitative predictions of unemployment are made, but it is assumed on the basis of past experiences in Alaska that OCS activity will not be a panacea for unemployment problems. While a boom can reduce unemployment temporarily, long-term patterns of unemployment tend to reestablish themselves. This has certainly been the case in Fairbanks and Valdez after completion of the trans-Alaska pipeline, and it was the case after the oil boom receded on the Kenai Peninsula in the late 1960's and early 1970's. Thus, it seems reasonable to assume that unemployment in Nome

during the production phase will continue to vary within the same general range that it now varies (depending upon such factors as the condition of the mining industry, the sate economy, etc.).

IMPACTS ON VILLAGES ECONOMIES

Development of petroleum resources in Norton Sound is likely to cause an increase in the personal income of village residents who are temporarily or seasonally employed in OCS activities. However, no structural change in the village economics can be expected to occur as a direct result of petroleum development. While construction of the trans-Alaska pipeline temporarily increased personal income of many rural Natives, no permanent changes in village economic systems have occurred. On the North Slope, Eskimo villages are benefiting from public sector spending by the North Slope Borough. Since it is assumed that tax revenue benefits of OCS will be localized rather than distributed throughout the region, the changes expected by large scale revenues are expected to focus on Nome and have a minimal effect on the region's villages. Seasonal wages generated by the OCS development can be expected to have effects similar to the present pattern of migration of villagers seeking employment opportunities. It is assumed that opportunities will improve regional incomes but only incrementally since most opportunities will still go to non-regional residents.

PUBLIC SECTOR REVENUE

Under all three petroleum development scenarios the City of Nome will enjoy sugstnatial property tax revenue from the onshore facilities at Cape Nome. It is assumed that this revenue will be the major source of city revenue,

and that, like Valdez, Nome will abandon its sales tax (now 3.0 percent). Each development scenario calls for three major facilities to be located onshore at Cape Nome: an oil terminal, an LNG plant, and a service base. In addition to this new taxable property, Nome will also have new private property in town as a resultof OCS activity, mainly new housing and commercial buildings.

It must be pointed out that the city will not have unlimited access to this taxable wealth. State law establishes limits on the general property tax rate that local governments can set, and on the income that local government can derive from a general property tax. (The 1 imit on income derived from property tax was an effort to make an equitable statewide distribution of the property tax wealth associated with oil production and transportation. See Richard Garnett III, "Equalization of Local Government Revenue in Alaska," ISEGR Occasional Papers No. 9, January, 1973, University of Alaska.) These limits are established by AS 29.53.045 and 050. (These two key provisions of state law must be read together; the state interprets them according to a memorandum from the Attorney General to the Commissioner of the Department of Community and Regional Affairs of March 15, 1978 (file no. J-66-380-78). According to these provisions, no municipality may under any circumstances tax at a rate higher than 30 mills. Within this ceiling of 30 mills, a municipality may tax the full assessed value of its private property as long as it does not exceed revenue of $1,500 per person, or it may tax property valued at no more that 225 percent of the average state per capita assessed valuation multiplied times the number of local inhabitants. Municipalities may choose between the latter two alternative methods of

calculating their allowable property tax. These limits apply only to the collection of property tax income that is used for operating expenses. They do not apply to property tax revenue used to pay debts of the municipality. Thus, municipalities can exceed these limits to repay bonded indebtness incurred for capital improvements.

It is expected that Nome would undertake a major capital improvement program during the production phase. City streets, the municipal water and sewer systems, and the electric system currently need upgrading, and they would require substantial expansion to accommodate growth. The availability of natural gas creates the opportunity for a local distribution system for residential and commercial use, and for power generation. In addition to utilities, capital investments would probably be made in recreational facilities such as a gym and indoor swimming pool and in a small boat harbor for pleasure and fishing boats.

PERSONAL EXPENDITURES

Personal expenditures by the resident primary workforce and by the transient OCS workers are a major source of secondary employment (government spending is also a source of some secondary employment and a significant source of local personal income. An estimate of the general magnitude of this spending has been made for each scenario. The estimates in the tables are based on the assumption that the average transient worker will spend $250 annually in Nome on casual purchases of durable goods, souvenirs, and entertainment in each phase of activity, and that the average resident primary worker will spend $6,750 annually during explora-

tion, and $10,850 during development and production. The estimates of annual resident primary workforce expenditures are based on the assumption that 50 percent of each worker's annual disposable income is spent locally (housing, food, services, and a few durable goods), and that disposable income is 75 percent of the annual average wages of $18,000 during exploration (it is largely seasonal work) and 62 percent of the annual average wages of $35,000 during development and production.

Medium Find OCS Scenario

Reviewing the soc oeconomic character of the community and the existing service infrastru ture, the following observations on the economy and the community, and the additional needs for education, public safety, recreation, utilities, land use and housing, health, social services, and financial capacity are required to the year 2000 in the case of the medium find OCS scenario.

THE ECONOMY AND THE COMMUNITY

Table 76 outlines the employment patterns for the medium find OCS scenario. Primary employment rises to a peak of 3,555 by 1990 and moderates to 2,447 between 1996 and 2000. Between one-fifth and one-fourth of this total works onshore while the balance are employed on offshore facilities. Except for a small increment which decides to take up local residence, - much of the workforce live in a highly self-contained and self-sufficient environment offshore. A portion of the onshore workforce (86 to 89 per-cent) also reside in an enclave environment either at the Cape Nome service base or in coastal work camps.

Secondary employment increases in direct relationship to the primary work-force and phase of development. The real increase in the secondary work-force peaks at 266. There is also in-migration to replace workers in the existing base case secondary employment who shift to primary sec-tor jobs. Secondary employment is sensitive to the level of residential primary employment, the size of the onshore enclave and public sector spending.

Secondary employment is expected to be partially filled by existing unemployed residents available to the workforce (15 percent). The remainder would be filled by primarily native regional residents drawn into the Nome employment area (33 percent), or primarily non-native workers from outside the region who move to Nome (67 percent). For example, if there is a secondary workforce of 100,15 will be filled by local residents, 28 by in-migrant natives and 57 by in-migrant non-natives.

Primary employment is filled by local workers, up to 15 percent of the total, to a ceiling of 250. This causes employment shifts as new workers move in to replace old workers who leave secondary jobs to take those in the primary area. It is assumed that this shifting will produce replacement by a regional population attracted to Nome (15 percent) and by a primarily non-native population from outside the region (85 percent). The implications of this in-migration suggests a shift in the racial balance of the non-OCS case from approximately 63 percent native and 37 percent non-native to a residential division of 56 percent native, 44 percent non-native by 1984 and a 54-46 percent balance by 2000. If the Cape Nome enclave is included, 1987 is projected* to have 50 percent native and 50 percent non-native with a 53-47 split by the year 2000. The medium find scenario also has some effect on the workforce "participation rates. The base case had annual participation rates varying between 35 and 39 percent. Increased employment opportunities in the scenario improves participation to about 41 percent for the residential workforce, an improvement of two to three percent.

Table 84 indicates personal expenditures by the OCS workforce of $364,800 during exploration, most of this attributable to the transient population. Maxi-

mum expenditures of over $5 million occur in year eight. Production phase expenditures decline to approximately $4.2 million by year 12.

TABLE 84

ESTIMATES OF ANNUAL PERSONAi_ EXPENDITURES IN NOME
BY LABORFORCE DIRECTLY EMPLOYED IN OCS ACTIVITIES
MEDIUM FIND SCENARIO[a]
($000, 1 979)

	OCS Laborforce		Expenditures[b]		
Year[c]	Nome Residents	Transient	Nome Residents	Transient	Total
1	6	357	40.5	89.3	129.8
2	14	859	94.5	214.8	309.3
3	16	1,027	108.0	256.8	364.8
4	213	905	2,311.1	226.3	2,537.4
5	274	1,169	2,972.9	292.3	3,265.2
6	347	2,068	3,765.0	517.0	4,282.0
7	336	1,814	3,645.6	453.5	4,099.1
8	392	3,163	4,253.2	790.8	5,044.0
9	385	2,993	4,177.3	748.3	4,925.6
10	373	2,712	4,047.1	678.0	4,725.1
11	354	2,243	3,840.9	560.8	4,401.7
12	345	2,041	3,743.3	510.3	4,253.6
13	345	2,042	3,743.3	510.5	4,253.8
14	345	2,102	3,743.3	525.5	4,268.8
18	345	2,102	3,743.3	525.5	4,268.8

[a]Policy Analysts, Limited

[b]$6,750/resident during exploration, $10,850/resident thereafter; $250/transient worker.

[c]Year 1 = 1983.

EDUCATION

Primary arid Secondary

In order to meet the standards discussed in the appendix, additional students added to the system due to OCS development will require increased manpower and facilities. Significant increases in enrollment begin in the development phase and peak in 1991 when the scenario provides 22.5 percent of the total enrollment (see table 85). This proportion declines to 20 percent by the end of the study period. The significant increase in demand occur in 1986 and 1987, and again in 1990. Even with the scenario added to the base case, the student population still falls 326 below a 1997 forecast used for educational facilities planning. Thus if the plans for an addition to Nome-Beltz, and new elementary school facilities were carried out between 1985 and 1990, it would probably exceed projected needs. In all, 17 additional classrooms will be required. Any requirements above this should be handled on a temporary basis. Total student enrollment rises to 1,178 in 1990 and stabilizes. for the next decade, This is due to a decline in the scenario increment with a corresponding increase in the base case.

Postsecondary Education

Postsecondary education is impacted in the development phase due to greater demand from the residential increment while the production phase generates demands from both residential and onshore enclave populations. In all, 11.4 percent of the students in 1987 are expected to be due to the medium find scenario (see table 86). This is projected to increase to 15.4

TABLE 85

ADDITIONAL TEACHER AND CLASSROOM NEEDS
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

	Non-OCS Base Case			Medium Find Scenario			Total		
	Students	Teachers	Classrooms	Students	Teachers	Classrooms	Students	Teachers	Classrooms
1980	847	65	58	0	0	0	847	65	58
1981	854	66	59	0	0	0	854	66	59
1982	862	66	59	0	0	0	862	66	59
1983	869	67	60	2	0	0	871	67	60
1984	876	67	60	6	1	1	882	68	61
1985	883	68	61	7	0	0	890	68	61
1986	891	69	61	138	10	10	1,029	79	71
1987	898	69	62	193	15	13	1,091	84	75
1988	905	70	62	216	16	15	1,121	86	77
1989	911	70	63	209	16	12	1,120	86	77
1990	918	71	63	260	20	18	1,178	91	81
1991	919	71	63	267	21	19	1,186	92	82
1992	924	71	64	258	20	18	1,182	91	82
1993	928	71	64	247	19	17	1,175	90	81
1994	933	72	64	240	18	17	1,173	90	81
1995	937	72	65	240	19	16	1,177	91	81
1996	942	72	65	240	19	17	1,182	91	82
1997	947	73	65	240	18	17	1,187	91	82
1998	952	73	66	240	19	16	1,192	92	82
1999	956	74	66	240	18	16	1,196	92	82
2000	961	74	66	240	18	17	1,201	92	83

TABLE 86

POSTSECONDARY STUDENT ENROLLMENT PROJECTIONS
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case[a]		Medium Find Scenario		Total	
	Semester Students	Credit Hours	Semester Students	Credit Hours	Semester Students	Credit Hours
1980	313	1,722	0	0	313	1,722
1981	335	1,841	0	0	335	1,841
1982	358	1,969	0	0	358	1,969
1983	381	2,098	0	0	381	2,098
1984	406	2,233	0	0	406	2,233
1985	431	2,373	0	0	431	2,373
1986	458	2,517	41	227	499	2,744
1987	485	2,666	63	347	548	3,013
1988	513	2,820	76	418	589	3,238
1989	542	2,979	78	429	620	3,408
1990	571	3,143	104	572	675	3,715
1991	574	3,159	132	726	706	3,885
1992	577	3,175	125	688	702	3,863
1993	580	3,190	120	660	700	3,850
1994	583	3,206	117	641	700	3,847
1995	586	3,222	117	641	703	3,863
1996	589	3,238	117	641	706	3,879
1997	592	3,255	117	641	709	3,896
1998	595	3,271	117	641	712	3,912
1999	598	3,288	117	641	715	3,929
2000	601	3,304	117	641	718	3,945

[a]Regional Projections

percent in 1990, and 16.3 percent in 2000. The additional students and accompanying credit hours are important and will require additional faculty. Present expansion plans and other community and enclave facilities should be sufficient to meet the projected increase in demand.

PUBLIC SAFETY

Police

Using the standard of one sworn officer per 500 people added to the population, the following table displays manpower requirements for the non-OCS case, the medium find scenario and the total cumulative effect for the period under study. A minimum of six sworn officers are necessary as a base to provide 24 hour police protection. The base population requiring 24 hour protection has been designated at 1,500.

The standard generates an addition of two sworn officers over and above the non-OCS case beginning in 1987. This constitutes an increase of 18 percent over the non-OCS case and a very significant 86 percent increase over the present manpower capability. The department presently employs seven sworn officers and in order to accommodate the affects of OCS development, it will virtually have to double in size by 1989. Growth of this magnitude is of significant concern with respect to the level of effectiveness in the community and the associated strains on the administration of the force.

TABLE 87

POLICE MANPOWER REQUIREMENTS
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case	Medium Find Scenario	Total
1983	10	0	10
1984	10	0	10
1985	10	0	10
1986	10	1	11
1987	10	2	12
1988	10	2	12
1989	11	2	13
1990	11	2	13
1991	11	2	13
1992	11	2	13
1993	11	2	13
1994	11	2	13
1995	11	2	13
1996	11	2	13
1997	11	2	13
1998	11	2	13
1999	11	2	13
2000	11	2	13

In addition, several other factors should be considered. First, the estimate of police needs are made on the permanent residential population. It is reasonable to expect that public safety in work camps, the Cape Nome enclave and onshore facilities will be handled by private security. However, many direct workers, especially onshore, will have access to the Nome community and thus accentuate present public safety problems. If non-resident onshore workers are included, one additional sworn officer would be necessary to meet service needs.

A second problem is the possibility of an increased incidence of part I crimes. Rapid growth, higher levels of transiency and in-migration not necessarily compatible with existing racial and cultural composition can be expected to result in a rise in an already significantly high part I crime index. While all part I crimes could rise, it is expected that crimes of violence (murder, rape, assault) would be especially effected. In addition, part II crimes such as simple assault, vandalism, weapons possession, prostitution and disorderly conduct induced by alcohol abuse are expected to spiral. These kinds of changes in the rate of crime could increase the need for additional manpower.

A third consideration is the role of the state troopers. Presently, the troopers, headquartered in Nome, provide regional assistance usually outside the city limits. With development of oil and gas reserves, it is very likely that state assistance would increase the presence of the troopers in the detachment.

Detention Facilities

Detention facility requirements dictate a ratio of one jail cell per 500 in the population with a minimum of three cells to allow for separation of male adults, female adults and juvenile offenders. At the peak impact point in the medium find scenario, Nome should ideally have four additional cells over the non-OCS case for a total facility requirement of 19. After 1990, the demand tapers off to an incremental need of three additional detention cells over the non-OCS case. From a simple cost standpoint, Nome need maintain no more than 19 to 20 cells or beds to accommodate demand from the medium find scenario. If additional need is determined, demand could be met by utilizing other state facilities rather than creating additional facilities to meet a short-term demand.

The detention facility requirements table is based on the total population anticipated to impact Nome as a result of the medium find scenario and is adjusted to reflect the regional orientation of the facility. Since Nome constitutes approximately 47 percent of the region's population, the projections in the base case have been doubled to allow for the regional perspective.

The present detention facility has a total of 30 dormitory beds and eight cell beds. Plans are on board through the Department. of Health and Social Services for a new facility between 1983 and 1985. It is assumed that sizing of such a facility will be geared to long range need and will ultimately be capable of accommodating demand generated through OCS activity.

TABLE 88

DETENTION FACILITY REQUIREMENTS
NON-OCS BASE CASE - MEDIUM FIND SCENARIO
(Cumulative)

Year	Non-OCS Case Medium Find Scenario		Total
1983	13	0	13
1984	14	0	14
1985	14	0	14
1986	14	2	16
1987	14	3	17
1988	15	3	18
1989	15	3	18
1990	15	4	19
1991	15	3	18
1992	15	3	18
1993	16	3	19
1994	16	3	19
1995	16	3	19
1996	16	3	19
1997	16	3	19
1998	16	3	19
1999	16	3	19
2000	16	3	19

Fire

The following calculations for fire flow needs are based on a constant of 1,893 liters (500 gallons) per minute minimum within Nome's distribution system. Added to this constant is the minimum community water requirement which yields a projected total minimum pumping capacity within the water distribution system. The cumulative water and fire flow need is presented for the non-OCS case, the medium find scenario and the total combined effect of the standard through the period under study.

To accommodate OCS demand, Nóme's water distribution system, at a minimum, should be capable of pumping 2,986 liters (789 gallons) per minute to meet normal water usage rates and minimum fire flow. The incremental affect of the medium find scenario over the non-OCS case reaches a peak in 1991 at 280 liters (74 gallons) per minute. Presently, the system's capacity is 2,460 liters (650 gallons) per minute indicating a deficiency as early as year one of the lease sale. Furthermore, the above fire flow standard is not considered sufficient to accommodate fire flow needs for large structures such as hospitals or schools. In order to insure adequate fire protection to the community, Nome will need to upgrade its pumping capability early-on.

Equipment and manpower requirements are considered sufficient to meet permanent residential population demand. It is assumed that the enclave facilities will develop fire fighting capabilities commensurate with the level of fire hazard associated with such facilities.

TABLE 89

MINIMUM FIRE FLOW REQUIREMENTS
NON-OCS BASE CASE - MEDIUM FIND SCENARIO
(Cumulative)

Year	Minimum Fire Flow		Non-OCS Base Case				Medium Find Scenario				Total			
			Minimum Water Requirement		Total Pumping Capability		Minimum Water Requirement		Total Pumping Capability		Minimum Water Retirement		Total Pumping Capability	
	LPM[a]	GPM[b]	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	GPM	LPM	GPM
1983	1,893	500	696	184	2,589	684	4	1	1,896	501	700	185	2,593		685
1984	1,893	500	712	188	2,604	688	8	2	1,900	502	719	190	2,612		690
1985	1,893	500	727	192	2,619	692	8	2	1,900	502	734	194	2,627		694
1986	1,893	500	742	196	2,634	696	144	38	2,036	538	886	234	2,778		734
1987	1,893	500	753	199	2,646	699	204	54	2,097	554	958	253	2,850		753
1988	1,893	500	768	203	2,661	703	227	60	2,120	560	995	263	2,888		763
1989	1,893	500	787	208	2,680	708	220	58	2,112	558	1,007	266	2,899		766
1990	1,893	500	802	212	2,695	712	273	72	2,165	572	1,075	284	2,967		784
1991	1,893	500	806	213	2,699	713	280	74	2,173	574	1,086	287	2,979		787
1992	1,893	500	810	214	2,702	714	269	71	2,161	571	1,019	285	2,971		785
1993	1,893	500	814	215	2,706	715	257	68	2,150	568	1,071	283	2,964		783
1994	1,893	500	818	216	2,710	716	254	67	2,146	567	1,071	283	2,964		783
1995	1,893	500	821	217	2,714	717	254	67	2,146	567	1,075	284	2,967		784
1996	1,893	500	825	218	2,718	718	254	67	2,146	567	1,079	285	2,971		785
1997	1,893	500	829	219	2,721	719	254	67	2,146	567	1,083	286	2,975		786
1998	1,893	500	833	220	2,725	720	254	67	2,146	567	1,086	287	2,979		787
1999	1,893	500	836	221	2,729	721	254	67	2,146	567	1,090	288	2,983		788
2000	1,893	500	844	223	2,737	723	250	66	2,146	567	1,094	289	2,986		789

[a]LPM= liters per minute
[b]GPM = gallons per minute

RECREATION

The following table displays recreational facility requirements for the non-OCS case, the medium find scenario and the combined cumulative affect through the period under study. The facility requirements are based on nationally accepted optimum standards as generated by the National Recreation and Parks Association. As noted in the facilities inventory in the baseline section of this report, Nome meets or exceeds the minimum requirements for play lots, softball fields and skating rinks as displayed in the table. Undoubtedly, additional revenues to the City of Nome as a result of oil and gas development will be used to expand and enhance existing facilities as well as developing new ones. Due to land constraints and lower public interest, however, land acquisition for major park development may be a problem. Based on the action of other Alaskan communities which have benefited from oil tax revenue all other categories would undoubtedly be pursued.

It is assumed that workers housed in the onshore enclave would be provided with a wide variety of recreational facilities and activities which would virtually eliminate impact on local recreational facilities.

UTILITIES

Water

Per capita water consumption has been estimated at 303 lpcpd (80 gpcpd) for planning purposes and will be used as the standard to assess permanent residential water demand for the period under study. The following table displays water requirements for the non-OCS case, the medium find scenario

TABLE 90

RECREATION FACILITIES REQUIREMENTS
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

	Play Lots			Neighborhood Parks			Basketball Courts			Tennis Courts			Softball Fields			Skating Rinks			Community Centers		
Year	Base[a]	Medium[b]	Total	Base	Medium	Total	Base	Medium	Total	Base	Medium	Total	Base	Medium	Total	Base	Medium	Total	Base	Medium	Tots 1
1983	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1984	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1985	1-7	0	1-7	2	0	2	2	0	2	2	0	2 '	1	0	1	0	0	0	0	0	0
1986	1-7	2	2-8	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1987"	1-7	2	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1988	1-7	2	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1989	2-7	3	2-1o	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1990	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1991	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1992	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1993	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1994	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1995	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1996	2-8	2	2-10	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1997	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1998	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1999	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
2000	2-8	2	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	o

[a] Non-OCS Base Case
[b] Medium Find Scenario

TABLE 91

WATER REQUIREMENTS - LITERS PER DAY
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

	Non-OCS Base Case		Medium Find Scenario		Total	
Year	Million Liters Per Day	Gallons Per Day	Liters Per Day	Gallons Per Day	Million Liters Per Day	Gallons Per Day
1983	1.0	265,360	3,936	1,040	1.0	266,400
1984	1.0	270,640	9,690	2,560	1.0	273,200
1985	1.0	276,080	10,295	2,720	1.1	278,800
1986	1.1	281,600	208,629	55,120	1.3	336,720
1987	1.1	287,200	291,596	77,640	1.4	364,240
1988	1.1	292,960	327,327	86,480	1.4	379,440
1989	1.1	298,800	316,729	83,680	1.5	382,480
1990	1.2	304,800	393,640	104,000	1.6	408,800
1991	1.2	306,320	404,238	106,800	1.6	413,120
1992	1.2	307,840	390,006	103,040	1.6	410,880
1993	1.2	309,360	373,958	98,800	1.5	408,160
1994	1.2	310,880	363,966	96,160	1.5	407,040
1995	1.2	312,400	363,966	96,160	1.5	408,560
1996	1.2	314,000	363,966	96,160	1.6	410,160
1997	1.2	315,600	363,966	96,160	1.6	411,760
1998	1,2	317,200	363,966	96,160	1.6	413,360
1999	1,2	318,800	363,966	96,160	1.6	414,960
2000	1.2	320,400	363,966	96,160	1.6	416,560

and the total cumulative affect of the standard in use.

Total water demand for the community of Nome reaches a peak in 1991 and again in the year 2000 with a system capacity requirement of 1.6 million liters (416,560 gallons) per day. Nome's present water source has the potential to yield 1.9 million liters (489,600 gallons) of water per day which is sufficient to meet water demand through the forecast period. The incremental affect of the medium find scenario reaches a high in 1991 of 404,238 liters (106,800 gallons) per day and slowly declines to 363,966 liters (96,160 gallons) per day by 2000. The difference is picked UP, however, with the natural population increase anticipated in the non-OCS case.

Storage facilities should ideally accommodate a three day reserve. Present storage capacity is 1.2 million liters (320,000 gallons) which is not sufficient to meet reserve requirements. However, plans are proposed to build a 4.5 million liter (1.2 million gallons) storage facility which would be adequate to meet the three day reserve requirement through the forecast period.

It is assumed that increased city revenues generated through OCS activity in the region will provide sufficient capital to expand the water distribution system to include all old and new feasible construction not receiving this service.

During the exploration and possibly during the development phase of OCS activity, offshore rigs, boats and barges may decide to utilize the community's present water source. Table 92 displays water requirements for offshore activity thorugh the forecast period. The standard use is 379 lpcpd (100 gpcpd) Assuming offshore activity utilizes the existing water source through 1990, (or the end of the development phase) the combined peak impact w· 11 reach 2.3 million liters (509,960 gallons) per day. This significantly exceeds the capability of the source in use by 25 percent. In actuality, it would only be feasible to utilize the existing source through 1987 at which time an alternative will have to be identified and and developed.

Onshore enclave facilities are assumed to identify and develop their own water source. Assuming a per capita consumption of 478 lpcpd (125 gpcpd) onshore onsite facilities will, at a minimum, require 268,735 liters (71,000 gallons) per day. Any water requirements for fire flow would be over and above this figure. This is based on the peak onshore, onsite population of 568 anticipated by 1990. Additional demand from offshore activity would be added to this as displayed in table 92.

Sewer

Wastewater generation closely approximates water consumption, and for the purpose of assessing impact, it is assumed that the two are equal. Water consumption is estimated for planning purposes at 303 lpcpd (80 gpcpd) and will be employed as the standard to assess effluent quantities. The following table displays amounts generated over the forecast period.

TABLE 92

OFFSHORE WATER REQUIREMENT
MEDIUM FIND SCENARIO
(Cumulative)

Year	Offshore Water Requirement	
	LPD[a]	GPD[b]
1983	123,013	32,500
1984	296,366	78,300
1985	355,033	93,800
1986	275,927	72,900
1987	224,072	59,200
1988	752,080	198,700
1989	651,020	172,000
1990	1,014,759	268,100
1991	1,065,478	281,500
1992	967,446	255,600
1993	784,252	207,200
1994	707,795	187,000
1995	707,795	187,000
1996	732,019	193,400
1997	732,019	193,400
1998	732,019	193,400
1999	732,019	193,400
2000	732,019	193,400

[a]LPD = liters per day
[b]GPD = gallons per day

TABLE 93

WASTEWATER GENERATION - LITERS PER DAY
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

	Non-OCS Base Case		Medium Find Scenario		Total	
Year	Million Liters Per Day	Gallons Per Day	Liters Per Day	Gallons Per Day	Million Liters Per Day	Gallons Per Day
1983	1.0	265,360	3,936	1,040	1.0	266,400
1984	1.0	270,640	9,690	2,560	1.0	273,200
1985	1.0	276,080	10,295	2,720	1.1	278,800
1986	1.1	281,600	208,629	55,120	1.3	336,720
1987	1.1	287,200	291,596	77,040	1.4	364,240
1988	1.1	292,960	327,327	86,480	1.4	379,440
1989	1.1	298,800	316,729	83,680	1.5	382,480
1990	1.2	304,800	393,640	104,000	1.6	408,800
1991	1.2	306,320	404,238	106,800	1.6	413,120
1992	1.2	307,840	390,006	103,040	1.6	410,880
1993	1.2	309,360	373,958	98,800	1.5	408,160
1994	1.2	310,880	363,966	96,160	1.5	407,040
1995	1.2	312,400	363,966	96,160	1.5	408,560
1996	1.2	314,000	363,966	96,160	1.6	410,160
1997	1.2	315,600	363,966	96,160	1.6	411,760
1998	1.2	317,200	363,966	96,160	1.6	413,360
1999	1.2	318,800	363,966	96,160	1.6	414,960
2000	1.2	320,400	363,966	96,160	1.6	416,560

Total community requirements will dictate a collector system which can accommodate flows up to 1.6 million liters (416,560 gallons) per day. This is an overall increase of 56 percent over the forecast period.

Nome presently handles effluents through a primary treatment facility which is currently operating at capacity. However, federal mandates are necessitating the installation of secondary treatment systems, and as a result, the city has contracted for a facilities plan. The study projects a population for the Nome area of 5,000 by the year 2000 and recommends several secondary treatment alternatives. Under serious consideration is a 4.9 hectare (12 acre) lagoon which would be sized sufficiently to meet demand through 1989. After 1989, expansion of such a secondary system would be necessary to accommodate continued growth as a result of the medium find scenario. In any event, the present system is definitely inadequate in meeting any OCS or non-OCS growth.

Onsite, onshore facilities are assumed to provide for their own wastewater collection and disposal. The level of effluent treatment to be used is unknown. However, whatever type of system is used, flows at a minimum of 283,815 liters (75,000 gallons) will have to be met based on a per capita wastewater generation of 473 lpcpd (125 gpcpd).

Electricity

The following table displays load requirements for the non-OCS case, the medium find scenario and the total cumulative impact for the period under study. In the non-OCS case a per capita load of 2,0 KW is in use to generate the level of service capacity. For the OCS scenario increment, a slightly higher per capita demand is anticipated at 2.5 KW. The two columns are combined yielding a total system capacity requirement for the permanent population in the community.

Total generation capability is presently 5,850 KW. The city has plans to add an eighth unit with a firm capacity of 2,500 KW bringing total generation capability to 8,350 KW. This capacity would only accommodate OCS activity through 1985. In addition due to a short-term surplus anticipated by the city, several of the smaller generators will probably be retired. The overall implication of the medium fired scenario is that prior to OCS development and production phases, generating capacity will have to be significantly increased. Over the forecast period, the overall effect of the medium find scenario produces an increased need of 65 percent.

It is important to note that with rising fuel prices, diesel generation is becoming a costly method of generating electricity. Alternative forms of power generation are being considered such as geothermal and hydroelectric. However, any new major development will have to be implemented immediately and will need to be subsidized in the interim with diesel generation until such time as the new system is on line. The meeting

TABLE 94

KW LOAD REQUIREMENTS
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case KW	Medium Find Scenario KW	Total KW
1983	6,634	33	6,667
1984	6,766	80	6,846
1985	6,902	85	6,987
1986	7,040	1,723	8,763
1987	7,180	2,408	9,588
1988	7,324	2,703	10,027
1989	7,470	2,615	10,085
1990	7,620	3,250	10,870
1997	7,658	3,338	10,996
1992	7,696	3,220	10,916
1993 "	7,734	3,088	10,822
1994	7,772	3,005	10,777
1995	7,810	3,005	10,815
1996	7,850	3,005	10,855
1997	7,890	3,005	10,895
1998	7,930	3,005	10,935
1999	7,970	3,005	10,975
2000	8,010	3,005	11,015

of future energy requirements, with all the federal limitations and restrictions may be one of Nome's most critical problems in accommodating OCS activity. With development of petroleum resources in the region, Nome may be able to utilize natural gas as a more cost effective means of power generation. However, an exemption from the Power Plant and Industrial Fuel Use Act which bans the use of natural gas as a source for new base load will have to be obtained.

It is assumed that onshore enclave facilities will also have large power demands. However, the oil and gas processed in these facilities are often used for electrical generation and for the purpose of assessing impact, this is assumed to be the course of action which will be followed.

Solid Waste

Solid waste generation for Nome has not actually been calculated; however, national standards indicate an estimated per capita solid waste generation rate of 2.3 kilograms (5 pounds) per capita per day. As per standards, utilizing a fill depth of 2.1 meters (7 feet) of which two-thirds is solid waste material, .08 hectares (.21 acres) per year per 1,000 people is required to accommodate a sanitary landfill. The following two tables display the quantities of solid waste generated per year and the landfill requirement by the end of the study period for the non-OCS case, the medium find scenario and the combined effect of the two projections.

TABLE 95

SOLID WASTE GENERATION
QUANTITY OF SOLID WASTE PER YEAR

Year	Non-OCS Base Case		Medium Find Scenario		Total	
	Metric Tons	Us. Tons	Metric Tons	U.-s. Tons	Metric Tons	Us. Tons
1983	2,745	3,026	11	12	2,755	3,038
1984	2,800	3,087	26	29	2,826	3,116
1985	2,856	3,149	28	31	2,884	3,180
1986	2,913	3,212	570	629	3,484	3,841
1987	2,971	3,276	797	879	3,769	4,155
1988	3,031	3,342	894	986	3,925	4,328
1989	3,091	3,408	866	955	3,957	4,363
1990	3,154	3,477	1,076	1,186	4,229	4,663
1991	3,169	3,494	1,105	1,218	4,274	4,712
1992	3,184	3,511	1,067	1,176	4,251	4,687
1993	3,201	3,529.	1,022	1,127	4,223	4,656
1994	3,216	3,546	995	1,097	4,211	4,643
1995	3,232	3,563	995	1,097	4,227	4,660
1996	3,249	3,582	994	1,096	4,243	4,678
1997	3,265	3,600	995	1,097	4,260	4,697
1998	3,282	3,618	995	1,097	4,277	4,715
1999	3,298	3,636	995	1,097	4,293	4,733
2000	3,315	3,655	994	1,096	4,309	4,751
TOTAL	55,972	61,711	14,425	15,905	70,397	77,616

TABLE 96

LANDFILL REQUIREMENTS

NON-OCS BASE CASE - MEDIUM FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case		Medium Find Scenario		Total	
	Hectares	Acres	Hectares	Acres	Hectares	Acres
1983	.28	.70	0	0	.28	.70
1984	.29	.71	.004	.01	.29	.72
1985	.29	.72	.004	.01	.30	.73
1986	.30	.74	.06	.14	.36	.88
1987	.30	.74	.09	.22	.39	.96
1988	.31	.77	.09	.23	.40	1.0
1989	.32	.78	.09	.22	.40	1.0
1990	.32	.80	.12	.30	.45	1.1
1991	.32	.80	.12	.30	.45	1.1
1992	.32	.80	.12	.30	.45	1.1
1993	.33	.81	.12	.29	.45	1.1
1994	.33	.82	.11	.28	.45	1.1
1995	.33	.82	.11	.28	.45	1.1
1996	.33	.82	.11	.28	.45	1.1
1997	.34	.83	.11	.27	.45	1.1
1998	.34	.83	.11	.27	.45	1.1
1999	.34	.84	.11	.26	.45	1.1
2000	.34	.84	.11	.26	.45	1.1
TOTAL	5.73	14.17	1.588	3.92	7.37	18.09

The total amount of solid waste generated by the community over the forecast period will be 70,397 metric tons (77,616 U.S. tons) which is a 26 percent increase over the base case and yields a total fill requirement of 7.37 hectares (18.09 acres). In addition, the city should maintain at least one collection vehicle through the forecast period to accommodate demand.

OCS generated solid waste is assumed to be handled through the facilities located in proximity with the enclave at Cape Nome. However, during the development phase, some generation of solid waste might occur where it would be more expeditious to utilize the community's landfill. However, this amount will probably not significantly impact the land requirements as noted above.

Telephone

The following tab" e indicates the number of main stations required in the non-OCS case, the medium find scenario and the total cumulative effect of the two projections over the forecast period. The projections are based on the standard of .53 telephones per person increasing to .61 telephones per person between 1980 and 2000 at a rate of .02 telephones per person every five years.

The present system by General Telephone Company of Alaska serves 584 residential working stations and 1,028 commercial working stations for a total of 1,612. The present switching equipment can accommodate 200 more main stations before saturation occurs. This essentially means

TABLE 97

CAPACITY REQUIREMENTS - TELEPHONE SERVICE
NON-OCS BASE CASE - MEDIUM FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case	Medium Find Scenario	Total
1983	1,791	7	1,798
1984	1,861	18	1,879
1985	1,898	19	1,917
1986	1,936	379	2,315
1987	2,010	539	2,549
1988	2,051	605	2,656
1989	2,129	596	2,725
1990	2,172	741	2,913
1991	2,183	761	2,944
1992	2,232	747	2,979
1993	2,243	716	2,959
1994	2,293	709	3,002
1995	2,304	709	3,013
1996	2,316	709	3,025
1997	2,367	721	3,088
1998	2,379	721	3,100
1999	2,431	733	3,164
2000	2,443	733	3,176

that as early as year one of the lease sale, General Telephone Company of Alaska will have to expand their switching equipment to accommodate the effect of the medium find scenario. At that point in time, a move to solid state switching equipment is anticipated.

With regard to the enclave facility located at Cape Nome, it is assumed that Alascom will meet facility requirements as deemed necessary to accommodate communication needs.

HOUSING AND LAND USE

Housing and Residential Land

Compared to the base case, the medium find scenario rapidly accelerates the estimated rate of growth in housing demand between 1986 and 1991 (see table 98). These years represent the period of the major housing and residential land demand in Nome under this scenario. From 1991 to 1994, there will actually be a surplus of units on the market if construction keeps pace with the demand during the height of OCS employment. After 1994, the overall level of new housing demand returns to approximately the level projected for the base case.

In the medium find scenario, the incremental effect above the base case upon demand levels from 1983 to the year 2000 is approximately 387 additional dwelling units and between 62 acres (25 hectares) and 123 acres (50 hectares) of residential land (tables 98 and 99). This represents over 180 percent of the total increase in housing and residential land

TABLE 98

FORECAST OF NET CHANGE IN HOUSING DEMAND[a]
NON-OCS BASE CASE - MEDIUM FIND SCENARIO

	Non-OCS Base Case		Net Residential Medium Find Scenario			Total	
Year	Net Change Demand for Housing Units	Cumulative Housing Demand	Population Increase Over Base Case	Net. Change Demand for Housing Units	Cumulative Housing Demand Over Base Case	Net Change Demand for Housing Units	Cumulative Housing Demand
1983	18	18	13	4	4	22	22
1984	18	36	19	6	10	24	46
1985	19	55	2	1	11	20	66
1986	20	75	655	211	222	231	297
1987	20	95	274	88	310	108	405
1988	21	116	118	38	348	59	464
1989	21	137	(35)	(11)	337	10	474
1990	21	158	254	82	419	103	577
1991	5	163	35	11	430	16	593
1992	5	168	(47)	(15)	415	(10)	583
1993	6	174	(53)	(17)	398	(11)	572
1994	5	179	(33)	(11)	387	(6)	565
1995	6	185	0	0	387	6	572
1996	6	191	0	0	387	6	578
1997	5	196	0	0	387	5	583
1998	6	202	0	0	387	6	589
1999	6	208	0	0	387	6	595
2000	6	214	0	0	387	6	601
Total	214		1,202	387		601	

[a]See Methods Section

TABLE 99

ESTIMATED DEMAND FOR RESIDENTIAL LAND
MEDIUM FIND SCENARIO

		Within Existing Corporate Limits	Outside Existing Corporate Limits		
	Net New Housing Units	Net New Residential Land Use (Acres)[a]	Net New Residential Land Use (Acres)[a]	Public Rights-of-way (Acres)[a]	Gross New Residential Land Use (Acres)[a]
1983-1985	11	1.8	2.5	1.0	3.5
1986-1990	408	65.6	93.7	36.4	130.1
1991-1995	(32)	(5.1)	(7.3)	(2.9)	(10.2)
1996-2000	0	0	0	0	0
TOTAL	387	62.3	88.9	34.5	123.4

[a]Multiply by .40469 to obtain hectares

estimated to be needed under the base case between 1983 and 2000. (These figures do not include 52 units projected under the base case from 1980 to 1982).

The rapid increase in housing demand projected in the medium find scenario will probably cause Nome rents to inflate. Though this will have a negative impact on all renters, the poor are likely to be the most affected. When rents increase, those with limited and irregular incomes will probably be the first to be forced into substandard housing. Many low-income families were protected because Nome had a high ownership rate in governmental housing. But, according to Ellanna (1980, p. 387-388), HUD regulations require the purchaser of low income housing to pay for utilities, which are rising beyond the point that some purchasers are able to pay. Therefore, many buyers were forced to revert back to renter status.

Rents in Nome are already too high for low income families renting privately owned dwellings to receive governmental rental subsidies (Ellanna, 1980, p.387). Therefore, when rents increase with OCS development, the chances for governmental rental subsidies will further diminish.

One possible method of building additional housing in Nome is through governmental funded housing. As Ellanna (1980, p.386) points out, the City of Nome is apparently reluctant to participate in additional government funded housing in Nome because of problems associated with providing water and sewer services to these houses. The city would have this responsibility, and it is hesitant to expand its system before it can

adequately serve existing homes. In addition, current HUD low income housing programs require the local government (in this case the city) to give up taxing authority and receive small payments in lieu of taxes. Thus, the city may be put in the situation of having to provide services to these homes without being able to adequately tax the residents.

Because of the uncertainty of OCS development in the Nome area, it is doubtful that the private sector will bet on oil development and therefore build enough housing beforehand to meet the potential demand. This projection, coupled with the city's reluctance to participate in additional government funded housing, leads to the conclusion that there will be a definite housing shortage in Nome under the medium find scenario. The shortage will be gradual until 1986, when 211 additional units are required under the scenario (see table 98). After the demand becomes critical, the private sector will probably respond by constructing additional dwellings. Therefore, high impacts, caused by housing shortages, are forecasted for Nome. This will probably result in rising costs and rents, which will tend to force the less affluent, long-term residents into poorer housing.

Some of Nome's seasonal and transient housing (between 52 and 66 hotel rooms and the 50 man Alaska Gold Company camp) could be used before the enclave is completed or with early OCS support services and exploration. But, there is no evidence that Alaska Gold Company will make its camp available or that it might not be full. In addition, any reliance on Nome's limited hotel stock may prove futile during the peak tourist

months in the summer. Even under present conditions, it is often difficult to find a hotel room in Nome during the tourist season.

The lack of residential lots in Nome is currently a problem (see the Baseline), and growth caused by OCS development will compound this problem. As discussed in the Baseline, city expansion is difficult because Nome is surrounded by patented mining claims. Therefore, future building sites must come from privately owned undeveloped land both within and outside of the Nome townsite as well as city owned lots within Nome.

The two major land owners of vacant, platted but undeveloped lots in Nome are the city and private parties. Much of this land is located northeast of the central core area. A lack of roads makes much of this area inaccessible. Though an EDA drainage project will extend Sixth Avenue and drain some of this land, adequate lots for forecasted residential expansion will not be made available. In addition, water and sewer services will present another problem,

It is not possible to determine when private parties will sell residential lots held for speculation or other purposes. Presumably, if the price becomes inflated high enough, many privately owned lots will be sold. The high land prices will probably result in many lots being divided in half to get two dwellings on one 7,000 square foot lot. Also, a trend towards multi-family units may emerge. Both of these conditions will lead to crowding in the community.

The forecasted residential land requirements (see table 99) and the problems associated with meeting this demand within the city limits will probably force construction out of the city. For example, Icy View still has approximately 80 vacant lots. Possibly, additional subdivisions will emerge outside of the city limits. Services to these new residences will present a problem. Mater and sewer are currently hauled back and forth from Icy View, a less than desirable arrangement. Serving a couple of hundred homes in this manner can cause untold problems. Especially during winter when lack of snow removal, already a difficulty in Icy View, causes the system to break down.

Industrial Land Requirements

In the medium find scenario, potential Cape Nome land requirements for the crude oil terminal and LNG facility are estimated to be between 224 acres (91 hectares) and 424 acres (171 hectares) (table 100), depending on site topography and building conditions. These figures are based on the assumption that the total acreage required for a terminal facility is twice the amount of land needed for storage (Kramer, 1978}. In addition, the calculations are based on peak productions of both oil and gas. A ten day storage period is assumed because of potential tanker delays caused by poor weather and related ice problems in the Bering Sea.

TABLE 100

ESTIMATED LAND REQUIREMENTS FOR OIL TERMINAL AND LNG FACILITY
CAPE NOME
MEDIUM FIND SCENARIO

Peak Production Oil B/D	10 Day Storage Capacity (Million Brls)	10 Day Storage Area		Total Area Required For Oil Terminal		LNG Facility	Total Area Required For Oil Terminal and LNG Facility	
		Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)	Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)	Acres (Hectares)	Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)
463,000	4.63	66 (27)	166 (67)	132 (54)	332 (134)	92 (37)	224 (91)	424 (171)

Many potential problems exist with locating an oil terminal and LNG facility at Cape Nome. Land ownership and use conflicts could develop between industry and traditional users and owners of much of the land in the area. Sitnasuak, a major landowner through ANCSA in the Cape Nome area (once the land is conveyed), may be opposed to locating an oil terminal at Cape Nome. The area has traditionally been used for subsistence activities, and numerous Native allotments are located in the general vicinity. In addition, numerous archeological sites are located in the Cape Nome area.

Though specific airport and port land requirements associated with OCS development do not appear to present a problem, freight transported from either of these facilities to Cape Nome could be the source of potential difficulties. As discussed in the Baseline, the main route from either the airport or port to Cape Nome is through Nome's main commercial avenue, Front Street. Depending upon the amount of freight and people projected to pass from the port and airport to Cape Nome, this condition could cause undesirable effects in the community. The streets are not designed for heavy industrial traffic. If an attempt were made to replat another street to provide industrial access to Cape Nome, it would not only be expensive, but also residential land would be lost in the process. In addition, replanting would prove difficult because of the many clouded title problems in Nome (see Baseline). Numerous right-of-way infringements already exist in Nome.

HEALTH

Applying the ratios of 3.5 acute care beds per 1,000 people and one primary care physician per 1,500 population, table101 projects the added beds and physicians needed under the medium find scenario. The present hospitals facilities will be sorely strained with OCS development. In the base case, additional beds are required slowly and incrementally throughout the study period. The present number of beds provides some excess capacity to accommodate needs in the short-term. Oil and gas development begin affecting the health infrastructure in 1983 and build to an additional need of 17 beds in 1990, This is a substantial additional demand and represents a 71 percent increase in required capacity. About 24 percent of this increased demand should be handled on a temporary basis without permanent facilities but 13 beds above the base case are required on a long-term basis. This increment would require additional facilities significantly above what is presently available. In 1990, a facility with 37 beds with temporary availability of four additional beds would be needed. This is double their present capacity. To cope with this demand, planning and feasibility work would have to begin in 1982 and 1983 so once the extent of OCS development were determined, new facilities could be added by 1985-1986.

Having adequate health facilities and services available to the community, region, and offshore and onshore OCS enclaves are important. These health care needs for primary OCS employees will be partially met through a rapid medical care evacuation system. It would seem likely that the fact that the enclave approach means rotation of most employees to homes outside of the Norton Sound area means that local health systems will not be

TABLE 101

ADDITIONAL ACUTE CARE BED AND PRIMARY CARE PHYSICIAN NEED
NON-OCS BASE - MEDIUM FIND SCENARIO
(Cumulative)

	Non-OCS Base Case[a]		Medium Find Scenario		Total	
Year	Acute Care Beds	Primary Care Physicians	Acute Care Beds	Primary Care Physicians	Acute Care Beds	Primary Care Physicians
1980	20	4	0	0	20	4
1981	20	4	0	0	20	4
1982	21	4	0	0	21	4
1983	21	4	1	0	22	4
1984	22	4	3	1	25	5
1985	22	4	4	1	26	5
1986	22	4	6	1	28	5
1987	23	4	8	1	31	5
1988	23	4	12	2	35	6
1989	24	4	11	2	35	6
1990	24	4	17	3	41	7
1991	24	4	15	3	39	7
1992	25	4	15	3	40	7
1993	25	4	13	3	38	7
1994	26	4	12	2	38	6
1995	26	4	12	2	38	6
1996	26	4	13	2	39	6
1997	27	4	13	2	40	6
1998	27	4	13	2	40	6
1999	28	5	13	2	41	7
2000	28	5	13	2	41	7

[a]Regional Forecast

impacted in regard to preventive care. The impact on the local system would come in treatment of illness care and particularly accident care.

Oil companies would have air transport available to evacuate workers requiring medical attention. While this approach to care would be adequate in many cases, it does not cope with the problem of immediate emergency treatment which may be required prior to evacuation. Also, the major concern of health professionals in Nome is the possibility of a serious accident effecting a large number of workers. Injury due to accidents in the oil industry are certainly a possibility, and this could overwhelm any transport system and local hospital emergency facilities.

One concern for a local health system in OCS development is whether the system is administratively designed to provide care for OCS workers. In the case of Norton Sound, the Norton Sound Health Corporation, as a non-profit corporation, is capable of providing services to all races, individually and contractually. A major impediment may be adequate capital to expand facilities on a timely basis. Commitments from private industry may be necessary if access to the local health care system is to be available.

In addition to acute care beds, other facility improvements may be necessary. These would be in the areas of accident care. A limited burn center and a frostbite and hypertension facility would be two possible facilities requiring development.

In addition to facilities, sufficient health professionals are necessary to provide adequate service levels. Table 101 notes the number of additional primary care physicians projected for the medium find scenario. The need for three additional physicians between 1990 and 1993 and two thereafter are projected. While seemingly a modest increment, it is a 75 percent increase during the peak years over the base case. This also implies corresponding increases in other health professionals and support staff including registered nurses, licensed practical nurses, nurses' aides, medical technicians, etc. The substantial increase in population may also raise the possibility of a physician specialist residing in Nome. If this occurred, it would most likely be a specialty that could deal with trauma cases.

Besides bed and physician needs for OCS development, a less measurable health need is the possibility for increased demands on the system by the resident base case population due to development. While most levels of needs within the base population should not be effected by development, some could. Health problems related to or induced by socio-cultural problems could well be exacerbated by OCS. This could well mean increased service needs for dealing with such health problems as alcoholism, other substance abuse and psychological problems. This would require appropriate facilities and staff to meet this need.

SOCIAL SERVICES

Though no formal quantitative standards exist for the delivery of social services, the following points are made to provide a qualitative framework for future service needs under the medium find scenario.

- Social services which deal with problems in behavioral and social health areas are presently a chronic and serious community problem. OCS development can be expected to exacerbate these problems in two ways. First, these problems can be expected to increase above levels presently found as the influx of new residents, money, and transients tear into the social and cultural fabric of the community. The majority of new residents are expected to be whites with little previous contact with rural native populations. The cultural gap and subsequent impact on the native community in particular but also the general base population is expected to be severe. Alcoholism and other substance abuse, spousal and child abuse general cross-cultural adjustment, and general emotional problems can be expected to rise above existing levels under the scenario. In addition, social problems within the enclave population can be expected to be severe. Offshore workers live in a more restricted environment so problems should be more controllable by management. Social problems within the enclave or work camps should be more severe due to the accessibility of the Nome mmunity. Nome has the reputation as a wide open town

and the monetary benefits of enclave workers having access to Nome is expected to increase these workers exposure to alcohol abuse and increase the possibility of anti-social behavior. This is expected to cause significant public safety problems, though it should not cause an increase in social services delivery beyond the increased needs of the resident population.

While employment opportunity does expand for the resident population, in-migration will cause sharp competition for jobs and for the better positions. An increase of two or three percent in the participation rate is not sufficient to alter the basic problems of unemployment, underemployment, and seasonal employment. While native employment rates are expected to rise, it is possible that non-natives will do even better, exacerbating employment and income gaps in the communtiy. One difficulty for native employment is that major opportunities for primary sector employment came in the summer months when conflicts for subsistance activities are especially high. While some employment opportunities may be compatible with subsistence pursuits (especially if rotated one week on and one week off), others could inhibit subsistence activities and thus effect diet, heavy reliance on the cash economy, etc.

- The provision of decent housing is expected to be an important issue if development occurs. The limited amount of standard quality housing stock, the high cost of housing construction, and high rents are all factors presently being contended with. The influx of additional population is expected to produce severe shortages and rising rents. As new workers compete for scarce housing, this will tend to push poor residents into the more substandard units, and generally increase crowding. This issue is discussed in the housing section.

PUBLIC SECTOR EXPENDITURES

Table 102 shows estimated assessed values in Nome under the medium find scenario. Estimates of the oil terminal and LNG plant are by Dames and Moore. Incremental value in Nome is an estimate based on the amount of population growth forecast under the moderate find scenario and the current assessed value in Nome. Thus, for example, in the medium find scenario, additional assessed value is assumed to be 70 percent of current value because the population is expected to increase 70 percent by the production phase.

Table 103 presents the maximum general property tax revenue that the City of Nome could generate under the tax limits imposed by AS 29.53. Also, the table shows the amount of revenue that could be generated under alternative 2 at the current property tax rate in Nome of 17.9 mills (under the first alternative, the city could not legally tax at over the rate shown in column 4 of table 103).

TABLE 102

ESTIMATED TOTAL ASSESSED VALUE IN NOME
MEDIUM FIND SCENARIO PRODUCTION PHASE
(1978 $)

Property	Plant Capacity	Estimated Assessed Value ($ Million)
Oil Terminal[a]	436 MB/D	$1,046.4
LNG Plant[b]	461 MMCF/D	859.5
Service Base[c]	Medium	20.0
Existing Value[d]		29.3
Incremental Value[e]		20.5
TOTAL		$1,975.7

[a]Dames & Moore; includes pipeline terminal, crude stabilization, LPG recovery, tankers ballast treatment, crude storage, tankers loading piers; mid-range cost estimate of $2,400/bbl of daily through put capacity.

[b]Dames & Moore; includes liquefaction trains and marine terminal; cost estimate $514 Million for 200 MMCF/D capacity plus $155 Million for each additional 200 MMCF/D of capacity.

[c]Estimate by Policy Analysts, Ltd.

'Alaska Department of Community and Regional Affairs, State Assessor's Office, Alaska Taxable 1978, p.39.

'Incremental value is directly proportional to population increase in Nome between 1979 and production phase (High Find 90% of current value, medium, 70%, 10W, 40%).

Table 103 also illustrates the amount of money that the City of Nome could raise for bonding purposes. Note that the city can raise any amount of money for bonds that it wishes, as long as it does not exceed locally imposed limits on total debt or endanger its bond rating in financial markets. For practical purposes, the amount of bonds sold will be limited by the willingness of local residents and businessmen to tax themselves, because while the oil property will pay most of the total cost (see % oil related property, table 103), this property can not be taxed at a rate higher than that which applies to the rest of the community. Therefore, a bond issue that requires one mill to retire will cost the owner of a $100,000 home $100 annually.

Under alternative one, the City of Nome could raise $8,025,000 for operating expenses with a buy of 4.1 mills, or, under alternative two, $18,996,000 with a tax of 30 mills. The current rate of 17.9 mills would raise some $11,334,000 under alternative two.

Fifty million do" lars of bond revenue could be raised for capital improvements with a levy of 2 36 mills, and this debt would be only 2.5 percent of the city's assessed value. A total of $12,688,000 could be raised for operating and bond repayment with a combined tax rate of 6.46 mills.

Table 104 summarizes OCS revenues from OCS operations and excluding OCS facilities. This is presented for illustrative purposes to note the general magnitude of OCS" revenues. The primary problem would appear to occur during the development phase when substantial impact is expected to occur, but the predominate share of OCS revenues has yet to be made available. This can be expected to cause problems of balancing revenues and expenditure demands.

TABLE 103

ANNUAL PROPERTY TAX REVENUE FOR OPERATIONS, CITY OF NOME
DURING PRODUCTION PHASE OF MEDIUM FIND SCENARIO
(1978 $)

Alternative	Estimate of population During Production[a]	Maximum Revenue	Tax Rate to Obtain Maximum Revenue	Revenue at 1978 Tax Rate of 17.9 Mills
1[b]	5,350	$8,025,000	4.1	N.A.
2[c]	5,350	$18,996,000	30	$11,334,000

[a]An estimate of approximate population during years of production, from Tables 76.
[b]Maximum revenue $1,500 per capita, AS 29,53,045(b).
[c]Maximum taxable property value is 2.5 times state average per capita assessed value times population; maximum tax rate is 30 mills, AS 29.53.045(c)

TABLE 103, Continued

ILLUSTRATION OF DEBT CAPACITY AND REPAYMENT OBLIGATION FOR CITY OF NOME
DURING PRODUCTION PHASE - MEDIUM FIND SCENARIO

($ Million, 1979)

Total Assessed Value[a]	% Oil Related Property	Debt Capacity and Repayment Obligation[b]					
		Debt at 1.5% of Total Assessed Value			Debt at 2.5% of Total Assessed Value		
		Debt	Repayment	Mills	Debt	Repayment	Mills
1,975.7	(97.5)	29.6	2.794	1.42	49.4	4.663	2.36

[a]From Table 102.
[b]Annual payment required to amortize principal and interest of the total debt at seven percent (7%) interest over a 20 year period; millage rate = $\frac{\text{annual payment}}{\text{assessed value}}$

TABLE 104

REVENUE PROJECTIONS FOR NOME
MEDIUM FIND SCENARIO

Year	Non-OCS Base Case	Medium Find Scenario		
	Revenues from Al 1 Sources	Revenues, excluding OCS Facilities[b]	OCS Operations Revenue	Total[a]
1983	6,049	27	0	6,076
1984	6,103	65	0	6,168
1985	6,287	70	0	6,357
1986	6,354	1,251	0	7,605
1987	6,426	1,733	0	8,159
1988	6,500	1,935	0	8,435
1989	6,574	1,855	0	8,429
1990	6,666	2,299	0	8,965
1991	6,701	2,906	11,334	20,941
1992	6,734	2,274	11,334	20,352
1993	6,729	2,166	11,334	20,229
1994	6,762	2,106	11,334	70,202
1995	6,813	Z,106	lì ,334	2?0,253
1996	6,825	2,107	11,334	20,265
1997	6,864	2,107	11,334	20,305
1998	6,899	2,107	11,334	20,340
1999	6,934	2,107	11,334	20,374
2000	6,988	2,107	11,334	20,429

[a] Includes property taxes, sales taxes, state and federal revenues, all other revenue, all in constant dollars discounting inflation.

[b] Includes all noted in footnote "a" plus sales tax revenues on transients' local expenditures.

[c] Alternative two using 1978 tax rate used for illustrative purposes. Actual amount is dependent upon local decision. This does not include the amount of money Nome could raise for bonding purposes. ,

'Figures have been rounded.

High Find OCS Scenario

Reviewing the socioeconomic character of the community and the existing service infrastructure, the following observations on the economy and the community, and the additional needs for education, public safety, recreation, utilities, land use and housing, health, social services, and financial capacity are required to the year 2000 in the case of the high find OCS scenario.

THE ECONOMY AND THE COMMUNITY

Table 77 outlines the employment patterns for the high find OCS scenario. Primary employment rises to a peak of 5,276 in 1991 and moderates to 3,930 in 2000. Onshore primary employment rises to 1,544 in 1987 during development (58 percent of the total). This stabilizes at 21-22 percent of the total force during late development and production phases. The balance are employed on offshore facilities. Except for a small increment which decides to take up local residence, much of the workforce life reside in a self-contained and self-sufficient environment offshore. Most of the onshore workforce (87 to 90 percent) also reside in an enclave environment either at the Cape Nome service base or in coastal work camps.

Secondary employment increases indirect relationship to the primary workforce and phase of development. The real increase in the secondary workforce peaks at 356 though there is also in-migration to replace workers in the existing base case secondary employment areas who shift to primary sector jobs. Secondary employment is expected to be partially filled by

existing unemployed residents available to the workforce (15 percent). The remainder would be filled by primarily native regional residents drawn into the Nome employment area (33 percent), or primarily non-native workers from outside the region who move to Nome (67 percent).

Primary employment is filled by local workers up to 15 percent of the total to a ceiling of 250. This causes employment shifts as new workers move in to replace old workers who leave secondary jobs to take those in the primary area. It is assumed that this shifting will produce replacement by a regional population attracted to Nome (15 percent) and by a primarily non-native population from outside the region (85 percent). The implications of this in-migration suggest a shift in the racial balance of the non-OCS base case from approximately 63 percent native and 37 non-native to a residential division of 53 percent native, 47 percent non-native by 1987, and a 55-45 percent balance by 2000. If the Cape Nome enclave is included, 1987 is projected to have 46 percent native and 54 percent non-native, with an equal 50-50 split by the year 2000.

The high find scenario also has some effect on the workforce participation rates. The base case had annual participation rates varying between 35 and 39 percent. This improves to 42 percent which moderates to 41 percent for the residential workforce. This is an improvement of two to three percent.

Table 105 shows that during exploration, personal expenditures by the OCS workforce reach $466,600. In this case, transient workers spend more than local workers, However, in subsequent phases the resident primary workers spend up to four times as much of their income locally as do transient workers. Peak expenditures occur in year nine, at over $6.2 million of this amount, local workers spend about $5 million and non-local workers $1.2 million. Production phase expenditures decline gradually to approximately $5.3 million.

TABLE 105

ESTIMATES OF ANNUAL PERSONAL EXPENDITURES IN NOME
BY LABORFORCE DIRECTLY EMPLOYED IN OCS ACTIVITIES
HIGH FIND SCENARIO[a]
($000, 1979)

	OCS Laborforce		Expenditures[b]		
Year[c]	Nome Residents	Transient	Nome Residents	Transient	Total
1	6	346	40.5	86.5	127.0
2	12	744	81.0	186.0	267.0
3	19	1,353	128.3	338.3	466.6
4	320	1,441	3,472.0	360.3	3,832.3
5	356	2,295	3,862.6	573.8	4,436.4
6	391	3,123	4,242.4	780.8	5,023.2
7	439	4,297	4,763.2	1,074.3	5,837.5
8	449	4,522	4,871.7	1,130.5	6,002.2
9	461	4,815	5,001.9	1,203.8	6,205.7
10	453	4,632	4,915.1	1,158.0	6,073.1
11	426	3,979	4,622.1	994.8	5,616.9
12	408	3,551	4,426.8	887.7	5,314.5
13	406	3,496	4,405.1	874.0	5,279.1
14	405	3,464	4,394.3	866.0	5,260.3
15-16	406	3,494	4,405.1	873.5	5,278.6
17-22	407	3,493	4,416.0	873.3	5,289.3

[a] Policy Analysts, Limited

[b] $6,750/resident during exploration, $10,850/resident thereafter; $250/transient worker.

[c] Year 1 = 1983.

EDUCATION

Primary and Secondary

In order to meet the standards discussed in the appendix, additional students added to the system due to OCS development will require increased manpower and facilities. Significant increases in enrollment begin in the development phase and peak in 1991 when the scenario provides 26.8 percent of the total enrollment (see table 106). This proportion declines to 23.8 percent by the end of the study period. The significant increases in demand occur in 1986 and 1987, and again in 1991. Even with the scenario added to the base case, the student population still falls 266 below a 1977 forecast used for educational facilities planning. Thus if the plans for an addition to Nome-Beltz and new elementary school facilities were carried out between 1985 and 1990, it would probably exceed projected needs. In all, 23 additional classrooms will be required. Any requirements above this should be handled on a temporary basis. Total student enrollment rises to 1,178 in 1990 and stabilize for the next decade. This is due to a decline in the scenario increment with a corresponding increase in the base case.

Postsecondary Education

Postsecondary education is impacted in the development phase due to greater demand from the residential increment while the production phase generates demands from both residential and onshore enclave populations.

TABLE 106

ADDITIONAL TEACHER AND CLASSROOM NEEDS
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

	Non-OCS Base Case			High Find Scenario			Total		
	Students	Teachers	Classrooms	Students	Teachers	Classrooms	Students	Teachers	Classrooms
1980	847	65	58	0	0	0	847	65	58
1981	854	66	59	0	0	0	854	66	59
1982	862	66	59	0	0	0	862	66	59
1983	869	67	60	3	0	0	872	67	60
1984	876	67	60	6	1	1	882	68	61
1985	883	68	61	9	1	1	892	69	62
1986	891	69	61	209	16	15	1,100	85	76
1987	898	69	62	269	21	18	1,167	90	80
1988	905	70	62	273	21	19	1,178	91	81
1989	911	70	63	293	23	20	1,204	93	83
1990	918	71	63	302	23	21	1,220	94	84
1991	919	71	63	336	26	23	1,255	97	86
1992	924	71	64	330	25	22	1,254	96	86
1993	928	71	64	311	24	21	1,239	95	85
1994	933	72	64	303	23	21	1,236	95	85
1995	937	72	65	300	23	20	1,237	95	85
1996	942	72	65	300	24	21	1,242	96	86
1997	947	73	65	300	23	21	1,247	96	86
1998	942	73	66	300	23	20	1,242	96	86
1999	956	74	66	300	23	21	1,256	97	87
2000	961	74	66	300	23	21	1,261	97	87

In all, 15.2 percent of the students in 1987 are expected to be due to the high find scenario (see table 107). This is projected to increase to 17.5 percent in 1990, and 20.5 percent in 2000. The additional students and accompanying credit hours are important and will require additional faculty. Present expansion plans and other community and enclave facilities should be sufficient to meet the projected increase in demand.

PUBLIC SAFETY

Police

Using the standard of one sworn officer per 500 people added to the population, the following table displays manpower requirements for the non-OCS case, the high find scenario and the total cumulative effect for the period under study. A minimum of six sworn officers are necessary as a base to provide 24 hour police protection. The base population requiring 24 hour protection has been designated at 1,500.

The standard generates an addition of three sworn officers over and above the non-OCS case beginning in 1987. This constitutes an increase of 27 percent over the non-OCS case and a very significant 100 percent increase over the present manpower capability. The department presently employs seven sworn officers and in order to accommodate the effects of OCS development, it will have to double in size by 1990. Growth of this magnitude is of significant concern with respect to the level of effectiveness in the community and the associated strains on the administration of the force.

TABLE 107

POSTSECONDARY STUDENT ENROLLMENT PROJECTIONS
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case[a]		High Find Scenario		Total	
	Semester Students	Credit Hours	Semester Students	Credit Hours	Semester Students	Credit Hours
1980	313	1,722	0	0	313	1,722
1981	335	1,841	0	0	335	1,841
1982	358	1,969	0	0	358	1,969
1983	381	2,098	0	0	381	2,098
1984	406	2,233	0	0	406	2,233
1985	431	2,373	0	0	431	2,373
1986	458	2,517	63	344	521	2,861
1987	485	2,666	87	480	572	3,146
1988	513	2,820	95	525	608	3,345
1989	542	2,979	110	605	652	3,584
1990	571	3,143	121	665	692	3,808
1991	574	3,159	175	963	749	4,122
1992	577	3,175	170	937	747	4,112
1993	580	3,190	161	887	741	4,077
1994	583	3,206	158	867	741	4,073
1995	586	3,222	156	855	742	4,077
1996	589	3,238	155	854	744	4,092
1997	592	3,255	155	854	747	4,109
1998	595	3,271	155	854	750	4,125
1999	598	3,288	155	855	753	4,143
2000	601	3,304	155	855	756	4,159

[a] Regional Projections

TABLE 108

POLICE MANPOWER REQUIREMENTS
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case	High Find Scenario	Tota 1
1983	10	0	10
1984	10	0	10
1985	10	0	10
1986	10	2	12
1987	10	3	13
1988	10	3	13
1989	10	3	13
1990	11	3	14
1991	11	3	14
1992	11	3	14
1993	11	3	14
1994	11	3	14
1995	11	3	14
1996	11	3	14
1997	11	3	14
1998	11	3	14
7999	11	3	14
2000	11	3	14

In addition, several other factors should be considered. First, the estimate of police needs are made on the permanent residential population. It is reasonable to expect that public safety in work camps, the Cape Nome conclave and onshore facilities will be handled by private security. However, many direct workers, especially onshore, will have access to the Nome community and thus accentuate present public safety problems. If non-resident onshore workers are included one additional sworn officer would be necessary to meet service needs.

A second problem is the possibility of an increased incidence of part 1 crimes. Rapid growth, higher levels of transiency and in-migration not necessarily compatible with existing racial and cultural compositions can be expected to result in a rise in an already significantly high part I crime index. While all part I crimes could rise, it is expected that crimes of violence (i.e., murder, rape, assault) would be especially effected. In addition, part II crimes such as simple assault, vandalism, weapons possession, prostitution and disorderly conduct induced by alcohol abuse are expected to spiral . These kinds of changes in the rate of crime could increase the need for additional manpower.

A third consideration is the role of the state troopers. Presently, the troopers, headquartered in Nome, provide regional assistance usually outside the city limits. With development of oil and gas reserves, it is very likely that state assistance would increase the presence of the troopers in the detachment.

Detention Facilities

Detention facility requirements dictate a ratio of one jail cell per 500 in the population with a minimum of three cells to allow for separation of male adults, female adults and juvenile offenders. At the peak impact point in the high find scenario, Nome should ideally have five additional cells over the non-OCS case for a total facility requirement of 20. After 1990, the demand tapers off to an incremental need of four additional detention cells over the non-OCS case. From a simple cost standpoint, Nome should maintain no more than 20 cells or beds to accommodate demand from the high find scenario. If additional need is determined, demand could be met with utilizing other state facilities rather than creating additional facilities to meet a short-term demand.

The detention facility requirements table is based on the total population anticipated to impact Nome as a result of the high find scenario and is adjusted to reflect the regional orientation of the facility. Since Nome constitutes approximately 47 percent of the regions population, the base case has been doubled to allow for the regions" perspective.

The present detention facility has a total of 30 dormitory beds and eight cell beds. Plans are on board through the Department of Health and Social Services for a new facility between 1983 and 1985. It is assumed that sizing of such a facility will be geared to long range need and will ultimately be capable of accommodating demand generated through OCS activity.

TABLE 109

DETENTION FACILITY REQUIREMENTS
NON-OCS BASE CASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Case	High Find Scenario	Total
1983	13	0	13
1984	14	0	14
1985	14	0	14
1986	14	3	17
1987	14	5	19
1988	15	5	20
1989	15	5	20
1990	15	5	20
1991	15	4	19
1992	15	4	19
1993	16	4	20
1994	16	4	20
1995	16	4	20
1996	16	4	20
1997	16	4	20
1998	16	4	20
1999	16	4	20
2000	16	4	20

Fire

The following calculations for fire flow needs are based on a constant of 1,893 litters (500 gallons) per minute minimum within Nome's distribution system. Added to this constant is the minimum community water requirement which yields a projected total minimum pumping capacity within the water distribution system. The cumulative water and fire flow need is presented for the non-OCS case, the high find scenario and the total combined affect of the standard through the period under study.

To accommodate OCS demand, Nome's water distribution system, at a minimum, should be capable of pumping 2,986 liters (806 gallons) per minute to meet normal water usage rates and minimum fire flow. The incremental affect of the high find scenario over the non-OCS case reaches a peak in 1991 at 352 liters (93 gallons) per minute. Presently, the system's capacity is 2,460 liters (650 gallons) per minute indicating a deficiency as early as year one of the lease sale. Furthermore, the above fire flow standard is not considered sufficient to accommodate fire flow needs for large structures such as hospitals or schools. In order to insure adequate fire protection to the community, Nome will need to upgrade its pumping capability early-on.

Equipment and manpower requirements are considered sufficient to meet permanent residential population demand, It is assumed that the enclave facilities will develop fire fighting capabilities commensurate with the level of fire hazard associated with such facilities.

TABLE 110

MINIMUM FIRE FLOW REQUIREMENTS
NON-OCS BASE CASE - HIGH FIND SCENARIO
(Cumulative)

Year	Minimum Fire Flow		Non-OCS Base Case				High Find Scenario				Total			
			Minimum Water Requirement		Total Pumping Capability		Minimum Water Requirement		Total Pumping Capability		Minimum Water Requirement		Total Pumping Capability	
	LPM[a]	GPM[b]	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM
1983	1,893	500	696	184	2,589	684	4	1	1,896	501	700	185	2,593	685
1984	1,893	500	712	188	2,604	688	8	2	1,900	502	704	186	2,597	686
1985	1,893	500	727	192	2,619	692	8	2	1,900	502	734	194	2,627	694
1986	1,893	500	742	196	2,634	696	220	58	2,112	558	961	254	2,854	754
1987	1,893	500	757	200	2,650	700	280	74	2,173	574	1,037	274	2,930	774
1988	1,893	500	768	203	2,661	703	288	76	2,180	576	1,056	279	2,949	779
1989	1,893	500	787	208	2,680	708	307	81	2,199	581	1,094	289	2,986	789
1990	1,893	500	802	212	2,695	712	318	84	2,210	584	1,120	296	3,013	796
1991	1,893	500	806	213	2,699	713	352	93	2,245	593	1,158	306	3,051	806
1992	1,893	500	810	214	2,702	714	344	91	2,237	591	1,154	305	3,047	805
1993	1,893	500	814	215	2,706	715	326	86	2,218	586	1,139	301	3,032	801
1994	1,893	500	818	216	2,710	716	318	84	2,210	584	1,136	300	3,028	800
1995	1,893	500	821	217	2,714	717	314	83	2,207	583	1,136	300	3,028	800
1996	1,893	500	825	218	2,718	718	314	83	2,207	583	1,139	301	3,032	801
1997	1,893	500	829	219	2,721	719	318	84	2,210	584	1,147	303	3,039	803
1998	1,893	500	833	220	2,725	720	318	84	2,210	584	1,151	304	3,043	804
1999	1,893	500	836	221	2,729	721	318	84	2,210	584	1,154	305	3,047	805
2000	1,893	500	844	223	2,737	723	314	83	2,207	583	1,158	306	3,051	806

[a]LPM = liters per minute
[b]GPM = gallons per minute

Recreation

The following table displays recreation facilities requirements for the non-OCS case, the high find scenario and the combined cumulative affect through the period under study. The facility requirements are based on nationally accepted optimum standards as generated by the National Recreation and Parks Association. As noted in the facilities inventory in the baseline section of this report, Nome meets or exceeds the minimum requirements for play lots, softball fields and basketball courts through 1987 as displayed in the table. Undoubtedly additional revenues to the city of Nome as a result of oil and gas development will be used to expand and enhance existing facilities as well as developing new ones. Due to land constraints and lower public interest, however, land acquisition for major park development may be a problem. Based on the action of other Alaskan communities which have benefited from oil tax revenue all other categories would undoubtedly be pursued.

It is assumed that workers housed in the onshore enclave would be provialed with a wide variety of recreational facilities and activities which would virtually eliminate impact on local recreational facilities.

TABLE 111

RECREATION FAC LITIES REQUIREMENTS
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

	Play Lots			Neighborhood Parks			Basketball Courts			Tennis Courts			Softball Fields			Skating Rinks			Community Centers		
Year	Base[a]	High[b]	Total	Base	High	Total	Base	High	Total	Base	High	Tots l	Base	High	Total	8ase	High	Total	Base	High	Total
1983	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	o	0	0
1984	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1985	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1986	1-7	3	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1987	1-7	4	2-1o	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1988	1-7	4	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1989	2-7	3	2-1o	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1990	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1991	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1992	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1993	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1994	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1995	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1996	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1997	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1998	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
1999	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0
2000	2-8	3	2-11	2	1	3	2	1	3	2	1	3	1	1	2	0	1	1	0	0	0

[a] Non-OCS Base Case
[b] High Find Scenario

UTILITIES

Water

Per capita water consumption has been estimated at 303 lpcpd (80 qpcpd) for planning purposes and will be used as the standard to assess permanent residential water demand for the period under study. The following table displays water requirements for the non-OCS case, the high find scenario and the total cumulative affect of the standard in use.

Total water demand for the community of Nome reaches a peak in 1991 and again in the year 2000 with a system capacity requirement of 1.6 million liters (416,560 gallons) per day. Nome's present water source has the potential to yield 1.9 million liters (489,600 gallons) of water per day which is sufficient to meet water demand through the forecast The incremental effect of the medium find scenario reaches a high in 1991 of 508,704 liters (134,490 gallons) per day and slowly declines to 454,806 liters (120,160 gallons) per day by 2000. The difference is picked up, however, with the natural population increase anticipated in the non-OCS case.

Storage facilities should ideally accommodate a three day reserve. Present storage capacity is 1.2 million liters (320,000 gallons) which is not sufficient to meet reserve requirements. However, plans are proposed to build a 4.5 million liter (1.2 million gallon) storage facility which would be adequate to meet the three day reserve requirement through 1990 at which time some consideration might be given to expansion.

TABLE 112

WATER REQUIREMENTS - LITERS PER DAY
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case		High Find Scenario		Total	
	Million Liters Per Day	Gallons Per Day	Liters Per Day	Gallons Per Day	Million Liters Per Day	Gallons Per Day
1983	1.0	265,360	3,936	1,040	1.0	266,400
1984	1.0	270,640	8,478	2,240	1.0	272,880
1985	1.0	276,080	13,626	3,600	1.1	279,680
1986	1.1	281,600	315,820	83,440	1.4	365,040
1987	1.1	287,200	406,963	107,520	1.5	394,720
1988	1.1	292,960	412,716	109,040	1.5	402,000
1989	1.1	298,800	444,208	117,360	1.6	416,160
1990	1.2	304,800	457,834	120,960	1.6	425,760
1991	1.2	306,320	508,704	134,400	1.7	440,720
1992	1.2	307,840	499,317	131,920	1.7	439,760
1993	1.2	309,360	471,460	124,560	1.6	433,920
1994	1.2	310,880	459,045	121,280	1.6	432,160
1995	1.2	312,400	424,200	120,000	1.6	432,400
1996	1.2	314,000	453,594	119,840	1.6	433,840
1997	1.2	315,600	454,200	120,000	1.6	435,600
1998	1.2	317,200	454,200	120,000	1.7	437,200
1999	1.2	318,800	454,806	120,160	1.7	438,960
2000	1.2	320,400	454,806	120,160	1.7	440,560

It is assumed that increased city revenues generated through OCS activity in the region will provide sufficient capital to expand the water distribution system to include all old and new feasible construction not receiving this service.

During the exploration and possibly during the development phase of OCS activity, offshore rigs, boats and barges may decide to utilize the community's present water source. Table 113 displays water requirements for offshore activity through the forecast period. The standard in use is 379 lpcpd (100 qpcpd). Assuming offshore activity utilizes the existing water source through 1990 (or the end of the development phase), the combined peak impact will reach 3.1 million liters (813,260) gallons) per day. This significantly exceeds the capability of the source in use by 66 percent. In actuality, it would only be feasible to utilize the existing source through 1986 at which time an alternative will have to be identified and developed.

Onshore enclave facilities are assumed to identify and develop their own water source. Assuming a per capita consumption of 478 1 pcpd (125 qpcpd) onshore insite facilities will, at a minimum, require 552,610 liters (146,000 gallons) per day. Any water requirements for fire flow would be over and above this figure. This is based on the peak onshore, onsite population of 1168 anticipated by 1987. Additional demand from offshore activity would be added to this as displayed in table 113.

TABLE 113

OFFSHORE WATER REQUIREMENT
HIGH FIND SCENARIO
(Cumulative)

Year	Offshore Water Requirement	
	LPDa	GPDb
1983	119,228	31,500
1984	257,002	67,900
1985	470,854	124,400
1986	434,518	114,800
1987	419,000	110,700
1988	895,531	236,600
1989	1,406,506	371,600
1990	1,466,688	387,500
1991	1,672,213	441,800
1992	1,608,247	424,900
1993	1,357,680	358,700
1994	1,186,219	313,400
1995	1,168,808	308,800
1996	1,156,696	305,600
1997	1,169,565	309,000
1998	1,169,565	309,000
1999	1,180,920	312,000
2000	1,180,920	312,000

[a]LPD · liters per day
[b]GPD · gallons per day

Sewer

Wastewater generation closely approximates water consumption, and for the purpose of assessing impact, it is assumed that the two are equal. Water consumption is estimated for planning purposes at 303 lpcpd (80 qpcpd) and will be employed as the standard to assess effluent quantities. The following table displays amounts generated over the forecast period.

Total community requirements will dictate a collector system which can accommodate flows up to 1.7 million liters (440,720 gallons} per day. This is an overall increase of 65 percent over forecast period,

Nome presently handles effluents through a primary treatment facility which is currently operating at capacity. However, federal mandates are necessitating the installation of secondary treatment systems, and as a result, the city has contracted for a facilities plan. The study projects a population for the Nome area of 5,000 by the year 2000 and recommends several secondary treatment alternatives. Under serious consideration is a 4.9 hectare (12 acre) lagoon which would be sized sufficiently to meet demand through 1986. After 1986, expansion of such a secondary system would be necessary to accommodate continued growth as a result of the high find scenario. In any event, the present system is definitely inadequate in meeting any OCS or non-OCS growth.

TABLE 114

WASTE WATER GENERATION - LITERS PER DAY
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case		High Find Scenario		Total	
	Million Liters Per Day	Gallons Per Day	Liters Per Day	Gallons Per Day	Million Liters Per Day	Gallons Per Day
1983	1.0	265,360	3,936	1,040	1.0	266,400
1984	1.0	270,640	8,478	2,240	1.0	272,880
1985	1.0	276,080	13,626	3,600	1.1	279,680
1986	1.1	281,600	315,820	83,440	1.4	365,040
1987	1.1	287,200	406,963	107,520	1.5	394,720
1988	1.1	292,960	412,716	109,040"	1.5	402,000
1989	1.1	298,800	444,208	117,360	1.6	416,160
1990	1.2	304,800	457,834	120,960	1.6	425,760
1991	1.2	306,320	508,704	134,400	1.7	440,720
1992	1.2	307,840	499,317	131,920	1.7	439,760
1993	1.2	309,360	471,460	124,560	1.6	433,920
1994	1.2	310,880	459,045	121,280	1.6	432,160
1995	1.2	312,400	424,200	120,000	1.6	432,400
1996	1.2	314,000	453,594	119,840	1.6	433,840
1997	1.2	315,600	454,200	120,000	1.6	435,600
1998	1.2	317,200	454,200	120,000	1.7	437,200
1999	1.2	318,800	454,806	120,160	1.7	438,960
2000	1.2	320,400	454,806	120,160	1.7	440,560

Onsite, onshore facilities are assumed to provide for their own wastewater collection and disposal. The level of effluent treatment to be used is unknown. However, whatever type of system is used, flows of up to 552,260 liters (146,000 gallons) will have to be met based on a per capita wastewater generation of 473 lpcpd (125 qpcpd).

Electricity

The following table displays load requirements for the non-OCS case, the high find scenario and the total cumulative impact for the period under study. In the non-OCS case a per capita load of 2.0 kw is in use to generate the level of service capacity. For the OCS scenario increment, a slightly higher per capita demand is anticipated at 2.5 kw. The two columns are combined yielding a total system capacity requirement for the permanent population in the community.

Total generation capability is presently 5850 kw. The city has plans to add an eighth unit with a firm capacity of 2500 kw bringing total generation capability to 8350 kw. This capacity would only accommodate OCS activity through 1985. In addition due to a short-term surplus anticipated by the city, several of the smaller generators will probably be retired. The overall implication of the high find scenario is that prior to OCS development and production phases, generating capacity will have to be significantly increased. Over the forecast period the overall effect of the high find scenario produces an increased need of 76 percent.

TABLE 115

KW LOAD REQUIREMENTS
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case KW	High Find Scenario KW	Total KW
1983	6,634	33	6,667
1984	6,766	70	6,836
1985	6,902	113	7,015
1986	7,040	2,607	9,647
1987	7,180	3,360	10,540
1988	7,324	3,408	10,732
1989	7,470	3,053	10,523
1990	7,620	3,780	11,400
1991	7,658	4,020	11,678
1992	7,696	4,123	11,819
1993	7,734	3,893	11,627
1994	7,772	3,790	11,562
1995	7,810	3,750	11,560
1996	7,850	3,745	11,595
1997	7,890	3,750	11,640
1998	7,930	3,750	11,680
1999	7,970	3,755	11,725
2000	8,010	3,755	11,765

It is important to note that with rising fuel prices diesel generation is becoming a costly method of generating electricity. Alternative forms of power generation are being considered such as geothermal and hydroelectric. However, any new major development will have to be implemented immediately and will need to be subsidized in the interim with diesel generation until such time as the new system is on line. The meeting of future energy requirements, with all the federal limitations and restrictions, may be one of Nome's most critical problems in accommodating OCS activity. With development of petroleum resources in the region, Nome may be able to utilize natural gas as a more cost effective means of power generation. However, an exemption from the Power Plant and Industrial Fuel Use Act which bans the use of natural gas as a source of new base load will have to be obtained.

It is assumed that onshore enclave facilities will also have large power demands. However, the oil and gas processed in these facilities are often used for electrical generation, and for the purpose of assessing impact, this is assumed to be the course of action which will be followed.

Solid Waste

Solid waste generation for Nome has not actually been calculated; however, national standards indicate an estimated per capita solid waste generation rate of 2.3 kilograms (five pounds) per capita per day. As per standards, utilizing a fill depth of 2.1 meters (seven feet) of which two-thirds is solid waste material, .08 hectares

(.21 acres) per year per 1,000 people is required to accommodate a sanitary landfill. The following two tables display the quantities of solid waste generated per year and the landfill requirement by the end of the study period for the non-OCS case, the high find scenario and the combined effect of the two projections.

The total amount of solid waste generated by the community over the forecast period will be 74,360 metric tons (81,985 U S tons) which is a 33 percent increase over the base case and yields a total fill requirement of 7.67 hectares (18.81 acres). In addition, the city should maintain at least one collection vehicle through the forecast period to accommodate demand.

OCS generated solid waste is assumed to be handled through the facilities located in proximity with the enclave at Cape Nome. However, during the development phase, some generation of solid waste might occur where it would be more expeditious to utilize the community's landfill. However, this amount will probably not significantly impact the land requirements as noted above.

Telephone

The following table indicates the number of main stations required in the non-OCS case, the high find scenario and the total cumulative effect of the two projections over the forecast period. The projections are based on the standard of .53 telephones per person increasing .61 telephones per person between 1980 and 2000 at a rate of .02 telephones per person every five years.

TABLE 116

SOLID WASTE GENERATION
QUANTITY OF SOLID WASTE PER YEAR

Year	Non-OCS Base Case		High Find Scenario		Total	
	Metric Tons	Us. Tons	Metric Tons	Us. Tons	Metric Tons	Us. Tons
1983	2,745	3,026	12	13	2,756	3,039
1984	2,800	3,087	24	26	2,823	3,113
1985	2,856	3,149	37	41	2,893	3,190
1986	2,913	3,212	863	952	3,777	4,164
1987	2,971	3,276	1,112	1,226	4,083	4,502
1988	3,031	3,342	1,127	1,243	4,159	4,585
1989	3,091	3,408	1,214	1,339	4,306	4,747
1990	3,154	3,477	1,251	1,379	4,404	4,856
1991	3,169	3,494	1,390	1,533	4,559	5,027
1992	3,184	3,511	1,365	1,505	4,550	5,016
1993	3,201	3,529	1,288	1,420	4,489	4,949
1994	3,216	3,546	1,254	1,383	4,471	4,929
1995	3,232	3,563	1,242	1,369	4,473	4,932
1996	3,249	3,582	1,239	1,366	4,488	4,948
1997	3,265	3,600	1,242	1,369	4,507	4,969
1998	3,282	3,618	1,242	1,369	4,523	4,987
1999	3,298	3,636	1,243	1,371	4,541	5,007
2000	3,315	3,655	1,243	1,370	4,558	5,025
TOTAL	55,972	61,711	18,388	20,274	74,360	81,985

TABLE 117

LANDFILL REQUIREMENTS
NON-OCS BASE CASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case		High Find Scenario		Total	
Year	Hectares	Acres	Hectares	Acres	Hectares	Acres
1983	.28	.70	0.00	0	.28	.70
1984	.29	.71	.004	.01	.29	.72
1985	.29	.72	.004	.01	.30	.73
1986	.30	.74	.09	.22	.39	.96
1987	.30	.74	.11	.26	.40	1.0
1988	.31	.77	.13	.33	.45	1.1
1989	.32	.78	.13	.32	.45	1.1
1990	.32	.80	.12	.30	.45	1.1
1991	.32	.80	.16	.40	.49	1.2
1992	.32	.80	.16	.40	.49	1.2
1993	.33	.81	.12	.30	.45	1.1
1994	.33	.82	.11	.28	.45	1.1
1995	.33	.82	.11	.28	.45	1.1
1996	.33	.82	.11	.28	.45	1.1
1997	.34	.83	.11	.27	.45	1.1
1998	.34	.83	.11	.27	.45	1.1
1999	.34	.84	.15	.36	.49	1.2
2000	.34	.84	.15	.36	.49	1.2
TOTAL	5.73	14.17	1.878	4.65	7.67	18.81

TABLE 118

CAPACITY REQUIREMENTS - TELEPHONE SERVICE
NON-OCS BASE CASE - HIGH FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case	High Find Scenario	Total
1983	1,791	7	1,798
1984	1,861	15	1,876
1985	1,898	25	1,923
1986	1,936	574	2,510
1987	2,010	753	2,763
1988	2,051	763	2,814
1989	2,129	836	2,965
1990	2,172	862	3,034
1991	2,183	958	3,141
1992	2,232	956	3,188
1993	2,243	903	3,146
1994	2,293	894	3,187
1995	2,304	885	3,189
1996	2,316	884	3,200
1997	2,367	900	3,267
1998	2,379	900	3,279
1999	2,431	916	3,347
2000	2,443	916	3,359

The present system by General Telephone Company of Alaska serves 854 residential working stations and 1,028 commercial working stations for a total of " ,612. The present switching equipment can accommodate 200 more main stations before satuation occurs. This essentially means that as early as year one of the lease sale, General Telephone Company of Alaska will have to expand this switching equipment to accommodate the effect of the high find scenario. At this point in time, a move to Solid State switching equipment is anticipated.

With regard to the enc' ave facility located at Cape Nome, it is assumed that Alascom will meet facility requirements as deemed necessary to accommodate communicant on needs.

HOUSING AND LAND USE

Housing and Residential Land

Compared to the base case, the high find scenario rapidly accelerates the estimated rate of growth in housing demand between 1986 and 1991 (see Table 119). These years represent the period of the major housing and residential land demand in Nome under this scenario. From 1992 to 1996, a negative housing demand occurs in this scenario. If the 542 projected incremental units are built by 1991, Nome will end up with a 58 house surplus as the OCS related employment declines beginning in 1991 (see Table 119). Unless these events are known, houses will be

TABLE 119

FORECASTOF NET CHANGE IN HOUSING DEMAND[a]
NON-OCS BASE CASE - HIGH FIND SCENARIO

	Non-OCS Base Case		Net Residential	High Find Scenario		Total	
Year	Net Change Demand for Housing Units	Cumulative Housing Demand	Population Increase Over Base Case	Net Change Demand for Housing Units	Cumulative Housing Demand Over Base Case	Net Change Demand for Housing Units	Cumulative Housing Demand
1983	18	18	13	4	4	22	22
1984	18	36	15	5	9	23	45
1985	19	55	17	5	14	24	69
1986	20	75	998	322	336	342	411
1987	20	95	301	97	433	117	528
1988	21	116	19	6	439	27	555
1989	21	137	104	34	473	55	6109
1990	21	158	45	15	488	36	646
1991	5	163	168	54	542	59	705
1992	5	168	(31)	(10)	532	(5)	700
1993	6	174	(92)	(30)	502	(24)	676
1994	5	179	(41)	(13)	489	(B)	668
1995	6	185	(16)	(5)	484	1	669
1996	6	191	(2)	(1)	483	5	674
1997	5	196	2	1	484	6	680
1998	6	202	0	0	484	6	686
1999	6	208	2	1	485	7	693
2000	6	214	0	0	485	6	699
Total	214		1,502	485		699	

[a]See Methods Section

TABLE 120

ESTIMATED DEMAND FOR RESIDENTIAL LAND
HIGH FIND SCENARIO

	Within Existing Corporate Limits	Outside Existing Corporate Limits		
	Net New Housing Units	Net New Residential Land Use (Acres)[a]	Net New Residential Land Use (Acres)[a]	Public Rights-of-way (Acres)[a]	Gross New Residential Land Use (Acres)[a]
1983-1985	114	2.3	3.2	1.3	4.5
1986-1990	474	76.2	108.8	42.3	151.1
1991-1995	(4)	(.6)	(.9)	(.4)	(1.3)
1996-2000	1	.2	.2	.1	.3
TOTAL	485	78.1	111.3	43.3	154.6

[a]Multiply by .40469 to obtain hectares

built that will be surplus in a few years. From 1997 to 2000, the overall level of new housing demand returns to approximately the level projected for the base case.

In the high find scenario, the incremental effect above the base case upon demand levels from 1983 to the year 2000 is approximately 485 additional dwelling units and between 78 acres (32 hectares) and 155 acres (63 hectares) of residential land (see tables 119 and 120). This represents over 225 percent of the total increase in housing and residential land estimated to be needed under the base case between 1983 and 2000. (These figures do not include 52 units projected under the base case from 1980 to 1982).

The rapid increase in housing demand projected in the high find scenario will tend to exacerbate the impacts forecasted under the medium find scenario. Nearly 100 additional units (over the medium find scenario) are projected under this scenario. The existing housing shortage, lack of residential land, high prices of land, high rents, as well as inadequate water and sewer services will cause this scenario to have a large impact on Nome.

Industrial Land Requirements

In the high find scenario, potential Cape Nome land requirements for the crude oil terminal and LNG facility are estimated to be between

TABLE 121

ESTIMATED LAND REQUIREMENTS FOR OIL TERMINAL AND LNG FACILITY
CAPE NOME
HIGH FIND SCENARIO

Peak Production Oil B/D	10 Day Storage Capacity (Million Brls)	10 Day Storage Area		Total Area Required For Oil Terminal		LNG Facility	Total Area Required For Oil Terminal and LNG Facility	
		Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)	Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)	Acres (Hectares)	Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)
764,000	7.64	109 (44)	273 (110)	218 (88)	546 (220)	184 (75)	402 (163)	730 (295)

402 acres (162 hectares) and 730 acres (295 hectares) (see Table 121). These figures are based on the same assumptions and calculations as the medium find scenario. As in housing and residential land, the high find scenario exacerbates the potential problems associated with using Cape Nome as an oil terminal that were presented in the medium find scenario. Based on peak production of oil and gas, industry acreage requirements increase to over one square mile of land.

HEALTH

Applying the ratios of 3.5 acute care beds per 1,000 people and one primary care physician per 1,500 population, table122 projects the added beds and physicians needed under the high find scenario. The present hospital facilities will be sorely strained with OCS development. In the base case, additional beds are required only slowly and incrementally throughout the study period. The present number of beds provide some excess capacity to accommodate needs in the short-term. Oil and gas development begin affecting the health infrastructure in 1983 and build to an additional need of24 beds in 1991. This is a substantial additional demand and represents a 100 percent increase in required capacity. About 21 percent of the increased demand should be handled on a temporary basis without permanent facilities, but 19 beds above the base case are required on a long-term basis. This increment would require additional facilities significantly above what is presently available. In 1991, a facility with 43 beds with temporary availability of five additional beds would be needed. This is more than double

their present capacity. To cope with this demand, planning and feasibility work would have to begin in 1982 and 1983 so once the extent of OCS development was determined, new facilities could be added by 1985-1986.

Having adequate health facilities and services available to the community, region, and offshore and onshore OCS enclaves are important. The fact that the enclave approach means rotation of most employees to homes outside of the Norton Sound area means that local health systems will not be impacted in regard to preventive care. The impact on the local system would come in treatment of illness care and particularly accident care. These health care needs for primary OCS employees will be partially met through a rapid medical care evacuation system. It would seem likely that oil companies would have air transport available to evacuate workers requiring medical attention. While this approach to care would be adequate in many cases, it does not cope with the problem of immediate emergency treatment which may be required prior to evacuation. Also, the major concern of health professionals in Nome is the possibility of a serious accident effecting a large number of workers. Injury due to accidents in the oil industry are certainly a possibility, and this could overwhelm any transport system and local hospital emergency facilities.

One concern for a local health system in OCS development is whether the system is administratively designed to provide care for OCS workers. In the case of Norton Sound, the Norton Sound Health Corporation, as

a non-profit corporat ion, is capable of providing services to all races, individually and contractually. A major impediment may be adequate capital to expand facilities on a timely basis. Commitments from private industry may be necessary if access to the local health care system is to be available.

In addition to acute care beds, other facility improvements may be necessary. These would be in the area of accident care. A 1 imi ted burn center and a frostbite and hypertension facility would be two possible facilities requiring development.

In addition to facilities, sufficient health professionals are necessary to provide adequate service levels. Table 122 notes the number of additional primary care physicians projected for the high find scenario. The need for four additional physicians after 1989 are projected. This is a 100 percent increase during the peak years over the base case, This also implies corresponding increases in other health professionals and support staff including registered nurses, licensed practical nurses, nurses aids, medical technicians, etc. The substantial increase in population may also raise the possibility of a physician specialist residing in Nome. If this occured, it would most likely be a specialty that could deal with trauma cases.

Besides beds and physician needs for OCS development, a less measurable health need is the possibility for demands on the system by the resident base care population due to development. While most levels of

TABLE 122

ADDITIONAL ACUTE CARE BED AND PRIMARY CARE PHYSICIAN NEED
NON-OCS BASE - HIGH FIND SCENARIO
(Cumulative)

	Non-OCS Base Case[a]		High Find Scenario		Total	
Year	Acute Care Beds	Primary Care Physicians	Acute Care Beds	Primary Care Physicians	Acute Care Beds	Primary Care Physicians
1980	20	4	0	0	20	4
1981	20	4	0	0	22	4
1982	21	4	0	0	21	4
1983	21	4	1	0	22	4
1984	22	4	3	1	25	5
1985	22	4	5	1	27	5
1986	22	4	9	2	31	6
1987	23	4	13	3	36	7
1988	23	4	17	3	40	7
1989	24	4	22	4	46	8
1990	24	4	23	4	47	8
1991	24	4	24	5	48	9
1992	25	4	23	4	48	8
1993	25	4	21	4	46	8
1994	26	4	19	4	45	8
1995	26	4	19	4	45	8
1996	26	4	18	4	44	8
1997	27	4	19	4	46	8
1998	27	4	19	4	46	8
1999	28	5	19	4	47	9
2000	28	5	19	4	47	9

[a] Regional Forecast

needs within the base population should not be affected by development, some could. Health problems related to or induced by socio-cultural problems could well be exacerbated by OCS. This could well mean incurred service needs for dealing with such health problems as alcoholism, other substance abuse and psychological problems. This would require appropriate facilities and staff to meet this need.

SOCIAL SERVICES

Though no formal quantitative standards exist for the delivery of social services, the following points are made to provide a qualitative framework for future service needs under the high find scenario.

- Social services which deal with problems in behavioral and social health areas are presently a chronic and serious community problem. OCS development can be expected to exacerbate these problems in two ways. First, these problems can be expected to increase above levels presently found in the influx of new residents, money, and transients, tear into the social and cultural fabric of the community. The majority of new residents are expected to be whites with little previous contact with rural native populations. The cultural gap and subsequent impact on the native community in particular but also the general base population is expected to be severe. Alcoholism and other substance abuse, spousal and child abuse, general cross-cultural adjustment,

and general emotional problems can be expected to rise above existing levels under the scenario. In addition, social problems within the enclave populations can be expected to be severe. Offshore workers ' ive in a more restricted environment so problems should be more controllable by management. Social problems within the enclave or work camps should be more severe due to the accessibility of the Nome community. Nome has the reputation as a wide open town and the monetary benefits of enclave workers having access to Nome is expected to increase these workers exposure to alcohol abuse and increase the possibility of anti-social behavior. This is expected to cause significant public safety problems, though it should not cause an increase in social services delivery beyond the increased needs of the resident population.

- While employment opportunity does expand for the resident population, in-migration will cause sharp competition for jobs and for the better positions. An increase of two or three percent in the participation rate is not sufficient to alter the basic problems of unemployment, underemployment, and seasonal employment. While native employment rates are expected to rise, it is possible that non-natives will do even better, exacerbating employment and income gaps in the community. One difficulty for native employment is that major opportunities for primary sector employment came in the summer months when conflicts for subsistance activities are especially high. While some employment

opportunities may be compatible with subsistence pursuits (especially if rotated one week on and one week off), others could inhibit subsistence activities and thus effect diet, heavy reliance on the cash economy, etc.

- The provision of decent housing is expected to be an important issue if development occurs. The limited amount of standard quality housing stock, the high cost of housing construction, and high rents are all factors presently being contended with. The influx of additional population is expected to produce severe shortages and rising rents. As new workers compete for scarce housing, this will tend to push poor residents into the more substandard units, and generally increase crowding. This issue is discussed in the housing section.

PUBLIC SECTOR EXPENDITURES

Table123 shows estimated assessed values in Nome under the high find scenario. Estimates of the oil terminal and LNG plant are by Dames and Moore. Incremental value in Nome is an estimate based on the amount of population growth forecast under the high find scenario and the current assessed value in Nome. Thus, for example, in the high find scenario, additional assessed value is assumed to be 70 percent of current value because the population is expected to increase 70 percent by the production phase.

TABLE 123

ESTIMATED TOTAL ASSESSED VALUE IN NOME
HIGH FIND SCENARIO PRODUCTION PHASE
(1978 $)

Property	Plant Capacity	Estimated Assessed Value ($ Million)
Oil Terminal[a]	765 MB/D	$1,836.0
LNG Plant[b]	922 MMCF/D	1,288.3
Service Base[c]	Large	40.0
Existing Value[d]		29.3
Incremental Value[e]		26.7
TOTAL		$3,220.3

[a] Dames & Moore; includes pipeline terminal, crude stabilization, LPG recovery, tankers ballast treatment, crude storage, tankers loading piers; mid-range cost estimate of 2,400/bbl of daily through put capacity.

[b] Dames & Moore; includes liquefaction trains and marine terminal; cost estimate $514 Million for 200 MMCF/D capacity plus $155 Million for each additional 200 MMCF/D of capacity.

[c] Estimate by Policy Analysts, Ltd.

[d] Alaska Department of Community and Regional Affairs, State Assessor's Office, Alaska Taxable 1978, p.39.

'Incremental value is directly proportional to population increase in Nome between 1979 and production phase (High Find 90% of current value, Medium, 70%, Low, 40%).

Table 124 presents the maximum general property tax revenue that the City of Nome could generate under the tax limits imposed by AS 29.53. Also, the table shows the amount of revenue that could be generated under alternative two at the current property tax rate in Nome of 17.9 mills (under the first alternative, the city could not legally tax at over the rate shown in column 4 of table 124).

Table 124 also illustrates the amount of money that the City of Nome could raise for bonding purposes. Note that the city can raise any amount of money for bonds that it wishes, as long as it does not exceed locally imposed limits on total debt or endanger its bond rating in financial markets. For practical purposes, the amount of bonds sold will be limited by the willingness of local residents and businessmen to tax themselves, because while the oil property will pay most of the total cost (see % oil related Property, Table 124) this property can not be taxed at a rate higher than that which applies to the rest of the community. Therefore, a bond issue that requires one mill to retire will cost the owner of a $100,000 home $700 annually.

Alternative one would generate a maximum tax income for operating purposes of $8,775,000 at a rate of 2.7 mills. Under the second alternative, the city could raise a maximum of $22,771,300, but this would require a tax rate of 30 mills. If the city were to keep its present tax rate of 17.9 mills, it could raise $12,393,500.

For capital improvements, the city could raise $80.5 million with a bond levy of 2.36 mills. This would represent a bonded indebtness of only

TABLE 124

ANNUAL PROPERTY TAX REVENUE FOR OPERATIONS, CITY OF NOME
DURING PRODUCTION PHASE OF HIGH FIND SCENARIO
(1978 $)

Alternative	Population During Production[a]	Maximum Revenue	Tax Rate to Obtain Maximum Revenue	Revenue at 1978 Tax Rate of 17.9 Mills
1[b]	5,850	$8,775,000	2.7	N.A.
2[c]	5,850	$20,771,300	30	$12,393,500

aAn estimate of approximate population during years of production, from Table 77.
bMaximum revenue $1,500 per capita, AS 29.53.045(b)
cMaximum taxable property value is 2.5 times state average per capita assessed value times population; maximum tax rate is 30 mills, AS 29.53.045(c)

Table 124, Continued

ILLUSTRATION OF DEBT CAPACITY AND REPAYMENT OBLIGATION FOR CITY OF NOME
DURING PRODUCTION PHASE - HIGH FIND SCENARIO
($ Million, 1979)

Total Assessed Value	% Oil Related Property	Debt Capacity and Repayment Obligation[b]					
		Debt at 1.5% of Total Assessed Value			Debt at 2.5% of Total Assessed Value		
		Debt	Repayment	Mills	Debt	Repayment	Mills
3220.3	(98.3)	48.3	4.560	1.42	80.5	7.599	2.36

aFrom Table 123.
bAnnual payment required to amortize principal and interest of the total debt at seven percent interest over 20 year period; millage rate = $\frac{\text{Annual payment}}{\text{Assessed value}}$

TABLE 125

REVENUE PROJECTIONS FOR NOME
HIGH FIND SCENARIO

	Non-OCS Base Case	High Find Scenario		
Year	Revenues from All Sources	Revenues, excluding OCS Facilities[b]	OCS Operations Revenue[c]	Total[d]
1983	6,049	27	o	6,076
1984	6,103	57	0	6,160
1985	6,287	92	0	6,379
1986	6,354	1,893	0	8,247
1987	6,426	2,434	0	8,849
1988	6,500	2,443	0	8,943
1989	6,574	2,614	0	9,188
1990	6,666	2,680	0	9,346
1991	6,701	2,976	12,393	22,071
1992	6,734	2,920	12,393	22,047
1993	6,729	2,739	12,393	21,861
1994	6,762	2,664	12,393	21,819
1995	6,813	2,636	12,393	21,842
1996	6,825	2,633	12,393	21,851
1997	6,864	2,636	12,393	21,893
1998	6,899	2,636	12,393	21,928
1999	6,934	2,640	12,393	21,967
2000	6,988	2,640	12,393	22,021

[a]Includes property taxes, sales taxes, state and federal revenues, all other revenue, all in constant dollars discounting inflation

[b]Includes all noted in footnote "a" plus sales tax revenues on transients' local expenditures

[c]Alternative two using 1978 tax rate used for illustrative purposes. Actual amount is dependent upon local decision. This does not include the amount of money Nome could raise for bonding purposes.

'Figures have been rounded.

2.5 percent of the city's total assessed value. Note that the city could raise a total of $16,374,000 annually ($8,755,000 for operations and $7,599,000 to repay debt) with a tax rate of 5.06 mills, a rate less than one third its current property tax rate.

Table 125 summarizes OCS revenues from OCS operations and excluding QCS facilities. This is presented for illustrative purposes to note the general magnitudeof OCS revenues. The primary problem would appear to occur during the development phase when substantial impact is expected to occur, but the predominate share of OCS revenues has yet to be made available. This can be expected to cause problems of balancing revenues and expenditure demand.

Low Find OCS Scenario

Reviewing the socioeconomic character of the community and the existing service infrastructure, the following observations on the economy and the community, and the additional needs for education, public safety, recreation, utilities, land use and housing, health, social services, and financial capacity are required to the year 2000 in the case of the low find OCS scenario.

THE ECONOMY AND THE COMMUNITY

Table 78 outlines the employment patterns for the low find OCS scenario. Primary employment rises to a peak of 1,376 in 1990 and moderates to 846 in 2000. Onshore primary employment rises to 387 in 1989 during development (28,7 percent of the total). This stabilizes at 26 percent of the total force during late development and production phases. The balance are employed on offshore facilities. Except for a small increment which decides to take up local residence, much of the workforce live in a highly self-contained and self-sufficient environment offshore. Most of the onshore workforce (81 percent) also reside in an enclave environment either at the Cape Nome service base or in coastal work camps.

Secondary employment increases in direct relationship to the primary workforce and phase of development. The real increase in the secondary workforce peaks at 152 though there is also in-migration to replace workers in the existing base case secondary employment area who shift to primary sector jobs. Secondary employment is sensitive to the level of resi-

dential primary employment, the size of the onshore enclave and public sector spending.

Secondary employment is expected to be partially filled by existing unemployed residents available to the workforce (15 percent). The remainder would be filled by primarily native regional residents drawn into the Nome employment area (33 percent), or largely non-native workers from outside the region who move to Nome (67 percent).

Primary employment is filled by local workers up to 15 percent of the total to a ceiling of 250. This causes employment shifts as new workers move in to replace old workers who leave secondary jobs to take those in the primary area. It is assumed that this shifting will produce replacement by a regional population attracted to Nome (15 percent) and by a primarily non-native population from outside the region (85 percent). The implications of this in-migration suggest a shift in the racial balance of the non-OCS base case from approximately 63 percent native and 37 percent non-native to a residential division of 61 percent native, 39 percent non-native by 1987, and a 59-41 percent balance by 2000. If the Cape Nome enclave is included 1987 is projected to have a 60 percent native and 40 percent non-native, with a 58-52 split by the year 2000.

The low find scenario also has some effect on the workforce participation rates. The base case had annual participation rates varying between 35 and 39 percent. This improves to about 41 percent for the residential workforce. This is a slight improvement of two to three percent.

Table 126 shows high exploration phase expenditures of $260,800 in year 4, most of this attributable to spending by transient workers. Peak expenditures occur in year 8 at approximately $3.1 million. Production phase spending declines slowly to under $2 million annually by year 11.

EDUCATION

Primary and Secondary

In order to meet the standards discussed in the appendix, additional students added to the system due to OCS development will require increased manpower and facilities. Significant increases in enrollment begin in the development phase and peak in 1990 when the scenario provides 10.4 percent of the total enrollment (see table 127). This proportion declines to 10.4 percent by the end of the study period. The significant increases in demand occur in 1987, 1988 and 1989. Even with the scenario added to the base case, the student population still falls significantly below a 1997 forecast used for educational facilities planning. Thus if the plans for an addition to Nome-Beltz and new elementary school facilities were carried out between 1985 and 1990, it would exceed projected needs. In the long term, 8 additional classrooms will be required. The five additional classrooms required above this limit should be handled on a temporary basis. Total student enrollment rises to 1,178 in 1990 and stabilize for the next decade. This is due to a decline in the scenario increment with a corresponding increase in the base case.

TABLE 126

ESTIMATES OF ANNUAL PERSONAL EXPENDITURES IN NOME
BY LABORFORCE DIRECTLY EMPLOYED IN OCS ACTIVITIES
LOW FIND SCENARIO[a]
($000, 1979)

	OCS Laborforce		Expenditures[b]		
Year[c]	Nome Residents	Transient	Nome Residents	Transient	To ta 1
1	3	232	20.3	58.0	78.3
2	5	400	33.8	100.0	133.8
3	6	569	40.5	142.3	182.8
4	9	800	60.8	200.0	260.8
5	80	342	868.0	85.5	953.5
6	167	716	1,812.0	179.0	1,991.0
7	257	1,093	2,788.5	273.3	3,061.8
8	261	1,115	2,831.9	278.8	3,110.9
9	242	1,032	2,625.7	258.0	2,883.7
10	189	803	2,050.7	200.8	2,251.5
11	149	637	1,616.7	159.3	1,776.0
12	143	613	1,551.6	153.3	1,704.9
13-18	161	685	1,746.9	171.3	1,918.2

[a] Policy Analysts, Limited

[b] $6,750/resident during exploration, $10,850/resident thereafter; $250/transient worker

[c] Year 1 = 1983.

TABLE 127

ADDITIONAL TEACHER AND CLASSROOM NEEDS
Non-OCS BASE - LOW FIND SCENARIO
(Cumulative)

	Non-OCS Base Case			Low Find Scenario			Total		
	Students	Teachers	Classrooms	Students	Teachers	Classrooms	Students	Teachers	Classrooms
1980	847	65	58	0	0	0	847	65	58
1981	854	66	59	0	0	0	854	66	59
1982	862	66	59	0	0	0	862	66	59
1983	869	67	60	2	0	0	871	67	60
1984	876	67	60	2	1	1	878	68	61
1985	883	68	61	3	0	0	886	68	61
1986	891	69	61	3	0	1	894	69	62
1987	898	69	62		4	3	948	73	65
1988	905	70	62	1::	8	8	1,010	78	70
1989	911	70	63	163	13	11	1,074	83	74
1990	918	71	63	169	13	12	1,087	84	75
1991	919	71	63	158	12	11	? ,077	83	74
1992	924	71	64	128	10	9	1,052	81	73
1993	928	71	64	104	8	7	1,032	79	71
1994	933	72	64	100	7	7	1,033	79	71
1995	937	72	65	111	8	7	1,048	80	72
1996	942	72	65	111	9	8	1,053	81	73
1997	947	73	65	111	8	8	1,058	81	73
1998	942	73	66	111	8	7	1,053	81	73
1999	956	74	66	111	8	8	1,067	82	74
2000	961	74	66	111	8	8	1,072	82	74

Postsecondary Education

Postsecondary education is impacted in the development phase due to greater demand from the residential increment while the production phase generates demands from both residential and onshore enclave populations.

In all, 3.2 percent of the students in 1987 are expected to be due to the low find scenario (see table 128). This is projected to increase to 11.7 percent in 1990, and 8.1 percent in 2000. The additional students and accompanying credit hours are important and will require additional faculty. Present expansion plans and other community and enclave facilities should be sufficient to meet the projected increase in demand.

PUBLIC SAFETY

Police

Using the standard of one sworn officer per 500 people added to the population, the following table displays manpower requirements for the non-OCS case, the low find scenario and the total cumulative effect for the period under study. A minimum of six sworn officers are necessary as a base to provide 24 hour police protection. The base population requiring 24 hour protection has been designated at 1,500.

The standard generates an addition of one sworn officer over and above the non-OCS case beginning in 1987. This constitutes an increase of 9 percent over the non-OCS case and a very significant 71 percent increase

TABLE 128

POSTSECONDARY STUDENT ENROLLMENT PROJECTIONS
NON-OCS BASE - LOW FIND SCENARIO
(Cumulative)

	Non-OCS Base Case[a]		Low Find Scenario		Total	
Year	Semester Students	Credit Hours	Semester Students	Credit Hours	Semester Students	Credit Hours
1980	313	1,722	0	0	313	1,722
1981	335	1,841	0	0	335	1,841
19821	358	1,969	0	0	358	1,969
1983	381	2,098	0	0	381	2,098
1984	406	2,233	0	0	406	2,233
1985	431	2,373	0	0	431	2,373
1986	458	2,517	0	0	458	2,517
1987	485	2,666	16	90	501	2,756
1988	513	2,820	37	203	550	3,023
1989	542	2,979	60	332	602	3,311
1990	571	3,143	76	418	647	3,561
1991	574	3,159	71	390	645	3,549
1992	577	3,175	59	326	636	3,501
1993	580	3,190	49	270	629	3,460
1994	583	3,206	47	261	630	3,467
1995	586	3,222	52	284	628	3,506
1996	589	3,238	52	284	631	3,522
1997	592	3,255	52	284	634	3,539
1998	595	3,271	52	284	637	3,555
1999	598	3,288	52	284	640	3,572
2000	601	3,304	52	284	643	3,588

[a]Regional Projections

TABLE 129

POLICE MANPOWER REQUIREMENTS
NON-OCS BASE - LOW FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case	Low Find Scenario	Total
1983	10	0	10
1984	10	0	10
1985	10	0	10
1986	10	0	10
1987	0	1	11
1988	0	1	11
1989	0	2	12
1990	1	1	12
1991	11	1	12
1992	11	1	12
1993	11	1	12
1994	11	1	12
1995	11	1	12
1996	11	1	12
1997	11	1	12
7998	11	1	12
1999	11	1	12
2000	11	1	12

over the present manpower capability. The department presently employs seven sworn officers and in order to accommodate the affects of OCS development, it will almost have to double in size by 1989. Growth of this magnitude is of significant concern with respect to the level of effectiveness in the community and the associated strains on the administration of the force.

In addition, several other factors should be considered. First, the estimate of police needs are made on the permanent residential population. It is reasonable to expect that public safety in work camps, the Cape Nome enclave and onshore facilities will be handled by private security. However, many direct workers, especially onshore, will have access to the Nome community and thus accentuate present public safety problems. If non-resident onshore workers are included one additional sworn officer would be necessary to meet service needs.

A second problem is the possibility of an increased incidence of part I crimes. Rapid growth, higher levels of transiency and in-migration not necessarily compatible with existing racial and cultural compositions can be expected to result in a rise in an already significantly high part I crime index. While all part I crimes could rise, it is expected that crimes of violence (murder, rape, assault) would be especially effected. In addition, part II crimes such as simple assault, vandalism, weapons possession, prostitution and disorderly conduct induced by alcohol abuse are expected to spiral. These kinds of changes in the rate of crime could increase the need for additional manpower.

A third consideration is the role of the state troopers. Presently, the troopers, headquartered in Nome, provide regional assistance usually outside the city limits. With development of oil and gas reserves, it is very likely that state assistance would increase the presence of the troopers in the detachment.

Detention Facilities

Detention facility requirements dictate a ratio of one jail cell per 500 in the population with a minimum of three cells to allow for separation of male adults, female adults and juvenile offenders. At the peak impact point in the low find scenario, Nome should ideally have two additional cells over the non-OCS case for a total facility requirement of 17. After 1992, the demand tapers off to an incremental need of one additional detention cell over the non-OCS case. From a simple cost standpoint, Nome need maintain no more than 17 cells or beds to accommodate demand from the low find scenario. If additional need is determined, demand could be met with utilizing other state facilities rather than creating additional facilities to meet a short-term demand.

The detention facility requirements table is based on the total population anticipated to impact Nome as a result of the low find scenario and is adjusted to reflect the regional orientation of the facility. Since Nome constitutes approximately 47 percent of the region's population, the base case has been doubled to allow for the regional perspective.

TABLE 130

DETENTION FACILITY REQUIREMENTS
NON-OCS BASE CASE - LOW FIND SCENARIO
(Cumulative)

Year	Non-OCS Case	Low Find Scenario	Total
1983	13	0	13
1984	14	0	14
1985	14	0	14
1986	14	0	14
1987	14	1	15
1988	15	1	16
1989	15	2	17
1990	15	2	17
1991	15	2	17
1992	15	2	17
1993	15	1	16
1994	16	1	17
1995	16	1	17
1996	16	1	17
1997	16	1	17
1998	16	1	17
1999	16	1	17
2000	16	1	17

The present detention facility has a total of 30 dormitory beds and eight cell beds. Plans are on board through the Department of Health and Social Services for a new facility between 1983 and 1985. It is assumed that sizing of such a facility will be geared to long-range need and will ultimately be capable of accommodating demand generated through OCS activity.

Fire

The following calculations for fire flow needs are based on a constant of 1,893 liters (500 gallons) per minute minimum within Nome's distribution system. Added to this constant is the minimum community water requirement which yields a projected total minimum pumping capacity within the water distribution system. The cumulative water and fire flow need is presented for the non-OCS case, the low find scenario and the total combined effect of the standard through the period under study.

To accommodate OCS demand, Nome's water distribution system, at a minimum, should be capable of pumping 2,873 liters (759 gallons) per minute to meet normal water usage rates and minimum fire flow. The incremental affect of the low find scenario over the non-OCS case reaches a peak in 1990 at 178 liters (47 gallons) per minute. Presently, the system's capacity is 2,460 liters (650 gallons) per minute indicating a deficiency as early as year one of the lease sale. Furthermore, the above fire flow standard is not considered sufficient to accommodate fire flow needs for large structures such as hospitals or schools. In order to insure adequate fire protection to the community, Nome will need to upgrade its pumping capability early-on.

TABLE 131

MINIMUM FIRE FLOW REQUIREMENTS
NON-OCS BASE CASE - LOW FIND SCENARIO
(Cumulative)

Year	Minimum Fire Flow		Non-OCS Base Case				Low Find Scenario				Total			
			Minimum Water Requirement		Total Pumping Capability		Minimum Water Requirement		Total Pumping Capability		Minimum Water Requirement		Total Pumping Capability	
	LPM [a]	GPM [b]	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM
1983	1,893	500	696	184	2,589	684	4	1	1,896	501	700	185	2,593	685
1984	1,893	500	712	188	2,604	688	0	0	1,893	500	712	188	2,604	688
1985	1,893	500	727	192	2,619	692	0	0	1,893	500	727	192	2,619	692
1986	1,893	500	742	196	2,634	696	4	1	1,896	501	746	197	2,638	697
1987	1,893	500	753	199	2,646	699	53	14	1,945	514	806	213	2,699	713
1988	1,893	500	768	203	2,661	703	114	30	2,006	530	882	233	2,774	733
1989	1,893	500	787	208	2,680	708	170	45	2,063	545	958	253	2,850	753
1990	1,893	500	802	212	2,695	712	178	47	2,070	547	980	259	2,873	759
1991	1,893	500	806	213	2,699	713	167	44	2,059	544	973	257	2,865	757
1992	1,893	500	810	214	2,702	714	132	35	2,025	535	942	249	2,835	749
1993	1,893	500	814	215	2,706	715	110	29	2,002	529	924	244	2,816	744
1994	1,893	500	818	216	2,710	716	106	28	1,998	528	924	244	2,816	744
1995	1,893	500	821	217	2,714	717	117	31	2,010	531	939	248	2,831	248
1996	1,893	500	825	218	2,718	718	117	31	2,010	531	942	249	2,835	749
1997	1,893	500	829	219	2,721	719	117	31	2,010	531	946	250	2,839	750
1998	1,893	500	833	220	2,725	720	117	31	2,010	531	950	251	2,843	751
1999	1,893	500	836	221	2,729	721	117	31	2,010	531	954	252	2,846	752
2000	1,893	500	844	223	2,737	723	117	30	2,010	530	958	253	2.850	753

[a] LPM . liters per minute
[b] GPM = gallons per minute

Equipment and manpower requirements are considered sufficient to meet permanent residential population demand. It is assumed that the enclave facilities will develop fire fighting capabilities commensurate with the level of fire hazard associated with such facilities.

RECREATION

The following table displays recreation facilities requirements for the non-OCS case, the low find scenario and the combined cumulative affect through the period under study. The facility requirements are based on nationally accepted optimum standards as generated by the National Recreation and Parks Association. As noted in the facilities inventory in the baseline section of this report, Nome meets or exceeds the minimum requirements for play lots, softball fields and skating rinks as displayed in the table. Undoubtedly, additional revenues to the City of Nome as a result of oil and gas development will be used to expand and enhance existing facilities as well as developing new ones. Due to land constraints and lower public interest. However, land acquisition for major park development may be a problem. Based on the action of other Alaskan communities which have benefited from oil tax revenue all other categories would undoubtedly be pursued.

It is assumed that workers housed in the onshore enclave would be provided with a wide variety of recreational facilities and activities which would virtually eliminate impact on local recreational facilities

TABLE 132

RECREATION FACILITIES REQUIREMENTS
NON-OCS BASE - LOW FIND SCENARIO
(Cumulative)

Year	Play Lots			Neighborhood Parks			Basketball Courts			Tennis Courts			Softball Fields			Skating Rinks			Community Centers		
	Base[a]	Low[b]	Total	Base	Low	Total	Base	Low	Total	Base	Low	Total	Base	Low	Total	Base	Low	Total	Base	Low	Total
1983	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1984	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1985	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1986	1-7	0	1-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1987	1-7	1	2-7	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1988	1-7	2	2-8	2	0	2	2	0	2	2	0	2	1	0	1	0	0	0	0	0	0
1989	2-7	2	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1990	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1991	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1992	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1993	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1994	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1995	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1996	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1997	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1998	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
1999	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0
2000	2-8	1	2-9	2	0	2	2	0	2	2	0	2	1	1	2	0	0	0	0	0	0

[a]Non-OCS Base Case
[b]Low Find Scenario

UTILITIES

Water

Per capita water consumption has been estimated at 303 lpcpd (80 gpcpd) for planning purposes and will be used as the standard to assess permanent residential water demand for the period under study. The following table displays water requirements for the non-OCS case, the low find scenario and the total cumulative affect of the standard in use.

Total water demand for the community of Nome reaches a peak in 1990 with a system capacity requirement of 1.4 million liters (372,400 gallons) per day. Nome's present water source has the potential to yield 1.9 million liters (489,600 gallons) of water per day which is sufficient to meet water demand through the forecast period. The incremental affect of the low find scenario reaches a high in 1990 of 255,866 liters (67,600 gallons) per day and declines to 167,448 liters (44,240 gallons) per day by 2000. The difference is picked up, however, with the natural population increase anticipated in the non-OCS case.

Storage facilities should ideally accommodate a three day reserve. Present storage capacity is 1 2 million liters (320,000 gallons) which is not sufficient to meet reserve requirements. However, plans are proposed to build a 4.5 million liter (1.2 million gallon) storage facility which would be adequate to meet the three day reserve requirement through the forecast period.

TABLE 133

WATER REQUIREMENTS - LITERS PER DAY
NON-OCS BASE - LOW FIND SCENARIO
(Cumulative)

	Non-OCS Base Case		Low Find Scenario		Total	
Year	Million Liters Per Day	Gallons Per Day	Liters Per Day	Gallons Per Day	Million Liters Per Day	Gallons Per Day
1983	1.0	265,360	2,422	640	1.0	266,000
1984	1.0	270,640	2,42'2	640	1.0	271,280
1985	1,0	276,080	3,936	1,040	1.0	277,120
1986	1.1	281,600	5,148	1,360	1.1	282,960
1987	1.1	287,200	76,306	20,160	1.2	307,360
1988	1.1	292,960	159,273	42,080	1.3	335,040
1989	1.1	298,800	247,085	65,280	1.4	364,080
1990	1.2	304,800	255,866	67,600	1.4	372,400
1991	1.2	306,320	243,320	63,200	1.4	369,520
1992	1.2	307,840	237,339	61,120	1.4	358,960
1993	1.2	309,360	156,850	41,440	1.3	350,800
1994	1.2	310,880	151,400	40,000	1.3	350,880
1995	1.2	312,400	167,448	44,240	1.3	356,640
1996	1.2	314,000	167,448	44,240	1.4	358,240
1997	1.2	315,600	167,448	44,240	1.4	359,840
1998	1.2	317,200	167,448	44,240	1.4	361,440
1999	1.2	318,800	167,448	44,240	1.4	363,040
2000	1.2	320,400	167,448	44,240	1.4	364,640

It is assumed that increased city revenues generated through OCS activity in the region will provide sufficient capital to expand the water distribution system to include all old and new feasible construction not receiving this service.

During the exploration and possibly during the development phase of OCS activity, offshore rigs, boats and barges may decide to utilize the community's present water source. Table 133 displays water requirements for offshore activity through the forecast period. The standard in use is 379 lpcpd (100 gpcpd) assuming offshore activity utilizes the existing water source through 1989, (or the end of the development phase) the combined peak impact will reach 1.6 million liters (427,040 gallons) per day virtually exhausting the present water source. At this point in time an alternative will have to be identified and developed.

Onshore enclave facilities are assumed to identify and develop their own water source. Assuming a per capita consumption of 478 lpcpd (125 gpcpd) onshore onsite facilities will, at a minimum, require 82,967 liters (21,920 gallons) per day. Any water requirements for fire flow would be over and above this figure. This is based on the peak onshore, onsite population of 274 anticipated by 1989. Additional demand from offshore activity would be added to this as displayed in table 134.

TABLE 134

OFFSHORE WATER REQUIREMENT
LOW FIND SCENARIO
(Cumulative)

Year	Offshore Water Requirement	
	LPDa	GPD[b]
1983	79,485	21,000
1984	138,153	36,500
1985	196,820	52,000
1986	275,927	72,900
1987	117,335	31,000
1988	246,404	65,100
1989	364,496	96,300
1990	429,598	113,500
1991	395,911	104,600
1992	286,903	75,800
1993	212,717	56,200
1994	202,119	53,400
1995	236,184	62,400
1996	236,184	62,400
1997	236,184	62,400
1998	236,184	62,400
1999	236,184	62,400
2000	236,184	62,400

[a]LPD · liters per day
[b]GPD = gallons per day

Sewer

Wastewater generation closely approximates water consumption, and for the purpose of assessing impact, it is assumed that the two are equal. Water consumption is estimated for planning purposes at 303 lpcpd (80 gpcpd) and will be employed as the standard to assess effluent quantities. The following table displays amounts generated over the forecast period.

Total community requirements will dictate a collector system which can accommodate flows up to 1.4 million liters (364,640 gallons) per day. This is an overall increase of 37 percent for the forecast period

Nome presently handles effluents through a primary treatment facility which is currently operating at capacity. However, federal mandates are necessitating the installation of secondary treatment systems, and as a result, the city has contracted for a facilities plan. The study projects a population for the Nome area of 5,000 by the year 2000 and recommends several secondary treatment alternatives. Under serious consideration is a 4.9 hectare (12 acre) lagoon which would be sized sufficiently to meet demand through the end of the study period.

Onsite, onshore facilities are assumed to provide for their own wastewater collection and disposal. The level of effluent treatment to be used is unknown. However, whatever type of system is used, flows at a minimum of 129,636 liters (34,250 gallons) will have to be met based on a per capita wastewater generation of 473 lpcpd (125 gpcpd).

TABLE 135

WASTEMATER GENERATION - LITERS PER DAY
NON-OCS BASE - LOW FIND SCENARIO
(Cumulative)

	Non-OCS Base Case		Low Find Scenario		Total	
Year	Million Liters Per Day	Gallons Per Day	Liters Per Day	Gallons Per Day	Million Liters Per Day	Gallons Per Day
1983	1.0	265,360	2,422	640	1.0	266,000
1984	1.0	270,640	2,422	640	1.0	271,280
1985	1.0	276,080	3,936	1,040	1.0	277,120
1986	1.1	281,600	5,148	1,360	1.1	282,960
1987	1.1	287,200	76,306	20,160	1.2	307,360
1988	1.1	292,960	159,273	42,080	1.3	335,040
1989	1.1	298,800	247,085	65,280	1.4	364,080
1990	1.2	304,800	255,866	67,600	1.4	372,400
1991	1.2	306,320	243,320	63,200	1.4	369,520
1992	1.2	307,840	231,339	61,120	1.4	358,960
1993	1.2	309,360	156,850	41,440	1.3	350,800
1994	1.2	310,880	151,400	40,000	1.3	350,880
1995	1.2	312,400	167,448	44,240	1.3	356,640
1996	1.2	314,000	167,448	44,240	1.4	358,240
1997	1.2	315,600	167,448	44,240	1.4	359,840
1998	1.2	317,200	167,448	44,240	1.4	361,440
1999	1.2	318,800	167,448	44,240	1.4	363,040
2000	1.2	320,400	167,448	44,240	1.4	364,640

Electricity

The following table displays load requirements for the non-OCS case, the low find scenario and the total cumulative impact for the period under study. In the non-OCS case a per capita load of 2.0 KW is in use to generate the level of service capacity. For the OCS scenario increment, a slightly higher per capita demand is anticipated at 2.5 KW. The two columns are combined yielding a total system capacity requirement for the permanent population in the community.

Total generation capability is presently 5,850 KW. The city has plans to add an eighth unit with a firm capacity of 2,500 KW bringing total generation capability to 8,350 KW. This capacity would only accommodate OCS activity through 1987. In addition, due to a short-term surplus anticipated by the city, several of the smaller generators will probably be retired. The overall implication of the low find scenario is that prior to OCS development and production phases generating capacity will have to be significantly increased. Over the forecast period the overall effect of the low find scenario plus the base case produces an increased need of 41 percent.

It is important to note that with rising fuel prices diesel generation is becoming a costly method of generating electricity. Alternative forms of power generation are being considered such as geothermal and hydroelectric. However, any new major development will have to be implemented immediately and will need to be subsidized in the interim with diesel generation until such time as the new system is on line.

TABLE 136

KW LOAD REQUIREMENTS
NON-OCS BASE - LOW FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case KW	Low Find Scenario KW	Total KW
1983	6,634	20	6,654
1984	6,766	20	6,786
1985	6,902	33	6,935
1986	7,040	43	7,083
1987	7,180	630	7,810
1988	7,324	1,315	8,639
1989	7,470	2,040	9,510
1990	7,620	2,113	9,733
1991	7,658	1,975	9,633
1992	7,696	1,598	9,294
1993	7,734	1,295	9,029
1994	7,772	1,250	9,022
1995	7,810	1,383	9,193
1996	7,850	1,383	9,233
1997	7,890	1,383	9,273
1998	7,930	1,383	9,313
1999	7,970	1,383	9,353
2000	8,010	1,383	9,393

The meeting of future energy requirements, with all the federal limitations and restrictions, may be one of Nome's most critical problems in accommodating OCS activity. With development of petroleum resources in the region, Nome may be able to utilize natural gas as a more cost effective means of power generation. However an exemption from the Power Plant and Industrial Fuel Use Act which bans the use of natural gas as a source for new base load will have to be obtained.

It is assumed that onshore enclave facilities will also have large power demands. However, the oil and gas processed . n these facilities are often used for electrical generation, and for the purpose of assessing impact, this is assumed to be the course of action which will be fol-
1 owed.

Solid Waste

Solid waste generation for Nome has not actually been calculated; however, national standards indicate an estimated per capita solid waste generation rate of 2.3 kilograms (5 pounds) per capita per day. As per standards, utilizing a fill depth of 2.1 meters (7 feet) of which two-thirds is solid waste material, .08 hectares (.21 acres) per year per 1,000 people is required to accommodate a sanitary landfill. The following two tables display the quantities of solid waste generated per year and the landfill requirement by the end of the study period for the non-OCS case, the low find scenario and the combined effects of the two projections.

TABLE 137

SOLID WASTE GENERATION
QUANTITY OF SOLID WASTE PER YEAR

Year	Non-OCS Base Case		Low Find Scenario		Total	
	Metric Tons	Us. Tons	Metric Tons	U.S. Tons	Metric Tons	Us. Tons
1983	2,745	3,026	7	8	2,752	3,034
1984	2,800	3,087	6	7	2,806	3,094
1985	2,856	3,149	11	12	2,867	3,161
1986	2,913	3,212	15	16	2,928	3,228
1987	2,971	3,276	209	230	3,180	3,506
1988	3,031	3,342	435	480	3,467	3,822
1989	3,091	3,408	676	745	3,767	4,153
1990	3,154	3,477	698	770	3,852	4,247
1991	3,169	3,494	654	721	3,823	4,215
1992	3,184	3,511	529	583	3,713	4,094
1993	3,201	3,529	428	472	3,629	4,001
1994	3,216	3,546	414	456	3,630	4,002
1995	3,232	3,563	458	505	3,690	4,068
1996	3,249	3,582	457	504	3,706	4,086
1997	3,265	3,600	457	504	3,722	4,104
1998	3,282	3,618	458	505	3,740	4,123
1999	3,298	3,636	458	505	3,756	4,141
2000	3,315	3,655	457	504	3,772	4,159
TOTAL	55,972	61,711	6,827	7,527	62,800	69,238

TABLE 138

LANDFILL REQUIREMENTS
NON-OCS BASE CASE - LOW FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case		Low Find Scenario		Total	
	Hectares	Acres	Hectares	Acres	Hectares	Acres
1983	.28	.70	0.0	0.0	.28	.70
1984	.29	.71	0.0	0.0	.29	.71
1985	.29	.72	0.004	0.01	.30	.73
1986	.30	.74	0.0	0.0	.30	.73
1987	.30	.74	.03	0.07	.33	.81
1988	.31	.77	.04	0.11	.36	.88
1989	.32	.78	.07	.18	.39	.96
1990	.32	.80	.07	.18	.40	.98
1991	.32	.80	.07	.17	.39	.97
1992	.32	.80	.06	.14	.38	.94
1993	.33	.81	.04	.11	.37	.92
1994	.33	.82	.04	.10	.37	.92
1995	.33	.82	.05	.12	.38	.94
1996	.33	.82	.05	.12	.38	.94
1997	.34	.83	.04	.11	.38	.94
1998	.34	.83	.05	.12	.38	.95
1999	.34	.84	.04	.11	.38	.95
2000	.34	.84	.05	.12	.39	.96
TOTAL	5.73	14.17	.704	1.77	6.45	15.94

The total amount of solid waste generated by the community over the forecast period will be 62,800 metric tons (69,238 U.S. tons) which is a 12 percent increase over the base case and yields a total fill requirement of 6.45 hectares (15.94 acres). In addition, the city should maintain at least one collection vehicle through the forecast period to accommodate demand.

OCS generated solid waste is assumed to be handled through the facilities located in proximity with the enclave at Cape Nome. However, during the development phase, some generation of solid waste might occur where it would be more expeditious to utilize the community's landfill, However, this amount will probably not significantly impact the land requirements as noted above.

Telephone

The following table indicates the number of main stations required in the non-OCS case, the low find scenario and the total cumulative effect of the two projections over the forecast period. The projections are based on the standard of .53 telephones per person increasing to .61 telephones per person between 1980 and 2000 at a rate of .02 telephones per person every five years.

The present system by General Telephone Company of Alaska serves 584 residential working stations and 1,028 commercial working stations for a total of 1,612. The present switching equipment can accommodate 200

TABLE 139

CAPACITY REQUIREMENTS - TELEPHONE SERVICE
NON-OCS BASE CASE - LOW FIND SCENARIO
(Cumulative)

Year	Non-OCS Base Case	Low Find Scenario	Total
1983	1,791	4	1,795
1984	1,861	4	1,865
1985	1,898	7	1,905
1986	1,936	9	1,945
1987	2,010	141	2,151
1988	2,051	295	2,346
1989	2,129	465	2,594
1990	2,172	482	2,654
1991	2,183	450	2,633
1992	2,232	371	2,603
1993	2,243	300	2,543
1994	2,293	295	2,588
1995	2,304	326	2,630
1996	2,316	326	2,642
1997	2,367	332	2,699
1998	2,379	332	2,711
1999	2,431	337	2,768
2000	2,443	337	2,780

more main stations before saturation occurs. This essentially means that as early as year one of the lease sale, Genera? Telephone Company of Alaska will have to expand their switching equipment to accommodate the effect of the low find scenario. At that point in time, a move to solid state switching equipment is anticipated.

With regard to the enclave facility located at Cape Nome, it is assumed that Alascom will meet facility requirements as deemed necessary to accommodate communication needs.

HOUSING AND LAND USE

Housing and Residential Land

Compared to the base case, the low find scenario rapidly accelerates the estimated rate of growth in housing demand between 1987 and 1990 (see table 140). These years represent the period of the major housing and residential land demand in Nome under this scenario. As in the medium find scenario, there is a negative housing demand from 1991 to 1994. Then, in 1995 the housing demand resumes for one year before returning to approximately the level projected for the base case in 1996. As in the other scenarios, if housing is constructed to meet the peak demand, a surplus will develop (see table 140).

TABLE 140

FORECAST OF NET CHANGE IN HOUSING DEMAND[a]
NON-OCS BASE CASE - LOW FIND SCENARIO

	Non-OCS Base Case		Net Residential	Low Find Scenario		Total	
Year	Net Change Demand for Housing Units	Cumulative Housing Demand	Population Increase Over Base Case	Net Change Demand for Housing Units	Cumulative Housing Demand Over Base Case	Net Change Demand for Housing Units	Cumulative Housing Demand
1983	18	18	8	3	3	21	21
1984	18	36	0	0	3	18	39
1985	19	55	5	2	5	21	60
1986	20	75	4	1	6	21	81
1987	20	95	235	76	82	96	177
1988	21	116	274	88	170	109	286
1989	21	137	290	94	264	115	401
1990	21	158	29	9	273	30	431
1991	5	163	(55)	(18)	255	(13)	418
1992	55	168	(151)	(49)	206	(44)	374
1993	6	174	(121)	(39)	167	(33)	341
1994	5	179	(18)	(6)	161	(1)	340
1995	6	185	53	17	178	23	363
1996	6	191	0	0	178	6	369
1997	5	196	0	0	178	5	374
1998	6	202	0	0	178	6	380
1999	6	208	0	0	178	6	386
2000	6	214	0	0	178	6	392
Total	214		553	178		392	

[a]See Methods Section

In the low find scenario, the incremental effect above the base case upon demand levels from 1983 to the year 2000 is approximately 178 additional dwelling units and between 29 acres (12 hectares) and 57 acres (23 hectares) of residential land (see tables 140 and 141). This represents about 83 percent of the total increase in housing and residential land estimated to be needed under the base case between 1983 and 2000. (These figures do not include 52 units projected under the base case from 1980 to 1982).

Though the incremental demand for housing and residential land under the low find scenario is considerably less than the other scenarios, this scenario still represents an 83% increase over the base case. Because of the problems presented in the baseline and medium find scenario (housing shortage, lack of land, high land prices, high rents, inadequate services), even the low find scenario is expected to have a considerable impact on Nome.

Industrial Land Requirements

In the low find scenario, potential Cape Nome land requirements for the crude oil terminal and LNG facility are estimated to be between 90 acres (37 hectares) and 156 acres (63 hectares) (see table 142). These figures are based on the same assumptions and calculations as the medium find scenario. Even though the demand for land at Cape Nome is considerably less than under the other scenarios, potential problems identified in the medium find scenario with using this site for an oil terminal also apply to the low find scenario.

TABLE 141

ESTIMATED DEMAND FOR RESIDENTIAL LAND
LOW FIND SCENARIO

	Net New Housing Units	Within Existing Corporate Limits: Net New Residential Land Use (Acres)[a]	Outside Existing Corporate Limits: Net New Residential Land Use (Acres)[a]	Outside Existing Corporate Limits: Public Rights-of-way (Acres)[a]	Outside Existing Corporate Limits: Gross New Residential Land Use (Acres)[a]
1983-1985	5	.8	1.1	.4	1.5
1986-1990	268	43.1	61.5	23.9	85.4
1991-1995	(95)	(15.3)	(21.8)	(8.5)	(30.3)
1996-2000	0	0	0	0	0
TOTAL	178	28.6	40.8	15.8	56.6

[a]Multiply by .40469 to obtain hectares

TABLE 142

ESTIMATED LAND REQUIREMENTS FOR OIL TERMINAL AND LNG FACILITY
CAPE NOME
10W FIND SCENARIO

Peak Production Oil B/D	10 Day Storage Capacity (Million Brls)	10 Day Storage Area		Total Area Required For Oil Terminal		LNG Facility	Total Area Required For Oil Terminal and LNG Facility	
		Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)	Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)	Acres (Hectares)	Ideal Building Conditions Acres (Hectares)	Poor Building Conditions Acres (Hectares)
153,000	1.53	22 (9)	55 (22)	44 (18)	110 (44)	46 (19)	90 (37)	156 (63)

HEALTH

Applying the ratios of 3.5 acute care beds per 1,000 people and one primary care physician per 1,500 population, table 143 projects the added beds and physicians needed under the low find scenario. The present hospitals facilities will be moderately strained with OCS development. In the base case, additional beds are required slowly and incrementally throughout the study period. The present number of beds provides some excess capacity to accommodate needs in the short-term. Oil and gas development begin affecting the health infrastructure in 1983 and build to an additional need of eight beds in 1990. This is a substantial additional demand and represents a 33 percent increase in required capacity. About 37.5 percent of this increased demand could be handled on a temporary basis without permanent facilities, but 5 beds above the base case are required on a long-term basis. This increment would require additional facilities significantly above what is presently available. In 1990, a facility with 32 beds with temporary availability of three additional beds would be needed. This is about 50 percent above the present capacity. To cope with this demand planning and feasibil ity work would have to begin in 1982 and 1983 so once the extent of OCS development were determined, new facilities could be added by 1985-1986.

Having adequate health facilities and services available to the community, region, and offshore and onshore OCS enclaves are important. These health care needs for primary OCS employees will be partially met through a rapid medical care evacuation system. It would seem likely that the fact that the

enclave approach means rotation of most employees to homes outside of the Norton Sound area means that local health systems will not be impacted in regards to preventive care. The impact on the local system would come in treatment of illness care and particularly accident care.

Oil companies would have air transport available to evacuate workers requiring medical attention. While this approach to care would be adequate in many cases, it does not cope with the problem of immediate emergency treatment which may be required prior to evacuation. Also, the major concern of health professionals in Nome is the possibility of a serious accident effecting a large number of workers. Injury due to accidents in the oil industry are certainly a possibility, and this could overwhelm any transport system and local hospital emergency facility.

One concern for a local health system in OCS development is whether the system is administratively designed to provide care for OCS workers. In the case of Norton Sound, the Norton Sound Health Corporation, as a nonprofit corporation, is capable of providing services to all races, individually and contractually. A major impediment may be adequate capital to expand facilities on a timely basis. Commitments from private industry may be necessary if access to the local health care system is to be available.

In addition to acute care beds, other facility improvements may be necessary. These would be in the areas of accident care. A limited burn center and a frostbite and hypertension facility would be two possible facilities

requiring development.

In addition to facilities, sufficient health professionals are necessary to provide adequate service levels. Table 143 notes the number of additional primary care physicians projected for the low find scenario. The need for one additional physician after 1988 is projected. While seemingly a modest increment, retention and continuity of care by physician is not an easy task. This also implies corresponding increases in other health professionals and support staff including registered nurses, licensed practical nurses, nurses' aides, medical technicians, etc. The increase in population may also raise the possibility of a physician specialist residing in Nome. If this occurred, it would most likely be a specialty that could deal with trauma cases. It is doubtful, however, if the low find would have sufficient need for this to occur.

Besides beds and physician needs for OCS development, a less measurable health need is the possibility for increased demands on the system by the resident base case population due to development. While most levels of needs within the base population should not be effected by development, some could. Health problems related to or induced by socio-cultural problems could well be exacerbated by OCS. This could well mean increased service needs for dealing with such health problems as alcoholism, other substance abuse, and psychological problems. This would require appropriate facilities and staff to meet this need.

TABLE 143

ADDITIONAL ACUTE CARE BED AND PRIMARY CARE PHYSICIAN NEED
NON-OCS BASE - LOW FIND SCENARIO
(Cumulative)

	Non-OCS Base Case[a]		Low Find Scenario		Total	
Year	Acute Care Beds	Primary Care Physicians	Acute Care Beds	Primary Care Physicians	Acute Care Beds	Primary Care Physicians
1980	20	4	0	0	20	4
1981	20	4	0	0	20	4
1982	21	4	0	0	21	4
1983	21	4	1	0	22	4
1984	22	4	1	0	23	4
1985	22	4	2	0	24	4
1986	22	4	3	1	25	5
1987	23	4	2	0	25	4
1988	23	4	5	1	28	5
1989	24	4	7	1	31	5
1990	24	4	8	1	32	5
1991	24	4	7	1	31	5
1992	25	4	6	1	31	5
1993	25	4	4	1	29	5
1994	26	4	4	1	30	5
1995	26	4	5	1	31	5
1996	26	4	5	1	31	5
1997	27	4	5	1	32	5
1998	27	4	5	1	32	5
1999	28	5	5	1	33	6
2000	28	5	5	1	33	6

[a]Regional Forecast

SOCIAL SERVICES

Though no formal quantitative standards exist for the delivery of social services, the following points are to provide a qualitative framework for future service needs under the low find scenario.

- Social services which deal with problems in behavioral and social health areas are presently a chronic and serious community problem. OCS development can be expected to exacerbate these problems in two ways. First, these problems can be expected to increase above levels presently found as the influx of new residents, money, and transients tear into the social and cultural fabric of the community. The majority of new residents are expected to be whites with little previous contact with rural native populations. The cultural gap and subsequent impact on the native community in particular but also the general base population is expected to be severe. Alcoholism and other substance abuse, spousal and child abuse, general cross-cultural adjustment, and general emotional problems can be expected to rise above existing levels under the scenario. In addition, social problems within the enclave populations can be expected to be severe, Offshore workers live in a more restricted environment so problems should be more controllable by management, Social problems within the enclave or work camps should be more severe due to the accessibility of the Nome community. Nome has the reputation as a wide open town and

the monetary benefits of enclave workers having access to Nome is expected to increase these workers exposure to alcohol abuse and increase the possibility of anti-social behavior. This is expected to cause significant public safety problems, though it should not cause an increase in social services delivery beyond the increased needs of the resident population.

While employment opportunity does expand for the resident population, in-migration will cause sharp competition for jobs and for the better positions. An increase of two or three percent in the participation rate is not sufficient to alter the basic problems of unemployment, underemployment, and seasonal employment. While native employment rates are expected to rise, it is possible that non-natives will do even better, exacerbating employment and income gaps in the community. One difficulty for native employment is that major opportunities for primary sector employment came in the summer months when conflicts for subsistance activities are especially high. While some employment opportunities may be compatible with subsistence pursuits (especially if rotated one week on and one week off), others could inhibit subsistence activities and thus effect diet, heavy reliance on the cash economy, etc.

- The provision of decent housing is expected to be an important issue if development occurs. The limited amount of standard quality housing stock, the high cost of housing construction, and high rents are all factors presently being contended with. The influx of additional population is expected to produce severe shortages and rising rents. As new workers compete for scarce housing, this will tend to push poor residents into the more substandard units and generally increase crowding. These issues are discussed in the housing section.

PUBLIC SECTOR EXPENDITURES

Table 144 shows estimated assessed values in Nome under the low find scenario. Estimates of the oil terminal and LNG plant are by Dames and Moore. Incremental value in Nome is an estimate based on the amount of population growth forecast under the low find scenario and the current assessed value in Nome. Thus, for example, in the low find scenario, additional assessed value is assumed to be 70 percent of current value because the population is expected to increase 70 percent by the production phase.

Table 145 presents the maximum general property tax revenue that the City of Nome could generate under the tax limits imposed by AS 29.53. Also, the table shows the amount of revenue that could be generated under alternative 2 at the current property tax rate in Nome of 17.9 mills (under the first alternative, the city could not legally tax at over the rate shown in column 4 of table 145).

TABLE 144

ESTIMATED TOTAL ASSESSED VALUE IN NOME
LOW FIND SCENARIO PRODUCTION PHASE
(1978 $)

Property	Plant Capacity	Estimated Assessed Value ($ Million)
Oil Terminal[a]	153.6 MB/D	$ 368.6
LNG Plant[b]	230.4 MMCF/D	645.1
Service Base[c]	Small	10.0
Existing Value[d]		29.3
Incremental Value[e]		11.7
TOTAL		$1,064.7

[a] Dames & Moore: includes pipeline terminal, crude stabilization, LPG recovery, tankers ballast treatment, crude storage, tankers loading piers; mid-range cost estimate of $2,400/bbl of daily through put capacity.

[b] Dames & Moore; includes liquefaction trains and marine terminal; cost estimate $514 Million for 200 MMCF/D capacity plus $155 Million for each additional 200 MMCF/D of capacity.

[c] Estimate by Policy Analysts, Ltd.

[d] Alaska Department of Community and Regional Affairs, State Assessor's Office, Alaska Taxable 1978, p.39.

'Incremental value is directly proportional to population increase in Nome between 1979 and production phase (High Find 90% of current value, Medium, 70%, Low, 40%).

TABLE 145

ANNUAL PROPERTY TAX REVENUE FOR OPERATIONS, CITY OF NOME
DURING PRODUCTION PHASE OF LOW FIND SCENARIO
(1978 $)

Alternative	Estimate of Population During Production[a]	Maximum Revenue	Tax Rate to Obtain Maximum Revenue	Revenue at 1978 Tax Rate of 17.9 Mills
1[b]	4,550	$ 6,825,000	6.4	N.A.
2[c]	4,550	$16,155,500	30	$9,639,000

[a]An estimate of approximate population during years of production, from Tables 78.
[b]Maximum revenue $1,500 per capita, AS 29.53.045(b)
[c]Maximumtaxable property value is 2.5 times state average per capita assessed value times population; maximum tax rate is 30 mills, AS 29.53.045(c)

TABLE 145, Continued

ILLUSTRATION OF DEBT CAPACITY AND REPAYMENT OBLIGATION FOR CITY OF NOME
DURING PRODUCTION PHASE - LOW FIND SCENARIO
($ Million, 1979)

Total Assessed Value[a]	% Oil Related Property	Debt Capacity and Repayment Obligation[b]: Debt at 1.5% of Total Assessed Value			Debt at 2.5% of Total Assessed Value		
		Debt	Repayment	Mills	Debt	Repayment	Mills
1,064.7	(96.1)	16.0	1.510	1.42	26.6	2.511	2.36

[a]From Table 144.
[b]Annual payment required to amortize principal and interest of the total debt at seven percent (7%) interest over a 20 year period; millage rate = $\frac{\text{annual payment}}{\text{assessed value}}$.

Table 145 also illustrates the amount of money that the City of Nome could raise for bonding purposes. Note that the city can raise any amount of money for bonds that it wishes, as long as it does not exceed locally imposed limits on total debt or endanger its bond rating in financial markets. For practical purposes, the amount of bonds sold will be limited by the willingness of local residents and businessmen to tax themselves, because while the oil property will pay most of the total cost (% of oil related property, column 145), this property can not be taxed at a rate higher than that which applies to the rest of the community. Therefore, a bond issue that requires one mill to retire will cost the owner of a $100,000 home $100 annually.

Under alternative one, Nome could raise a maximum of $6,825,000 for operating purposes with a tax rate of 6.4 mills, or, under alternative two, $16,155,000 with a rate of 30 mills. The current rate of 17.9 mills would generate $9,639,000 under alternative two.

If the city were to sell bonds representing 2.5 of the local assessed value, $26.6 million could be raised. This would require an annual payment of $2,511,000 requiring abondlevy of2.36 mills. The city could raise a total of $9,336,000 for both operating purposes and bond repayment with a combined property tax rate of 8.76 mills.

Table 146 summarizes OCS revenues from OCS operations and excluding OCS facilities. This is presented for illustrative purposes to note the general magnitude of OCS revenues. The primary problem would appear to occur during the development phase when substantial impact is expected, but the predominate share of OCS revenues has yet to be made available. This can be expected to cause problems of balancing revenue and expenditure demands.

TABLE 146

REVENUE PROJECTIONS FOR NOME
LOW FIND SCENARIO

	Non-OCS Base Case	Low Find Scenario		
Year	Revenues from All Sources	Revenues, excluding OCS Facilities	OCS Operations Revenue[c]	Total[d]
1983	6,049	17	0	6,066
1984	6,103	18	0	6,121
1985	6,287	28	0	6,315
1986	6,354	37	0	6,391
1987	6,426	454	0	6,880
1988	6,500	939	0	7,439
1989	6,574	1,444	0	8,018
1990	6,666	1,487	0	8,153
1991	6,701	1,390	9,639	17,730
1992	6,734	1,124	9,639	17,497
1993	6,729	906	9,639	17,274
1994	6,762	875	9,639	17,276
1995	6,813	967	9,639	17,419
1996	6,825	967	9,639	17,431
1997	6,864	967	9,639	17,470
1998	6,899	967	9,639	17,505
1999	6,934	967	9,639	17,540
2000	6,988	967	9,639	17,594

[a]Includes property taxes, sales taxes, state and federal revenues, all other revenue, all in constant dollars discounting inflation.

[b]Includes all noted in footnote "a" plus sales tax revenues on transients' local expenditures

[c]Alternative two using 1978 tax rate used for illustrative purposes. Actual amount is dependent upon local decision. This does not include the amount of money Nome could raise for bonding purposes.

'Figures have been rounded.

Exploration Case OCS Scenario

Reviewing the socioeconomic character of the community and the existing service infrastructure, the following observations on the economy and the community have been made in the case of the exploration OCS scenario.

THE ECONOMY AND THE COMMUNITY

Employment patterns for the exploration case show the total primary workforce occurring only during 1983, 1984 and 1985. Direct employment peaks at 288 in the second year, but an average of 90 percent all direct employment is located offshore in self-contained enclaves. This workforce will be almost exclusively supplied through rear support bases and rotated on a regular schedule between offshore platforms and Anchorage or other urban points. While the Nome airport may provide some logistical support and act as a conduit for personnel rotation, there will be an effect on the community due to offshore activity in the exploration case. Onshore employment peaks at 28 in 1984, of which about four jobs are projected to come from the local labor force. The replacement of these jobs (those leaving a secondary position to take a primary job) and the effects of direct employment spending also generate secondary employment (13 additional jobs in 1984).

Population is effected due to the lack of an enclave - all onshore direct employment will reside in Nome - and whether secondary jobs are filled by in-migration or the total load labor pool - 85 percent due to in-migration. These assumptions produce a forecast of 27 in 1983, 58 in 1984, and 30 in 1985.

The effect the exploration case in terms of population and employment impacts are negligible. The reasons two-fold. First, the stimulus of added population is short-lived and transient. A three year effect (highly concentrated to just the summer months) calls for temporary solutions rather than long-term or capital intensive ones. Second, the level of impact is quite small even within the context of a community as small as Nome. In 1984, the peak activity year, employment increases 3.4 percent above the case, and population rises 1.7 percent. While this is a nice (if temporary) boost to the economy of Nome, it generally has no effect on most of the community's infrastructure.

ASSESSMENT OF SERVICES AND COMMUNITY INFRASTRUCTURE

A review of the standards developed to measure service impacts found that the following services would require no additional increase in capacity, whether in terms of capital investment, or personnel, to meet any additional needs suggested by the projections developed for the exploration case:

- Primary and secondary education - the exploration case is unlikely to produce any additional children, and in any event would not exceed 10. This increment could be absorbed with no increase in classrooms or teachers.

- Postsecondary education - no additional postsecondary education needs are projected for any exploration phase including this case.

- Police - no additional officers are projected though pressure might increase to insure that the force reaches levels projected in the non-OCS case.

- Detention facilities - there is an excess of capacity during the three affected years.

- Fire - fire flow needs are projected to be the same as the non-OCS case.

- Recreation - no additional recreational facilities above the non-OCS case are projected.

- Water - no additional storage capacity or system requirements are projected under the exploration case. One possibility is that the offshore facilities would use the Nome water source for their supply. Nome has sufficient excess capacity to do this during the projected activity years.

- Sewer - additional wastewater generation under the exploration case is not sufficient to alter wastewater capacity requirements called for under the non-OCS case.

- Electricity - the excess electrical generation capacity projected in the baseline exceed the additional incremental need under the exploration case.

- Solid waste - additional solid waste generated under the exploration case would not exceed the investments necessary under the non-OCS case.

- Telephone - additional telephones required for the exploration case would not. be sufficient to alter the basic capital investment pattern projected under the non-OCS case.

- Health - no additional hospital beds, professional personnel would be required above the non-OCS case.

- Social services - the social services problems and needs outlined in the non-OCS case are not expected to be measurably changed with the addition of the exploration case increment.

- Government revenues and expenditures - the short-term effects of the exploration case is expected to produce a modest and temporary increase in revenues. This fact, however, is not expected to change the long-term pattern of revenues and expenditures projected in the non-OCS case.

The following infrastructure requirement was assessed and projected to be adversely effected by the exploration case:

- Housing and land use - housing is in such a weak position in terms of meeting present needs, that even a small temporary increase in population is expected to have a negative effect. Because the

workforce is expected to be highly concentrated during the summer months, population can be expected to peak up to three times higher than the forecast. Table 147 forecasts the housing required under the exploration case.

TABLE 147

HOUSING REQUIREMENTS UNDER THE EXPLORATION CASE

	Average Annual Demand		Summer Peak Demand	
Year	Transient Direct	Other Needs	Transient Direct	Other Needs
1983	11	5	33	10
1984	24	11	72	22
1985	14	5	42	10

There is insufficient housing stock or expectations of additional stock that the demand for this level of additional units, especially during the summer months, could only be accommodated with some planning or a great many people could end up on the beach in tents. It is assumed that non-residential directly employed OCS workers will be assisted in their housing by sponsoring companies. This could include the introduction of prefab or mobile housing on a temporary basis, the renting of lodging rooms by the months for workers, or the leasing of existing group facilities or facilities which could be transferred into group housing. As for the other housing needs, they are less severe, but still would require an increase in the non-OCS base stock to meet needs. While this increment is short-term any permanent additions to the stock could be readily absorbed in a short period due to growth in the non-OCS case.

In summary, of all services reviewed, only housing is considered to be seriously affected by the exploration case. All other services either have no measurable impact or the impact expected is insufficient to warrant a change in the capacity requirements projected under the non-OCS case.

V. SOCIO-ECONOMIC AND PHYSICAL BASELINE OF THE CITY OF KOTZEBUE

The following chapter provides an overview of the City of Kotzebue's social and economic characteristics and community infrastructure. This analysis uses existing secondary data, supplemental with primary data personal interviews to look at the topics of the demography, economy, local government, education, public safety, utilities, land and housing, and health and social services.

Historical Background

The site on which Kotzebue stands shows evidence of continuous Eskimo residence for at least 600 years. (Gidding, 1952) Originally classified as a fish camp called Kikitaruk, the area was home to the Kikitarmuit people, numbering about 200. In 1897, a reindeer station was located at Kotzebue and the community became a permanent settlement. In 1902, the Society of Friends Mission was established and a post office opened. In the 1909 census, the population count was 193.

Over the next 30 years, Kotzebue grew slowly but steadily, so by 1939 the census recorded 372 people. The post World War II period brought an expanded role for the community and concomitants of growth of population and development of a service infrastructure. This change grew out of the federal government's increasing commitment toward upgrading the health, education and quality of life of Alaska natives. Kotzebue, because of its geographic location and already the largest village in the region, was selected

as a center from which to develop these services. This role also enchanced other traditional functions of Kotzebue including the sea and air gateway to the northwestern Alaskan arctic, and its role as the hub of trading and distribution activities for the Kobuk region. (MSMI, 1976; Smith, 1966)

The two largest federal projects were the U.S. Public Health Service Hospital and the large Bureau of Indian Affairs school, but there was also Alaska Communication Service, FAA, White Alice (Military Communications), Post Office and Weather Bureau. The construction of these buildings and others and their maintenance and operations assured a limited economic stability for the community. (Smith, 1966) In order to operate this infrastructure, the government had to station a group of skilled personnel (primarily white) to provide the various services. However, Kotzebue's growth was more a result of migration within the region than from outside it. The community's share of the region's civilian population increased from 16.5 percent in 1939 to 39.2 percent in 1970.

LOCAL GOVERNMENT

Kotzebue has been incorporated as a second class city since 1958. This status limits both its powers and sources for revenue. Second class cities do not have the responsibility for education. It did assume the optional power of planning and zoning, and exercises police, fire, and some animal control powers. In addition, it is possible for the water, sewer, and garbage collection utilities. Its local revenues are

limited to a three percent sales tax. (MSNI, 1976)

Authority is vested in an annually elected city council of seven members headed by a mayor who is a council member. A salaried city manager runs the day to day operations of the city. During the early years of the city, the white minority dominated the local government. In 1965, the mayor was white and only one member of the council was Eskimo. Political interest and activity in local government was minimal by the majority of residents. (Smith, 1966)

The situation changed somewhat in the 1970's with the development of a larger group of white collar, professional, managerial Eskimos. This, tied to the activities of land claims, led to greater political participation by some segments of the native community. Today five natives and two whites hold seats on the City Council.

NATIVE POLITICAL STRUCTURE

In 1966, the Northwest Alaska Native Association (N.A.N.A.) was organized to unify land claim activities. In 1967, the Kikiktagruk Development Corporation (KDC) was formed as a result of President Johnson's anti-poverty program funded by the U. S. Office of Economic Opportunity and development of the fish co-op, parent-child center, and coordination of manpower and firefighter efforts were promoted throughout the Region; Upon passage of the Alaska Native Claims Settlement Act in 1971, the NANA Regional Corporation was formed and certified eligible to obtain

land and money benefits. Both the Northwest Alaska Native Association and NANA Regional Corporation fell under one management. The settlement act also created a local profit corporation for each village. All of the village profit corporations within the NANA region, with the exception of the Kotzebue based Kikiktagnuk Inupiat Corporation (KIC), merged together with the NANA Regional Corporation in 1975.

In addition to waging the battle for a claims settlement, NANA promoted a variety of social programs through government grants and contracts. As a corporation whose main responsibility was to earn a profit, it was difficult for NANA to also promote its social programs to the extent desired. The Northwest Alaska Native Association was renamed Mauneluk Association in 1972 and separated from the NANA Regional Corporation. The Kotzebue Area Health Corporation was formed in 1973 and separately incorporated, merging with the Mauneluk Association in 1975. Mauneluk Association is incorporated to promote the economic and social well-being of the people of Northwest Alaska. Currently two regional organizations exist: the profit-oriented NANA Regional Corporation, and the non-profit Mauneluk Association.

Each village within the region has an IRA council formed under the Indian Reorganization Act of 1934, and with the exception of the village of Noatak, each is also incorporated as a second class city under the laws of the state of Alaska. It is the IRA councils who have designed Mauneluk Association to act on their behalf as a regional tribal organization. (Mauneluk Association, 1979)

Current Demographic and Economic Profile

The present population of Kotzebue can be characterized as young, lacking in formal eduation, underemployed, with a large Eskimo majority and a white (largely professional/managerial) minority. Kotzebue plays a dominant economic role in the region, characterized by growing population and employment. Government spending continues to dominate the economic life of the community; participation in the cash economy and personal incomes remain below U. S. and state averages, even though higher relative to the balance of the region.

BASELINE POPULATION ESTIMATE

The population of Kotzebue has shown a pattern of incremental growth prior to 1940 with rapid expansion characterizing the post-World War II period. Kotzebue doubled its population between 1950 and 1960, jumped another 31.5 percent in the 1960's, and climbed 48.9 percent between 1970 and 1978. Even more startling is the changing role of Kotzebue in the region. In its early history, the city was estimated to be only 10 to 15 percent of the region's population. By 1960, it was 36.2 percent of the region and the ratio was fairly stable up to 1970. During the 1970's it climbed to 49.6 percent by 1978. Constituting about one-half the Kobuk's population. (See Table 148)

Kotzebue also has a high temporary transient population who increase the population during the summer season. This group has two components: attraction of regional and outside people to take seasonal jobs in

construction, transportation, and other jobs, and a fish camp outside the city limits. The seasonality due to employment was estimated to be 400 in 1965 (Smith, 1966). Today, that figure is assumed to fluctuate 200 to 400 residents depending on the level of construction, transportation and other seasonal activity.

Population growth in recent years appears to be due to a fairly straight line growth in employment (adjusting for seasonality) during the 1970's which continued to attract regional residents to Kotzebue. In the 1979 Mauneluk survey, 38.6 percent of the Kotzebue population said they had lived in another village at some time prior to residing in Kotzebue, 37.5 percent of the sample migrated to the city for employment reasons, and only 38.1 percent were born in Kotzebue. The major employment opportunities which contributed to this growth appears to be FIRE (profit native corporations), services, and state and local government.

Table 74 compares the City of Kotzebue and the NANA (Kobuk) region at selected historical points in time. It should be noted that conflicting estimates were found and were noted in the table. The balance of region (excluding Kotzebue) has had a relatively stable or slightly declining population while Kotzebue has shown a record of growth and development. While this pattern could continue, there are some changes which could slow the obvious population drain on the region's villages. These include a greater variety of village services (especially education but also health, utilities, public safety, etc.), the eventual completion of land transfers, and greater regional employment opportunities.

TABLE 148

CITY OF KOTZEBUE AND NANA REGION POPULATION GROWTH

1909 - 1979

	City of Kotzebue		NANA (Kobuk) Census Division		% City in Region
1909	193[a]		n.a.		n.a.
1920	230		1,675		13.7
1929	291		2,857		10.2
1939	372		3,604		10.3
1950	623		3,692		16.9
1960	1,290		3,560		36.2
1965	1,588[b]		4,101		38.7
1970	1,696[a]	1,875[c]	4,434		38.2
1971		1,696	4,733		35.8
1972		1,957	4,597		42.6
1973		2,125	4,352		48.8
1974		2,125	4,807		44.2
1975	2,431[e]	2,125	4,548		46.7
1976		2,431	4,788		50.8
1977		2,431	5,100		47.7
1978		2,526	5,088		49.6
1979		2,526	5,100	5,600[f]	49.5

[a]1900-1970 U.S. Census

[b]Smith, 1966 (this excludes 400 temporary residents present during the summer)

[c]State Revenue Sharing Program

e

'Alaska Department of Labor, Current Population Estimates

'City of Kotzebue (This figure most likely overestimates Kotzebue's permanent population by at least 300).

[f]Kotzebue Service Unit Operating Plan FY-1979 (This figure is considered too high by about 500).

In 7978, there were 10 villages in the balance of the region ranging in size from 60 (Kobuk) to 529 (Noorvick). These villages are located along the Noatak and Kobuk Rivers and the coastline of Kotzebue Sound and Chukchi Sea.

INDIVIDUAL CENSUS DATA

Age and Sex

The Kotzebue populat· on in 1978 revealed slightly more females (51.6 percent) than males (48 4 percent). This is unusual in rural Alaska and even compared to the balance of the region which have an imbalance in favor of males. Excluding Nome, the 1978 survey sampled 51.6 percent males and 48.4 percent females.

An age-sex pyramid is only available regionally using the 1970 census. This is shown in figure 7 . The first observation is the very young composition of the pyramid. Median age is 16.7 years with males somewhat higher than females. This is significantly below the state as a whole which was 22.9 years in 1970. Outmigration of young adults is evident with the rapid decline in the proportion of the 20 to 24 year old group. In all, 57.6 percent of the 1970 population was under 20 years of age and 5.1 percent was over 60 years. One interesting note is the bulge of males in the 5 to 9 years bracket, while females are most numerous in the 10 to 14 years group. On the other hand, there is a smaller proportion of O to 4 years group than either the 5 to 9 or 10 to 14 years groups. This may suggest a declining birth rate and

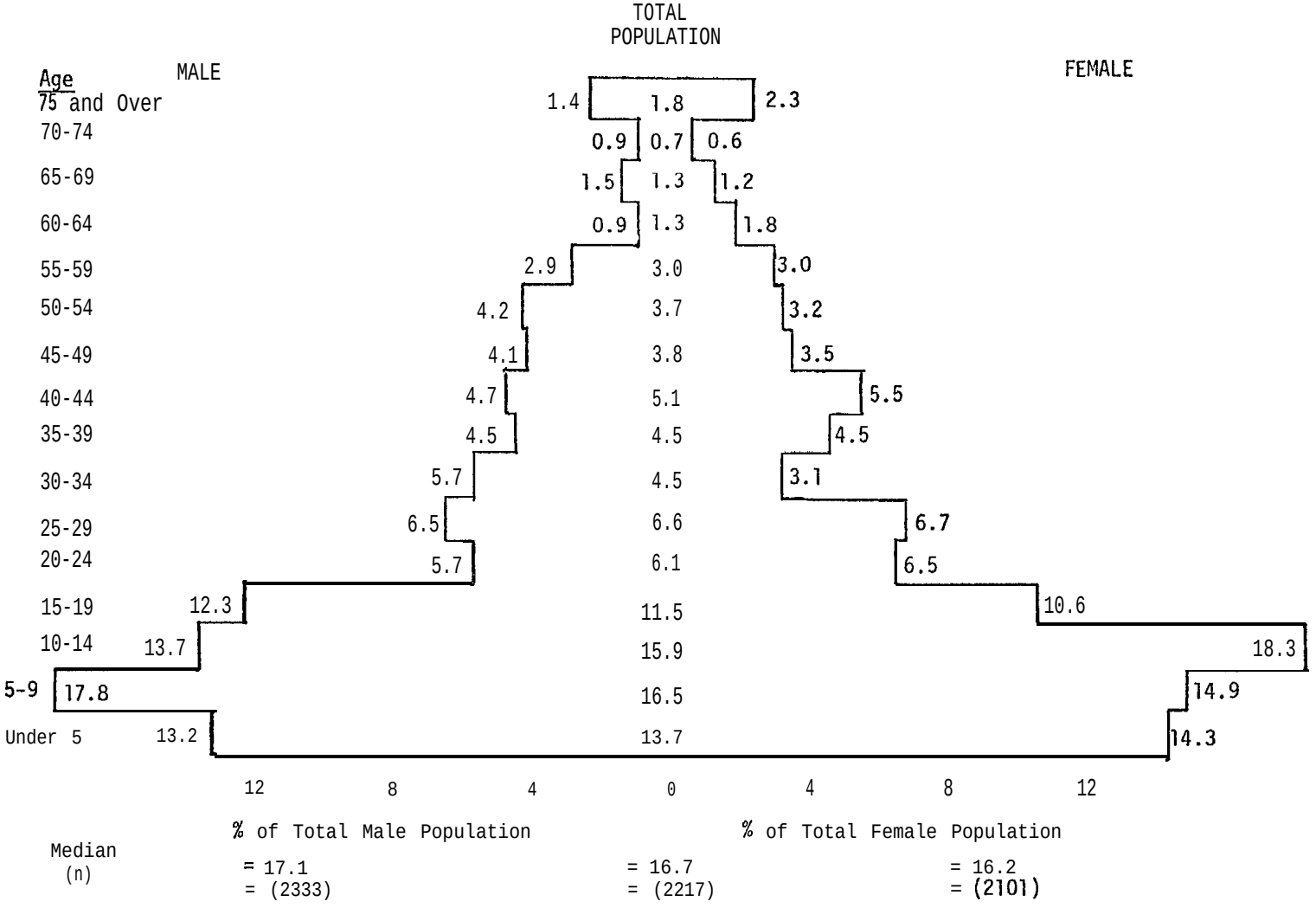


FIGURE 7
NANA REGIONAGE/SEX PYRAMID- 1970

resultant smaller household size. While evidence on these cohorts are not available, the birth rates in the 1970's show a declining birth rate. From 1972 to 1974 the crude birth rate was 26.1; in 1975-1976 it was 25.3; and in 1977-1978 it was 22.6.

It can be assumed that Kotzebue's population pyramid would be similar to the region's due to the similar composition of the residences. However, the age distribution is assumed to be slightly older because of the small but significant white community residing in Kotzebue. The 1970 median age in Kotzebue was only 17.1 years for males and 16.9 years for females only fractionally higher than the census division. A 1978 random sample of Kotzebue adults found 39.1 percent, 18 to 29 years; 31.3 percent, 30 to 45 years; and 29.8 percent over 46 years and older. The median age was 38.5 years. The 1970 regional census found 36.7 percent were 18 to 29 years, 31.5 percent were 30 to 45 years, and 31.8 percent were over 45 years. The median age was 37 years. Since the balance of region in 1978 closely resembled Kotzebue, this suggests the population is aging. However, it does not answer the question concerning Kotzebue/regional differences since most of the difference would be expected to occur among those under 18 years.

Race

The racial composition of the City of Kotzebue has been relatively stable in recent years. In a 1965 community census, Eskimos constituted 77 percent of the population. Of 349 households identified in

1965 (excluding migrants), 238 were eskimo, 20 were mixed, 24 were permanent white, and 67 white contract government employees (Smith, 1966).

The 1970 census identified 545 whites (12.3 percent) in the Kobuk region, 18 blacks (0.4 percent), and 3,871 other races (virtually all Eskimo) (87.3 percent), (Bureau of the Census, 1971). It is estimated that just under 80 percent of Kotzebue's residents were Eskimo in 1970. A population estimate made in June 1976 calculated the native population of Kotzebue at 71.9 percent and non-native, 28.1 percent. (Mauneluk Association, 1979) This estimate seems to have overestimated the non-native population. This may be due by including both the permanent and transient populations present during the summer months.

A sample survey in 1978 by Mauneluk identified 81.4 percent of the Kotzebue respondents as native, 17.4 percent as white, and 1.2 percent as other. This compares to 96.3 percent native in the balance of the region, and 3.8 percent white. This suggests a fairly stable racial balance over the past 15 years with a slowly increasing proportion of Alaska natives. (Northrim Associates, 1979)

Education

Formal educational achievement appears to have changed substantially in recent years. In 1970, 58.8 percent of the adults in the region (25 years and older) had not completed 8 years of education. Another 9.9 percent completed eighth grades, 6.4 percent completed 9 to 11 years of

school, 12.7 percent completed high school, and 11.5 percent went beyond high school. Males had 7.5 median years of formal education and females had 6.5 years.

The 1978 NANA Regional Strategy Community Survey revealed a much different situation. Of adults in the region (18 years and older), 42.3 percent of the sample had 8 or fewer years of education, 12.5 percent had 9 to 11 years, and 45.1 percent had 12 years or more. This almost doubles the proportion of people finishing high school, and raises educational achievement by a substantial level. This is due to rising achievement and the 1978 survey which included 18-24 year olds.

Because Kotzebue is the government and service center of the region, one would expect attainment to be higher than the region as a whole. The city in 1978 had 54 percent of the survey sample with 12 or more years of education, 9.9 percent had nine to 11 years and 36.0 percent had eight or fewer years. Almost 46 percent failing to achieve a high school education is still substantially below urban patterns. In Anchorage, for example, only 12.7 percent of adults have failed to achieve a high school education.

Household Composition

Regional data is available from 1978 to describe households in the NANA region. The average household was 5.08 in the 1978 NANA Regional Strategy survey. This is down from an estimated 5.6 persons per household (6.2 persons in family defined households) in the 1970 census.

Thirty-one percent of the 1978 survey population was 12 years and younger, and 66.2 percent of all households had children 12 years and younger. This ranged from 20 percent of the households with a single child this age to 0.3 percent with seven children under 12. Thirteen to 17 years old children were present in 40.3 percent of all households. This ranges from 18,6 percent of the households with one child in this age group to 0.3 percent with six.

Looking at adults, the 1978 regional sample found 14.6 percent of the households with only one adult, 42.3 percent with two adults, and 43.1 percent with three or more. The 1970 census found two percent of the family households with a second married couple (a second family with children ususally living with parents). Of all married couples (with or without children), 5.5 percent were without their own household. Of children under 18 years of age, 75.9 percent are living with both parents. This is below the state average (85.3 percent).

Length of Residence

Kotzebue has a U-shaped distribution of length of residency. The majority of those sampled in 1978 were long-time residents, though a significant subgroup had lived there three years or less. Table 149 notes the distribution with a mean ($\bar{x}$) length of-residency of 20.1 years and median of 18.8 years. This stability is considerably greater than the state as a whole, but lower then the balance of the NANA region. The rest of the region has a mean residency of 30.7 years and a median of 24.7 years.

TABLE 149

LENGTH OF RESIDENCY IN KOTZEBUE[a]

Years	Percent
Less than 1	8.7
1-3	15.5
4-5	5.6
6-10	3.7
11-12	21.1
21 or More	45.4
	100.0%
(n)	(161)

[a]Northrim Associates, Inc., 1979.

When asked if they had been away from Kotzebue for more than six months, 46.1 percent said yes, and 53.9 percent said no. Since few of the white minority were life long residence, about two-thirds of the native population have never left Kotzebue for an extended period of time.

When asked why they moved to Kotzebue, 38.1 percent said they were born there, 37.5 percent did so for employment reasons, 13.1 percent came with their parents, and 11.3 percent gave other responses. When asked where they had lived before coming to Kotzebue, 38.6 percent responded another village in the region, 24.8 percent said an Alaskan city, 32.2 percent said the lower 48, and 4.4 percent gave other responses.

EMPLOYMENT AND ECONOMIC ACTIVITY

Economic data on Kotzebue tends to have many of the same problems as discussed for Nome. Despite those shortcomings, estimates were derrived from existing data which portrays a sufficient if incomplete picture of the economic trends in Kotzebue. The two primary sources for employment data are the Alaska State Department of Labor and the 1978 NANA Regional Strategy survey.

Regional Employment Status

The Research and Analysis Section of the Alaska State Department of Labor publishes on a quarterly basis monthly non-agricultural employment, wage and salary data by industry for the state as a whole and for each of 29 regions. Non-agricultural employment data is available only for the Nome region in this series. Data pertaining to the City of Kotzebue is not disaggregate from the regional data. Despite this, Kotzebue's historical role as the primary employment center in region (especially in the post-World War II period) gives this information importance in describing general employment trends. Table 150 outlines total non-agricultural wage and salary employment in the Kobuk region.

Historically, the region's employment grew steadily in the 1960's. In 1961, the average monthly employment was 305 with a first quarter low of 187 and a third quarter high of 461. The wide seasonal swings reflected in 1961, decreased in severity as the year around employment base increased. In 1965, average monthly employment was 392, with a fourth

quarter low of 331, and a third quarter high of 496. In 1969 monthly employment averaged 508, a 66 percent increase over 1961. This was due to moderate growth in most classifications but strong growth in TUC, and state and local government.

In the 1970's, growth in employment had a similar pattern of steady linear improvement but the rate of changed increased. The annual rate of change averaged almost 20 percent between 1969 and 1978. From 1969 to 1973 employment grew while 1974 showed the only decline in the decade. In 1975, things recovered with a 16.6 percent increase, but 1976 just barely improved. The years of 1977 and 1978 had a much stronger performance and peak regional employment was reached in September 1978 with 1526 workers.

The only consistent industry driving the total up is state and local government. As shown in Table 150 this category increases to dominate employment base of the region. By 1978, 44.7 percent of all employment is state and local government. This rise is primarily due to the development of a local education function through the establishment of the REAA system. A generally greater presence from the Department of Transportation, Health and Social Services and other state agencies, local government employment via CETA and other program contributed to the strong performance in this area. Transportation, Utilities and Communications grew rapidly to a peak in 1973 and has had a more erratic performance since then. Trade averaged about a hundred employees between 1969 and 1976. In 1977 and 1978, this rose to a new plateau of 139.

TABLE 150

CHANGE IN ANNUAL MONTHLY AVERAGE NON-AGRICULTURAL
WAGE AND SALARY EMPLOYMENT 1969 and 1978

Category	1969 n	1969 %	1978 n	1978 %	% of Change
Mining	(11)	2.2	(10)	0.7	9%
Construction	(25)	4.9	(52)	3.7	+ 108%
Manufacturing	0	0.0	(3)	0.2	---
TUC	99	19.5	122	8.7	+ 23%
Trade	77	15.2	138	9.8	+ 79%
FIRE	(3)	0.6	(38)	2.7	+1,167%
Services	(17)	3.3	129	9.2	+ 859%
Federal Government	208	40.9	283	20.2	+ 36%
State and Local Gov't	68	13.4	627	44.7	+ 822%
Miscellaneous	0	0.0	(1)	0.1	---
Total Non-Agricultural	508	100.0%	1,403	100.0%	+ 176%

Services grew, especially in 1975 and 1976 to a peak the latter year of 166. This followed a moderate decline in 1977-1978. Activity in this area is due to the development of the native non-profit corporations. Mauneluk, the regional association, and the village IRA councils. Federal government employment has remained very stable in 1970 with the peak actually being 1971 with 301. In 1978, federal employemnt stood at 283.

The remaining industrial classifications are composed of undisclosed data which makes interpretation more difficult. Mining remains more a potential than a reality, and employment has remained low in sector. The same is true in manufacturing. Construction is an important seasonal factor and has its ups and downs during the decade.

Some construction activity may be masked in either categories, especially road and airport construction under state government, and general construction under FIRE. This last category includes the native profit corporations of which there are two in the region - the NANA Regional Corporation and the Kotzebue based Kikiktagnuk Inupiat Corporation (KIC) (the only vi 1 lage profit corporation which did not merge with the NANA Regional Corporation). The activities of NANA and KIC are the primary influence on the FIRE category.

Seasonality of Employment

The Kobuk census division has always had significant seasonal fluctuations, and reflects a consistent cyclical pattern reflecting increased economic activity during the May through September months. As figure 8 shows, employment peaks in the summer (usually the third quarter) and bottoms out usually in the first quarter of each year. In 1973, peak monthly employment was 72 percent above the low month and 35 percent above the annual average. In 1978, the peak monthly employment was 14 percent above the low month and seven percent above the annual average. As can be seen, the seasonal shifts of 1977-1978 were less characteristic compared to previous years, and in 1978 there was not any diserable seasonable jump similar to past years. In fact employment for both years peaked in November.

The seasonal shifts are most likely to occur in construction (when summer projects are available), TUC (water transport lightening is possible only during the ice free periods). Other possible peaks are due to mining and manufacturing, though their size is unlikely to mitigate impact. FIRE (due to activity of the profit native corporations) can be another source of seasonality, but information is not available to demonstrate this possibility.

There is not sufficient data to indicate whether the cyclical employment trends found historically have been altered for the long-term. The strength of the year around economy is tied to the very heavy dependence on government employment or government contracts (over three-quarters of employees). The fall off of seasonality is due to actual or relative drops in industries most responsible for seasonal employment-mining, construction, manufacturing (fish processing), and transportation.

Kotzebue Employment Status

Though state labor statistics do not disaggregate the community of Kotzebue from regional data, the State Department of Labor, upon special request, broke out the Kotzebue data from the regional totals. This non-agricultural employment data on the City of Kotzebue includes only workers who are covered by the state's unemployment insurance (UI) law. On January 1, 1978, this insurance coverage was extended to many workers who were previously uncovered including most state and local government employees.

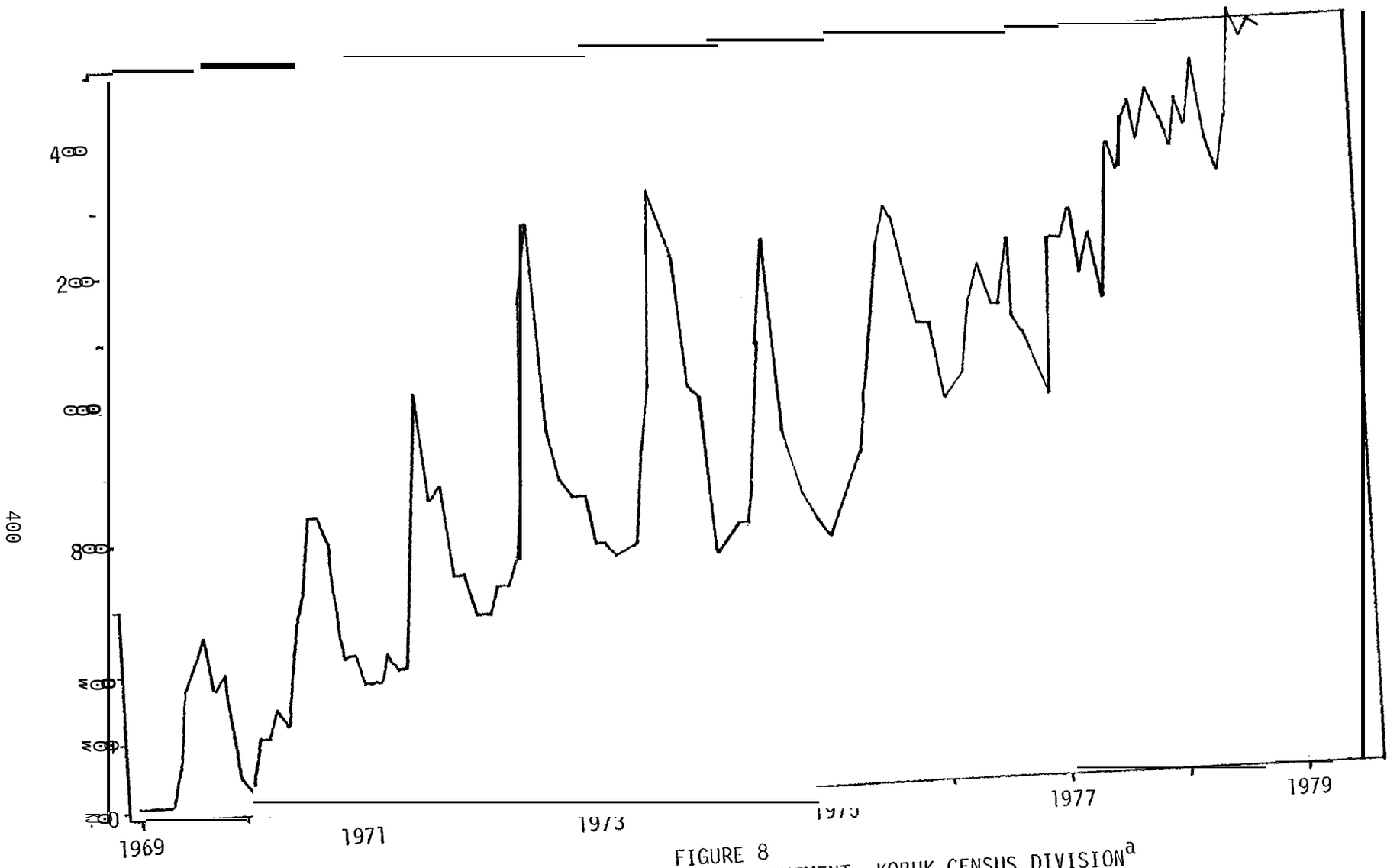


FIGURE 8
NON-AGRICULTURAL WAGE AND SALARY EMPLOYEMENT, KOBUK CENSUS DIVISION[a]

[a]Alaska Department of Labor

The regular Department statistical series reports total non-agricultural employment (that is, workers covered and uncovered by the state UI law). Workers not covered by state UI law in 1978 were primarily in the state and local government category (averaging about 11.5 percent of this group). This difference has complicated analysis of the community level data. The percent of regional workers covered by state UI law is shown to estimate the total community's employment. Reviewing the 1977 and 1978 data on Tables 151 and 151 there are several apparant and deceptive limits on the information. First, the total number of employed workers far exceed reasonable estimates of adult participation rates in the work force. The 1970 census noted that only 29.5 percent of the region's adult population 16 years and older were employed and the civilian labor force participation rate was 33.2 percent (an additional 4.5 percent were in the military). In 1969, only 28.3 percent of the labor force was employed full-time throughout the year, while 53.5 percent worked less than six months. (U. S. Census, 1971).

The 1978 NANA Region Survey found that 53.7 percent of the region's adults (18 years or older) were employed in the past year, of this group, 29.1 percent were employed full-time, 61.2 percent were employed part-time and 9.7 percent were employed on a seasonal basis. When asked how long their last job lasted, 45.8 percent said a 12 or more months, and 44.4 percent six months or less. This suggests an employment base in the NANA Region of 24.6 percent of the adult population and a ceiling of 53.7 percent. To estimate the adult participation range in Kotzebue, the NANA survey asked where the job was located for those working during

TABLE 151

1977 MONTHLY EMPLOYMENT, KOTZEBUE[a]

Employment (Workers Covered by State UI Law)

Industry	Jan	Feb	Mar	Apr	May	Jun	Jul	Rug	Sep	Ott	Nov	Dec	Average Mo.	Average % of Total
Mining	*[e]	*	*	*	*	*	*	*	*	*	*	*	(0)[f]	(.0)
Construction	*	*	*	*	*	*	*	*	*	*	*	*	(17)	(2.1)
Manufacturing	*	*	*	*	*	*	*	*	*	*	*	*	(3)	(.4)
TUC[b]	99	97	98	105	136	141	300	304	298	108	111	104	158	19.0
Retail Trade	185	84	90	94	98	111	194	186	178	99	100	105	118	14.2
FIRE[c]	*	*	*	*	*	*	*	*	*	*	*	*	(50)	(6.0)
Services	183	189	178	110	121	118	*	*	*	163	161	159	154	18.5
Federal Govt.	268	268	269	267	257	235	232	234	253	270	275	270	258	31.0
State Govt.[d]	12	15	16	14	13	12	9	8	8	12	13	14	12	1.5
Local Govt.[d]	56	51	47	51	63	73	73	75	68	66	68	44	61	7.3
Total Covered by State UI Law	767	771	768	709	758	762	1012	1008	964	822	828	792	831	100.0
Percent Covered by UI Law(Region)	74	75	73	72	75	83	85	86	77	75	71	71	76	
Est.Tot.Kotzebue Non-Agricultural	(1036)	(1028)	(1052)	(985)	(1011)	(918)	(119.1)	(1172)	(1251)	(1096)	(1166)	(1115)	(1093)	

[a]Alaska Department of Labor
[b]Transportation, communication, utilities
[c]Finance, insurance, real estate
[d]State and Local government coverage began in 1978.
'Undisclosed data
'Estimated undisclosed data

TABLE 152

1978 MONTHLY EMPLOYMENT, KOTZEBUE[a]

Employment (Workers Covered by State UI Law)

Industry	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Ott	Nov	Dec	Average Mo.	Average % of Total
Mining	*[e]	*	*	*	*	*	*	*	*	*	*	*	(0)[f]	(.0)
Construction	*	*	*	*	*	*	*	*	*	*	*	*	(17)	(.6)
Manufacturing	*	*	*	*	*	*	*	*	*	*	*	*	(1)	(.1)
TUCb	91	87	92	92	130	1 89	1 80	166	182		84	87	122	11.2
Retail Trade	99	88	117	115	125	131	119	123	126	1;;	124	123	118	10.8
FIRE[c]	*	*	*	*	*	*	*	*	*	*	*	*	(30)	(3.6)
Services	148	139	140	99	105	114	87	123	1 40	113	127	119	121	11.1
Federal Govt.	277	271	270	275	205	247	248	270	281	280	280	279	270	24.7
State Govt.[d]	41	41	55	40	41	40	37	37	42	40	50	57	43	3.9
Local Govt.[d]	399	401	419	421	407	225	245	259	401	432	429	420	372	34.0
Total Covered by State UI Law	1100	1071	1134	1080	1122	1004	967	1033	1220	1115	1147	1135	1094	100.0
Percent Covered by UI Law (Region)	95	94	95	95	95	94	94	95	95	95	95	95	95	
Est. Total Kotzebue Non-Ag.	(1158)	(1139)	(1194)	(1137)	(1181)	(1068)	(1029)	(1087)	(1284)	(1174)	(1207)	(1195)	(1152)	

[a]Alaska Department of Labor
[b]Transportation, communications, utilities
[c]Finance, insurance, real estate
dState and Local government coverage began in 1978.
'Undisclosed data
'Estimated undisclosed data.

the previous year. With Kotzebue residents being about one-half the sample, Kotzebue was the location of 46.3 percent of the jobs, 37.1 percent of the jobs were in the villages and the balance were elsewhere, primarily in camps. This extrapolates to about 56 percent of the employment is centered in Kotzebue and the balance is in the region. However, it must be assumed that a greater proportion of the full-time jobs are available in Kotzebue than the balance of the region. The 1978 state employment data was compared to population estimates extrapolated from the 1978 data. If the state data is correct, an average of 84.1 percent of all residents 18 years and over were employed in 1978. This can be compared to the much stronger labor market of Anchorage which has a 72.5 percent employment rate among adults 18 years or older. In addition 82 percent of the jobs found in the region were reported as being located in Kotzebue. This conflictual information leads to a more detailed assessment of the data.

Analysis suggested three points:

- Because Kotzebue acts as the regional center for the NANA area, some reporting units pay their regional employees out of Kotzebue and are counted in the Kotzebue statistics.

- There is some indication of high job turnover in certain job classifications due to turnover in professional occupations as people leave the area, and turnover in unskilled categories by generally permanent residents. More detailed information

is available for Nome and this is probably applicable to Kotzebue. High turnover reduces the full-time equivalent (FTE) employment since workers only employed for a week are counted in the monthly totals, or two workers counted in the same month for the same job due to turnover. With at least 61.2 percent of the workforce employed only part of the year thus turning over one or more times a year, the possibility of inflating the data above the FTE base is strong.

- Finally, there appears to be rates of underemployment and part-time employment above urban averages which tends to inflate data above the FTE employment base. This tendency is exacerbated by individual working two or more part-time jobs, or businesses, thus being double counted in the data.

Each of these points contributed to a misleading data base. To compensate for this weakness, estimates of the Kotzebue workforce were made using the state labor statistics in conjunction with the 1970 U. S. Census and 1978 NANA Regional survey.

Employment Participation Rates

Employment participation rates of Nome and the region can be expected to vary considerably by season and place of residence. Employment opportunities, and pursuit of subsistence activities outside the cash economy

also vary. In addition, the calculation of labor force participation rates are impossible to derive because of the lack of definition and reliable data to measure it.

Based on the strategy survey, there were an estimated 2,758 adults (18 years and older) in the NANA Region in 1978. Of that number, about 1,481 were employed during the year, and worked an average of 7.7 months. This produces an average monthly employment (FTE) of 950. This is an adult regional employment participation rate of 34.4 percent.

Because more of the year around, full-time jobs are located in Kotzebue, it is assumed that the average annual participation rate is higher when compared to the balance of the region. For this reason, a rate estimate of 43.9 percent for the City and 25.0 percent for the balance of the region was developed. This would assume that 345 (36.3 percent) of the jobs are in the balance of the region, and 605 (63.7 percent) of the jobs are in Kotzebue.

This is the participation rate of the permanent population. Also added to this figure must be estimates of the temporary or transient workforce. While this figure can be expected to vary from year to year, on the average it is assumed that transient workforce adds 125 annual FTE employees to the total for an annual average regional employment level of 1,075. As can be noted this number is considerably lower than the state labor statistics. Based on the evidence, the two estimates are not necessarily incompatible.

The data does suggest, however, that the participation has not changed in the 1970's. Since the labor statistics employment data rose at a rate to that of the population (119 percent vs. 49 percent) between 1970 and 1978, it should be expected that the participation would also rise. The NANA Regional Strategy survey suggests that the permanent population and its employment grew at about the same rate. It may be that the NANA survey underestimated employment. Another explanation is the high proportion of the sample who stated they worked part-time. While this may have been interpreted as working part of the year, a portion of the response may also be seen as less than 40 hours a week employment.

Industrial Composition of the Morkforce

The composition of the industries in Kotzebue is very similar to that of the region. The following is a qualitative review of the major SIC categories.

- Mining is still small and located in remote sites using Kotzebue only as a transportation pass through. Activity is concentrated during warm weather months and there is not yet any large scale production though companies have shown interest in several sites in the region. NANA made an informal review of the Kotzebue infrastructure when attempting on-shore oil exploration. The City was initially not considered adequate to stage oil development if a large find was made.

- Construction is also concentrated during the summer months. Undisclosed data makes it difficult to trace its pattern but it is assumed that only a portion of the employment in this sector is located in Kotzebue though its residents most likely travel to camps to participate. In Kotzebue, housing and commercial space construction constitute the major opportunities in this area.

- Manufacturing data is undisclosed but its level of activity is very small. Most of the handicrafts industry is in the subsistance economy and not recorded. NANA's Jade Mountain Products is one concern which would fall into the manufacturing category.

- Transportation, utilities and communications is headquartered in Kotzebue, and most of the activity in this area is located there. Major employees include the barge and lightening services by Arctic Lighterage, the airline companies and independent charter services in the transportation area. The drop of TUC in the mid-1970's is partly due to the termination of air service to Kotzebue by Alaska Airlines. Now only Wien schedules regular passenger service to Kotzebue. Though Great Northern operated up until recently, it now is just a freight carrier.

- About 87 percent of the retail trade employees are found in Kotzebue as most commercial activity in the region is located there.

- FIRE is dominated by the activities of NANA and KIC. Employment by profit native corporations remains low. This is due to the comparative youth of the corporations, and that much of the activities of both companies take place outside the region. NANA does operate several businesses in the areas of construction, services, and manufacturing which may show up in the FIRE or other SIC categories.

- Services has seen growth in NANA with the strength of the Mauneluk Association and village IRA councils. Kotzebue has 75 to 80 percent of the service employment with the health aid station in the villages as the primary group outside Kotzebue. The use of CETA employees permitted strong performance in 1977. The addition of new hotel facilities also added to this category.

- Federal Government is almost exclusively in Kotzebue with the large unit being the regional hospital operated by PHS. Other important units include BIA and FAA.

- State Government in NANA is smaller than that of Bering Straits (due to the lack of roads requiring a large presence by the Department of Transportation). Again almost all state employees are located in Kotzebue.

- Local Government has come to dominate regional employment. Because of other economic opportunities in Kotzebue, local government is less significant there compared to the balance of the region. By far the largest employer is the Northwest Arctic School District which employs about 80 people in Kotzebue and another 89 in the balance of the region, CETA employment added a major boost to local government employment, especially in the region, since the IRA council and city government are the same in most of the balance of the region.

Occupational Composition of the Kotzebue Workforce

A comprehensive inventory of the job skills in Kotzebue is not available. An approximation is available in the 1979 NANA Regional survey which classified the occupations of those who had been employed during the previous year. The proportion of skilled blue collar occupations are quite small (4.8 percent) while semi-skilled and unskilled service occupations are an important component (27.2 percent). Considering the large service industry in Kotzebue, this distribution is reasonable. To support this government/service industry, it is necessary to have a large professional/technical/managerial group, and in Kotzebue, this is the largest class (34.0 percent). A 10.1 percent clerical group also provide necessary support for the government/service industry. Interestingly, only 1.2 percent noted fishing as their “occupation.”

TABLE 153

OCCUPATIONS OF EMPLOYED PERSONS IN KOTZEBUE 1978[a]

Classification	Percent
Professional	12.6%
Management/Public	8.1
Management/Private	3.6
Technical Worker	9.7
Clerical	10.1
Sales	4.0
Crafts Person	0.8
Carpenter/Mechanic	4.0
Operator/Driver	4.9
Laborer/Construction	9.3
Cleaning Services	9.3
Food Services	4.5
Health Services	6.5
Protective Services	1.6
Personal Services	5.3
Fishing	1.2
Cannery	1.2
Military	1.2
Religious	2.0
TOTAL	100.0%
(n)	(247)

[a]Northrim Associates, NANA Regional Strategy Survey, 1979.

This contrasts with the fact that 134 commercial fishing license holders have a Kotzebue address. This raises the possibility that a large proportion of these fisherman hold second jobs for the balance of the year. See the section on the fishing industry.

Unemployment

Alaska Department of Labor estimates regional unemployment using the Current Population Survey (a small sample interview) and defines it as a person who has actively sought work in the past four weeks. The data reflects an annual average increase from 1975 to 1978 and a decline in 1979. The Kobuk region runs two to four percent higher than the Nome region. It is assumed that the unemployment data is misleading. If employment opportunities do not exist, there is no unemployment because one is not actively seeking work. On the other hand, federal regulations concerning public assistance payments many times require able bodied workers to seek work pro forma in order to maintain eligibility. (See Table 154)

Fishing Industry

The commercial salmon fishery in Kotzebue Sound is small by comparison with other fisheries in the state. The Kotzebue Sound commercial fishery is roughly similar to that of Norton Sound in terms of the number of fish caught. The 1978 commercial season was poor, with only 118,501 fish landed (contrasted with 531,948 in Norton Sound). (Alaska Department of Fish and Game, Annual Management Report, Kotzebue Sound, 1978). This is only 790 pounds for a hypothesized 150 active fishermen (assuming that al 1 1 icense holders were active).

TABLE 154

UNEMPLOYMENT RATE FOR KOBUK CENSUS REGION - 1975-79a

Year	Unemployment Rate
1975	8.9%
1976	10,9%
1977	10.2%
1978	13.6%
1st Quarter	13.8%
2nd Quarter	14.9%
3rd Quarter	12.2%
4th Quarter	13.4%
1979	10.5%b
January	12.6%
February	12.6%
March	11.9%
April	9.6%
May	8.7%
June	10.8%
July	11.6%
August	9.3%
September	7.3%
October	9.7% (preliminary)

[a]1975-1978 from Alaska Department of Commerce and Economic Devleopment, Numbers: Basic Economic Statistics of Alaska Census Division (Number 1979); and 1979 from Alaska Department of Labor, Anchorage Office.

[b]Based on an assumed November rate of 10.7 percent and December rate of 11.7 percent.

The City of Kotzebue, however, is the center of this fishery, unlike Nome, which is very much a marginal participant in the local fishery: Of a total of 180 commercial salmon entry permit holders, 134 have a Kotzebue address. (State of Alaska, Commercial Fisheries Entry Commission, 1979) Several fish buyers work out of Kotzebue, including a fishermen' cooperative subsidized by the federally funded Community Enterprise Development Corporation of Anchorage. In addition, land near Kotzebue gives way to a large summer subsistence fish camp for regional residents.

Subsistence Activities

Subsistence is still a strong component of the Kotzebue lifestyle. Those living in Kotzebue participate in subsistence activities significantly below that of village residents. Only 14.3 percent of the households have no dependence on subsistence activities. Conversely, 5.6 percent depend totally on subsistence, 14.9 percent depend mostly, 16.1 percent depend about half and 49.1 percent depend some. In all, 47.6 percent of the 1978 Kotzebue sample said they use subsistence to meet their daily needs. This compares to 88.2 percent who said employment and 18.6 percent who said food stamps or other aid (not mutually exclusive responses on this last question). (Northrim Associates, 1979)

Activities varies from 65 percent of the households who do berry picking; 53.8 percent fish for tomcod, and 44.4 percent for salmon. Caribou hunting s pursued by 41.3 percent and moose hunting by 40.9 percent. In contrast, only 5.6 percent have a garden and 3.8 percent make handicrafts.

Roughly two-thirds or more of the food consumed still comes from hunting and fishing. When asked what the main source of meat was, 45.1 percent said caribou and 19.5 percent said chicken. Recalling 10 years ago, 69.1 percent of the survey said caribou and none said chicken. (Northrim Associates, 1979)

Business Activity

Table 155 shows the gross business income in Kotzebue in 1975, 1976 and 1977. This information is reported by the businesses to the Alaska Department of Revenue for the purpose of paying sales taxes and state gross receipts taxes. Gross business revenue was approximately $16.7 million in 1975; $16,6 million in 1976, a slight decline from the previous year (even a greater decline in constant dollars). In 1977, gross business income increased 21 percent, to $20,1 million. These figures do not indicate a clear trend; rather, it seems that the business community may face somewhat erratic influences in local expenditure patterns.

Future Employment Considerations

In predicting future employment participation in Kotzebue, consideration will have to be given to the relationship of the permanent population to the cash economy. The 1978 regional survey asked the Kotzebue sample their desire for work. Fifty-five percent preferred full-time work, while 45 percent wanted seasonal opportunities only. This preference suggests a continuing interest in subsistence pursuits in

TABLE 155

GROSS BUSINESS RECEIPTS, KOTZEBUE, 1975-1977[a]

Business	Code	Amount ($) 1975	1976	1977
General Bldg. Construction	15	1,765,198	2,009,958	1,982,846
Heavy Construction	16		129,722	33,700
Special Trade Construction	17	1,938,488	320,703	830,061
Printing & Publishing	27	190	365	365
Motor Freight	42	69,195		
Water Transportation	44	2,712,835	3,274,441	3,398,720
Air Transportation	45	776,757	9,879	703,409
Communication	48	818	102,674	373,320
Whlsl trade-durable goods	50	448,581	2,021	109,794
Building Material	52	223,687	446,736	1,021,256
General Retail Merchandise	53	4,059,467	4,565,796	4,084,128
Food Stores	54		316,017	1,094,184
Auto Dealer & Service Sta.	55	102,716		
Retail Apparel	56	446,685		743,819
Furniture Stores	57		17,917	4,291
Eating & Drinking Places	58	32,231	113,821	
Miscellaneous Retail	59	2,912,520	3,023,346	586,115
Real Estate	65	86,110	59,527	525,731
Hotels	70	664,638	1,317,492	1,567,193
Business Services	73,62	195,619	258,194	2,865,247
Miscellaneous Repair	76	3,577	40,631	
Amusement & Rec. Services	78,79	12,217	11,863	
Health Services	80	141,341	106,518	128,044
Miscellaneous Services	89	81,347	151,581	72,701
TOTAL		16,674,217	16,581,531	20,124,924

[a]Alaska Department of Revenue

conjunction with cash economic interests. The problem is that seasonal employment is ususally most available in the summer months, which conflicts with many subsistence activities. Of those who preferred seasonal employment, 81.8 percent would not want to work in July, and 74.2 percent would not want to work in June or August. Conversely, 78.8 percent would want to work in January and February (the months when employment is usually at its lowest point). The extreme shifts in preference in the Kotzebue is not as nearly apparent in the villages of the Nome region.

Apparently, many residents would be willing to be moved for job opportunities. Fifty point three percent of the Kotzebue sample would likely want to work on a large development project, if it came to the region, 45.5 percent would be willing to work in a camp. In addition, 68.2 percent of the villages said they would be willing to move to Kotzebue to work, and the same proportion of Kotzebue residents would be willing to work in the region outside of the city. In addition, 686 percent said they would be willing to leave the region for a job. (Northrim Associates, Inc., 1979)

PERSONAL INCOME

Measures of current personal income for Kotzebue include wages reported to the Alaska Department of Labor and per capita income estimates and family income from survey data.

The average monthly wage in the NANA Region rose consistently between 1969 and 1975. In 1969, monthly wages averaged $508. Between 1970 and 1975 it averaged respectively $632, $657, $661, $706, $896, and $1,001. This was an 11.7 percent average annual increase with a large jump occuring between 1973 and 1974. Between 1975 and 1976, the monthly wage rose to $1,148, a 14.7 percent increase. Wages rose another 12.9 percent, 7.8 percent rise from 1976 to 1977 ($1,296) and remained almost constant from 1977 to 1978 ($1,309) though the state as a whole experienced a drop. Reasons for this seems to be general wage increases across all industrial categories, though undisclosed data limit the usefulness of the analysis. It is assumed that construction wages led the way but the exact magnitude cannot be calculated. The greatest change is most likely services which had a 337 percent increase from 1969 to 1979, ($240 to $1 ,040). This is likely due to the development of a health and social services industry in this sector. TUC also has had strong performance with a 231 percent increase ($559 to $1,852). State and local government follows but at a lower absolute level ($447 to $1,147) with a 156 percent increase, while the federal government doubled, ($621 to $1 ,286).

Wage data for the Kobuk Census Division is noted in Table 156. Wage payments rose slowly from 1975 to 1976, increased dramatically in 1977 and increased at a smaller rate in 1978. Greatest gains were found in state and local government, TUC, and probably FIRE and construction.

For the City of Kotzebue, the total 1978 civilian non-ag. wages covered under UI law was $17,888,785. For total wages paid this can be adjusted to $18,830,300 (UI law represents about 95 percent). This constitutes 84.7 percent of all wages in the region. This is due to reporting regional workers under Kotzebue data, but Kotzebue also is assumed to have higher wage rates with the role of government employment. Thus, while Kotzebue has about 63,7 percent of the FTE workforce, it is estimated to have about 70 percent of the wages paid in the region. ($15,564,198 in 1978)

In addition to wages, per capita income analysis has been carried out by the U. S. Bureau of Economic Analysis and the U. S. Bureau of the Census. Table 157 shows estimates of total personal income and per capita income.

Based on the data between 1969 and 1978, the Kobuk Census Division showed a 228 percent increase in total personal income, and a 284 percent rise in per capita personal income. Personal income includes not only wages and salaries, but rents, dividends, proprietor income, and transfer payments. Transfer payments in rural Alaska are an important

TABLE 156

KOBUK CENSUS DIVISION, WAGE PAYMENTS[a]
(wage totals in thousands)

	1975	1976	1977	1978 1Q	1978 2Q	1978 3Q	1978 4Q	1978 Annual Totals
TOTAL WAGE PAYMENTS (place of work basis)	13,681	15,931	21,163	5,045	5,794	6,161	6,362	23,362
Military & Related Federal Civilian Wages	n.a.	n.a.	n.a.	247	25G	253	256	1,006
Military Personnel Wages(active duty only)	989	843	945	247	250	253	256	1,006
Military-related Federal Civilian Wages	n.a.	n.a.	n.a.	0	0	0	0	0
PX & NAF (largely part-time workers)[b]	n.a.	n.a.	n.a.	0	0	0	0	0
Other Military-related Federal Wages	n.a.	n.a.	n.a.	0	0	0	0	0
Federal Govt. (except military-related in 1978)	3,832	4,202	4,382	983	1,163	1,086	1,133	4,365
State & Local Government	2,679	3,913	6,080	2,125	2,126	1,930	2,448	8,629
Mining	*	*	*	*	*	*	*	*
Construction	*	*	*	*	*	*	*	*
Manufacturing	*	*	*	*	*	*	*	*
Transportation,Communities ,Utilities	3,055	1,457	2,972	434	715	995	549	2,693
Wholesale Trade	*	*	*	0	*	*	*	*
Retail Trade	851	934	1,134	296	353	415	362	1,426
Finance, Insurance, and Real Estate	*	*	*	*	*	*	*	*
Services	939	2,016	2,037	432	380	339	464	1,615
Farm Workers	0	0	0	0	0	0	0	0
Miscellaneous	*	*	*	*	*	*	*	*
TOTAL WAGE PAYMENTS INDEX (Annual Total in 1975 = 1.00)	1.00	1.16	1.55	1.48	1.69	1.80	1.86	1.71
AVERAGE MONTHLY WAGE PER WORKER (Dollars)	1.001	1,148	1,296	1,165	1,324	1,392	1,351	1,309

n.a. Not Available
[a]State of Alaska, Department of Commerce and Economic Development, November 1979.
[b]PX & NAF (Post Exchange, and Nonappropriated Fund activities, including officers' clubs and enlisted men's clubs)
[c]Excludes military-related Federal civilian employees and their wages, shown separately above.
* Information withheld under regulations protecting confidentiality of data for individual firms.

TABLE 157

KOBUK CENSUS DIVISION TCTAL PERSONAL INCOME AND
CENSUS DIVISION PER CAPITA INCOME COMPARED TO U.S. PER CAPITA INCOME,
WITH ADJUSTMENTS FOR COST OF LIVING Differences

	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1. Total Personal Income to Census Division Residents (millions of $)	7.4	8.5	9.6	11.8	22.7	20.2	25.2	23.2	26.7	28.4
2. Resident Population - Census Bureau Estimates: 1969-77 (thousands)	4.0	4.1	4.1	4.0	4.4	4.2	4.8	4.9	4.8	5.0
3. Census Division Per Capita Personal Income ($) (Line l/Line 2 - unrounded figures)	1,865	2,095	2,336	2,920	5,180	4,838	5,286	4,729	5,592	5,680
4. U. S. Per Capita Personal Income ($)	3,667	3,893	4,132	4,493	4,980	5,428	5,861	6,397	7,026	7,810
5. Ratio: Census Division Per Capita Income to U.S.Per Capita Income (Line 3/Line 4)	0.51	0.54	0.57	0.65	1.04	0.89	0.90	0.74	0.80	0.73
6. Family Budget Required in this Census Division for a Moderate Standard of Living ($)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	36,856	38,146	41,900
7. Average U.S.Family Budget Required for a Moderate Standard of Living ($)	10,064	10,664	10,971	11,446	12,626	14,333	15,318	16,236	17,106	18,622
8. Ratio: Census Division Family Budget Requirements to Average U.S. Family Budget Requirements (Line 6/Line 7)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	2.27	2.23	2.25
9. Ratio: Family Budget Requirements for a Moderate Standard of Living - This Census Division Compared to Anchorage Census Division	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	1.596	1.596	1.596
10. Ratio: Per Capita Income in this Census Division, Adjusted for Family Budget Requirements, to Anchorage Per Capita Income	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.28	0.31	0.29

[a]State of Alaska, Department of Commerce and Economic Development, November 1979.

component of personal income. As the employment base in the region expands and the employment participant" on rate rises, the role of transfer payments can be expected to dimin sh. In 1975, 40.8 percent of the total personal income was derived from services other than wages and salaries. By 1978, this had declined to 17.7 percent. It can be assumed that the majority of this non-wage and salary category was made up of transfer payments. For comparison, the Anchorage census division has 22.3 percent of its personal income made up of non-wage and salary sources, with less than a majority of that being transfer payments.

When comparing the Kobuk division's per capita income to that of the U. S. average, Kobuk rose above the average only one of the ten years reviewed. In 1978, Kobuk stood at .73 (assuming U. S. average 1.00). This relationship is critical when one accounts for the substantial difference in the cost of living. Kobuk census division is estimated to have a family budget requirement for a moderate standard of living which is 2.25 times the U. S. average and 1.596 times Anchorage. When adjusting the per capita income data for this cost of living differential, the Kobuk region is .29 or one-third that of Anchorage in 1978. The relative purchasing power of Kobuk residents is substantially below that of urban Alaska.

Personal income also varies between the census division as a whole and the communtiy of Kotzebue. With employment opportunities concentrated in Kotzebue and also an increased dependence on the cash economy, it is

expected that personal income in Kotzebue is greater than that of the region as a whole. An analysis by the U. S. Census Bureau comparing 1969 and 1975 confirms the income differences (See Table 158).

TABLE 158

COMPARISON OF PER CAPITA INCOME BETWEEN KOTZEBUE, KOBUK CENSUS DIVISION AND ALASKA[a]

	1969	1975	Percent Change
Kotzebue	$2,094	$5,383	157.1
Kobuk Census Division	$1,698	$4,006	135.9
Alaska	$3,725	$7,969	113.9
Percent Kotzebue of Alaska	56	68	---
Percent Kotzebue of Census Division	123	134	---

[a]U. S. Bureau of the Census, 1976 Population Estimates and 1975 and Revised 1974 per capita Income Estimates for Census Division, Boroughs, and Incorporated Places in Alaska, 1979.

This data shows that, on the average, Kotzebue residents have incomes about 34 percent above the region as a whole, but are less prosperous than residents statewide. The real discrepancy between the three groups of residents is actually greater than these numbers show, however, because of cost of living differentials. Prices are higher, on the average, in the region than in Kotzebue, and prices are higher in Kotzebue than they are statewide (the population of Alaska is concentrated in Anchorage, Fairbanks, and Juneau, so statewide averages reflect to a high degree

conditions in urban Alaska, where prices are lower than rural Alaska). These data show that relative to the rest of the state, personal income of Kotzebue residents increased faster during the period 1969-1975 (157.1 percent vs. 113.9 percent). In 1969, Kotzebue per capita income was 56 percent of the statewide average; in 1975 it had increased to 68 percent.

It is important to note that there is a substantial discrepancy between the Census and BEA data, which tends to leave a question in both sources. Research in urban Alaska supports the information developed by BEA and therefore it is assumed that the gross level of income is more accurately shown in BEA data for the Kobuk area. However, the relative position of Kotzebue within the census division and within the state is considered to be as portrayed no matter what the gross level of income is. Disaggregating Kotzebue from the region can lead to problems as was noted in the analysis of employment. While Kotzebue does have about 63 percent of the employment and only 49 percent of the population, reporting problems accentuate this and thus wage and salary data. In addition, the balance of the region has improved its employment in the area of local government. The increased emphasis on social services delivery has affected both Kotzebue and the region. While an accurate figure of personal income is impossible with the information available, certain assumptions can be made which approximates the city and balance of region relationship. It is assumed that Kotzebue has 63 percent of the employment and 70 percent of the wages and salaries in the region.

Analysis of adults not working can lead to an assumption concerning the distribution of non-wage and salary payments. This review produced an estimate that 42.9 percent of these payments occured in Kotzebue and 57.1 percent. were in the balance of the region. Using the BEA estimate of $5,680 per capita income in 1978, it is estimated that the city had a personal income of $17,725,500 and per capita income of $7,017, while the balance of the region had a personal income of $7,797,802 and per capita income of $3,044. If a figure of 5.08 persons per household is used, an average 1978 Kotzebue household income would be $35,646. This is $6,254 below the family budget requirement for a moderate standard of living.

Considering the high unemployment and low participation rate, this household income figure appears to be on the optimistic side. Another indicator of family income is the 1978 NANA Regional survey. Table 159 suggests a much lower distribution and calls into question the recent per capita data developed for the region. The total family income for Kotzebue is only $20,369, while the balance of the region is $11,788. This is substantially below the BEA based data. The Kotzebue data reveals a major difference between the mean and median incomes suggesting an upward skewed distribution.

It is possible that the recall data of the survey underestimates the income pattern to some degree. Though the question is well worded, recall of income tends to be underreported in comparable survey approaches.

TABLE 159

TOTAL 1978 HOUSEHOLD INCOME, KOTZEBUE

AND BALANCE OF THE REGION[a]

Amount	Kotzebue	Balance of Region
Under $3,000	9.9%	17.2%
$3,000- $4,999	5.6	8.3
$5,000- $7,999	11.8	14.0
$8,000- $11,999	11.2	22.3
$12,000 - $14,999	8.7	10.8
$15,000-$19,999	13.0	14.0
.$20,000 - $24,999	8.7	3.8
$25,000- $29,999	8.1	3.2
$30,000 - $39,999	17.8	5.1
$40,000- $49,999	2.5	0.6
$50,000 or More	8.7	0.6
TOTAL	100.0%	100.0%
(n)	(161)	(157)
Median	$16,077	$10,353
Mean	$20,369	$11,788

[a]Northrim Associates, Inc., 1979.

"Can you tell me what your total household income for the last year is? This would include money from jobs, businesses, unemployment, other types of government assistance, as well as other kinds of income."

Approaching the family income question from another direction seems to support the lower income estimate of the survey. This is done by taking the number of 1978 households in Kotzebue (497), multiplied by the number employed people per household (1.53) to yield the total number employed during the year (760). This number is then multiplied

by the average number of months worked (7.7) which is in turn multiplied by the average monthly wage ($1,309). Adding in an estimated $2,161,302 in non-wage payments, the sum is divided by the total number of households to obtain an estimate of household income. The result is $19,770, within $500 of the survey estimate.

Municipal Expenditures and Revenues

Kotzebue is a second class city located outside a borough. Second class cities do not have powers of education (this function is performed in Kotzebue by a special service district of the unorganized borough known as a Rural Education Attendance Area, or REAA). The City of Kotzebue exercises the powers of planning, platting and zoning in addition to the traditional police and regulatory powers of second class cities (police and fire protection, municipal utilities, etc). Kotzebue exercises the authority to levy and collect sales taxes, but has not yet exercised the power granted to second class cities to levy and collect a property tax.

Table 160 summarizes the FY-1980 general fund expenditures and revenues of the City of Kotzebue. The city anticipates expenditures of approximately $491 per capita. Public safety and public works comprise 36 percent of the budgeted expenditures on the revenue side. The largest single source of municipal income is the retail sales tax--$398,578, or about 32 percent of total anticipated city revenue. Intergovernmental transfers

TABLE 160

FY-1980 GENERAL FUND BUDGET, CITY OF KOTZEBUE[a]

Expenditures

Account	Amount
Administrative	$ 154,123
Law	20,000
Finance	169,559
Public Safety	430,387
Public Works	212,274
Vehicle Maintenance	16,000
Non-Departmental	96,742
Total	$1,240,980

Revenues

Account	Amount
Retail Sales Tax	$ 398,578
Penalties & Interest	3,946
Licenses Permits & Fees	51,854
Service Charges	32,880
Federal Revenue Sharing	103,313
State Revenue Sharing	149,760
Federal Programs (CETA)	122,279
Sale of Property	30,000
Rent	20,000
Other	328,370
Total	$1,240,980

[a]Ordinance 79-105, City of Kotzebue (Budget)

account for an additional 30 percent, or $375,352 (state and federal shared revenue and federal programs).

Table 161 shows budgetary trends over the Past six fiscal years. City spending has increased substantially in four of five years. Municipal expenditures show an average overall growth rate of about 22 percent per year between FY-1975 and FY-1980 in current dollars, which is probably the equivalent of 10 to 12 percent growth in constant dollars (after discounting the effects of inflation at about 10 percent per year).

Kotzebue does not levy a property tax, so the value of local property is not assessed. The city has no outstanding general obligation bonded debt.

TABLE 161

GENERAL FUND EXPENDITURES, CITY OF KOTZEBUE, 1975-1980

MUNICIPAL Expenditures

Year	Amount	% Change from Previous Year
1975	$ 585,909	
1976	$ 886,883	+51
1977	$ 745,523	-16
1978	$ 967,392	+30
1979 (budget)	$1,076,576	+11
1980 (budget)	$1,240,980	+15

[a]Financial Reports of the City of Kotzebue, 1975-1978, City Bueget, 1979-1980

Education

PRIMARY AND SECONDARY

Kotzebue's kindergarden through twelfth (K-12) grade students attend public schools under the jurisdiction of the Northwest Arctic School District organized under REAA which serves the entire NANA Region. There are no private educational facilities serving this age group in Kotzebue. Originally a school under the jurisdiction of the Bureau of Indian Affairs, the community agreed to leave the BIA system and become part of the REAA on July 1, 1976. By 1976, all public schools in the NANA region were under the authority of the NWASD.

Student Population

In 1978-1979 school year had 647 students of which 343 were elementary (K-6) and 304 were high school students (7-12). The 1978 enrollment was about 25.6 percent of the total population. The 1978 NANA regional survey found that about 33 percent of the region's population was of school age. The age distribution of Kotzebue is similar to the region though may have slightly fewer of this age group. The difference between actual enrollments and projected student population may indicate a high dropout rate and/or data inconsistencies. For towns and villages composed largely of Alaska natives, the ratio of student age population to the total ranges from 28 to 33 percent,

TABLE 162

KOTZEBUE SCHOOL ENROLLMENT TRENDS[a]

Year	Final Enrollment				Average Daily Attendance
	Elementary[d]	Secondary[d]	Sp.Ed./ Upgraded	Total	
1960-1961	n.a.[b]	n.a.	n.a.	308	259
1970-1971	538	82	65	685	610
1971-1972	644	149	80	873	n.a.
1972-1973	482	127	40	649	565
1973-1974	490	157	28	675	603
1974-1975	473	121	37	631	596
1975-1976	466	157	70[c]	693	n.a.
1976-1977	352[e]		n.a.	625	
1977-7978	338[e]		n.a.		
1978-1979	332e	304	n.a.	647	n.a.
1979-1980	324[ef]		36		

[a]Alaska Department of Education and Northwest Arctic School District,

[b]Figures not available.

[c]Listed as non-native students.

'The definition elementary and secondary changed as the system changed from BIA to REAA control. BIA had a K-8 and 9-12 division, while REAA has a K-6 and 7-12 split. There were 123, 7th and 8th grade students in 1978-1979, which would make elementary enrollment in that year comparable to 1975-1976.

eNome Elementary School

'Approximate figure

Table 162 outlines enrollment trends in Kotzebue. Student totals are somewhat erratic with more than a doubling of enrollment between 1960 and 1970. Today enrollment stands at about the level of 1970 with increases in secondary enrollment and a decline in elementary enrollment which occured mostly between 1970 and 1975. In 1978-1979, enrollment by grade was fairly well distributed. Table 163 shows this distribution. Note the peak in the eighth grade and the falling off by the twelfth grade suggesting continuing problems with retention of students through high school.

TABLE 163

ENROLLMENT BY GRADE FOR KOTZEBUE PUBLIC SCHOOLS

OCTOBER 31, 1978[a]

Grade	Enrollment
K	44
1	52
2	59
3	54
4	40
5	44
6	50
7	52
8	71
9	57
10	43
11	43
12	38

The racial distribution of the Kotzebue system is estimated to be 90 percent native and 10 percent white. This is due to the fewer number of children per household in non-native households.

Personal and Facilities

The school district presently maintained a student teacher ratio in 1978-1979 of 13.8 pupils for each teacher. Elementary grades are somewhat higher (15.6 pupils per teacher) compared to secondary (12.7). This was accomplished with 18 elementary and 21 secondary certified teachers, plus 8 certified specialists in library, special education, reading, music, etc. Using just general instructors, the ratio is 16.6 to one, and with specialists the ratio is 13.8. This professional staff is supervised by two principals (one for each unit), and supplemented by 20 to 25 teacher aides which include people with special traditional skills as well as general classroom assistants. In 1975-1976, the teacher/pupil ratio was 15.7 to one which is similar to what it is currently.

To accommodate the enrollment, the school district maintains a single site complex in the north part of the community adjacent to the hospital. The basic building dates from 1958, with major additions in 1962, 1966, 1969 and 1970. The elementary wing has 17 classrooms, a library, a multi-purpose room/cafeteria media resource room and office complex. The secondary wing contains eight general classrooms, a full size gymnasium with stage, business room, home economics, lab, shops, library and land/chorus room.

In addition to academic facilities, the district has 27 housing units for staff. Present facilities plans call for the development of a regional vocational center in Kotzebue to support both local needs in this area as well as expanding vocational programs throughout the region. The center has a target opening data of 1981. There is some discussion of additional high school facilities because of overcrowding but not firm plans are presently developed. The high school is using some community college classrooms under a cooperative agreement.

As the largest school in the REAA district, Kotzebue community schools offer a full curriculum with diversity and many local support services. The district has locally developed a cross cultural curriculum with emphasis on the basics and bringing in cultural studies. Kotzebue also is the administrative center for the district, and the superintendent and 30 staff maintain offices adjacent to the airport.

The Cost of Education

Table 164 breaks down the cost and funding sources of education in the entire NANA Region. The district uses an integrated funding approach. In this way, income generated from categorical sources (such as vocational education, special education, bilingual education and correspondence study) can be pooled to provide program support in areas of greater need.

In 1977-1978, revenues and expenditures totaled $10,883,000 or $7,058 per student. With enrollments generally plateaued, costs continue to rise to

TABLE 164

EDUCATION EXPENDITURES AND REVENUE SOURCES - 1977-1979[a]

Categories	1976-1977[b] Amount	1976-1977[b] Percent	1977-1978 Amount	1977-1978 Percent
Expenditures				
Instructional				43%
Operation and Maintenance				25
Operating Costs - (FY-1979)				11
General and Administrative				10
Food Services				5
Instructional Support				4
Other				2
	$6,924,000	100%	$10,883,000	100%
Source of Funds				
Federal	$1,270,000	18%	$5,320,000	49%
State	5,434,000	79	5,279,000	48
Local	220,000	3	284,000	3
	$6,924,000	100%	$10,883,000	100%

[a]Northwest Arctic School District Profile, 1979.

[b]Selawik, the second largest school is the system still had direct funding through BIA until 1977-1978.

maintain and improve programs and cover the costs of inflation. Despite that, the district costs do appear to be well above urban averages even when taking the cost differential of the region into consideration. Anchorage costs of education in 1977-1978 was $2,539. Adjusted for Kotzebue costs would be $4,052. Nome spends $4,771 per student in 1978-1979, significantly below the NWASD.

Sources or revenue include the federal government, the majority of these funds, $4,148,800, were federal aid in lieu of local taxes, provided under P.L. 81-874. State financial aid is provided under the foundation program and aid in lieu of local taxes. A small portion, $253,200, related to support of the boarding home and bilingual education programs as well as purchase of equipment related to capital improvements. Local monies were generated primarily by rental of district operated housing, sale of school lunches, and revenue related to investment of temporally idle cash.

POSTSECONDARY EDUCATION

Higher education- adult education and postsecondary career and vocational-technical training is provided by a number of agencies. The Chukchi Community College (CCC) is the largest delivery system of higher education in the region. " he Community schools offer a variety of community interest courses for both children and adults. Mauneluk provides training for the village health a' de program, and has cooperative arrangements with the Community College for the placement of college students in CETA slots. This section will focus on CCC and its activities and programs.

Functions of Chukchi Community College

The Chukchi Community College serves the NANA Region through a main campus in Kotzebue. CCC has a campus president under the statewide community colleges chancellor. The president is advised by a Regional Policy Advisory Council. The College was officially recognized in 1978, but still has no approved programs or catalogue. College courses have been offered a number of years prior to that through the Cooperative Extension Service.

Presently the college offers a variety of classes in accounting, vocational-technical, history, mathematics , music, physical education, political science, psychology, sociology, and speech. In the spring semester 1979, CCC offered 26 courses, plus 18 specialized welding courses, and five upper division and graduate courses through REA, Forty courses offerings were planned for the fall 1979 semester, The welding courses were offered in both Kotzebue and regional villages using a portable welding classroom.

Student Population

Enrollment data at the college does not have a sufficient history to judge potential in the community. The spring 1978 semester produced 700 credit hours with 221 students. The fall 1978 semester had 485 credit hours with 152 students. This is an average of 3.2 credit hours per student. There are presently six full-time students, so most students are part-time with the majority of classes in the evenings and weekends.

Personnel and Facilities

The college employed two full-time instructors in 1978-1979 (vocational education and English) with two new positions added for 197%1980 (business and biological sciences). These are supported by part-time adjunct instructors (18 in the spring 1979 semester).

Classes are taught in a new facility completed in 1977. The building contains three classrooms, office space, dark room, classroom kitchen. In addition, there is a portable welding building. A second building is planned for summer of 1980 which will add office. space, a library and about five classrooms in all. Also a storage building for vocational technical work is planned within the next year.

Thereis also an exchange agreement with the public schools with college classrooms used by secondary students during the day and college classes in the high school in the evenings and weekends. The Senior Citizens Home is also used for an Eskimo dancing class.

Funding

Revenues for the college come primarily from budgeted funds through the University of Alaska. In addition, grant funds through Maneluk pay for part of the two new instructors in 1979-1980, small engine maintenance courses, and CETA money for students.

KOTZEBUE POLICE DEPARTMENT

Organizational Context

The Kotzebue Police Department is located in the core area of Kotzebue adjacent to the city hall and city fire department. The department employs eight sworn officers and four reserve officers to handle requests for service. A total of two officers are on duty per shift. In addition, there are thirteen other personnel who function as dispatchers, jailers, animal control and janitor. (Gorski, Community Contact, 19791)

Kotzebue has recently implemented the 911 emergency communications network for police, fire and emergency medical services. The program is slightly over one year old. Response time for the department is presently estimated to be under five minutes. (Gorski , Community Contact, 19791)

As well as performing normal duties, the Kotzebue police department is responsible for airport security. For each commercial passenger jet operation out of Kotzebue, the department dispatches one sworn officer to do security checks in compliance with airport regulation.

Incidence of Crime

Part 1 crimes are considered to be the most serious in terms of their impact on the victim and the community. There are seven classes of Part 1 crimes as determined nationally by the Uniformed Crime Reports.

They are murder, rape, robbery, aggravated assault, burglary, larceny and auto theft. Part II crimes are less serious in nature and are classified as simple assault forgery, fraud, embezzlement, vandalism, weapons possession, prostitution and disorderly conduct. Kotzebue is presently not reporting using the uniform crime reports but follows an outline somewhat similar in format. Table 165 displays the incidence of more violent crimes for the city for 1978 and the first quarter of 1979.

TABLE 165[a]

INDEX OF VIOLENT CRIMES LESS UNFOUNDED

	1978	1979 (First Quarter)
1. (a) Murder	1	0
(b) Manslaughter	0	0
2. Rape	10	3
3. Robbery		
(a) with gun or knife	0	0
(b) any other weapon	0	0
(c) hands/fist/feet	3	2
4. Aggravated Assault		
(a) with gun or knife	7	0
(b) any other weapon	1	0
(c) hands/fist/feet	3	0
5. Burglary		
(a) entry with force	77	26
(b) entry without force	9	1
(c) attempts	13	2
6. Larceny		
(a) $200 or more	45	11
(b) $50 to $199	41	8
(c) $0to $49	42	12
7. Motor vehicle theft		
(a) automobile	6	0
(b) trucks and buses		1
(c) other vehicles	12:	30

[a]Gorski, Community Contact, 1979L

Unattended death under the first category is not classified as a Part 1 crime. In addition only nonnegligent manslaughter is considered under murder/homicide in the uniform crime reports. The remaining groups are classified as Part 1 crimes. Excluding the two above mentioned subcategories, a ratio of violent crimes for 1978 to the population can be established at 126 violent crimes per 1,000 in the population (base population estimate of 3,000). This is alarmingly high when compared to urban Alaska. Anchorage's ratio of violent crimes to the total population is 70.8 per 1,000 in the population. Several indicators which might account for this difference are increased per capita alcohol consumption, the relative isolation of this arctic community and possibly better reporting due to the more closely knit nature of the community.

Although no specific statistics have been tabulated on the use of alcohol and the incidence of crime in Kotzebue, the Kotzebue Police Department estimates that 40 to 45 percent of incidence to which police respond involve drinking. This is comparable to Nome, the closest regional community, in which 37 percent of all offenses also involve alcohol.

Crime Clearance

Crime clearance is defined in two ways, either by the arrest of the perpetrator, or by knowing who committed the crime but for a particular reason, the suspect cannot be apprehended. Examples of the second clearance would be death of the suspected offender or apprehension of the offender in another jurisdiction. Table 166 displays the percent cleared for 1978 and the first quarter of 1979 and compares these

clearance rates to Anchorage, Alaska.

TABLE 166[a]

CRIME CLEARANCE PROFILE

	Anchorage	Kotzebue
Murder/homicide	81 .3%	-0-
Rape	9.9%	80%
Robbery	12.8%	67%
Aggravated assault	35.5%	91%
Burglary	10.2%	25%
Larceny	27.9%	38%
Auto theft	7.9%	20%

[a]Gorski, Community Contact, 1979L

On an overall scale, Kotzebue Police Department has a more successful crime clearance rate than Anchorage. It is important to note, however, that there is a substantial difference in the general frequency of crimes in Kotzebue and Anchorage which raises some statistical problems in comparative analysis. However, one big difference that exists between the two areas is the level of citizenry interaction. The close knit nature of the Kotzebue community can be assumed to have afforded the police department with better information channels than what might otherwise exist in an urban area. Urban isolation tends not to permit an adequate flow of information to police thus hindering investigative capabilities.

Issues

The City of Kotzebue is presently 32.5 square miles. Although most activity occurs in the core area, there is still an occasional demand

for services in the surrounding tundra. The department now lacks the specialized equipment to cope with the surrounding tundra countryside. In addition to the large land mass with which the Kotzebue Police must deal, there are great fluctuations in population due to the seasonal summer influx for subsistence type fishing activity. W nter population is estimated at 3,026 with a summer estimate of 4,000 With no increase in the size of the force to accommodate for seasonal fluctuations, the current manpower seasonally faces a heavy work load. In 1978 alone, the Kotzebue Police handled over 8,000 complaints. National standards require 2.1 sworn officers per 1,000 or one sworn officer per 500 in the population. When accounting for sick leave, annual leave and time off, it is assumed that six (5.75) officers are required to adequately maintain a 24 hour public protection service. The level of population used to determine a 24 hour service is generally 1,000 (Alaska Consultants, 1979b). Using the above standard, Kotzebue should ideally have a full time sworn staff of ten. As noted earlier, the department presently employs eight full time sworn officers and four reserve officers. With the extreme population fluctuations as discussed, the department could, by accepted standards, employ at least two additional sworn officers. Even disregarding national standards, the level of activity in the area of violent crimes alone could be considered sufficient justification. (Gorski , Community Contact, 1979 l)

Detention Facilities

The City of Kotzebue operates a 12 cell detention facility by state contract. The state troopers also utilize the facility and the state

subsidizes with funds for state prisoners. The facility has the capability of detaining up to 24, but according to the Kotzebue Police Department, the average population is generally around ten. The facility is designed for short-term use only with sentences longer than 30 days handled at the Nome correctional facility. As much as possible, segregation is provided for juveniles, females and male offenders.

ALASKA STATE TROOPERS

The Kotzebue post for F Detachment of the Alaska State Troopers is located in Kotzebue. Jurisdictional responsibility are the bush communities in the Nana Region with some spillover into the North Slope Borough. Total area served is approximately 46,000 square miles. Functions of the troopers include search and rescue, criminal investigation and handling of complaints outside the city. The primary focus is on complaints in the bush villages with some assistance to the Kotzebue Police Department in homicide cases. To handle complaints in the villages, the troopers have available one snow machine, one four wheel drive vehicle, one aircraft located in Nome and a 19 foot Boston Whaler. In addition, the troopers have an arrangement with Shellagarger Flying Service to accommodate for emergency travel into the bush. Presently stationed at the Kotzebue Post is one sworn trooper and a constable who was newly acquired as of May 31 of this year. (Gorski, Community Contact, 1979a)

FIRE PROTECTION

The Kotzebue Fire Department is located in the downtown core area adjacent to city hall. The Department presently has 23 volunteers as well as one fulltime paid fireman, one CETA employee and the fire chief who is classified as a consultant on retainer to the department. (Gorski, Community Contact, 1979k)

Equipment available for use in extinguishing fires includes one high pressure rig which holds 600 gallons of water; one attach rig with a pumping capability of 250 gpm and a 300 gallon tank; one Class A pumper which pumps 750 gpm and has a 750 gallon tank; and one all terrain fire truck with a 1,500 gallon tank. Water sources for fighting fires are standing bodies of water on both sides of the community and a hydrant system. The fire insurance rating for the community is 8 and 9 depending on the location of the dwelling in relation to the hydrant system. (Gorski, Community Contract, 1979k)

In addition, emergency medical services in Kotzebue are handled by the fire department. The department has seven fully trained EMTs and one paramedic/EMT Instructor. Additional training classes for EMTs are scheduled in the near future. (Gorski, Community Contact, 1979k)

Dispatch for police, fire and emergency medical is handled through a "911" emergency communications network. The system is new, within the last year. Response time to the scene for fire and rescue operations is under three minutes and response time for emergency medical services is presently under five minutes. Table 167 displays fire alarms and

emergency medical responses for 1978 and the first six months of 1979.

TABLE 167

FIRE ALARMS AND EMERGENCY MEDICAL Responses

	1978	1979
Fire	63	80 (as of Nov,79)
Emergency Medical	602	312 (as of June,79)

[a]Gorski, Community Contact, 1979k

The leading cause of fires in 1978 was overheated oil stoves and the leading responses in emergency medical were fractures and sprains, and abrasions and lacerations. (Gorski, Community Contact, 1979k)

There is a substantial difference between the reported alarms for 1978 and 1979. According to the Kotzebue Fire Department, there are several reasons for the apparent increased incidence in alarms. The first is a difference in reporting. False alarms during 1978 were not always reported but have been included in tabulations for 1979. Second, a number of private alarm systems have been installed in Kotzebue over the last year and there has been some problem of malfunctioning systems. Thirdly, there appears to be a general increased awareness of the department's capabilities. The citizenry is turning to the department more and more for assistance in other types of problems not necessarily directly related to fire. (Gorski, Community Contact, 1979k)

Issues

Plans are on board to develop Kotzebue fire department into a regional training center. It is hoped that $500,000 will be allocated over the next several years for training of people from the bush villages in fire-fighting techniques. In addition, the Department has recently been deemed the search and rescue communications headquarters for the region. The department will function as a central dispatch for all agencies involved in search and rescue operations. (Gorski, Community Contact, 1979k)

Recreation

There is no organized municipal recreation program in Kotzebue. However, a number of organizations, with special emphasis on the native corporation, participate to offer various programs for public involvement.

The Kotzebue IRA opened an adult recreation facility in January of 1979. Activities and facilities include pingpong, pool, an exercise room, showers, and men's and women's suanas. The facility is open to adults 19 years and older. Participants pay $30 per month or $5.00 per day. On the average, about ten to twelve people use the facility daily and the number of monthly memberships average 28. The IRA has plans on board to add another floor to the facility for new office space.

Mauneluk, the non profit arm of Nana Native Corporation, runs a day camp for children during the summer months. The program is offered in three sessions: one week, learning outdoor skills, and two one-week sessions in town in which participants receive swimming instruction, boating and first aid. Four Red Cross personnel came from Anchorage this past year to assist with the program implementation. In addition, the program employed nine youth counselors and 12 volunteer adults and accommodated 45 children per session.

Little league has just started up in Kotzebue. There are presently three teams with a total of 60-65 participants. For adults, from June through the end of August, there is city league softball. Presently eight men's

teams have organized with 96 participants and four women's teams with 60 participants. From the end of September through May adults participate in city league basketball. There are eight men's teams with 72 participants and two women's teams with twenty participants. In addition to the above, there is a small bowling league which utilizes facilities at the airforce complex.

Community-wide Special Events

There were basically three annual community events during 1978-1979. The first was the Fourth of July celebration with a parade, dancing and a softball tournament. Following the Fourth of July was the N.W. Alaska Trade Fair. Participants came from all the surrounding villages and participated in arts and crafts and cultural dance for five days. The program was sponsored by the city and NANA Regional Corporation. In the early spring the dogmushers and Lyons Club sponsors snow go and dog mushing races.

Facilities

Facilities are somewhat limited in Kotzebue. Table 168 displays existing facilities as compared to optimum standards developed by the National Park and Recreation Association. Although it is difficult to apply small urban community standards to Kotzebue, it is never-the-less offered far comparative purposes.

TABLE 168

FACILITIES INVENTORY

	Existing	Optimum
Ice Skating Rink	0 (1 proposed)	1/5,000
Tennis Court	0	1/2,000
Community Center	1 Adult 1 Teen	1/25,000
Basketball Courts	1 - 2b	1/2 ,000
Neighborhood Parks	0	1/2,000 - 1/10,000
Play Lots	0	1/500 - 1/2,500
Softball Diamond	1	1/3,000

[a]Gorski, Community Contact, 1979g
[b]Use of the airforce basketball court is the prerogative of the base commander.

In addition to the above, the airforce complex houses a two lane bowling alley, one basketball court, a small weight room and a movie theatre. Use of these facilities is at the discretion of the base commander, Two boat ramps were recently constructed for a boating lagoon; however, the principal use for boats in Kotzebue is utilitarian in nature. In addition, there is a teen center located in the Eskimo Building which operates partially on revenue sharing monies. The center offers dances and other recreation activities. The center is incorporated as a non-profit organization although the building is owned by the City which also provides a CETA position for the directorship. Also, The Friends Church runs a teen center and the Catholic church operates a preteen center.

Examination of the above table indicates some discrepancy between actual facilities and optimum standards. A community the size of Kotzebue should ideally have a tennis court, a neighborhood park and a play lot. With the

vast amount of undeveloped land surrounding Kotzebue, the inclimate weather and budget constraints it is understandable that these and other facilities, either publically or privately, have not been instigated. However, because of the relative isolation, and the long dark winters recreational outlets are vital to the community's well being. Access to the wilderness may, in some cases be difficult and it is here that neighborhood parks and play lots become realistic. Locally developed lands can be the center for hours of constructive recreation and community socializing. The city has plans on board for an outdoor skating rink this winter. This too would be an excellent winter sport to encourage development in as well as being conducive to Kotzebue's artic climate.

Other

Many community members find a recreational outlet in subsistence activities such as hunting and fishing. Although subsistence is a primary means of food acquisition, it also affords many people an outlet from the confines of Kotzebue and can thus be considered in a recreational light.

Two other activities which receive fairly heavy participation include snow machining and cross country skiing during the winter months. Although, for the most part, these activities are unorganized, they play a vital role in the mental health of community members by affording a break to the long, dark winter months.

Proposed Facilities

The local IRA and the school district are jointly considering the feasibility of an indoor swimming pool. Although this is an expensive project, such facilities wou' d be conducive to year round use and would allow participation on a ocal basis.

The IRA has plans on board to add a racquetball facility and a barbeque to the adult recreation center. Consideration for this project is next year.

In addition, the city has plans to add an outdoor skating rink for use this winter and the school is targeted to build a new gym facility.

The above mentioned facilities would greatly enhance Kotzebue's rather limited recreational outlets. For the wellbeing of the community, facilities and recreational programs should be encouraged as much as possible. Perhaps the most serious problem limiting development is simply budget constraints. With the city facing severe utility problems, and supporting the essential human services of police and fire, with a negligible tax base, it is understandable why recreation has not become a municipal function. Until there is a real impetus to Kotzebue's 1)cal economy, generating sufficient capital to justify a program, recreat· on will continue to be a function of private organizations such as the native profit and nonprofit corporations.

WATER

The water system in Kotzebue is one of the first arctic projects to be fully implemented. The system was constructed by the Indian Health Service beginning 17 years ago and has since been at various stages of development. It has been the general consensus and intention of both the City and the Indian Health Service (IHS) that upon completion of the system, the City would acquire operation and maintenance responsibilities. Presently, the City and the IHS are operating under a use agreement with the City acquiring portions o· the system as it is completed. It is the hope of the Indian Health Service that the system will be handed over to the City of Kotzebue ·n its entirety within one year. .

In January, 1979, the engineering firm of CH_2M Hill completed a water and sewerage systems evaluation study for the City of Kotzebue and the IHS. The study is designed to point out deficiencies in the system with remedies to be resolved by the two parties. Much of the information for this section has been extracted from the above mentioned report.

The primary water source for the City of Kotzebue is the 757 million liter (200 million gallon) Vortac storage reservoir located east of town. Vortac Reservoir is supplemented during the summer months for about sixty days by Devils Lake via a 15 centimeter (six inch) pvc arctic transmission line.

The combination of these bodies of water generally provide a sufficient resource to accommodate water demand through the winter months.

A boiler house is located on the dam to supply hot water and prevent freezing of the pump intake and to raise the water temperature to approximately 40 degrees. At the intake, the water is pumped via an insulated above ground transmission line 2,743 meters (9,000 feet) to the water treatment facility in downtown Kotzebue. The capacity of the pump is between 2082 lpm (550 gpm) and 2839 lpm (750 gpm).

A water quality problem exists with the present water source. In the past, the pipeline has been affected by an internal slime growth which has been the cause of reduced delivery capacity. In June, 1978, the line was "pigged" and the capacity increased from 439 lpm (116 gpm) to 897 lpm (237 gpm).

The treatment facility has a design capacity of 908 lpm (240 gpm) or 1,308,096 lpm (345,600 gpd). The actual capacity of the plant is between 568 lpm (150 gpm) and 681 lpm (180 gpm). Water is treated extensively and then passes to a 5.7 million liter (1.5 million gallon) storage tank for distribution.

The arctic climate in Kotzebue has created design problems unique to this part of the world. To prevent freezeups during the winter months, the storage tank is heated through a waste heat recovery system from

the Kotzebue Electric Association power plant. The first of four water distribution loops was installed in 1969 using 10-centimeter (4 inch) uninsulated PVC. Due to the severity of the winters, however, line freezeups occurred and it was decided that insulated lines would have to be installed. In the 1969-1970 construction season, all mains and service lines installed were replaced with 3,658 meters (12,000 feet) of 10-centimeter (4 inch) PVC insulated main and 100 insulated polyethylene service lines with an accompanying heat tape. It was found, however, that heat tapes sometimes caused system failures by melting the plastic pipe, so a decision was made in 1972 to replace the polyethylene with 1.9 centimeter (3/4 inch) soft drawn copper. A thaw cable was installed to prevent service line freezeups.

Water Issues

The following section indicates some of the problems with the system. The information is not all inclusive but points only to some of the major issues.

- Water demand is normally between 529,900 and 681,300 liters (140,000 and 180,000 gallons) per day through the year. This constitutes a rather low per capita water usage rate by urban standards of 246 lpcpd (65 gpcpd). This is also equal to the treatment capacity of 530 lpm (140 gpm) indicating that the treatment facility is not greatly in excess of system demand.

- There are between 400 and 450 water hookups. Customers pay a flat rate of $40 per month per service connection which, by comparative standards, is a costly utility.

- Historically, the system has had numerous problems with lines freezing. The system is largely reliant on electricity to prevent distribution and service line freezeups. Often, however, individual service lines will freeze when residents let their individual fuel supply run out.

- In a recent survey conducted by NANA Regional Corporation, 92.5 percent indicated that they were presently receiving piped water. When asked about the water quality, 56 percent said the water tasted alright and 44 percent indicated dissatisfaction with the water quality. In addition, when asked if they thought water and sewer improvement was very important, 84.5 percent of the sample indicated it was and ranked water and sewer improvement third of nine services. (Northrim Associates, 1979.)

- Perhaps the most serious problem is the reliability of the water source in use. The city's primary concern is that water demand is depleting the supply in Devil's Lake. The current demand on the water supply is approximately 225 acre feet per year (includes wastage during the treatment process). The existing system has a demand of of about 75 acre-feet less than the estimated input into the system.

The CH2M Hill report indicates several options to be considered to supplement or provide a new source of water for Kotzebue. These options are listed in Table 169.

The report notes four of the eight as possible alternatives for future water sources for the City of Kotzebue. As noted in the table they are: Kotzebue Lagoon, snow fencing, water conservation and water wells.

TABLE 169

POSSIBLE FUTURE WATER SOURCES

RANKED ACCORDING TO Effectiveness

Water Source	Quantity of Water	Quality of Water	Capita? cost	O &M cost	Total
1. Desalinization	10	10	3	0	23
2. June Creek	10	07	3	5	25
3. Kotzebue Lagoon	10	07	7	5	29
4. Noatak River	10	10	0	5	25
5. Sadie Creek	10	3	3	5	21
6. Snow Fencing	7	7	10	7	31
7. Water Conservation	7	7	10	7	31
8. Water Well (s)	7	5	10	7	29

[a]CH2M Hill, 1979.

In addition, the city favors the Noatak River as a possible development source. Although the quantity and quality of the water is very good, the project is comparatively more capital intensive than other options available.

The Public Health Service is examining June Creek as a potential source, however, there is speculation that June Creek is drainage from the same water source that is currently serving the City of Kotzebue.

Planning for water needs requires some idea of future population for the area. Although no formal studies exist, the systems evaluation study indicates planning for future needs should be based on a population of 4,000 by 1995. Assuming the present per capita of 246 liters (65 gallons) per day remains constant, 984,100 liters (260,000 gallons) per day would be required.

SEWER

Design and implementation for the sewer system in Kotzebue came somewhat later than water. Funds were allocated for construction in 1969 and over a period of time, 5,486 meters (18,000 linear feet) of collection mains with 3,139 meters (10,300 feet) of service lines were installed to serve 180 homes. The system was substantially expanded in 1976 with approximately 9,148 meters (30,000 linear feet) of sewer lines, and presently serves almost all homes in the community. There are eight sewage lift stations operating to assist flows to a two cell facultative-seepage lagoon at Isaac Lake, approximately 10.4 hectares (25.7 acres) in size, located adjacent to the airport. Treated effluent at Isaac Lake is disposed of by natural percolation to the groundwater tables. A study completed in 1975 recommends expansion at the lagoon to approximately 13.8 hectares (34 acres) by 1995. Tentative commitment by the Division of Aviation has been obtained but is subject to withdrawal upon airport expansion.

The majority of Kotzebue benefits from piped sewers. However, approximately 18 percent still use honeybuckets for sewerage disposal. Of the 18 percent,

69.2 percent maintain this system year round and 30.8 percent only implement honeybuckets at certain times per year. (Northrim Associates, 1979).

Issues

The sewer system was constructed through the Indian Health Service and the city is now operating and maintaining the system through a use agreement. Since a number of rather serious problems have developed, the city and the Indian Health Service jointly hired a third party to inspect and point out deficiencies in the system. CH2M Hill, in consideration of the above, completed a water and sewerage system evaluation study in January, 1979. Discussion of some of the major issues have been extracted from this report.

Unlike the water distribution systems, the sewerage collectors cannot be artificially heated during the winter months since their point of origin is the individual service connections. The report notes three variables which determine temperature in the collector system.

- The temperature of the water delivered to the customer.
- Quantity of heat added to waste in the home by water heaters.
- Quantity and manner in which the water is used.

Only the first of these three variables can be controlled with the other variables wholly contingent on each resident's individual living habits. It should be further noted that per capita water use rates in the community are comparatively low (246 lpcpd vs. an urban usage of 568 lpcpd [65 gpcpd *vs.* 150 gpcpd].) The system was initially uninsulated and it

was found that this, coupled with low usage rates made it impossible to maintain temperatures above freezing. The problem became apparent during thewinterof 1970-1971 and consequently, the uninsulated mains were replaced and all lift stations were insulated. There are still portions of the system which lack adequate insulation but this situation should be remedied in the future.

The most imminent problem with the system is a tremendous infiltration problem not accounted for by domestic use. As noted in the report, the degree of infiltration is as follows:

529,900 liters (140,000 gallons) per day in cold months

2,271,000 liters (600,000 gallons) per day in July/August.

Actual sewerage flows have been calculated by CH2M Hill based upon a per capita generation rate of 189 liters (50 gallons) per day. To gain a rough approximation of average sewerage flows, per capita generation can be multiplied by the total population. This yields a domestic wastewater generation of 473,125 liters (125,000 gallons) per day. It is here that the magnitude of 2,271,000 liters (600,000 gallons) per day of infiltration can be seen. System capacity cannot cope with flows of this nature and the lagoon is full to overflow during the summer months. The speculation is that infiltration is probably a result of a number of small leaks throughout the system. In addition, there is a problem with sediment collecting around a high portion of the manholes and evidence of infiltration appeared in 22 others.

The city is now in the process of trying to locate major sources of infiltration within the system. Regardless of the cause, rectifying this problem is going to be costly.

ELECTRICITY

Electrical generation is provided to almost all residential and commercial structures in Kotzebue. The only major user of electricity not on the system is the airforce complex which is presently self contained. The service is provided by Kotzebue Electric Association, (KEA), an REA cooperative. Load is generated through six diesel operated generators. The sizing of the generators is displayed in Table 170.

TABLE 170[a]

KOTZEBUE DIESEL GENERATORS

Number of Generators	Kilowatt output per Generator
2	500
2	1,000
2	900
Total System Capacity	4,800 KW

aGorski, Community Contact, 1979c

Kotzebue benefits from an unusual surplus of generator capacity. Peak demand is approximately 2000 kw with a total plant output of 4,800 kw. KEA ideally wants enough surplus power to replace the largest generator output if necessary. The cooperative presently has the capability of two times this output or two contingency backups.

KEA has a total of 608 residential and commercial customers who receive service through 16.5 kilometers (10.25 miles) of overhead transmission lines and .8 kilometers (.5 miles) of underground lines.

The system had a maximum demand in 1978 of 1,948 kw. The cooperative generated 10,003,354 kwh in 1978 and sold 8,562,961. Table 171 displays the residential and commercial rate structures.

TABLE 171[a]

KEA RESIDENTIAL AND COMMERCIAL
RATE STRUCTURES

Residential # of KWH	cost
First 50 KWH	26¢ per KWH
Next 50 KWH	22¢ per KWH
Over 100 KWH	13.5¢ per KWH
Over 10,000 KWH	12.5¢ per KWH
Commercial	
First 10,000	14¢ per KWH
Over 10,000	12.3¢ per KWH

[a]Gorski, Community Contact, 1979c

A surcharge has been placed on all kilowatt hours, over the above prices of 2.38¢ per kwh. This is to compensate for rising fuel prices.

Presently, to help offset rising fuel costs, KEA is putting in a one million gallon holding tank. The tank will supply enough fuel to operate the generators for one full year. This will be an advantage in price control as rate customers will experience delays in fuel hikes with a one year diesel reserve.

Per capita load for Kotzebue is presently about 0.8 kw per person which is comparatively low with urban areas. Reasons which may account for this include the fact that home heating is accomplished almost entirely by fuel oil and residences are small with fewer of the electrical luxuries available to the more urban dweller. This per capita figures allows for no surplus in the system; it is a direct relationship between the point of highest demand during 1978 and the total population of Kotzebue. In actuality, using the total generating capacity, the per capita potential is 1.92 kw per person.

As a sidenote, home heating is accomplished with fuel oil in 95.5 percent of the residences. The remaining households burn wood as their primary heat source. The average amount of fuel oil used during January is 2.5 barrels. With rising fuel costs, this is a significant commodity in already marginal budgets. (Northrim Associates, 1979).

TELEPHONE

Communications in Kotzebue are presently handled through OTZ telephone Cooperative. The Cooperative provides service to 356 residential and 172 commercial customers (main stations). The present system is one and one-half years old replacing mechanical switching equipment in 1977. The current system is electronic with a present surplus capacity of 400 more lines. At saturation OTZ would then examine solid state, however, it will be sometime before population increases would justify this type of expansion.

Communications are accomplished through the use of Alascom's satellite. Customers pay $14.50 per residential station and $21.00 per commercial station. For operation and maintenance, OTZ employs three plant workers and three other employees.

SOLID WASTE

Solid waste disposal for Kotzebue is a city function. The city presently handles collection and disposal with one garbage truck and two city employees. Collection is done once per week at a cost of $12.00 per month. The city landf· 11 is located south of town and is approximately 2.4 hectares (six acres) in size. For maintenance at the fill, the city oeprates a CAT to cover over refuse with earth at reasonable intervals. In addition, in order to reduce the volume of fill, the city burns refuse at the site. At this point in time, there appears to be no real issues or problems associated with solid waste collection and disposal.

With regard to attitudinal data, in the NANA Regional Survey 73.7 percent of of the respondents were aware of and used the landfill. When asked if they thought road improvement to the landfill was important, 64.6 percent indicated that it was ranking this fourth of nine services. (Northrim Associates, 1979).

Land and Housing

LAND USE

Kotzebue is located on the northwestern shore of the Baldwin Peninsula, bounded on the west by Kotzebue Sound and on the east by Hotham Inlet. The community is built on a spit which is about 3 miles long and varies in width from 1,100 to 3,600 feet. Kotzebue Spit is ideally situated on the ocean's shore near the mouths of three major interior rivers that drain into Kotzebue Sound, the Noatak, Kobuk, and Selawik. Located at the center of ancient arctic trade routes, Kotzebue Spit has been a settlement site for centuries. Kotzebue, the traditional commercial trade center in northwest Alaska, is called Kikitagruk in Inupiat.

Consistent with the traditional lifestyle of Eskimos, the settlement pattern of the original village was oriented toward the waterfront. Thus, growth developed in a linear form along Kotzebue Sound. The gravel beach ridge furnished not only good building sites, but also an advantageous view of Kotzebue Sound. Homes built near the shore also afforded easy access to boat landing sites. Thus, the beachfront in Kotzebue became built up with closely spaced homes and stores. Kotzebue is culturally and economically oriented to the waterfront.

As Kotzebue developed into the transportation and urban center in the northwest region, its population rapidly increased. Because of its strategic location in relation to the water transportation system,

Kotzebue became the transfer point between ocean and inland shipping. Freight arrives by sea, is offloaded at Kotzebue, and later is barged to the outlying communities in northwest Alaska. Since no developed overland transportation exists between Kotzebue and the other villages, air transportation also became important. Thus, Kotzebue also grew into the major regional air transportation center. Because of the public services available and the growing dependence on the cash economy, Kotzebue also became the urban center for all of the villages in the northwest region.

In the late 1940's, Kotzebue petitioned for a townsite survey, and in 1952, the community became a Native townsite. By this time, much of the town was already developed, and consequently for the older section of town near the waterfront, the townsite survey was primarily an "as built" survey. In this area, the survey and subdividing reflected past patterns of the subsistence lifestyle rather than the emerging needs of an increasingly urban community (Alaska State Housing Authority, 1971). Land use patterns in the traditional settlement reflected a long tradition of ocean dependence, and the new subdivision tracts that were added southeast of the waterfront have a patchwork appearance when compared to the original linear village.

The result is a mixture of land use patterns. Relatively spacious subdivisions platted on mathematical grids are joined to the water-oriented traditional Eskimo village. According to Kotzebue's Comprehensive Development Plan prepared by the Alaska State Housing Authority (ASHA,1971),

this incongruous mixture had many drawbacks. These included poorly used land, a piecemeal street layout, and wasted land. Apparently, Kotzebue's rapid growth occurred without reference to any overall plan for city development. The traditional lineal development along the waterfront is still visible today, but more recent growth is occuring away from Shore Avenue.

Kotzebue's traditional development (lineal growth parallel to the resource producing sea) has not only been altered by rapid growth, but also by changing land ownership patterns, the scarcity of available and suitable developable land, and governmental decisions in the location of community facilities (Alaska Consultants, 1976). Often public agencies withdraw large tracts of land for their own use with little regard to the overall land needs of the community (ASHA, 1971). "This practice interrupts orderly growth. In Kotzebue the location of the large school, hospital, and Friends' Mission tracts divide the community into separate sections. Of a total of approximately 827 acres on Kotzebue Spit, over 400 acres are controlled by various public (BLM, BIA, PHS, FAA, and State Aviation) and semi-public (Friend's Mission) organizations (ASHA, 1971). The BLM Townsite Trustee currently holds about 76 acres and 12 lots in Kotzebue. Much of this land, held in reserve for future city expansion, is low and swampy. A relatively small portion of the land on Kotzebue Spit has been surveyed and made available as homesites to local residents.

The school withdrawal of approximately 12 acres houses the primary and secondary school and housing for the teachers (University of Alaska, 1976). Adjacent to the school complex is the Public Health Service Hospital and related housing units. This complex also utilizes a large tract of land. Across Third Avenue from the school is the community college building and a multipurpose building.

According to a Kotzebue land use plan prepared by Alaska Consultants (1976), approximately 207 acres of a 553 acre planning area (Kotzebue Spit northeast of the airport) were used for public and private purposes in 1976 (see Table 98). Alaska Consultants (1976) recommended that of the 346 vacant acres, 150 remain vacant because of soil and flooding problems. Thus, if the community utilized the remaining vacant 196 acres for development, a total of 402 acres would be available for residential, commercial, industrial and public/semi-public uses. Alaska Consultants (1976) considered these land use allotments appropriate for a community of Kotzebue's size (see Table 172).

The mixture of land use patterns in Kotzebue apparently resulted from unplanned growth in the community. According to ASHA (1971), the cumulative shortcomings of unplanned growth in Kotzebue wasted much land. Even after ASHA prepared a comprehensive development plan for the community in 1971, residents evidently did not agree with the plan. A later study reported,

> The least effective part of Kotzebue's initial planning program may have been the land use plan. Though the recommendations of the land use plan were internally consistent and logical, in retrospect, they do not appear to have the consensus of the community. There is no unity in Kotzebue about

TABLE 172

LAND USE

CITY OF KOTZEBUE, 1976

Land Use	Area (Acres)	Percent of Developed Area	Percent of Planning Area	Percent of Total City Area
Residential	73.87	35.70	13.30	0.43
Commercial	7.93	3.8	1.40	0.05
Industrial	25.91	12.50	4.70	0.15
Light Industrial	(7.50)	(3.60)	(1.40)	(0.14)
General Industrial	(18.41)	(8.90)	(3.30)	(0.11)
Public & Semi-Public	31.78	15.40	5.70	0.19
Public	(24.02)	(11.60)	(4.30)	(0.14)
Semi-Public	(7.76)	(3.80)	(1.40)	(0.04)
Platted Streets	67.37	32.60	12.20	0.40
Total Developed Area	206.86	100.00*	37.30	1.22
Vacant Land -- Planning Area	346.62		62.60	2.04
Total Planning Area[a]	553.48		100.00±	3.26
Remainder City Area	16,406.52			96.74
TOTAL CITY AREA	16,960.00			100.00±

[a]Planning area represents Kotzebue Spit northeast of the airport. Kotzebue's corporate limits cover 26.5 sections, or 16,960 acres.

SOURCE: Alaska Consultants, 1976

> how the community should grow. Some people think that the main commercial area should be along Front Street. Others think Front Street should be gradually abandoned and a new commercial center should be developed along Third Avenue (ASHA, 1972, P.28).

A later land use plan prepared by Alaska Consultants (1976) apparently met with similar lack of community consensus (informal interview). Many residents feel the plan is too rigid although there is a planning commission in the city, Kotzebue's only planning ordinance is flexible, combining residential and commercial uses. Only preliminary zoning presently exists in the community.

Industrial and Warehousing Uses

Industrial development in Kotzebue is minimal with only a couple of land uses that could be classified in this category. The fisheries cooperative's cold storage building has a waterfront location toward the north end of town. The port facilities are also situated on the north end of the community. Warehousing and other storage facilities are well developed at this terminal. The Kotzebue Electric Association (KEA) power plant is 1 ocated on Lagoon Street near the airport. Other warehouses and cold storage facilities for local businesses are scattered throughout town.

The airport, located at the south end of town, effectively seals off the community from southward expansion. Traffic has to cross the end of the east-west runway to reach the FAA complex, the sewage treatment

facilities, the sanitary land fill, and the north-south landing strip. As large portions of the remaining vacant land on Kotzebue Spit are very poorly drained, it seems that, ultimately, the city will have to leapfrog across the lagoon to the mainland of the Baldwin Peninsula to supply its future land requirements. A current land use across the lagoon from Kotzebue Spit includes the city's water reservoir. The water is pumped through a transmission line to the water treatment plant located across from the hospital. A large storage tank is situated adjacent to the water treatment plant.

Commercial Uses

With a few exceptions, Kotzebue's commercial district is primarily concentrated along a two block span of Shore Avenue. Though residences are also spotted throughout this area, the majority of the community's stores and other small businesses are located here. Kotzebue's major hotel, Nulukvik, which also houses the offices of NANA Regional Corporation, is also situated here. In addition, the Eskimo Building is just a few doors away. This office complex, owned by the Kotzebue village corporation (Kikitagruk Inupiat Corporation or KIC), provides space for a number of businesses. These include Mauneluk Association (the regional non-profit arm of NANA), the telephone and television company, the day care center, the local branch credit union, KIC's office, the post office, a bookstore, the governor's office, and the Kotzebue IRA office. These offices and businesses are within easy walking distance to each other and conveniently located in relation to the nearby residential area. They are not easily accessible

by foot to the more recent residential subdivisions located away from Shore Avenue.

Many other small businesses are scattered throughout town. A new shopping center, Kotzebue Square owned by KIC, contains a modern grocery store and is located on Bison Street near Swan Lake. Its location is not convenient for pedestrian traffic. City buildings are situated on the corner of Third Avenue and Mission Street. Other public and semi-public offices are not so efficiently concentrated as the major commercial uses. State and federal offices are scattered throughout the community.

Residential Uses

Residential land uses are spread throughout Kotzebue. Apparently, land availability, rather than any planning effort, dictated the residential land use pattern in the community. Originally, residential development concentrated along Shore Avenue, until all of the available building sites were utilized. Because of the desirability of being close to the water, most of these homes were built close to Kotzebue Sound. About half of the residential lots on Shore Avenue are 40 feet wide or less, and consequently, the high density of many of the older buildings is a fire hazard. Sited side by side on the front edge of the very narrow lots presents the danger of a spreading fire, and also has created large, vacant inaccessible and unused areas in the middle of some blocks (ASHA, 1971). After the lots along the waterfront were

taken, residential growth spread southeast (inland) from Shore Avenue to the newer gridiron subdivisions (see Figure 9). Many of the lots in these subdivisions require gravel before construction of a dwelling. Additional residential development includes the FAA compound located south of the main airstrip, housing associated with both the PHS Hospital and school complex, the Pioneers Home near Swan Lake.

According to Alaska Consultants (1976), single-family residential lots in Kotzebue averaged 6,078 square feet in 1976. The newer lots in Swan Lake subdivision averaged 10,295 square feet. The planning commission indicated that lot sizes between 6,000 and 7,200 square feet were adequate for future single-family residential development in Kotzebue (Alaska Consultants, 1976). These comparatively dense settlement patterns in Kotzebue are necessitated by limited supplies of developable land, expensive improvement costs, scarce gravel supplies, and savings in the construction and maintenance of community facilities (Alaska Consultants, 1976). Currently, there is a trend toward high densities of land use in Kotzebue (multi-story apartment and office buildings) because of the short supply of land.

Streets

Since Kotzebue was not settled and developed to accommodate the automobile, the patterns of travel in the original townsite are more convenient for pedestrians. Foot travel, beach access, and dog sleds set the pattern of travelled ways (ASHA, 1971). Thus, subsequent

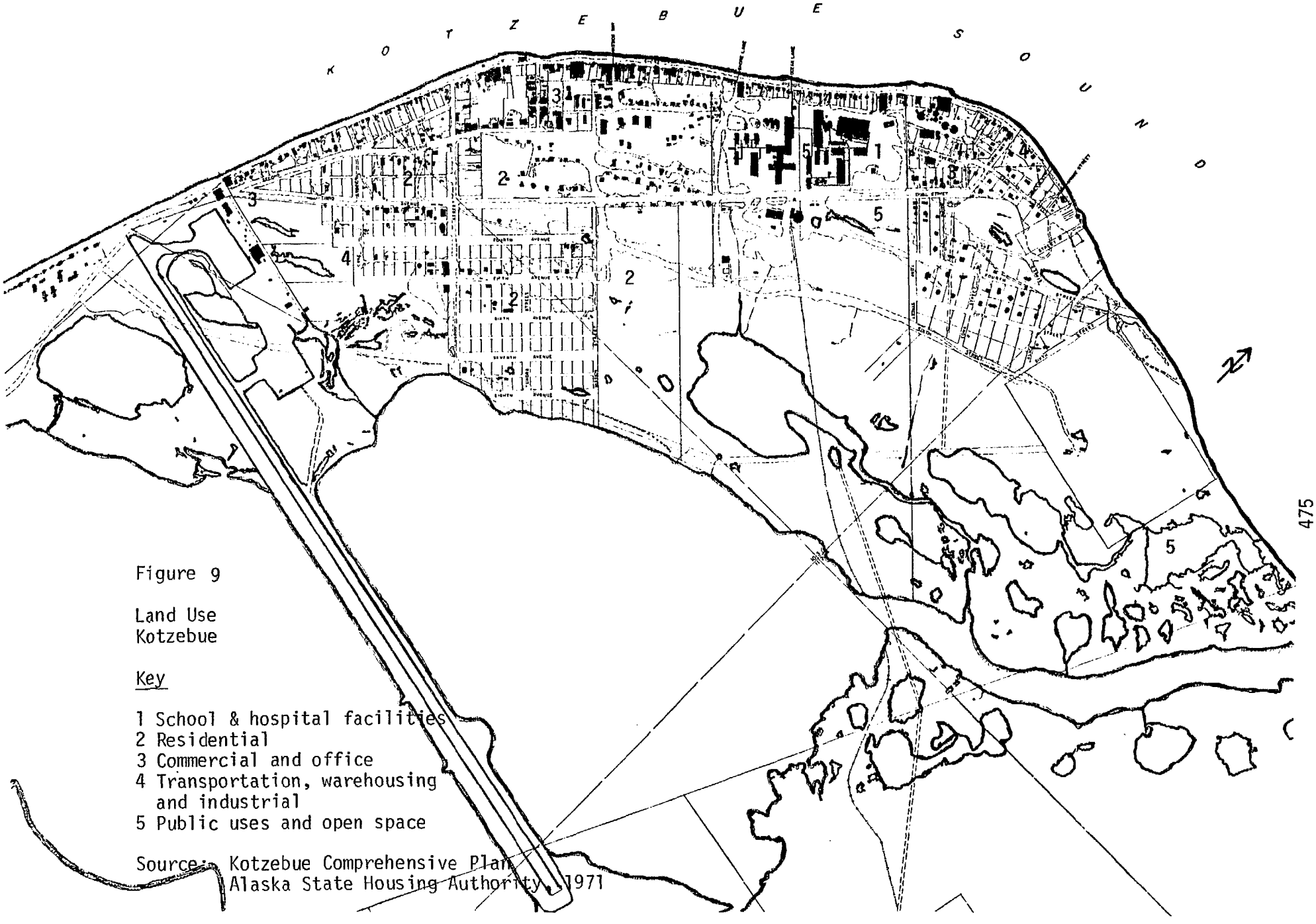


Figure 9

Land Use
Kotzebue

Key

1 School & hospital facilities
2 Residential
3 Commercial and office
4 Transportation, warehousing and industrial
5 Public uses and open space

Source: Kotzebue Comprehensive Plan, Alaska State Housing Authority, 1971

street platting ususally conformed to these customary routes. Where surveyed streets departed from existing travel patterns, often residents continued to use the familiar pathways. As a result, many public right-of-ways,especially in the original settlement, are poorly laid out for vehicular traffic (ASHA, 1971). On Shore Avenue, which is slowly eroding into Kotzebue Sound, people and vehicles often compete for space on the narrow right-of-way. In 1978, Kotzebue has approximately 11 miles of gravel roads which accommodated about 180 cars, trucks, and motorcycles {Alaska Department of Commerce and Economic Development, 1978). In the winter, most people use snowmobiles.

LAND OWNERSHIP AND CONTROL

Ownership Patterns

Kotzebue's corporate limits cover 26.5 square miles or 16,960 acres. Of this area, only a small portion on the Kotzebue Spit has been developed and surveyed. The surveyed land was first patented to the BLM Townsite Trustee, who then deeded the appropriate townsite lands back to private and public owners. To date, the Townsite Trustee has deeded all townsite lands, except 76.53 acres (an unsubdivided tract) and 12 lots (within a subdivision), back to private and public owners. Under current BLM policy, vacant land still held by the Townsite Trustee can only be deeded to the city and not to any other entity. Much of this vacant land is low and wet. Because there were several different plats in Kotzebue (numerous townsite additions), the Townsite Trustee issued both restricted and unrestricted deeds.

As discussed earlier, public agencies have withdrawn relatively large tracts of land in Kotzebue (see Land Use). According to Alaska Consultants (1976), federal, state, and city governments and the Friends' Mission own over 50% of the land on Kotzebue Spit northeast of the airport. Though the BLM Townsite Trustee has released some acreage since 1976, it is probably not enough to change this statistic significantly. These large public and semi-public land holdings have unduly restricted the amount of land available for urban uses, and have necessitated development that leapfrogged around the community creating a less than efficient development pattern (Alaska Consultants, 1976).

The city's lands include platted streets, lots occupied by municipal buildings, and some lots and acreage near Swan Lake. Federal lands include tracts for Kotzebue's Public Health Service hospital, the Air Force station, and FAA's complex south of the airport and transmitter facility at the north end of the spit. State facilities include the airport, the state office building, schools, and the Pioneer Home (University of Alaska, 1976),

Vacant land held in the private sector in Kotzebue is owned by a few major landowners. The Friend's Mission received title to the first surveyed and patented land in the community in 1933. Much of this nearly 60 acre tract is still in church ownership. This church tract bisects the spit and encompasses much of the community's best land (ASHA, 1971). Most of the vacant lots in Kotzebue are owned by a few individuals. Apparently, over the years, the BLM Townsite Trustee had

public auctions, and a few major landowners acquired most of the vacant lots in town for very low sales prices. Evidently, many of these landowners are speculating on their property, which enhances the land shortage in Kotzebue. Occasionally, the city sells some lots, but there is not much land left to buy in town.

The majority of the land around Kotzebue (outside of the city limits) is still owned by BLM, but much of this land has been selected by the Kotzebue village corporation (KIC) pursuant to ANCSA. KIC's land entitlement under ANCSA is 164,500 acres of surface estate. KIC has selected their land, and by the end of 1978, the corporation had received interim conveyance to 21,160 acres. Under section 14(c)(3) of ANCSA, KIC must convey a minimum of 1,280 acres for community expansion to the City of Kotzebue.

CZM

In the NANA Region, both the City of Kotzebue and the Northwest Arctic Regional Education Attendance Area (REAA) were eligible to be organized as coastal resource districts under the Alaska Coastal Management Program (CZM). (For a general discussion of the Alaska Coastal Management Program see the CZM section under Nome). Instead of forming separate coastal resource districts, as appears to be inevitable in the Nome area, the Kotzebue Planning Commission chose to join the larger Northwest Arctic REAA for purposes of coastal zone management. In Kotzebue, planning is regionally oriented.

Mauneluk Association, the non-profit regional organization, assisted in the organization of the NANA Region nto a coastal resource service area under Article 2 of the Alaska Coasta' Management Program. Mauneluk received adequate resolutions from the local governments in the region calling for a region-wide election to decide if a coastal resource service area (CRSA) should be formed in the NANA Region. In April of 1979, the region elected to create the Northwest CRSA in the NANA Region, and a few months later, the seven representatives to the CRSA board were also elected. Of the seven members, three come from Kotzebue and the remaining four are from the ten villages in the region. The board's job is to oversee the development of a NANA region coastal management plan.

DEVELOPMENT CONSTRAINTS

As in Nome, constraints to development in Kotzebue are numerous. Shortage of developable urban land is one of Kotzebue's most pressing land use problems. Although part of this problem is rooted in poor land management practices (see Land Use), poor soil conditions, permafrost, erosion, flooding, land ownership patterns, and scarce gravel supplies also contribute to the scarcity of developable land. The Kotzebue Spit is low, flat, and underlain with continuous permafrost. Though permafrost presents construction problems, they can usually be overcome by building on piling, over gravel pads, and utilizing utilidors.

The soil conditions and natural drainage on Kotzebue Spit are very poor, and spring thaws often cause much of the community to be covered with shallow water and mud (ASHA, 1971). When gravel is used to build up roads and building pads, the water simply flows to the low spots, including the gravel pits. Since much of the remaining vacant land in town is low and swampy (the better coastal land underlain with gravel was developed first), it required extensive fill before it would be available for any use, But, gravel is in short supply and of poor quality. Presently, gravel costs from $11 to $15 per yard delivered to the building site. Local residents indicate that it costs approximately $5,000 to fill a lot for residentail construction. Since the gravel source, located a couple of miles south of town on the beach, is limited, the gravel is mixed with mud to make it last longer. This results in an inferior gravel fill.

Waterfront problems include beach erosion and occasional flooding. Though tidal action in Kotzebue Sound is relatively minor, with a maximum range of-about four feet, storm-generated waves and corresponding ice action cause erosion along the beachfront. Occasionally, very severe storms have caused flooding across Shore Avenue, which is just a few feet above sea level. Shore Avenue, the most intensively developed street in Kotzebue, is already narrowed extensively by erosion. (For a discussion erosion and flooding problems and possible solutions see ASHA, 1971 and Alaska Consultants, 1976).

Though it is the transfer point between ocean and inland shipping in northwest Alaska, Kotzebue does not have a good natural harbor. Kotzebue Sound has an average depth of 40 to 50 feet, and it is too shallow near the shore to permit the approach of deep-draft vessels. Sand and gravel deposited by the Noatak River, which enters the Sound four miles above Kotzebue, contributes to the shallowness of the harbor. Consequently, deep-draft ocean vessels must anchor about 15 miles offshore, and cargo is then lightered to the docking facility at Kotzebue. The freight is unloaded and stored at Kotzebue and later delivered to the outlying villages by shallow-draft river barges. These lightening services for the last 15 miles make up 25% of the total shipping cost of freight from Seattle (Alaska Department of Commerce and Economic Development, 1978). In addition, Kotzebue Sound is free of ice only three months out of the year. During this short time all of the fuel, building materials, and food supplies must be offloaded.

Lack of available lots for residential construction is viewed by local residents as one of the primary problems in Kotzebue. Apparently, many private landowners are speculating with their land and will not sell . Other vacant land is either swampy or owned by the Friends' Mission. Since 1976, this lack of available residential lots has resulted in many people simply building homes on unsurveyed and unsubdivided land still owned by the BLM Townsite Trustee. Kotzebue's location on a spit makes community expansion difficult. Southward

growth is also difficult because of the airport. Expansion either south of the airport or across the lagoon would be inefficient, and the planning commission felt that if the available land was developed properly, there would be no need for such expansion (Alaska Consultants, 1976).

Additional development constraints include the high shipping and constructions costs associated with most remote Alaskan communities. Financing also presents a problem for the communtiy. Neither the local branch bank nor credit union were giving loans in the fall of 1979, In addition, many residents do not qualify for residential financing because of a lack of permanent employment. Kotzebue is also close to its maximum water usage.

HOUSING

According to a 1970 ASHA (1971) housing study, Kotzebue had a deficit of almost 250 homes of decent quality. Eighty percent of the housing stock was evaluated as substandard (ASHA, 1971) by reason of unsound construction, dilapidation, poor insulation, poor ventilation, and other similar physical shortcomings. In addition, the homes were overcrowded and lacked adequate utilities and services. High construction costs, high costs of heating oil, and low family incomes often resulted in compact designs to save money. Also, housing shortages often led to "doubling-up" of related families in a single small house. This increased the already large household size.

As in many other remote Alaskan communities, the only segment of Kotzebue's population that escaped living in substandard housing was the transient federal employees who lived in public housing provided by their agencies at subsidized rentals. The BIA, PHS, FAA, and U. S. Weather Bureau supply housing for many of their employees. The agency housing is usually segrated from the community by both location and quality.

According to city officials, the present housing shortage in Kotzebue is acute. The population increase was greater than the increase in housing supply. According to 1970 census data, the population of 1,696 lived in 410 housing units. By 1975, the population had increased to 2,431 (a 43.3% increase), but according to Alaska Consultants (1976), Kotzebue had only 430 housing units. This represents an increase of only 20 units over 1970. Since 1975, 57 low-rent homes have been constructed in town, and also numerous multi-family units have been built. But, the demand for housing still exceeds the supply. Thus, lack of available developable land and housing shortage are two paramount problems confronting Kotzebue.

In addition to a limited housing supply in Kotzebue, housing costs are very high. High transportation, construction, and land costs result in high rental charges. According to the Alaska Department of Commerce and Economic Development (1978), a two bedroom apartment in Kotzebue rented for $600 per month in 1978. Similar apartments in a new 41-unit

complex rent for $750 per month in 1979. Tenants who can afford these high prices include teachers, federal and state employees, and many of the employees associated with the Native corporations, Houses, when available, rent from $600 to $800 per month.

The NANA Regional Housing Authority was established in 1975 to administer the construction of 117 low-rent houses under 61A and HUD special programs. Fifty-seven of these low-rent houses were built in Kotzebue from 1975 to 1978. NANA Regional Housing Authority bought land from the city in Swan Lake Subdivision for the houses. Currently, all of the homes are occupied, and a long waiting list exists for one of the low income homes. These homes are leased on a 25 year lease agreement, and after the 25 years, the occupant owns the house and land.

NANA Regional Housing Authority owns additional property near the 57 units, and because of land shortages, the authority is considering multi-family construction and not single-family homes for future units. Also, high land costs further restrict future development. A typical 9,000 square foot lot near Front Street costs approximately $15,000 without water and sewer hookup, and lots in the marshy area near the back of town cost about $6,000. The authority cannot afford to spend such sums for only one single-family house. Construction costs are high, and therefore, apartments might prove more feasible. For future development, NANA Regional Housing Authority is considering medium income housing. This would be for residents who do not have adequate

income to qualify for conventional bank financing, but who earn too much for low income housing.

Kikitagruk Inupiat Corporation (KIC), the Kotzebue village corporation, developed a 41 unit apartment complex in Kotzebue. Completed in November of 1978 at a cost of 1.9 million dollars, this new apartment complex was available for occupancy in December, 1979. KIC built the apartment building in direct response to Kotzebue's severe housing shortage. One of the community's largest structures, the 41 unit was occupied to capacity before completion. It has been 100% occupied since the opening date, "and planners and development experts have suggested that multiple-unit dwellings are the Arctic's most practical and efficient type of housing" (Mauneluk Report, Vol. 2, No. 4, December, 1978, P. 7).

The BIA Housing Improvement Program (HIP) serves housing needs throughout the 'NANA Region, including Kotzebue. This program serves the following four housing categories: 1) improvements on substandard housing which qualifies for up to $2,500 for repairs; 2) improvements to substandard houses, which qualify for a maximum of $13,000 to bring them up to standard; 3) up to $50,000 for a new house (excluding land); and 4) a $6,000 maximum down payment grant. During FY-1978-79, the first year for this program in Kotzebue, the BIA/HIP provided $131,000 towards the rehabilitation of 43 homes in the community. Of these, 19 homes were brought up to BIA standards. The program had 45 eligible applicants who were not assisted because of a lack of funds.

Though no money was used for new home construction or down payment grants in FY-1978-79, in FY-1979-80, BIA/HIP officials hope to build some new homes in Kotzebue. This past year, most of the program's money was spent on elderly people (all 19 of the homes brought Up to standard belonged to older people). Money for younger couples was kept to a minimum because of their working potential. Difficulties in the program are related to funding levels. In Kotzebue, $40,000 is unrealistic for a new home, and $2,500 is usually inadequate to bring an existing house up to BIA standards.

According to 1970 census data, housing conditions in Kotzebue were substandard. Nearly 70% of the 410 units lacked one or more plumbing facility, and the average home contained three rooms and housed 4.8 persons. The 1970 person per household ratio in Kotzebue was substantially higher than the statewide average of 3.42 persons. The state urban housing median of 4.3 rooms per unit in 1970 was higher than the three rooms per unit in Kotzebue. Of the 43 homes rehabilitated under the BIA/HIP program in Kotzebue in FY-1978-79, the households averaged 5 persons per unit. This indicates that housing is still crowded in Kotzebue.

Lending institutions in Kotzebue include the local branch bank and credit union. Because of high interest rates and tight money supplies, it has been difficult for residents to acquire residential loans. The 61A sponsors a credit program in which it guarantees 90% of a loan,

but, according to local residents, no money is presently available under this program. Apparently, most of these funds were utilized on larger Native corporation projects.

A recent survey (Northrim Associates, 1979) conducted in the NANA region also included a sample from Kotzebue. This survey revealed that approximately 35% of the Kotzebue residents rent their home. Of these renters, nearly two-thirds pay between $200 and $600 per month rent (including heat). According to this survey, approximately 63% of Kotzebue residents own their own home, and of these homeowners, nearly 73% reportedly pay no monthly mortgage payment. Only 6% pay a monthly mortgage payment of $300 or more. This figure seems low and may be the result of a small sample size (between 50 and 160 respondents).

According to the survey, 72.5% of the homes were privately built, 12.7% were constructed by ASHA, 10.8% by the BIA, and 3.9% by NANA. Thus, the vast majority of Kotzebue residences were privately built. Of the 101 people polled, 73.3% said that their house needed repairs. If material were provided, 96% would be willing to make repairs to their homes (such as new doors and windows, repair roofs, and add insulation). Also, if material were provided, 81% of the 161 residents polled said they would build a new house. Nearly everyone felt that their relatives or friends would help them construct their new home. If they had to wait five years for a new house, only 31%

of the 157 persons polled would consider moving sooner into a new house somewhere else in the region. Thus, nearly 70% would prefer to remain in Kotzebue without a new home. If a house were not available, 56% would be willing to live in a duplex, while the remaining 44% would not. Residents seem fairly well divided on the desirability of living in duplexes.

Heal th

OVERVIEW

Health care delivery in the Kotzebue region is primarily provided by the Public Health Service through direct delivery and contract services. Kotzebue Hospital, the only major health delivery facility for the region, is operated by the Public Health Service. Some mental health and alcoholism counseling, emergency medical services, health aides, traditional Indian health practitioners and associated programs are contracted and provided by Mauneluk Association, the non-profit arm of NANA regional corporation. In addition, public health nursing is provided under contract through the State of Alaska. Two public health nurses service the area with itinerant visits to the villages.

The following is a discussion of manpower, facilities and health status of the NANA region. Statistics are extrapolated from the Mauneluk Comprehensive Health Plan unless otherwise noted.

FACILITIES

The Public Health Service Alaska Native Hospital in Kotzebue is a 40,000 square foot, 40 - bed general, medical and surgical facility constructed in 1961. The facility houses a dental clinic, laboratory, separate surgical and obstetric suites and an x-ray facility. In addition, the facility has a six bed geriatric unit which is not used for long-term care due to lack of available staffing. For more complex procedures, patients are frequently transferred to Alaska Native Medical Center in Anchorage. The service area

also includes nine clinics and two health stations staffed by community health aides to serve 12 villages including Pt. Hope which is outside the NANA region.

MANPOWER

The Public Health Service Alaska Native Hospital is staffed as follows:

Laboratory	0
X-ray	1
Medical records	0
Pharmacy	1
Housekeeping	4
Laundry services	4
Nursing services	18
Medicine	0
Dietary services	7
Maintenance services	45
Administration	6
Biomedical engineering	0
Quality assurance	0

In addition, there are four primary care physicians delivering ambulatory care services for the region. Two public health service dentists and one contract dental physician are available for dental care in the region; however, this level of manpower is only capable of delivering 25 percent of the required dental service for the service unit.

For delivery of social service and mental health, the hospital staffs one social worker. In addition, the hospital was granded funding for four additional positions in March, 1978.

The Office of Environmental Health has two branches: The Sanitation Facilities Construction branch and the Environmental Health Services Branch.

- The Sanitation Facilities Construction Branch is responsible for the installation of water and sewer systems in the region and providing for adequate solid waste disposal. The Branch employs one sanitaria who provides consultation services to local government agencies as well as the hospital.

- Environmental Health Services Branch offers a program to improve sanitation practices and facilities through education, consultation, technical assistance and training.

The State of Alaska under a contractual agreement with the Alaska Native Health Service staffs two public health nurses for the region. The nurses serve the area with itinerant visits to the villages.

Mauneluk Association engages in a number of health related services. The Association provides emergency medical services through contracts with the Public Health Service and operates with five full-time employees. In addition, there are 12 volunteer ambulance crew members, 26 community health aides, 65 search and rescue members and 80 additional first responders including police and fire fighters. The service unit presently has no

authorized optometry positions and contracts with Mauneluk for an eye care assistant. The 1979 authorizations give no positions for mental health in the service unit. The Association employs five people in their Human Resources Section for the delivery of mental health counseling, delinquency diversion, alcoholism, and BIA social services. For the community health aid program, Mauneluk employs 15 full-time health aides and 13 part-time health aides. For the delivery of traditional Indian health, the Association employs one tribal doctor and two tribal doctor assitants.

Patient Care

The facility and staff service 36,000 square miles including twelve villages and centers around the City of Kotzebue. The IHS official population is 4,936 for fiscal year 1978 and is projected to reach 5,526 for fiscal year 1984. The admission rate for the Service Unit is 200.4 per 1,000 population. In addition, there are fourteen admissions from other service areas. The adjusted average length of stay over the past three years is 5.0 days.

Table 173 displays admissions data for Kotzebue for October 1977-January 1978. Anchorage and Bethel's PHS hospital admission data is presented for comparative purposes.

TABLE 173[a]

ADMISSION, OCT. 1977 - JAN. 1978

SELECTED PHS HOSPITALS

	Kotzebue	Anchorage	Bethel
Number of Admissions			
1977	248	1,507	518
1978	306	1,455	579
Number of Inpatient Days			
1977	1,352	15,091	2,387
1978	1,619	14,594	2,641
Average Daily Patient Load			
1977	11.0	122.7	21.5
1978	13.2	118.6	19.4
Percent Change in Adm.			
77/78	23.4	-3.4	11.8
Percent Change in ADPL			
77/78	20.0	-3.3	10.8

[a]Kotzebue Service Unit Operating Plan FY 1979

Ambulatory Care

Clinics are conducted during the week with specialty clinics such as prenatal and family planning conducted in the afternoon. Table 174 displays clinics offered at the Kotzebue Service Unit during the year. During fiscal year 1978, 15,303 outpatient visits took place which yields a utilization rate of 6.7 visits per person per year. It is projected that 37,024 outpatient visits will be conducted during fiscal year 1984.

TABLE 174[a]

SPECIALTY CLINICS

AT KOTZEBUE SERVICE UNIT

Clinic	Times Per Year	No. of Days Per Clinic
Medicine	5	3
Surgery	5	3
Pediatric	4	3
Eye	3-4	3
Ears, nose, throat (contract)	4	3
Orthopedic	3	4
Urology	1	3
X-ray	5	2
Dermatology	2	2
Pathology (contract)	4	1
Ob-gyn	2	2
Cardiac	2	3-4
Chest (State of Alaska)	2	3
Audiology (State of Alaska)	3	3
Psychologist	4	3-4

[a]Kotzebue Service Unit, Operating Plan FY 1979

HEALTH STATUS

The NANA region has a comparatively young population. The median age is 15.4 years compared to the U.S. median of 28.1 years. National population over 65 is 9.9 percent compared to the NANA region which is 4.1 percent.

Crude Birth Rate

Table 175 displays the crude birth rate for the region from 1972 to 1978.

TABLE 175[a]

CRUDE BIRTH RATE/1,000

Year	Rate
1972	26.1
1973	25.7
1974	26.5
1975	25.2
1976	25.4
1977	23.8
1978	21.4

[a]Mauneluk Association, 1979d

The above figures display a potential decline in the birth rate for the NANA region.

Infant Mortality Rate and Crude Death Rate

The infant mortality rate has fluctuated in recent years from one to eight percent of the total number of deaths. Table 176 displays death rates for the region.

TABLE 176[a]

DEATH RATES

Deaths	1972	1973	1974	1975	1976	1977	197!3
Total Number	63	75	78	27	26	72	51
Rate per 1,000 population	7.4	7.4	7.1	5.6	6.0	16.3	11.4
Age At Death							
<1	1	6	1	5	4	unk	unk
1 - 4	-	2		1	-	unk	unk
5 - 24	15	15	4	5	6	unk	unk
25 - 44	16	19	6	3	5	unk	unk
45 - 64	13	12	2	6	5	unk	unk
65 and over	18	21	5	7	6	unk	unk

[a]Mauneluk Association, 1979d

The average crude death rate over the seven year period for the NANA region was 8.7 deaths per 1,000 population. This is less than the U.S. crude death rate of 9.2 per 1,000 population for 1974. A lower crude death rate might be anticipated due to the younger age of the population in the NANA region.

Table 177 displays deaths in Kotzebue only for 1978 and 1979.

TABLE 177[a]

DEATHS FOR KOTZEBUE

Cause	1978	1979
Natural causes	6	8
Suicide	2	2
Murder	1	0
Accident	1	0
Drowning	0	1
	10	11

[a]Ender, Community Contact, 19791

Morbidity and Mortality

Table 178 displays the leading causes of hospitalization for Kotzebue Hospital ranked in order of discharges for 1975 through 1977.

TABLE 178[a]

KOTZEBUE HOSPITAL

LEADING CAUSES OF HOSPITALIZATION

RANKED IN ORDER OF DISCHARGES

FY 1975 - FY 1977

	RANK	1977	RANK	1976	RANK	1975
Total Discharges		896	-	870		794
Leading Causes of Hospitalization		533	-	462		439
Accidents	1	180	1	166	1	146
Deliveries	2	108	2	118	2	84
Influenza & Pneumonia	3	66	3	57	5	39
Alcohol Misuse	4	44	5	29	3	51
Mental Disorders	5	43	4	32	6	38
Abortions, Therapeutic	6	24	13	11	7	13
Chronic Otitis Media	7	21	18	7	4	47
Ischemic Heart Disease	8	16	30	3	18	7
Infected Skin & Abrasions	9	16	6	25	12	10
Epilepsy, Convulsive Disorder	10	15	11	14	26	4

[a]Mauneluk Association, 1979d

Of the diagnostic categories admitted to the Kotzebue Hospital, the majority of patients were seen for the following reasons.

- Births
- Mental disorders
- Diseases of the nervous system and sense organs
- Diseases of the circulatory system
- Diseases of the respiratory system
- Complications of pregnancy and childbirth
- Symtoms of ill defined conditions
- Accidents, poisonings and violence

Of the total 1,461 diagnoses and 6,6ss patient days for Kotzebue Hospital in fiscal year 1978, 902 (62 percent) of the diagnoses and 4,250 (64 percent) of the patient days were patients classified in the above categories.

The following is a list of disease categories sought by the population as primary reasons for ambulatory care.

- Upper respiratory infection and common colds
- Acute Otitis Media
- Strep throat
- Gonococcal infections
- Impetigo
- Ectoparasitic infestation
- Gastroenteritis and diarrhea

Table 179 displays the leading causes of death for the NANA Region, the State of Alaska and the U.S.

TABLE 179[a]

LEADING CAUSES OF DEATH
(Percent of all deaths - 1976)

Cause	NANA[a]	ALASKA[b]	U.S. [c]
Accidents	22.5	27.7	5.5
Heart Disease	8.4	19.3	38.2
Cancer	11.2	14.4	19.8
Suicide	12.6	4.1	1.4
Vascular Lesions		4.1	9.9
Ill Defined		3.8	1.6
Cirrhosis of Liver		3.1	1.6
Homicide		3.2	1.0

TABLE 179, continued

Cause	NANA[a]	ALASKA[b]	U.S.[c]
Influenze and Pneumonia		3.0	3.2
Diseases of Early Infancy	5.6	2.9	1.3

[a]AANHS, Program Formulation Branch, Systems Development Section
[b]Data Service Unit, OPR, Alaska State Department of Health
[c]National Center for Health Statistics, U.S. Department HEW

NOTE : NANA region percentages represent deaths between 1974 and 1976

The major causes of death recorded at the Kotzebue Service Unit were accidents and suicides. Table 180 displays causes of injury for 1971-1976. Comparatively, accidents among Alaska natives throughout the State was the leading cause of death (27.7 percent) followed by heart disease (19.3 percent) and cancer (14.4 percent).

TABLE 180[a]

EXTERNAL CAUSE OF INJURY (lst Visits)

CAUSE OF INJURY	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Motor vehicles	41	35	63	123	149	159
Water transport	6	3	4	5	6	3
Air transport	3	2	2	1	4	1
Poisoning	7	3	3	10	14	11
Falls	247	256	201	232	284	343
Fire and flames	30	14	15	23	31	33
Environmental factors	83	53	49	34	76	40
Stings and venom	26	32	28	2	5	2
Animal bites	1		7	32	49	43
Drowning and submersion	128	12:	114	141	185	171
Firearms	5	2	6	8	9	13
Machinery	24	14	20	57	44	45
Suicide	9	8	19	8	16	12
Injury on purpose by others	88	108	121	125	141	144

TABLE 180, continued

CAUSE OF INJURY	FY 71	FY 72	FY 73	FY 74	FY 75	FY 76
Battered child	2	0	0	0	0	0
Undetermined	27	45	61	37	52	46
Other causes	88	87	141	145	162	193
Invalid	11	25	82	41	102	60
TOTAL	850	843	960	1,025	1,330	1,319
% Increase		-.8	13.8	6.7	29.7	-.8

[a]Ender, Community Contact, 1979 f

ISSUES

Alcoholism and Mental Health Counseling

It is the general consensus that alcoholism is considered a major health problem in the area. Alcoholism was credited for reduction in personal achievement and productivity, as a major source for civil disturbance, and injuries. Although not specifically documented, alcohol fetal syndrom was noted as a problem in the region with a large number of congenial heart problems seen in children. Mental health disorders are also noted as a major problem resulting in cases of depression and paranoia and manifested in suicides, suicide gestures, child abuse, child neglect and spousal abuse. Manuneluk operates a mental health outpatient counseling and development program under contract with the State of Alaska. (See Social Services section)

Dental Health Problems

Dental care is provided by two dentists and two assistants. In addition, there is one contract care dentist. This level of manpower is only capable

of delivering 25 percent of the required service. The contract dentist provides 35,000 service minutes. There is a backlog of approximately 200,000 service minutes. In fiscal year 1978, the two health service dentists provided 123,000 service minutes. In addition," diet and nutrition and lack of good oral hygiene have created a crisis oriented rather than a preventive mode of patient care.

Patient Load

In the first six months of fiscal year 1978, the average daily patient load increased by 20 percent and the number of outpatient visits increased 18.4 percent over the same period from FY 77. This is resulting in staff burning out and an additional physician is needed for full-time coverage on the weekends and to reduce workload to a more reasonable level. (Alaska Area Native Health Service, July, 1978).

Hospital Geriatric Unit

Life expectancy is increasing among Alaska natives and physicians are seeing a higher incidence of degenerative diseases. In addition, the construction of the twenty bed senior citizen home will undoubtedly draw additional geriatric patients to Kotzebue from the surrounding region. Additional staff will be necessary to accommodate this growing segment of the population.

Social Services

Social service delivery in Kotzebue is available through both the public and private sector. Services are offered in the following areas:

- Income assistance
- Employment assistance
- Housing assistance
- Child and adult protective services
- Drug and alcohol abuse services
- Youth services
- Elderly services

Delivery of social services is not coordinated among various agencies and an organized information and referral system does not exist. However, Mauneluk Association, the non-profit arm of NANA Regional Corporation, functions as an informal center for information and referral.

The following section is a discussion of social service delivery within the public and private sector by type of delivery.

INCOME ASSISTANCE

Income assistance is available through both the public and private sector. Predominant agencies are the Bureau of Indian Affairs, contracted to Mauneluk and the Kotzebue IRA, and the State of Alaska, Department of

Health and Social Services, Public Assistance Division.

United States Bureau of Indian Affairs

The U.S. Bureau of Indian Affairs is a federal agency whose target population in Alaska is all residents who are one-quarter native or more. There are four main areas of assistance as discussed below.

- General Assistance - BIA's general assistance helps provide financial aid to those of native background when no other aid is available. When resources are unavailable or insufficient, general assistance can be furnished to meet unmet needs or supplement available resources.

- Services to children - BIA provides child welfare services including identification of children of neglect, abuse, abandonment, out of wedlock or handicapped and identify needs and provide services where necessary. BIA cannot exercise powers of guardianship or custody and must refer to the State of Alaska for protective jurisdiction.

- Services to families and adults - BIA provides services emphasizing family unity, stability, and economic security of the family.

- Community organization - BIA works with established councils to develop and strengthen community services in order to more effectively meet social welfare needs of communities.

Delivery of these services is through contract to Mauneluk Association for the villages in the region excluding Kiana and Kotzebue, and the Kotzebue IRA for Kotzebue. The agency compiles an annual report of user statistics by region and by contracting agency. Table 181 displays the unduplicated case count for Kotzebue by type of assistance for fiscal year 1979. The total dollars spent for the year were $107,788 for the 157 cases under general assistance.

State of Alaska, Department of Health and Social Services

The State of Alaska has offices in Kotzebue to provide social service delivery to the region's population. Area offices include the Division of Public Assistance, Division of Public Health, and Division of Social Services. A discussion of the Division of Public Health is included under the health care delivery section of this report.

The Division of Public Assistance provides financial aid to families who meet eligibility criteria. Programs include:

- Aid the families with dependent children
- Adult public assistance - includes aid to the blind, aid to the disabled, and old age assistance
- General Relief

Table 182 displays race, caseload, and dollars paid for September and March, 1978 and 1979, for various programs under the Division of Public Assistance.

TABLE 181

FY 79 UNDUPLICATED CASE COUNT OF KOTZEBUE

BUREAU OF INDIAN AFFAIRS

CONTRACT AGENCY: Kotzebue IRA

GENERAL ASSISTANCE

Age	Under 21		21 - 34		35 - 49		50- 64		65 and over		Tots 1	
	Cs[a]	Prs[b]	Cs.	Prs.	Cs.	Prs.	Cs.	Prs.	Cs.	Prs.	Cs.	Prs.
Unemployable	0	0	0	0	0	0	0	0	0	0	0	0
Male Heads	0	0	0	0	0	0	0	0	0	0	0	0
Female Heads	0	0	0	0	0	0	0	0	0	0	0	0
Employable	11	15	81	214	41	148	18	87	5	22	156	486
Male Heads	5	9	57	140	32	104	12	64	3	12	111	329
Female Heads	6	6	22	74	9	44	6	23	2	10	45	157
Pending Public Assistance	0	0	0	0	0	0	1	1	0	0	1	1
Male Heads	0	0	0	0	0	0	0	0	0	0	0	0
Female Heads	0	0	0	0	0	0	1	1	0	0	1	1
Total	11	15	81	214	41	148	19	88	5	22	157	487

CHILD WELFARE

Age	Under 6	6-11	12 - 17	18- 20	21 and over	Total
Foster Care	0	2	0	0	0	2
Institutional Care	0	0	0	0	0	0
Mentally Retarded	0	0	0	0	0	0
Blind and Deaf	0	0	0	0	0	0
Dependent	0	0	0	0	0	0
Delinquent	0	0	0	0	0	0
Maternity	0	0	0	0	0	0
Other	0	0	0	0	0	0
Special Needs	0	0	1	0	0	1
Total	0	2	1	0	0	3

Gorski, Community Contact, 1979 b

[a]cs. - Cases

[b]Prs. - Persons

Two separate points in time are presented for comparative purposes.

TABLE 182

PUBLIC ASSISTANCE - KOTZEBUE REGION[a]

		White		Native		Unknown	
		9/78	3/79	9/78	3/79	9/78	3/79
Old Age Assistance	Cases	---		146	156	---	---
	$	---	17;	14,610	15,278	---	---
Aid to the Blind	Cases	1	1	3	3		
	$	? 88	188	406	406		
Aid to the Permanently Disabled	Cases	---	---	47	---	---	---
	$	---	---	5,964	---	---	---
AFDC[b] (Adult Included)	Cases	1	1	127	138	1	2
	$	500	500	47,514	47,881	---	400
AFDC[b] (Adult Not Included)	Cases	---	---	104	103	2	1
	$	---	---	20,171	20,728	---	---

[a]Public Assistance Recipient and Expenditures Study, Volume I and II, March 1979, May 1979.

[b]AFDC - Aid to families with Dependent Children

Trends displayed above reflect little variation when comparing the two points in time. In all categories of public assistance, natives are the predominant user of this service. Due to the proportion of natives to whites as well as the economic disparity between the two groups, this trend would be anticipated. The modal category for native users for both September and March is old age assistance. This can, in part, be attributed to a subsistence lifestyle which characterizes the economic mode of this age group. Unable to pursue traditional methods of food gathering,

and social security or other avenues not available, public assistance has become the logical recourse. The other significant category is Aid to Families with Dependent Children, with and without adults included. A major eligibility requirement under this service specifies, that children be deprived of the support and care of one or both natural or adoptive parents as a result of death, continued absence, or physical or mental incapacity. While there is little available information, the 1970 census noted that 13 percent of the children under 18 years of age in the Kobuk census region were not living with both parents. (Bureau of the Census, November 1971). While this is not broken down by race, public assistance data and the fact that the majority of the resident population is native suggests that natives would constitute most of the single or no parent households. Another problem is the abandonment and/or mistreatment of children for periods of time due to alcoholism. Qualitative information suggests that this is a serious problem in Kotzebue.

Under aid to families with dependent children, recipients can receive up to $500 per month for four children and one adult. Each additional child beyond four children qualifies the recipient for an additional $50. The average payment per recipient for the State of Alaska is approximately $123. Persons qualifying for Aid to the Blind, Aid to the Disabled and Old Age Assistance as a couple can receive up to $553 per month. Persons qualifying for General Relief who have an unmet need in one or more subsistence items can receive up to $80 per month. It is evident from the above that when considering cost of living in Alaska, those qualifying for public assistance programs would most probably need to subsidize this income with

another source(s).

In addition to the above relief programs, the Division of Public Assistance also administers food stamps. Table 183 displays total recipients, and total households receiving food stamps by month for 1978 and 1979.

TABLE 183

FOOD STAMP RECIPIENTS IN THE KOTZEBUE REGION[a]

	1978 Total Households	1978 Total Persons	1978 Total Households	1978 Total Persons
Jan	98	527	177	949
Feb	109	621	212	1,135
Mar	105	578	198	1,080
Apri l	62	321	199	1,059
May	150	504	199	1,105
June	103	568	240	1,279
July	62	345	268	1,429
Aug	36	183	214	1,111
Sept	42	247	*	*
Ott	105	588	*	*
Nov	74	448	*	*
Dec	139	764	*	*

[a]Gorski, Community Contact, 19790
* unavailable

There is a significant. increase in the number of recipients when comparing 1978 to 1979. Although no one 'specific item has been attributed to this shift, relaxation of the qualifying standards probably account for this. In addition, in the NANA regional survey, 18.6 percent of the respondents indicated use of food stamps or other government aid.

EMPLOYMENT ASSISTANCE

The main job training program in the region is through the Comprehensive Employment Training Act (CETA) for which Mauneluk is the prime sponsor. CETA has recently formed their own office but maintins their original board of directors with Mauneluk Association. CETA has between 137 and 140 public service positions many of which are subcontracted to other units (Ender, community contact, 1979b). Most all of the villages' administrations are CETA employees.

In addition, BIA Direct Employment Assistance contracted to Kotzebue IRA aids in helping native people find employment and directs people into adult vocational training. Also the State of Alaska, Department of Labor, Employment Security Division maintains files of job openings and matches these with job applicants. The Job Service Center also assists employees with wage claims against employers and interprets Alaska's child labor laws to the public. (Mauneluk, 1979d) Referrals to Job Corps aremade through the Job Service Center. Job Corps is a vocational training program available to youths 16 to 21 years old. The trainee attends a Job Corps Center in Washington, Oregon, Montana or Kodiak Island for a period varying six to fifteen months. (Mauneluk, 1979d) Chukchi Community College also offers a variety of vocational programs. (See Kotzebue education section.)

HOUSING ASSISTANCE

Housing assistance is provided through BIA funding to the Kotzebue IRA. For this fiscal year, the IRA has $130,000 plus administrative costs to operate the program. Several options are available to the recipients.

- Home improvements - assistance in bringing a home from substandard condition to standard or improve substandard housing but not necessarily to standard condition.

- Downpayments - funding allows for a downpayment grant of up to $6,000 on a new home.

- New construction - can construct a new home with funding with a ceiling of $50,000.

Ninety-five percent of the funding is used for housing improvement. Case count as of August 1979 is as follows:

- 43 home improvements
- 0 downpayments
- 0 financing of new homes

Loans to substandard homes is limited to $2,500 if the house is to remain substandard after improvements. However, $13,000 can be loaned on housing where improvements change the status from substandard to standard.

Approximately one-half of the 43 home improvements were to recipients 60 years of age and older. Kotzebue IRA can provide for a contracted as part of the grant if the recipient is incapable of performing the work himself.

NANA Regional Housing Authority was established to administer the construction of low rent housing in Kotzebue and several of the surrounding villages. Eligibility is solely contingent on income. These homes are leased on a 25 year lease agreement, and after the 25 years, the occupant owns the house and land. (See Kotzebue Land Use and Housing section.)

CHILD AND ADULT PROTECTIVE SERVICES

Social services delivery in this area is primarily provided through the public sector. The State of Alaska, Department of Health and Social Services handles complaints pertaining to adult and child protection. Additional referrals are made through the BIA contract agency, Kotzebue IRA.

Division of Social Services

The division has investigative, custody and placement abilities if deemed necessary. The social services are available to anyone receiving public assistance from the State of Alaska and to anyone in need of protective service. Services include individual and family counseling, child and adult protective services, and information and referral. Most cases are child and adult protective services. In addition,homemaker and home health services for the elderly and day care for the children are arranged. (Mauneluk, 1979d).

The average caseload per month varies. For a typical one month period in 1979, the division saw 142 cases. For fiscal year 1979, July through June, the division started with 106 cases, added 77 cases, closed 82 cases, reported 101 cases at the end of the period with 103 cases served to date. (Gorski, Community Contact, 19790).

Table 184 displays caseload allocation for a one month period.

TABLE 184

CASELOAD CATEGORIES - KOTZEBUE REGION

Type	Percent
Child protective services	69.7
Adult protective services	21.8
Information and referral	1.4
Individual and family counseling	7.0

[a]Gorski, Community Contact, 1979e

DRUG AND ALCOHOL ABUSE SERVICES

Alcoholism counseling is available through the State of Alaska, Department of Health and Social Services, the IHS Hospital, Bureau of Indian Affairs contract agency - Kotzebue IRA. Counseling is also done through Mauneluk Association. Mauneluk has three staff (two funded by IHS and one by the state) which provide mental health and alcohol counseling. The staff works closely with the state social worker who is located at the hospital. In August, 1979, it carried a total client file of 51 with 20 currently active. Of that number 15 to 18 are Kotzebue residents. Services include family counseling, school education and workshops, and referral outside the region

for rehabilitation in Fairbanks, Anchorage and Seattle. (Ender, Community Contact, 1979a).

It appears that the alcohol and drug abuse problems in the NANA region is at a critical level. One director in the field said that 85 percent of the adult population abuses alcohol and over one-half are chronic abusers. Drug abuse is also serious with marijuana plentiful and harder drugs available on a regular basis. It is suggested that alcohol is a major contributor to job terminations, accidental deaths and child and spousal abuse. Many times being sober is socially unacceptable and pressure is great to abuse alcohol. While alcohol appears to be a "way of life" as noted by one resident, there is an increasing concern in the problem. The NANA regional survey found that the most frequent and biggest problem noted by the Kotzebue sample was alcohol (57.1 percent). A consistent second was unemployment (17.3 percent). This level of agreement on an open-ended question is remarkable and suggests strong concern by the community. In addition, 36.4 percent said that alcohol and drugs were the thing that bothered them the most about life in Kotzebue. (Northrim Associates, Inc. 1979.)

Major program thrusts for the future may be the development of a ten bed rehabilitation center, major public education campaigns, and greater staffing of counseling services.

YOUTH SERVICES

Youth employment is available through Job Corps, Neighborhood Youth Corps, and Youth Employment Service. The Neighborhood Youth Corps (NYC) program places qualified youths in jobs with non-profit organizations in Kotzebue. NYC workers are paid by the NYC program which is administered by Mauneluk Association. Youth Employment Service is operated through the Job Service Center (State of Alaska, Department of Labor) with emphasis on youths from 14 to 25 years of age. It matches eligible individuals to available jobs. (Mauneluk, 1979d)

ELDERLY SERVICES

Financial assistance is available through the State of Alaska, Department of Health and Social Services, Division of Public Assistance.

Mauneluk Association presently operates the Senior Citizen's Center through a contract with the State of Alaska. The facility is in the expensive Pioneer Home building which ran into serious cost overruns and was eventually abandoned by the State. The center has the capacity for 16 and presently houses six, but will have ten or more this winter. Ambulatory, non-medical care in a "sober environment" is provided to the residents with a staff of one LPN, six nurses aides, and two administrative staff on duty 24 hours per day. The center works with the hospital to provide specialized medical care. Activities are available to keep residents active including shopping, church, berry picking and transportation to community activities.

To some extent, the Center itself acts as a community meeting place, but the potential has not yet been met. A meals on wheels Program is available through the Center four nights a week. The major problem for the program is the ability to attract residents because the Center model appears to present cultural barriers to many traditionally oriented elderly.

The 1979 - 1980 budget is $637,000 which is considered well below what the State would have incurred if they had retained the facility.

OTHER

Kotzebue IRA operates a day care center. The center is licensed for a total of 25 children ages six months to three years.

Low cost legal services are available in Kotzebue through Legal Aid operated under OEO. The staff has gone from three (two VISTA) to one with an active caseload of 200. (Ender, Community Contact, 1979j).

APPENDIX

The appendix is composed of three basic sections.

- The non-OCS Case assumptions provide the methodology and assumptions which form the basis for deriving the population and employment forecasts of the non-OCS base case. These projections are found in the first section of chapter III.

- The OCS Scenarios assumptions outline the methodology and assumptions which form the basis for forecasting scenarios of OCS oil and gas development. Four projections - medium find, high find, low find, and exploration case - are shown in the first section of chapter IV. These assumptions are not intended to repeat the work completed by Dames and Moore. The reader is referred to Technical Memorandum No. 49, "Bering-Norton Petroleum Development Scenarios," for additional background information.

- The final section deals with standards designed to measure impacts due to growth in both the base case and OCS scenarios. These standards were developed for such community infrastructures and services as education, public safety, recreation, utilities, land and housing, health and social services.

Non-OCS Case Assumptions

ECONOMY AND POPULATION

There are a number of techniques available to estimate the future growth (or decline) in the economy and population of local areas. Generally standard mathematical methods involve a number of assumptions. First, it is assumed that there exists a strong historical set of information and data which form the base for projection and forecast. Without a good base the ability to carry analysis into the future becomes tenuous. A second assumption is that growth in the community can be expected to possess some predictable pattern which can be utilized to forecast population and employment. If unpredictable growth or random patterns are expected there is little that can be done to develop a future's perspective,

A third assumption is that there are reasonable methods or assumptions available to describe expected changes in the composition of the population. These factors may include racial composition, household size, birth rate, employment/population ratios, and other measures which could alter prediction. A final assumption is that one can preduct the economic growth or decline of the community. This requires a thorough information base of the present and historical economic system of the community. There also needs to exist an intimate knowledge of the most likely additions and subtractions to the economy that would occur in the future.

9

In reviewing these assumptions in the context of Nome, the most significant limitations in forecasting is the tenuous nature of the existing data base.

The lack of reliable and detailed information clearly precludes the more prethodologically sophisticated approaches such as input-output modeling. The transient nature of a significant subpopulation suggests the impatience of in and out migration as a population factor and reduces the effectiveness of the cohort-survival method.

Reviewing the limited information on Nome and studying its present and future economic infrastructure the following method was selected to forecast Nome's Non-OCS population and employment. It involves the use of the historical population growth and the recent employment ratios in the Nome area to provide an understanding of the past trends. Because of Nome's highly stable and even rate of very slow growth since 1920, there is strong evidence of Nome's future baring major economic investments in the vicinity of the community. This historical trend can be used to judge the possibility of a significant shift in the existing economic infrastructure, its potential for expansion by the industrial sector, and the potential for major investments in the community under the non-OCS scenario.

Present Employment Estimates

Present employment from both published and unpublished estimates were made by the State Department of Labor. This information is generally collected at the regional/census division level as both non-agricultural wage and salary totals and employment covered by State UI Law. In addition, State UI covered employment for the Nome economic area was obtained. This included Nome, Beaver Creek, and Bessie #5 Dredge.

In order to interpret this data, the following points have to be considered:

- It appears that the Nome data is too high because it includes individuals who are employed outside of the Nome economic area but are recorded as Nome employees. One example is the school district which is headquartered in Nome but has a substantial portion of its employees are residing in other villages in the region.

- The data overestimate employment by the possibility of double counting individuals occupying the same job as a result of high turnover in certain jobs. Individuals who work only a few weeks in any one month or occupy a position part-time distort the data as an indicator or full-time equivalent employment. Evidence suggests the possibility of high turnover, underemployment, part-time employment, seasonal and temporary employment, all of which could produce higher official employment totals than would be indicated by the actual situation.

- There is also some evidence (though unsubstantiated) that some workers may be double counted by working for two or more employers, working two or more part-time jobs simultaneously, or working as an independent entrepreneur with several occupational roles producing multiple submission to the state.

- Finally, there appears to be a number of reporting problems in the data which could affect the final totals. There are several abrupt changes in the data trends which suggest reporting and classification problems.

These overestimates are important because it is calculated that the Nome full-time equivalent (FTE) workforce is approximately one-third lower than the data indicates. To estimate the actual FTE workforce in Nome, employment information was gathered from selected businesses and other economic units in Nome. This was used to estimate adjustments to the State UI data. In addition, estimates of employment participation rates were calculated and used with population estimates to act as a check on state workforce.

With a FTE workforce estimate, these data were disaggregated into permanent and transient workforce estimates. The role of the transient workforce has grown substantially in Nome particularly with the reopening of mining operations in the area.

Forecast on Non-OCS Employment

In order to estimate future employment under a non-OCS case, two factors were considered -- historical trends and future economic potential. Historically the Nome economic area had a very stable if stagnant employment base. Small incremental gains approximately doubled the employment base between 1930 and 1970. From 1960 through 1972, employment grew by an estimated average of .5 or .6 percent per year over the 13 year period. After 1972, the employment base grew and appears to have reached a new and somewhat higher base during 1975 to 1978. The swings of seasonality, and the presence of a transient workforce have become more apparant. The industries which are most effected by this trend include mining (significant consuitment to modern day mining did not occur in Nome until 1975, and have grown substantial since), construction (which produced less than

$50,000 in personal income in 1972 and jumped to $2.2 million in 1976 and fell to pre-pipeline levels by 1978), and services related to tourism.

Other trends which have been noted include the transference of historically government run social and health services to private sector non-profit corporations. This affects the industrial composition of the community through not necessarily the actual employment patterns. Also the educational function (outside of Nome) moved from a state to a local government function. A general rise in salaries and increased economic activity also has had a positive beneficial effect for retail trade and to some extent the FIRE categories. '

A thorough review of the present employment situation is contained in the baseline section. This information was then used in conjunction with personal interviews of a cross-section of Nome leaders and our analysis of the future Nome economy to project a non-OCS scenario of economic expansion. From that analysis, the following assumptions were made concerning factors which could affect economic activity in the Nome economic area.

- Mining, primarily for gold, will continue to play a role in Nome. It is cost effective to mine precious metals in Nome and this ratio is expected to continue the incentive for mining during the study period. It should be noted, however, that the technique of processing this mineral and existing claims system is conducive to heavy reliance on a transient and temporary labor force for

the larger operations and small scale operations which do not rely on the indigenous workforce to any great extent. It can be expected, however, that activity in mining will increase in the 1980's to an optional level in the 1990's. Investments will stress technology to reduce reliance on a large workforce and the largest component of that workforce will continue to be transient.

- The construction industry is assumed to be driven primarily by public spending which is sporadic and difficult to trend. Increased state spending can be expected to support several projects during the 1980's, but this will not stabilize either the seasonal quality of the employment or the erratic trend in average annual construction employment.

- Manufacturing is assumed to continue its marginal contribution to the employment base throughout the study period.

- Transportation, communications, and utilities are assumed to have a workforce which generally follows growth patterns reflected in the population as a whole. The seasonal nature of the transportation industry is assumed to continue, though lightening (water) transport employment could be largely replaced with other transportation employment if improved dock facilities are developed. However, this is not expected to alter overall employment in the sector.

- Wholesale and Retail trade is dependent on the amount of disposable income circulated through the local Nome economy. This was stable until 1973. The pipeline period pushed up general activity and disposable income increasing (primarily retail) trade employment to a 1976 and 1977 high. Success of this industry is thus tied to other sectors. It can be assumed that trade will grow modestly tracking the overall employment in the area.

- Finance, real estate, and insurance had only a neglible role in the economy up to 1973. Nome's role as a regional center for these services grew rapidly from 1974 to 1976 and moderated thereafter. It is assumed that the present level of activity will be sufficient to meet demands in this area with only very small increments during the study period.

- Services was an important growth center in the mid 1970's peaking in 1975 and 1976. This was due to two major sectors within this industry. The first was the spin-off of a variety of public services to private corporations under contract for delivery. This sector expanded rapidly but it is assumed that health and social services delivery employment will gross at or below general work-force gains. The second area is services related to eating, drinking and hotel services. This area is dependent on the level of tourism passing through Nome and the amount of disposable income available from local residents to use these services. It is assumed that

tourism will show some improvement in the 1980's with the potential for greater competition in air services. Otherwise, this sector is expected to show moderate growth with the growth of the overall economy.

- Government produces conflicting trends. Federal employment dropped with the transfer of programs to the service sector. It is assumed that federal employment will remain relatively stable during the study period. The same is somewhat true for local government employment. Local government is not likely to substantially improve its income position under the non-OCS case and thus is expected to grow at or below general population growth. In recent years, state government has increased its presence in Nome. It is assumed that this trend will continue at a slower rate in the 1980's and will stabilize thereafter.

In addition to these industrial category assumptions, the following possibilities were considered in projecting non-OCS growth.

- Nome does not have the regional center attractiveness for the in-migration of Alaskan natives compared to regional centers such as Bethel, Kotzebue, and Barrow. This is partly due to the latter examples having greater political control vested within the Alaska native community.

- Despite Nome distance from past and future large-side statewide economic investment projects, the community's economic life is

affected by this activity. It is expected however, that influence is modest and usually indirect.

- There is little evidence that industries which can be expected to lead employment trends in Nome have potential which is only modestly positive in terms of adding to the permanent workforce. This implies that the multiplier effect on other sectors such as TRADE, FIRE and TUC will also reduce their potential for future growth.

Based on these assumptions and the historical employment trends of Nome and the region, it is projected that the Nome employment area will grow an average of two percent per year from 1980 to 1990, and .5 percent per year thereafter.

Present Population Estimates

Population estimates with a high degree of reliability are difficult to find for the Nome area. Five sources were used in calculating the Nome population: the United States census, the 1975 Bering Strait Regional census (1976), a 1976 housing and population census made by CH2MHILL for the master water and sewer plan (1976), a census made by the City of Nome in 1978, and estimates made by the State of Alaska, Department of Community and Regional Affairs. These sources imply a fairly stable Nome population reflecting slow incremental growth to the mid 1970's. Greater than average population increases appeared to have occured in 1975 to 1977 due to general statewide economic activity and reopening of local gold mining operations. This

surge moderated between 1977 and 1979 but left Nome with a population possibly 21 percent higher than the 1975 census.

Another problem is the seasonal swings within the Nome population. The population grows and contracts due to the influx of transient workers during the summer months seeking employment or destined for temporary jobs for which they were hired, and the movement of people due to subsistence activities. As people pursue subsistence lifestyles, they move out of Nome to fishing and hunting camps for long periods though the city is considered their residence.

Forecast of Non-OCS Population

In forecasting the future population under a non-OCS base case, the following assumptions were used:

- The racial distribution of the permanent community will remain about 60 to 63 percent Alaska native and 37 to 40 percent non-native (primarily Caucasian).
- The labor force participation rate will slowly improve between 1980 and 1991 from 35 to 39 percent. This will then moderate and stabilize at 32 percent for the balance of the study period.
- In the non-OCS case, the population is assumed to grow in relation to the economic activity and the consequent employment base generated.

- Household size will show some decline due to a slowdown in the birthrate and its effect on the general age distribution.

Based on these assumptions and the previous analysis related to employment it is assumed that the Nome population will grow on the average of two percent each year from 1980 to 1990 and then growth will slow to a .5 percent average annual rate from 1991 to 2000.

OCS Scenario Assumptions

INTRODUCTION

Because onshore petroleum development near Nome is expected to be of the enclave type, in which crews are rotated from outside the Nome region, a conventional employment multiplier cannot be used reliably to estimate the total incremental employment associated with the development. Rather, a more circuitous methodology is required.

Employment levels have been estimated with the method desribed below. The method relies on several assumptions and uses several numerical constants. Employment forecasts reflect these assumptions and constants; changing the latter changes the former. However, the approach is used because it attempts to describe the main economic forces that will generate employment (and therefore population) in Nome.

More important than the selection of constant values and the quantitative forecasts that result from them is our attempt to express the dynamics and complexities of the relationship that will exist between OCS development activity on the one hand and employment and population patterns in Nome on the other hand. The exploration, development and production phases affect Nome employment and population in different ways. That is, within each phase there will be different sets of secondary employment and population impacts (for example, the resident and non-resident components of the primary OCS labor force will vary with the phase of activity, and each component will have its own secondary employment effects). This approach allows us to estimate changes in the residential labor-

force so that one can make estimates of residential population and its composition as well as total employment and population.

Numerical values selected for the constants represent reasonable, likely magnitudes selected by the contractor from a probability distribution of all possible constants. Other observers may argue that these values will tend to overstate or understate actual employment impacts. Despite this, the constants provided are considered reasonable in the judgement of the contractor. More important than the selection of constant values is our attempt to express in the method the relationship that will exist between the phases of development and workforce size and location, on the one hand, and the dynamics of change in the Nome labor market on the other hand. It is important to note that this method attempts to estimate the incremental employment among permanent Nome residents. That is, the approach estimates changes in the residential laborforce so that one can make estimates of residential population and its composition. Because it is assumed that the facilities at Cape Nome (or where ever they may be located in the vicinity of Nome) will be within the city limits, the onsite, onshore workers at the oil base are actually a part of the Nome laborforce, and they are also a part of the Nome population. Total employment and population estimates at the beginning of the scenarios include these workers.

It should be noted that the estimates are based on annual average employment estimates developed by Dames and Moore. This does not account for seasonal peaks and troughs of employment that may occur. Therefore, the laborforce projections may tend to understate annual peak employment levels. It is

known, for example, that most of the employment during the exploratory phase will occur between May and October (drilling from gravel islands may occur year around). Construction employment during the development phase will also tend to be concentrated in the summer season. However, after offshore platforms are in place, development drilling can occur 12 months per year. During the production phase, employment will have less seasonal fluctuation, although major maintenance and supply activity will take place during the ice-free months.

Finally, note that this analysis is based on the concept of full-time equivalent (FTE) employment. Many people may work for only short periods of time, so the total number of people involved during a single year may exceed the FTE employment estimates. For example, turnover in a task with 50 positions per year (FTE employment) may result in 100 people actually being employed during the year. We believe that job turn-over will be more frequent during exploration and development than during production.

METHOD FOR DERIVING EMPLOYMENT IMPACTS

This explanation will begin with the production phase, in which the method is fully developed, and then discussed in the development and exploration phases which incorporate modifications of the basic approach.

Production Phase

Incremental employment during the production phase will have three main components: a) primary, b) secondary, c) public sector.

Primary employment is the category of workers who are directly employed in petroleum activity and who live in Nome. This group of workers will be of two main types: those current residents of Nome who leave their existing jobs to work for the operators and contractors at Cape Nome and workers from outside Nome who find the city an appealing place to live, or who at least prefer it to the Anchorage area. It is assumed that these primary workers will be distributed between onshore and offshore jobs in the same proportion as the total number of jobs are divided into these categories. During the production phase, onshore jobs are approximately twenty percent of the total number of jobs, so it is assumed, for example, that twenty percent of the primary workers from Nome are employed onshore.

An additional assumption about this group of workers is that they will be replaced by new-comers to Nome. The jobs they vacate will be filled by new permanent residents. This is true also of those who were previously unemployed (even boom towns seem to have a measure of continuing unemployment). Therefore, the workforce in Nome will be augmented by the number of people who take jobs in OCS related industries at Cape Nome.

For purposes of this analysis, it is assumed that the number of current Nome residents who will change jobs is 15 percent of the total OCS manpower requirements, up to a maximum of 250. That is, we assume that no more than approximately 20 percent of the current Nome workforce will move into primary OCS employment.

Secondary Employment is that employment created by the direct spending and related income generated by the primary workforce and a public sector employment factor used to account for the tax revenues made available under the scenarios. Looking first at employment created by spending and related income by the primary workforce, there are two types: the secondary employment generated by the resident primary workforce, and the secondary employment generated by transient workers (i.e. those who rotate to and from the region). A distinction is made between these secondary employment effects because, on a per capita basis, the former will be relatively larger than the latter. This is because residents will spend more money and demand a broader range of services than transients, whose purchases will concentrate in the area of entertainment.

In the case of secondary employment attributable to the residential primary workforce we have choosen a multiplier of .4. This conventional labor multiplier assumes that .4 of a new employee will be created for every new residential employee.

In the case of secondary employment associated with the non-residential labor force, it is believed that a multiplier of .1 times the number of onshore workers is reasonable. This category of secondary employment is expressed as a function of onshore employment because these workers will have more opportunity to spend money locally than will offshore workers. However, this choice is arbitrary. None-the-less, the magnitude of secondary employment that results seems a reasonable estimate of the employment that could be realistically expected from this source and related spending.

Public sector employment is that category of employment that will result from the extraordinary property tax income that the onshore facilities will produce for the City of Nome. This employment will not occur until after the facilities have been completed. It represents "extra ordinary" public sector employment, because conventional employment multipliers include an allocation of public sector employment that typically occurs with growth. In the case of onshore oil development in Alaska, however, local governments are in a position to greatly expand their public spendings (the North Slope Borough and the City of Valdez are good examples of the opportunities that may be created for the City of Nome). Public sector revenues are discussed in the chapter on impacts due to OCS development. Therefore, a category of employemnt is likely to be created in addition to that reflected in the secondary employment mulitpliers.

This additional public sector employment should be linked with the number of onshore workers, since these workers are included in the calculation of maximum tax revenue that Nome can collect, and because this workforce indirectly expresses the size of the Cape Nome facilities (the size is a substitute measure for taxable value). A multiplier value of .1 has been chosen identical to the multiplier for secondary employment associated with the transient workforce. To keep the analysis manageable, we have not divided this employment between primary and secondary. (Tables 76,77 and 78 do not itemize public service employment in a separate column; it is included under the category of secondary employment in column 6).

In summary, the approach to estimating incremental residential employment is:

incremental employment = primary employment +

secondary employment + public sector employment

Where primary employment = local and new residents

or

(.15 x total laborforce to a maximum of 250) +(0.4 total laborforce)

secondary employment = multiplier x primary (residents)
+ multiplier x primary (transient)

or

.4 x primary (resident) + .1 x total onshore

and public sector = .1 x total onshore

Specifying Secondary Employment. Total secondary employment can be further specified by individual industrial sectors. Four industrial sectors were defined within secondary employment. The first, manufacturing, agriculture, forestry and fisheries, is not assumed to be impacted by OCS. Local construction and transportation is the largest secondary component ranging from 75 to 80 percent of employment. This sector includes public facilities construction. Trade, services and F. I.R.E. includes additional employment in retail sales, entertainment and eating establishments, both business, health and social services and native corporate growth. This component constitutes 15 to 24 percent of employment. The final sector is government with additional employment added during the production phase. This peaks at about eight percent of total secondary employment.

Development Phase

The same approach to estimating employment is used in the development as in the production phase, except there is no public sector employment category. This employment is derived from property tax income, and during the development phase property is not yet in place, fully assessed, on the rolls, and producing income. Actually a measure of property tax income may occur during construction because property is assessed if it is 50 percent or more complete at the time of assessment. However, this income is ignored for the sake of estimating public sector employment during the development phase.

Exploration

It is assumed that during the exploratory phase Nome residents will find employment only onshore This is because offshore drilling and supply boat crews tend to be mobile personnel who rotate from points of hire outside the state. Also for this reason it is assumed that no one will relocate to Nome during exploration. Thus, the primary workforce that lives in Nome will be only those local residents who get onshore employment locally. This is estimated at 15 percent of the total onshore labor requirements. During exploration, as during development, there will be no additional public sector employees.

METHOD FOR DERIVING POPULATION IMPACTS

Incremental population in a community affected by economic growth is a function of incremental employment. That is, population will increase in direct proportion to the number of new jobs created. In conventional socioeconomic analysts, population estimates are derived from workforce estimates by means of a labor force participation factor, which expresses the average number of non-working dependents who will accompany each new primary and secondary employee. The method is thus:

primary employment x (1+ secondary employment multiplier) X laborforce. participation factor = population increment.

This basic method is used to estimate incremental population growth in Nome from OCS activities, although an elaboration of it is required to deal with three significant peculiarities of the Nome situation. These are 1) the assumption that a number of secondary jobs will be taken by people who enter the labor force for the first time from the base population; 2) a number of the secondary jobs will go to Natives who immigrate from the region, and this group will have a significantly higher laborforce participation factor (more non-working dependents) than the in-coming Non-Natives; and 3) on-site, onshore workers will be included in the Nome population, but since these are transient workers the labor force participation factor is 1 (only they are counted).

To deal with the assumption that some secondary employment will be drawn from the base population, the total number of secondary jobs (including public sector) is reduced by 15 percent (multiply this number by a factor of .85), in the belief that this is a reasonable estimate of the secondary jobs that will go to new entrants into the laborforce. A larger percentage of secondary jobs will no doubt be filled by Nome residents, but the jobs vacated will need to be filled by newcomers, so the net increase in local resident workers is the total number of new secondary jobs minus new entrants into the laborforce.

Note that we believe that the number of unemployed people in Nome will not change substantially. Our assumption is that while some of the currently unemployed who find employment in the primary or secondary labor market, their numbers will be replaced by newcomers who fail to find work. In the long run, we believe that there will not be a high level of unemployment (i.e. people in the laborforce who actively seek work) in Nome.

It is assumed that one-third of the secondary jobs that draw newcomers to Nome will be filled by natives from the region, and that two-thirds will be filled by non-natives. A laborforce participation factor of two is used for non-native newcomers, and 3.5 for native newcomers. These ratios are based on estimates of present native and non-native participation rates. Non-natives have a participation factor of two based on both urban and Nome data, while the native ratio of 3.5 is based on 1978 Nome estimates. It is assumed that the economic activity of OCS is sufficiently long-term that some families of regional natives will accompany workers to Nome rather than

stay in the village. This is expected to act as an employment and population magnet in relation to the villages in the region. A participation factor of two is also used for the primary work force.

Finally, the number of on-site, onshore workers at the enclave must be added to the population equation, but to avoid double counting, the element of this work force that lives in Nome must be subtracted. During the development and production phases, it is assumed that the proportion of Nome residents who work onshore is the same as the proportion of the total work force is employed onshore. During exploration, it is assumed that all primary Nome employees work onshore.

Thus the population calculation is this:

incremental population = primary work force in Nome x 2 + (secondary work force x .85) X .67 x 2 + (secondary work forcex .85) X .33 X 3.5 + on-site onshore work force - onshore Nome residents,

where on-site onshore work force = onshore Nome residents during development and production =

$$\text{total on-site onshore} - \frac{(\text{total on-site onshore} \times \text{Nome})}{(\text{total work force} \quad \text{primary})}$$

DEFINITION OF PHASES

The definition of each phase of activity is somewhat arbitrary because the three phases of petroleum development overlap a great deal (i.e. exploration continues often after development has begun, and development continues after

production is underway from the same wells). For purposes of this study, it is assumed that the exploratory phase ends when the first construction employment begins, and the production phase begins when oil production has started on half of the platforms.

The identification of the three phases for each scenario is shown in Table 185.

Because a different formula has been used for estimating employment impacts in the production and development phases, a rather sharp change occurs in the projections between the years 8 and 9 in the medium and high find scenarios. In fact, the transition would be gradual, and the employment curve smoother, during the years when development activity gives way to production.

TABLE 185

YEARS OF OCS ACTIVITY PHASES

Phases	Scenarios		
	Low	Medium	High
Exploration	1-4 years	1-3 years	1-3 years
Development	5-7 years	4-8 years	4-8 years
Production	8-18 years	9-18 years	9-18 years

Overview of Infrastructure Standards

EDUCATION

Primary and Secondary

It is assumed that education facilities will continue to be provided by the City of Nome and by the REAA Regional District for rural areas outside the City of Nome.

The student enrollment in Nome has been fairly constant except for the loss of approximately 200 boarding school students who returned to their villages over a two year period with the establishment of the REAA district in 1976.

The present enrollment is about 780 students which compose about 27.4 percent of the total Nome population. This is a decline of about 30 students from 1977-1978. This proportion is somewhat above that of other areas of the state. The current average ratio for selected southeast and southcentral Alaska boroughs is approximately 23 percent. This is due to the largely white culture which is being measured in the latter example. For towns and villages composed largely of Alaska natives, the ratio averages 28 to 33 percent and Nome's current enrollment falls between these two patterns. This is due to Nome's racially divided population with approximately 60 percent native and the balance non-native. Though natives constitute about 60 percent of the population, they compose 72 percent of the student enrollment.

While Nome has a high student ‘co population enrollment, the national birth

rate has been falling rapidly, and this is reflected in both native and non-native households.

For these reasons, the following assumptions will be used to calculate the student population in Nome.

- The current ratio of 27.4 percent of the population being enrolled in school is considered the base for Nome. This ratio is then assumed to decrease by 3 tenths of one percent per year until 1991 when students account for 24 percent of the total forecasted resident population, with that ratio remaining constant thereafter. This is due to future changes in the racial composition and the continuing decline in the birth rate. The ratio is not expected to reach urban ratios of 20 percent or less because of the native component of the population, and the very young age of the adult population resulting in a high proportion of females in their child bearing years.

- Workers housed in camps will not add school children to the population and therefore will be discounted when projecting a population - student ratio. Direct OCS employment will add to the school population only for the very small fraction who decide to locate their residences in Nome rather than rotate to residences outside the Nome area. These workers and secondary employment generated by OCS activity are expected to have an urban student ratio of 20 percent throughout the scenario. This is due to the high

proportion of non-natives attracted to Nome and the transient nature of this population.

Once total school enrollment has been forecasted, students are usually allocated between elementary and high school grades. This is necessary since classroom sizes vary between the two levels. Elementary includes kindergarten through sixth grade plus modified primary, while high school includes junior high grades of seventh and eighth, and high school, ninth through 12th grades. Approximately 60 percent of school students in Alaska have historitally been enrolled in the elementary grades. In Nome this proportion is presently 52 percent.

While there are no national standards for student - teacher ratios, the maximum ratio usually used is 30 to one' in primary grades and 27 to one in the secondary grades. Many urban Alaska school districts use standards of 25 students per classroom for the elementary grades and 20 students per classroom for the high school grades. In Nome, the present ratio is about 11 to 12 students for each teacher. This is due to the high amount of federal categorized grant monies available to Nome and the educationally disadvantaged nature of many of the students. Also, smaller communities tend to have smaller classes due to a smaller student body being spread through a variety of programs.

Nome, does not differ significantly between elementary and secondary student ratios. This is due to the high number of specialized programs. Past years have suggested a difference of no more than 3 students per teacher.

In terms of facilities, a classroom is normally provided for each full-time teacher. In addition, certain facilities should accompany both primary and secondary schools including outdoor sports fields, indoor space for sports, specialized program space, library space, etc. Nome uses team teaching, resource teaching and open space concepts, so that the number of classrooms per teacher is actually about .9.

Based on this discussion, the following assumptions will be used to calculate the teacher and classroom needs in Nome:

- In the next decade, it is assumed that Nome will approach but not reach the 60/40 ratio in analyzing primary versus secondary students.

- It is expected that funding for Nome will continue to support specialized programs and keep pupil/teacher ratios below the state urban average. A constant ratio of 13 to one for the entire school system will be used to determine future faculty needs.

- A ratio of one classroom per 14.5 students will be used to determine basic facilities needs. The low teacher/pupil ratio reduces the need to have a usual one teacher per classroom.

- Direct OCS enclave employment is not expected to affect teacher/classroom needs except in so much as a small fraction of the workers take up permanent residence in Nome rather than rotate to residences outside the Nome area. Students generated due to OCS direct and secondary

employment would require the same teacher/classrooms ratio as already noted.

Postsecondary Education

The Northwest Community College (NWCC), an extension of the University of Alaska system, is located in Nome. Established in 1975, NWCC provides post-secondary education for the Norton Sound - Bering Straits region of western Alaska. University presence in Nome dates back to 1959, with the establishment of a Cooperative Extension Service Office.

Growth in enrollment and credit from production rose quickly to a peak in 1977-1978 and have since moderated. Commitment on the part of the statewide university system appears to be sufficient to assure a continued growth in resources which is likely to increase the proportion of the population taking classes and the number of credits taken by each student.

Presently, approximately 3.7 to 6.5 percent of the region's population is enrolled in postsecondary classes. Each student takes between 4.9 and 6.6 credit hours. The variation is due to the historically higher enrollments in the spring semester compared to the fall semester. The average number of students enrolled over the past five semesters was 35" with 1,715 average credits. This means that an average of 4.9 credits per student were taken. Since most postsecondary education is still delivered in Nome, the penetration rate of service in the community is about ten percent.

As a standard to project the role of postsecondary education, a measure of population participation and credits per student will be used. The participation rate is expected to vary greatly from semester to semester, but an increase from a semester average of about 10 percent to 15 percent by 1991 and stabilize at that level. Due to the community outreach approach of the present model, credits per student are assumed to remain stable at 5.5 during the study period. Enrollment at NWCC is not expected to be directly affected by OCS workers housed in camps until the production phase when extension offerings is expected to be available in the enclave. Therefore, it is assumed that no increment occurs during the exploration phase, a percent of participation consistent with the base population will be used during the development phase for the increment OCS population resident in Nome. During the production phase, both the resident and enclave OCS population increment are used with participation ratio consistent with the base population.

PUBLIC SAFETY

Police

National standards require 2.1 sworn police officers per 1,000 or one sworn officer per 500 in the population. Presently, the Nome police department employs seven sworn officers which is 1.75 officers in excess of what national standards require. However, when taking into account sick leave, annual leave and time off, it is assumed that a minimum of 5.75 officers are required to maintain a 24 hour public protection service. The level of population density used to determine a 24 hour service is variable but is generally 1,500 (Alaska Consultants, 1979b).

OCS activity in Nome will be largely enclave which will minimize contact with local law enforcement. With the present organizational structure, the Alaska State Troopers will be providing law enforcement to the Cape Nome site. Although an enclave facility will minimize contact, it will not eliminate it entirely. It is likely that employees rotated in and out of Cape Nome will occasionally use lodging and social opportunities in Nome. This could potentially burden the Nome Police Department as manpower capabilities would not necessarily be geared to accommodate personnel living outside of Nome proper. In addition, onshore facilities located in close proximity of Nome will have ready access to Nome's social environment and could potentially impact the service requirements provided by local law enforcement. This would imply a greater role for the state troopers during periods of greatest onshore direct OCS employment.

The following assumptions for local police manpower requirements are offered in consideration of the above:

- The first 1,500 people in Nome will require six sworn officers to provide 24 hour police protection.

- For every five hundred people added to the community of Nome, one sworn officer will be required to provide law enforcement services. This will include service required for onshore employees located as permanent residents in Nome.

- Employees rotated in and out of the enclave facility at Cape Nome will, by nature of their proximity to Nome, interact to some extent with local law enforcement. However, due to the minimized contact assumed under OCS development, no additional local officers will be required to maintain law enforcement services.

- All enclave facilities located at Cape Nome will fall under the jurisdictional responsibility of the Alaska State Troopers. Additional troopers would be temporarily added to those already stationed in Nome on a ratio of one trooper for every 2,000 onshore direct OCS employees. These requirements would be most important during the development phase.

Jails

Typically, jail facilities dictate a ratio of one per 500 in the population with a minimum requirement of three cells to allow for separation of children, fema" es and male offenders. This facility requirement will be used to assess need through the OCS activity over peak impact years.

The present facility has a total of 38 beds including two dorms with ten and twenty beds and eight cell beds. This facility actually provides a surplus of detention beds for the community as well as the region. In order to reflect the regional orientation, the projections for population in the base case have been doubled. This is based on the assumption that Nome presently constitutes about one-half of the region's population and natural population

growth will occur at about this same ratio. OCS activity is not expected to create the need for a new facility other than what is currently targeted in the state masterplan for the community of Nome. It is assumed that OCS activity is too limited in duration to warrant additional permanent facilities in this area.

Fire

Planning in the area of fire protection is closely related to the Insurance Service Office schedule for grading fire defenses. This grading determines the insurance premium rates for a community. In addition, fire protection standards are generally based on a rather complex formula for fire flow which generally requires knowledge of the size and structural characteristics of a community's buildings. Generally however, smaller communities of up to 30,000 people require two pumpers, one staff car and one ambulance. For communities under 1,000 population, one pumper may be adequate. Manpower necessitates approximately 20 volunteer firemen per pumper. Table 186 displays fire flow requirements based on population.

TABLE 186

REQUIRED FIRE FLOW BY Population

Population	LPM	GPM	Duration Hours
1,000	3,785	1,000	4
1,500	4,731	1,250	5
2,000	5,678	1,500	6
3,000	6,624	1,750	7
4,000	7,570	2,000	8

[a]Economic/Demographic Assessment Manual Current Practices Procedural Recommendations, and a Test Case.

The above fire flow requirements exceed the minimum criteria for the Insurance Service Office quoted as follows:

> "A minimum recognized water supply usually contemplates a network of mains and hydrants capable of delivering at least 5.77 liters per second (250 gallons per minute) (over and above normal consumption) for a periodof at least two hours. Where there are numerous commercial buildings, this minimum might be converted to at least 31.54 liters per second (500 gmp for one hour) (the same total quantity of water but available at a greater flow rate fora shorter period of time.)
>
> . . * the small settlement of a few hundred people and comprised of the usual number of small mercantile structures in a central commercial district would require 31.54 liters per second (500 gpm) in residential sections (well spaced or scattered small single family dwellings.) in the commercial district, water in the range of 63.08 to 189.24 liters per second (1,000 to 3,000 gpm would be required. A school complex serving the settlement and the surrounding territory probably would need something on the order of 189.24 to 315.4 liters per second (3,000 to 5,00 gpm) if there is a large building such as a gymnasium. " (Alaska Consultants, 1979b.)

It is evident from the above that a fair amount of flexibility in fire flow requirements exists. Presently 1S0 schedules Nome as both Class 7 and Class 9.

For the purpose of assessing impact, the following standards are offered for both the OCS and non-OCS case:

- For a population of 2,000 to 10,000, two pumpers and one ambulance is required.

- A minimum of 20 volunteer firemen per pumper is required to maintain adequate service levels.

- The required fire flow as illustrated in table 3 presently exceeds Nome's capability; however, 1S0 recommendations are more varied than what is displayed. For projection purposes, therefore, it is assumed that 1,893 liters per minute (500 gallons per minute) will be required to maintain a minimum fire flow over and above normal water usage rates.

- Additional fire stations will be required for concentrated development beyond a 3.2 to 6.4 kilometer (2 to 4 mile) radius of existing fire stations (Alaska Consultants).

- OCS enclave activities will be situated out of the fire protection service area of Nome. It is assumed that the facility will provide their own fire apparatus and location of a dependable water source.

RECREATION

National standards have been devised for the provision of leisure and recreational facilities based on population. Typical recreational facilities, according to community size, are displayed in table 187.

TABLE 187

RECREATIONAL FACILITY AND PARK Standards

Population Served	Playgrounds Hectares	Playgrounds Acres	Parks Hectares	Parks Acres	Sports Fields Hectares	Sports Fields Acres	Recreational Equipment
1,000	.2	.5	.6	1.5	.6	1.5	2 basketball cts
2,000	.4	1.0	1.2	3.0	1.2	3.0	4 basketball cts 1 tennis ct.
3,000	.6	1.5	1.8	4.5	1.8	4.5	6 basketball cts 1 tennis ct. softball field
4,000	.8	2.0	2.4	6.0	2.4	6.0	8 basketball cts 2 tennis cts. softball field

[a]Economic/Demographic Assessment Manual Current Practices, Procedural Recommendations, and a Test Case

The above table coupled with nationally accepted standards for recreational needs are displayed below.

TABLE 188

OPTIMUM RECREATIONAL STANDARDS

Facility	Optimum for Nome[a]
Play Lots - Lots/.40 hectares (acre)/500-2,500 population	1 - 6
Neighborhood Parks - 2.0 hectares (5 acres)/2,000-10,000 population	1
Basketball Courts - 1/2,000 population	2
Softball Fields - 1/3,000 population	1
Tennis Courts - 1/2,000 population	2
Skating Rinks[b] - 1/5,000 population	0
Community Centers[b] - 1/25,000 population	0

[a]Based on a population of 3,000.

[b]Facility exists in Nome and exceeds optimal requirement.

The above mentioned recreational facilities requirements notes two other standards for larger communities. The first is skating rinks with a standard of one per 5,000. Regardless of the standard, it is the judgment here that such a facility is conducive to northern climates and would provide for an excellent recreational outlet for the long winter months. The other two recreational facilities commonly found in medium sized communities are community centers with a standard of one per 25,000 and swimming pools with a ratio of one per 10,000. The same rational as noted for skating rinks is applicable here. Community centers provide for community gatherings on a social basis and allow for organized activities during the winter months and therefore should be considered an important component of community mental heal th. In addition, swimming pools could provide for an organized opportunity to teach water safety, a very needed area in community education.

It is assumed that OCS activity will provide a means for the City of Nome to acquire revenues which otherwise would not be available. As well as expansion of municipal services such as police, fire and utilities, it is likely that revenues will be allocated for use in the development of community recreational programs and facilities. Standards noted in table 5 become a realistic possibility in view of the above.

Enclave facilities are assumed to provide for their own recreational outlets similar to facilities constructed for employees at Prudhoe Bay. Little interaction is expected to occur between city facilities and OCS personnel seeking leisure activity during off hours. It is realistic to assume, however, that league games such as softball and basketball might be organized

between the Nome city league teams and employees located at both the service base and the enclave facilities.

UTILITIES

Water

Per capita water consumption has been estimated for the area at 257 liters per capita per day (1 pcpd) (68 gal ions per capita per day [gpcpd]). However, for planning purposes, it is assumed that increased distribution will produce a higher per capita rate of approximately 303 lpcpd (80 gpcpd). Nome benefits from an abundant water source located four miles north of town. The present yield has been calculated by the U.S.G.S. at approximately 1,136 to 1,438 liters per minute (300 to 380 gallons per minute) which is considerably greater than what is required to serve the present population. The only low flow periods presently experienced are during spring breakup. Assuming an average flow of 1,287 liters per minute (340 gallons per minute), Nome's water source has the potential to yield 1.9 million liters per day (489,600 gal ons per day). Present needs require only 908,400 liters per day (240,000 gal" ons per day) based on the planning per capita rate of 303 liters per day (80 gallons per day).

The above figures have been calculated without regard to the present capacity of storage and distribution facilities. A rule of thumb regarding storage is that the facility should contain no less than three days supply of water. Using the per capita water consumption figure of 303 liters per day (80 gallons

per day), the facility should contain at least 2.7 million liters (720,000 gallons) of water. The present storage capability at overflow is 1.2 million liters (320,000 gallons) producing a 56 percent discrepancy in meeting current requirements. Even using the present per capita consumption of 257 lpcpd (68 gpcpd), the three clay minimum would dictate a reserve of approximately 2.3 million liters (612,000 gallons) which also produces a discrepancy of 48 percent. It is assumed for projection purposes, however, that Nome will increase their storage capabilities to at least the three day minimum within the next three to five years. Plans are presently proposed for a 4.5 million liter (1.2 million gallon) storage facility for the city.

OCS activities will increase the industrial use factor for Nome's water supply. Onshore service base and offshore supply boats, rigs and barges will use Nome's present water source. Facilities located at Cape Nome will most probably identify and develop their own water source. This is assumed to be more cost effective then piping the existing water source from Nome. However, for all OCS activity, it can be assumed that per capita usage rates would increase due to the more industrial nature of the industry. In consideration of the above, the following assumptions and standards are offered in the OCS and non-OCS cases.

- Future per capita water consumption for the community of Nome is estimated at 303 lpcpd (80 gpcpd).

- Increased municipal revenues generated through OCS activity in the region will provide sufficient capital to expand the water distribution system to include all old and new feasible construction not

presently receiving this service.

- A three day reserve is necessary to insure an adequate domestic water supply.

- Offshore rigs, boats, barges and other structures are anticipated to have a higher per capita usage rate of approximately 379 lpcpd (100 gpcpd). (Alaska Consultants, 1979b) *

- Due to the industrial activity associated with OCS development, the enclave facilities will have a per capita usage rate of 478 lpcpd (125 gpcpd). Water needs will be calculated based on total number of employees actually ens" te. (Alaska Consultants, 1979 b).

- Enclave facilities located at Cape Nome will identify and develop their own water source. This is assumed to be more cost effective than extending service from Moonlight Springs, Nome's water source, and will insure that there is sufficient resources for both the community and the enclave facility.

Sewer

Wastewater generation closely approximates water consumption, and for the purposes of assessing impact, it is assumed that the two are equal. For planning purposes, water consumption is estimated at about 303 lpcpd (80 gpcpd) and will be employed as the standard to assess wastewater generation.

Present wastewater generation in Nome is handled through primary treatment with effluents discharged at the mouth of the Snake River. Currently, federal mandates require Nome to have at least secondary treatment to meet EPA and other agency requirements. CH2M Hill is beginning a study on the type and location of a secondary sewage lagoon. Plans proposed include a 12 acre secondary lagoon system sized to handle wastewater generation for a population approaching 5,000 by 1997. For those outlying areas not on the collection system a common city wastewater facility could provide treatment by 1997. Alternatives to those areas which cannot be feasibly incorporated include humus toilets, vacuum sewers, or pressure sewers. The primary treatment facility is presently operating close to capacity at 643,450 liters (170,000 gallons) per day. Design capacity is estimated at 654,048 liters (172,800 gallons) per day. It is assumed that within the next three to five years that new treatment facilities will be implemented.

The onshore OCS supply base located in Nome is assumed to be interconnected with the present wastewater collection system. Onshore enclave facilities, due to the more remote location at Cape Nome, are assumed to provide their own wastewater collection and treatment facilities. Offshore generation of wastewater from offshore rigs, boats and barges are also assumed to provide for their own disposal.

For the purpose of assessing impact, the following standards are offered in ‘ consideration of the above.

- Domestic per capita water usage equals wastewater generation and is estimated at 303 lpcpd (80 gpcpd).

- Secondary treatment facilities will be employed by the time OCS development and production phases occur in Norton Sound.

- The LNG plant, oil terminal and associated facilities located at Cape Nome will provide for their own collection and disposal of wastewater and are assumed to generate at 125 gpcpd.

Electricity

Planning for generation facilities is a multivariate process which encompasses such factors as historical usage rates, proposed commercial development within a given service territory and population projections. No one nationally accepted standard is employed in projections due to the variability of commercial usage. Presently, the total per capita generation is 1.95 kilowatts (kw) per person for all uses.

For the purposes of assessing future need for the community, it is assumed that the level and type of commercial development in Nome will increase proportionately to the population. As a result, the domestic per capita usage is assumed to remain close to or the same over the period under study.

With regard to assessing impact, a slightly higher per capita generation is anticipated due to probably increased industrial uses associated directly or indirectly with OCS activity. For the purpose of projection, the service base

operation in Nome will utilize the city generated electricity.

The following assumptions and standards are offered in consideration of the above.

- Non-OCS activities yield a per capita generation of 2.0 kw for all uses.

- For that increment of the population added to the Nome community due to OCS activity, the per capita load requirement will be 2.5 kw.

- The onshore LNG oil terminal and associated facilities will have large power demands. However, the oil or gas processed in these facilities are often used for electrical generation. (Alaska Consultants, 1979b). It is assumed, therefore that the enclave located at Cape Nome will provide their own electrical generation requirements probably utilizing natural gas developed from the producing fields.

Telephone

-Telephone service is provided to almost all households in Nome through General Telephone, Inc., a private corporation. Typically, one main station per household is the normal mode of operation. In addition, most businesses and government offices have one or more main stations. In 1979, it was estimated that Nome had .53 telephones per person. The commercial/residential te" ephone ratio is 64/34. The number of telephones per person can be expected to ncrease due

to declining household size (as larger households disperse, thus increasing individual phones), improving economic conditions (increasing both more residences and businesses with phones), and general technological innovation. The following assumption is made in forecasting telephones:

- The number of telephones per person increases from .53 to .61 between 1980 and 2000, reflecting an increase of .02 telephones per person every five years.

The above assumption does not include communications for business or dormatory facilities located at Cape Nome. Without knowledge of actual facility plans, communication needs cannot be established.

- For general service requirements, however, it can be assumed that ALASCOM will provide communications for the enclave facilities at Cape Nome and General Telephone, Inc. will service those OCS activities located in close proximity to Nome.

Solid Waste

A sanitary landfill is the present method of disposing of solid waste in a small community and is defined as "a method of disposing of solid wastes on land without creating nuisances or hazards to public health or safety, by utilizing the principals of engineering to confine the solid waste to the smallest area, to reduce it to the smallest practical volume, and to cover it with a layer of earth at the conclusion of each day's operation or at more frequent intervals as may be necessary." (Greater Anchorage Area Borough, 1975)

To assess community landfill requirements, the following standards are offered:

- Assuming a per capita solid waste generation of 2.3 kilograms (5 pounds) per capita per day and a fill depth of 2.1 meters (7 feet) of which two-thirds is solid waste material, .08 hectares (.21 acres) per year per 1,000 people is required to adequately house a sanitary landfill.

- National standards dictate a service requirement of one collection vehicle per 3,000 dwelling units.

In consideration of the additional effects of OCS activity in the generation of solid waste, the following assumptions have been made:

- During exploration, it is assumed that solid waste disposal will be self-contained and will not impact the community of Nome until the development phase. All solid waste during the initial phase will be shipped back to rear supply bases via otherwise empty vessels. During development and production phases, a sanitary landfill will be developed especially for disposal of OCS generated solid waste. Quantities are assumed to be sufficient to warrant a fill mutually exclusive of the city owned and operated facility.

LAND

Land use requirements in Nome and the surrounding area related to OCS development are primarily in three areas: 1) lands needed for residential growth, including street rights-of way; 2) lands associated with the assumed service base near Nome; and 3) lands associated with the assumed LNG and oil terminal facilities at Cape Nome. Since existing land use in Nome and the surrounding area has not been quantified, an estimate will be developed of land required for these different uses, and this estimate will be compared with land availability and capability in the area.

In forecasting the use of residential land in Nome, the following factors are assumed:

- Because of the lack of available land and the high costs associated with providing services, the type of housing available to new residents will show a trend towards multifamily structures.

- Because of the high cost of water and sewer system extensions, most of the immediate growth in the City of Nome will be limited to the undeveloped portions of land already serviced and along the borders of this area.

- Due to topography, soil conditions, land availability, and ownership patterns, private lands are assumed to play an important role in Nome's development.

- The direction of residential expansion in the City of Nome is assumed to be to the east and north of the existing core area.

- Because of the few available lots in Nome, a recent practice of dividing developable lots in half to accommodate two structures is assumed to continue.

- It is assumed that some land outside of the Nome townsite, when available, will be developed for residential purposes. It is also assumed that water and sewer services will be slow in coming to these developments.

Existing land use within the Nome townsite has not been quantified and therefore, a rough estimate will be developed to determine the amount of land required for future residential use within this area. A density of development for one and two family units, multifamily units, and mobile homes will be estimated based on existing patterns within the Nome townsite. A factor to allow for a slight trend towards multifamily units will be added.

Outside of the Nome townsite, it is assumed that only single family residences will reconstructed because of the lack of water and sewer facilities during the first years of occupancy. The amount of land required for residential use will be determined based on a recent subdivision in the area. Approximately 28 percent of the land was utilized for street rights-of-way, leaving 72 percent of the land developable. Developable land per acre

(72 percent) divided by the lot size (approximately 10,000 square feet) provides the number of lots per acre (43,560 x .72 ÷ 10,000 = 3.14 lots per .4 hectare [per acre]). Since it is assumed that only one house will be constructed on each lot, the number of lots equals the number of housing units which can be accommodated on .4 hectares (one acre) = 3.14. The number of housing units forecasted divided by 3.14 provides the number of hectares/acres required for both housing and street rights-of-way forecasted through the planning period.

It is assumed that a service base is located near Nome to utilize the existing transportation and communication 'facilities and the assumed dock. Because of the short summer weather window and ice problems, this service base is assumed to require more storage than an ice free port. Though the size and function may change with exploration, development, and production, this service base is assumed to be long lived because of the proximity of the Nome airport. It is assumed that the land required for this service base is related to the number of berths serving it. Based on a ratio of two hectares (five acres) per berth, this service base may require four to 24 hectares (10 to 60 acres), depending on the number of berths. Much of this land is used for storage.

The method used to establish the land use requirements for the assumed LNG and oil terminal facilities at Cape Nome is based on the following factors:

Oil Terminal (Kramer, 1978).

- It is assumed that the total acreage for a terminal facility is twice the amound needed for storage.

- The amount of land required for storage depends on the topography of the site.

- Under ideal conditions, it is assumed that up to 9,070 metric tons (10,000 tons) (70,000 barrels) of oil per acre can be stored in conventional steel tank farms.

- Under poorer conditions (poor terrain, steel slopes) as little as 3,628 metric tons (4,000 tons) (28,000 barrels) of oil per acre can be stored.

- The storage capacity will be for either five or ten days.

Thus, the peak daily production of o· 1 in each of the three scenarios developed by Dames and Moore will be used to determine the amount of land potentially required for the oil terminal at Cape Nome. Both five and ten day storage requirements will be calculated, based on both ideal and poor storage conditions. Preliminary evidence indicates that, using poor storage conditions, as many as 223 hectares (550 acres) could be required for the oil terminal.

LNG Facility. The acreage needs of an LNG liquefaction plant seem to vary. The Phillips LNG p“ ant at Nikiski processes approximately 200 million cubic feet per day on a 16 hectare (40 acre) site. Based on this facility, .4 hectares (one acre) is required for each five million cubic feet of gas processed per day.

HOUSING

The total forecast onshore population is divided between work crews who are assumed to live in dormitory housing provided by the oil industry and people living in individual households in Nome and the immediate area. The dormitory facilities are usually modulars, and this group housing is usually shown as places for persons which is equivalent to group housing population (Alaska Consultants, 1979). The yearly number of workers forecasted to be living in the enclave housing is seen as the yearly requirement for new group housing.

To determine the number of housing units needed to satisfy new household demands, the population forecast to be living in households is divided by the estimated family size. In Nome, the household size varies amoung native and nonnative households. Therefore, a family size is required for both groups. Based on a City of Nome housing survey taken in February, 1976, the following standards will be used to determine the future residential housing demands in Nome:

- 4.5 natives per household
- 2.9 nonnatives per household

Therefore, for every 4.5 natives or 2.9 nonnatives added to the population, one new housing unit will be required. The housing demand will be based on the number of people projected to live in the community.

As explained in the previous section, the amount of land required for future residential use will be estimated based on the existing density of development for one and two family units, multi-family units, and mobile homes. A factor to allow for a trend towards multi-family units will be added.

Since most direct onshore OCS employees will be housed in group housing provided at the various work camps, their presence is not expected to effect residential housing demand in Nome. Population increases due to indirect OCS impacts and direct employment residing in Nome will use the housing and land requirements noted above. OCS impacts will remeasured by comparing the base case of natural increase, and activity expected in the non-OCS scenario, with the various OCS scenarios of exploration, development, and production. Because considerably more non-Natives (with a lower relative household size) than Natives are projected to come to Nome in the OCS scenarios, the household size falls below the 3.72 reported in the baseline. Combining the household density identified in the baseline (4.5 Natives and 2.9 non-Natives) with the relative proportion of Natives and non-Natives forecasted for the OCS scenarios, a future household size of 3.1 is used in the projections. This household size is smaller than other Nome estimates, and therefore, these OCS forecasts will tend to show a demand for more units than if the larger household size were used.

HEALTH

Standards used to determine existing and future needs for medical facilities and services in Alaskan communities have been developed by South Central Health Planning and Development, Inc. These standards have been adopted and are used by the State of Alaska. Standards range from a Level I, village, to a Level V,

metropolis. Nome can best be classified as a Level III care system which acts as both a local and regional care center. Table 189 outlines the standards designed for this level of care.

Presently, Nome serves not only the local health needs of the community but also acts as a health service center for the Norton Sound region. Virtually all care is provided through the Norton Sound Health Corporation, a non-profit native corporation. The Corporation operates a 22 bed regional hospital (19 acute care and six intermediate care) which is at the three per ?,000 designated in the standards or somewhat above if the intermediate beds are included. In addition, four primary care physicians for a ratio of one per 1,500 regional residents work through the corporation. Present deficiencies include maintaining continuity of professional staff in the mental health area (Family Services Department), lack of an optometrist and use of an eye care technician. Other standards are met or exceeded by the present delivery system.

In the non-OCS case and the OCS cases, the following assumptions are made:

- For the non-OCS cases, the level three indicators will constitute the standards for health care delivery in the Bering Straits region. The exception is primary care physicians. A ratio of one physician per 3,000 residents with a minimum of four will be used. This is due to the need to staff both the inpatient and outpatient clinic, travel to the villages and high turnover in the manpower category.

TABLE 189

CRITERIA AND STANDARDS OF A LEVEL III

HEALTH DELIVERY SYSTEM[a]

Criteria	Level III Assessment	Indicators of Availability
Population	2,000 - 200,000	1 primary care M.D. per 3,500 peep" e (no less than two)
Isolation/Transportation Network	Moderately reliable transportation network to: 1) subregional center & outlying villages 2) urban centers	3 acute care beds per 1,000 peep" e community mental health center and psychologist
Communications	Reliable ratio, some television, statewide phone network	1 dentist per 4,000 x-ray technician
Economic Development	Service and commercial center for majority of villages in the region	detox capability c/ Class 4 emergency room (AMA) c/
Examples	Bethel, Homer	mobile e.m.s. capacity with EMT trained attendants medial technologist 1 optometrist short term shelter care itinerant M.D. specialist visits

[a]South Central Health Planning and Development, Inc.

- For the onshore and offshore OCS employment, a standard of 3.5 acute care beds per 1,000 full-time equivalent workers will be used. Given the high incidence of injury in large scale construction projects and the more hazardous offshore operations such as loading and unloading supply boats and driving, the upper range of the standard for hospital beds is deemed to be warranted. In addition, the threat of fire or explosion is present with any activity involving fuels. Because of the limited capacity of Level III systems to deal with trauma and serious acute care cases, it is further assumed that a readily available transportation system designed for rapid medical evaluation will be developed. A ratio of one primary care physician per 1,500 additional residents and offshore OCS employees is also used for projection purposes.

SOCIAL SERVICES

There currently exists no formal quantitative standards for the delivery of social services. The underlying assumption is that services never equal demand that any increase in the general population will cause resultant increases in demand for most social services.

Direct delivery of social services is provided by several public private agencies (including Norton Sound Health Corporation, Bureau of Indian Affairs, State Department of Social Services, Kawerak, Nome Eskimo Community, etc.) To project social services demand the following areas will be viewed:

- Behavioral health and social services is expected to be seriously affected with any major impact. Indicators of behavioral problems will include a forecast of the incidence of alcoholism and other substance abuse, spousal and child abuse, and general cross-cultural adjustment. It is assumed that the ratio of these problems within the population with increase the greater the economic activity occuring in the close proximity to Nome.

- Employment opportunity is a serious problem in Nome. Unemployment, seasonal unemployment, and those outside the cash economy (subsistence) partial ly or totally are things to be considered. It is estimated that only fifty percent of males and 32 percent of the females are employed year around in Nome. OCS development is expected to provide no employment opportunities during the exploration; moderate seasonal opportunity during development; and just a few permanent opportunities during production. Because indirect employment will also grow by attracting new job seeking the unemployment rate will be altered as these factors interest.

- Decent housing is an important measure for the harsh subarctic climate of Nome. Energy conservation, and health status has led to greater interest in better housing. It is assumed that the overall quality of the stock will be improved during the study period due to greater affluence and housing assistance programs.

- In addition, decent housing is barred to many due to income. It is expected that the proportion of low income households using housing assistance or living in low income designated housing will increase during the study period.

FINANCIAL CAPACITY AND CAPITAL REQUIREMENTS

Techniques and standards for projecting local government revenues and expenditures has already been addressed in the section on the economy and subsequent standards developed for selected infrastructure within the community. The following assumptions are made:

- Nome will expand its legal city boundaries to include areas where oil development will occur thereby increasing its potential property tax revenues.

- Current state statutory limitations on taxation of oil and gas properties and excise tax limitations will remain constant during the study period.

- Sales tax will be calculated on the estimated amount of disposable income spent in Nome as discussed in the section on the economy.

- Increases in revenues over the base year will be assumed to be a combination of forecasted economic activity and a constant inflation factor.

- Intergovernmental revenues are expected to increase beyond the present level plus an inflation facotr. This is due to an assumed constant level of federal spending but an increasing level of state spending due *to* increased state revenues. A per capital ratio increase of state spending will be defined.

- Expenditures will be forecasted on the basis of present level of service and projected increases in services due to discussed improvements in the community's infrastructure, The improvements will be added to an increase in the base cost due to inflation. This would be required to maintain the rpesent level of service.

- Bonding requirements and subsequent debt service are expected to rise considerably as the community acquires a broden set of capital improvements not in place at the present time. General estimates of debt service will be developed from a crude analysis of the capital improvement bonds expected.

Other assumptions are noted in the population, employment and economy sections.

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The following bibliography is divided into two sections. The first section lists those references utilized to develop the Nome baseline and the second section corresponds to references for the Kotzebue baseline. Where documents provided information on both communities, they were subsequently included in both listings. The references lended themselves to a disaggregate type format and the authors felt that this was the most appropriate form of presentation.

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