The appraisal of Gates of the Arctic as of August 9, 1983, prepared for Arctic Slope Regional Corporation. August 1, 1988

Real Estate Dynamics, Inc.

[s.l.]: [s.n.], August 1, 1988

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THE APPRAISAL OF GATES OF THE ARCTIC

AS OF

AUGUST 9, 1983

PREPARED FOR

ARCTIC SLOPE REGIONAL CORPORATION

REAL ESTATE DYNAMICS, INC.

AUGUST 1988

THE APPRAISAL OF

GATES OF THE ARCTIC

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PREPARED FOR

ARCTIC SLOPE REGIONAL CORPORATION

PREPARED BY

REAL ESTATE DYNAMICS INC.

MADISON, WISCONSIN

AUGUST 1, 1988

Real Estate Dynamics, inc.

COUNSELING ECONOMIC ASSESSMENT FEASIBILITY LAND PLANNING MARKET ANALYSIS

August 1, 1988

Mr. Conrad N. Bagne, Esq.
House Counsel
Arctic Slope Regional Corporation
Box 129
Barrow, AK 99723

RE: Appraisal of 101,272 acres of surface and subsurface estate known as the "Gates of the Arctic" lands.

This letter transmits our value conclusion and property analysis of the parcel described above, documented more specifically in the attached appraisal report and accompanying appendices.

We approached the valuation process using accepted methodology as described in the report, noting that the pricing of natural land is a specialized area of valuation within the appraisal profession. In the course of our property analysis, we determined the most probable use of the subject property is as natural land for the purpose of preserving, enhancing, and managing the wilderness attributes, and providing for Native subsistence activities.

We have concluded that Market Value of the subject property as of August 9, 1983 is:

SEVENTY THREE MILLION FIVE HUNDRED THOUSAND DOLLARS

($73,500,000)

We believe that these conclusions are fully documented and supported in the attached report and accompanying appendices.

Sincerely,

Michael L. Robbins, Ph.D., CRE
President

Craig D. Hungerford, M.S.
Vice President

Enclosures

TABLE OF CONTENTS

Page

LIST OF EXHIBITS

LIST OF EXHIBITS (continued)

LIST OF EXHIBITS (continued)

LIST OF APPENDICES

I. THE APPRAISAL ASSIGNMENT

The Appraisal Issue

The purpose of this appraisal is to estimate the "Market Value" of the fee simple estate of lands owned by Arctic Slope Regional Corporation (ASRC) located within the exterior boundaries of Gates of the Arctic National Park, Alaska, as of August 9, 1983--the date when ASRC exchanged the surface estate of these lands to the United States.

The following subsections consist of historical and legal discussion concerning the context of the surface land exchange, the effect and impact of applicable legislation, the nature of the title conveyed to ASRC by the United States in the subject property, as well as the definitions of "surface" and "subsurface" as those terms are used in the Alaska Native Claims Settlement Act, Act of December 18, 1981, Pub. L. 92-203, 85 Stat. 688 (ANCSA) and the Section 7(i) Settlement Agreement. The information and definitions contained in the following "Context of Appraisal" section were supplied to the appraisers by counsel for ASRC and utilized in the appraisal process.

Context of Appraisal

On August 9, 1983, ASRC exchanged approximately 101,272 acres of "surface" within the Gates of the Arctic National Park ("the Gates Surface") for a slightly lesser amount of "subsurface" underlying the surface estate selected, or to be selected, by the Kaktovik Inupiat Corporation within the Arctic National Wildlife Refuge. ASRC attempted to structure the Kaktovik Exchange to comply with the provisions of Article II, Section 6(g) of the so-called Section 7(i) Settlement Agreement, which defines certain revenue sharing obligations as between ASRC and eleven other Native Regional Corporations created under ANCSA. Article II, Section 6(g) provides as follows:

> (g) If surface is traded for surface, or for subsurface, or for surface and subsurface, revenues from the property received in trade shall not be subject to sharing under this Agreement or Section 7(i).

Pursuant to ASRC's understanding of this section, it has not shared any of the revenues received from the subsurface. ASRC is currently engaged in an arbitration proceeding with three other Native Regional Corporations who contest ASRC's characterization of the Kaktovik Exchange, and contend (among other things) that the Exchange should be characterized as "surface plus subsurface for subsurface" under Article II, Section 6(b):

> (b) If surface plus subsurface are traded for subsurface, revenues from the subsurface received in trade, until equal to the Fair Market Value (at the time of trade) of the surface given in trade (after adjustment by an interest factor equal to the Prime Rate plus one percent (1%) to discounted value as of the time of trade), shall be received by the Corporation without sharing under this Agreement or Section 7(i), and only subsequent revenues shall be included in Gross Section 7(i) Revenues.

A goal of this assignment is to assist in the determination of credit that ASRC might be entitled to under Article II, Section 6(b) in the event that the Kaktovik Exchange is determined to be a "surface plus subsurface for subsurface" exchange.

Nature of Title Acquired by Native Corporations Under ANCSA

Title to the subject parcel was conveyed to ASRC by the United States as part of ASRC's ANCSA entitlement. The title conveyed by the United States to Alaska Native Corporations in settlement of Alaska Native land claims pursuant to ANCSA, with a few minor exceptions not relevant here, is an unrestricted fee simple estate. Although Congress restricted the alienability of stock in Native Corporations for a period of twenty years, it did not impose any limitations on the right of Native Corporations to sell, exchange, encumber, or otherwise dispose of the lands conveyed to them under ANCSA.

Effect of ANILCA on Subject Lands

Section 201(4) of the Alaska National Interest Lands Conservation Act, Act of December 2, 1980, Pub. L. No. 96-487, 94 Stat. 2371 ("ANILCA") created the Gates of the Arctic National Park, effectively surrounding ASRC's ANCSA holdings in the area. As private lands preexisting the creation of the Park, ASRC's lands were not subject to Park regulation, although the Secretary of the Interior could regulate access to ASRC's lands over federally owned Park lands.

The Secretary was required, however, to "assure adequate and feasible access for economic and other purposes to the concerned land by [the] owner or occupier and their successors in interest." ANILCA Section 1110(b). To allay fears that the United States, having created a vastly expanded system of conservation units, would then attempt to remove private or state-owned "inholdings" through the exercise of eminent domain, Section 1302 of ANILCA prohibits the Secretary from acquiring inholdings owned by the State, its political subdivisions, Alaska Native Corporations, Native Groups and individuals (with some limitations) without the consent of the owner. Pursuant to 1302(h), however, the Secretary was authorized to acquire these inholdings for the purposes of the Act by entering into voluntary exchanges either on an "equal value" basis or for other than equal value where the Secretary determines that the acquisition would be in the public interest. Lands acquired through such an exchange automatically become part of the conservation unit.

The Kaktovik Exchange was consummated as a "public interest" exchange pursuant to ANILCA Section 1302(h) and ANCSA Section 22(f), which contains a similar provision, although one not limited specifically to conservation units.

"Surface" and "Subsurface" under ANCSA and the Section 7(i) Settlement Agreement

Under ANCSA, Village Corporations receive only "surface estate." Regional Corporations receive the "subsurface estate" under Village lands. Regional Corporations may not explore, develop or remove minerals from the subsurface estate "within the boundaries of any Native village" without the consent of the Village Corporation. Depending on the circumstance, Regional Corporations may also receive full title to surface and subsurface in other lands under Section 12(c) and other sections of ANCSA. The greatest part of ASRC's lands have been conveyed as surface and subsurface estate, including the lands within the Gates of the Arctic National Park. Section 7(i) of ANCSA requires each Regional Corporation, including ASRC, to share seventy per cent (70%) of all revenues received "from the timber and subsurface estate patented to it pursuant to [ANCSA]" among the twelve resident Regional Corporations established under Section 7 of ANCSA.

The Section 7(i) Settlement Agreement further defines the ANCSA Section 7(i) sharing obligations of the Regional Corporations. The Exchange provisions at issue, Article II, Section 6, contain specific definitions of surface and subsurface for purposes of determining the Section 7(i) consequences of land exchanges. For purposes of that section, "the term 'subsurface' [is] understood to mean all Section 7(i) Resources, [and] the term 'surface' [is] understood to mean any land or interest in land . . . which is not subsurface . . . ." "Section 7(i) Resources" is defined by Article I, Section 2(5) as "timber resources . . . and resources from the subsurface estate in ANCSA Lands."

Definition of Property Interests to be Valued

The property to be appraised consists of the surface and subsurface fee estate of six separate parcels aggregating approximately 101,272 acres of land within the exterior boundaries of the Gates of the Arctic National Park, Alaska, as more specifically described in Exhibit I-1, adjusting for Native subsistence rights that include All-Terrain Vehicle (ATV) access easements retained by ASRC as part of the exchange agreement. Exhibit I-2 depicts the location of the subject parcels.

Appraisal Principles and Definitions

The definition of market value provided by the American Institute of Real Estate Appraisers (AIREA) is contained in Exhibit I-3. "Fair Market Value" is defined in Article I, Section 2(20) of the Section 7(i) Settlement Agreement as follows:

> The amount of money which an informed purchaser, willing but not obligated to buy, would pay an informed seller, willing but not obligated to sell, for particular property, goods or services. In determining the Fair Market Value of land, consideration shall be given to all uses to which the land is suited and might in reason be applied.

This definition of fair market value is consistent with, although less specific than, the AIREA definition of market value. Accordingly, where appropriate, we have referred to the more specific standards of AIREA in determining value.

EXHIBIT I-1

Legal Description

ASRC TRACT I

Sections 1, 2, 11 through 14, 23 through 26, 35 and 36, Twp. 13 S, Rge 4 W, Sections 2, 11, 13, 14, 21 through 28, and 33 through 36, Twp. 14 S, Rge 4 W, excluding N/A FF 16425, N/A FF 16309, N/A FF 16434, and N/A FF 17885B, consisting of 470 acres , more or less, Sections 19 and 25 through 36, Twp. 14, S. Rge 3 W, Sections 29 through 32, Twp. 14 S, Rge 2 W, Sections 1 through 5 and 8 through 12, Twp. 15 S, Rge 2 W, Sections 7 through 10, 13 through 18, 21 through 26, 35 and 36, Twp. 15 S, Rge 1 W, excluding N/A FF 16431 and FF 17889 consisting of 320 acres, more or less, and Sections 1 through 4, 9, 10, 15, 16, 21, 22, and 29 through 31, Twp. 15 S, Rge 1 E, all within the Umiat Meridian, Alaska, consisting of 54,163 acres, more or less.

ASRC TRACT 2

Section 4, Twp. 14 W, Rge 3 W, Umiat Meridian, Alaska, consisting of 640 acres, more or less.

ASRC TRACT 3

Sections 3 and 4 (partials), Twp. 17 S, Rge 1 W, Umiat Meridian, Alaska, consisting of 582 acres, more or less.

ASRC TRACT 4

Sections 1 through 12, 16 through 21 and 28 through 33, Twp. 16 S, Rge 2 E, Sections 1 through 3, 6, 7, 9 through 16, 18, and 19 through 30, Twp. 16 S, Rge 3 E, Sections 21 through 28 and 33 through 36, Twp. 15 S, Rge 4 E, and Sections 5 through 8, 17 and 18, Twp. 16 S, Rge 4 E, Umiat Meridian, Alaska, consisting of 43,403 acres more or less.

ASRC TRACT 5

Sections 6, 7, 18, Twp. 15 S, Rge 4 E, Umiat Meridian, Alaska, consisting of 1844 acres, more or less.

ASRC TRACT 6

Section 32, Twp. 14 S, Rge 2 E, Umiat Meridian, Alaska, consisting of 640 acres, more or less.

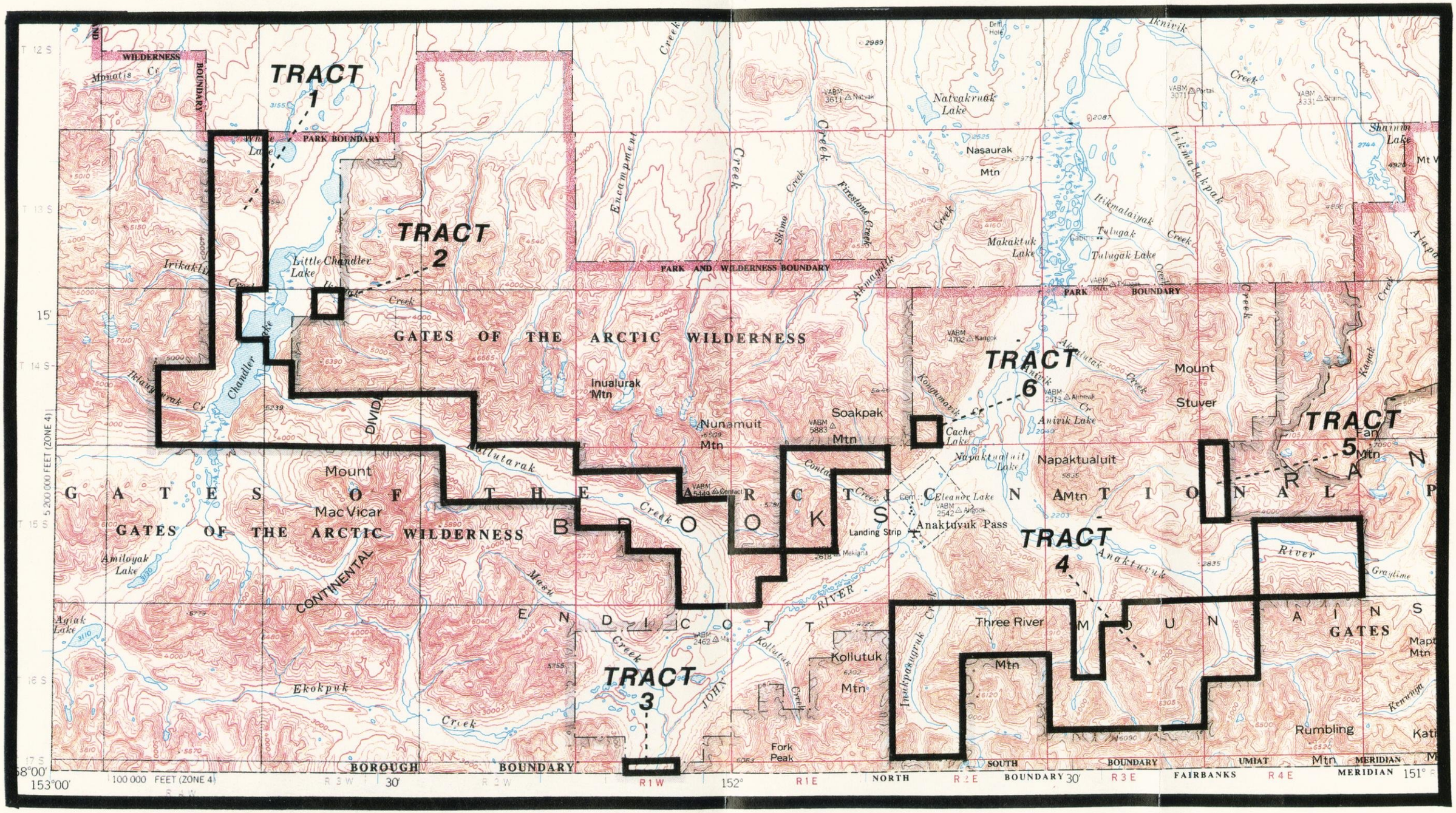
Source: Arctic Slope Regional Corporation, Kaktovik Land Exchange, Administrative Record, Sec.1, "Exchange Agreement," August 9, 1983. U.S. Department of the Interior, National Park Service Appraisal Report, Gates of the Arctic National Park/Preserve, March 1, 1983, Legal Description, p.4. Gates of the Arctic National Park/Preserve, Revision and Supplemental Appraisal Report of the March 1, 1983 Appraisal of Arctic Slope Regional Corporation Tracts 1, 2, 3, and 4, August 4, 1983. Real Estate Dynamics, Inc., 1988.

EXHIBIT I-2

Subject Parcel Map

CHANDLER LAKE

ALASKA
NORTH SLOPE BOROUGH
TOPOGRAPHIC SERIES



SCALE 1:250000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CONTOUR INTERVAL 200 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

CHANDLER LAKE, ALASKA
68150-A1-TF-250

1956

MINOR REVISION 1985

EXHIBIT I-3

Definition of Market Value

The most probable price in cash, terms equivalent to cash, or in other precisely revealed terms, for which the appraised property will sell in a competitive market under all conditions requisite to fair sale, with the buyer and seller each acting prudently, knowledgeably, and for self-interest, and assuming that neither is under undue duress.

Fundamental assumptions and conditions presumed in this definition are:

1. Buyer and seller are motivated by self-interest.
2. Buyer and seller are well informed and are acting prudently.
3. The property is exposed for a reasonable time on the open market.
4. Payment is made in cash, its equivalent, or in specified financing terms.
5. Specified financing, if any, may be the financing actually in place or on terms generally available for the property type in its locale on the effective appraisal date.
6. The effect, if any, on the amount of market value of atypical financing, services, or fees shall be clearly and precisely revealed in the appraisal report.

Source: American Institute of Real Estate Appraisers, The Appraisal of Real Estate, Eighth Edition, Chicago, IL, 1983, p. 33.

Real Estate Valuation Methodology

Critical to understanding and applying the definition of market value is the concept of both buyers and sellers having alternative choices of which both parties are knowledgeable. Ideally, the price of a transaction optimizes the self-interest of buyer and seller. The premise of choice involving alternative sites underlies the principle of substitution--a cornerstone of appraisal pricing methodology. A contemporary appraisal process moves inductively from what is known about the property to be appraised toward identification of alternative uses that might be placed on the land. These alternative uses are then ranked in terms of economic benefit, physical suitability, political acceptability, effective demand, and economic viability. This matrix of choice suggests scenarios of most probable use for the parcel that in turn suggests the nature of the most probable buyer. To estimate what the most probable buyer would pay in terms of market value, or most probable price, the appraiser must either find direct cash equivalent sales of comparable property between fully informed parties or, in the absence of current market information, the appraiser must simulate the economic logic and pricing calculus of the most probable buyer, given political constraints and available market alternatives.

Once a tentative value has been set, it must be reviewed in terms of exogenous factors such as changing interest rates, changing investor expectations about future economic scenarios, or other factors not explicitly considered in the basic pricing formula.

II. DESCRIPTION OF THE SUBJECT PROPERTY ATTRIBUTES

A Geographic Information System

A general overview of the physiographic setting of the subject property reveals its special qualities: gaunt, rugged mountains, glaciated valleys, and pristine rivers and lakes. These special qualities require special analysis techniques to effect a systematic evaluation of the diverse physiography of the subject property. The analysis technique employed involved the development of a spatial data base utilizing two separate geographic information systems.

Geographic information systems are computer software packages used to create, analyze, display and store spatial information that consists of geographically referenced, or mapped data. Data can be referenced to a specific point by latitude and longitude; meridian, township, range, and section; state plane coordinate system; or several other positioning systems.

The first spatial data source used was a natural resources data base provided by the Geographic Information System managed by the Alaska Department of Natural Resources, Division of Geological and Geophysical Surveys, Resource Analysis Section, 3601 C Street, Anchorage, Alaska.

The data base derived from this first system was then converted for use with a second geographic information system, the Spatial Analysis System (SPANS) developed by TYDAC Technologies, Inc., Suite 310, 1600 Carling Avenue, Ottawa, Ontario, Canada. The SPANS System has the added ability to perform sophisticated overlay analysis using two maps or more. This multiple map overlay capability can produce unique attribute files combining multiple sets of data, representing various combinations of physiographic site conditions.

Applying the Geographic Information System to the Evaluation Process

A keystone premise of real estate appraisal is the concept of highest and best use, or preferably most probable use, a premise that views land as a commodity and presumes the best use to maximize returns to the property owner. In determination of most probable use, the appraiser must indicate that the use proposed meets four important criteria: (1) physically possible, (2) legally permissible, (3) financially feasible, and (4) effective demand. These criteria are usually considered sequentially.

The Geographic Information System is used primarily to evaluate whether a particular use is "physically possible". Size, shape, area, and terrain affect the uses to which land may be developed. When a site's topography or subsoil conditions make utilization restrictive or costly, the site's potential future use is adversely affected. All land available for a particular use compete with one another. For example, if the cost for mineral exploration or extraction or the cost to construct is higher for the site being appraised than for typical sites in the area, the site being appraised may be unusable, or not feasible at the time of the best use determination.

The premise of physically possible is essentially a suitability evaluation concept where alternative uses are proposed by the appraiser and then evaluated. During the evaluation process, each proposed use is matched against the interplay of desirable attribute conditions and the attribute conditions existing on the subject site. For example, if the appraiser hypothesizes recreational housing as a possible use, then one of the important attributes for consideration is that of percent slope. If the ideal range of slope for recreational homesites is between 2 and 6 percent then, to the extent that slope exceeds 6 percent or is less than 2 percent, the site becomes less desirable. Thus, if the subject property has slope attribute conditions such that 80 percent of the site exceeds 50 percent slope, it would be reasonable to suggest that the hypothesis used was incompatible with conditions present on the site.

Of even greater importance is when the physical evaluation process goes beyond single-attribute evaluation and combines multiple site conditions. Going back to the recreational housing example, it is well recognized that while slope is

an important consideration, other attributes such as the engineering capabilities of the soil are also important. If the appraiser independently evaluates the site's slope condition and then the site's soil conditions and determines that 20 percent of the site is too flat, and 30 percent is too steep, and 40 percent suffers from poor soil conditions, the only way the data can be used is to plot the slope and soil conditions so that a determination can be made as to where the conditions occur in combination. Note, this type of procedure is the only way of determining whether the part of the site acceptable for use, relative to the slope attribute, is also acceptable relative to soil conditions.

Following the determination of where on the site attribute conditions occur in combination, it is generally important to rank, in some ordinal fashion, combinations of attributes that exist. To rank combinations of conditions, it is important to impose a weighted overlay process that identifies areas of the site exhibiting the worst possible combinations to the best possible combinations. Note that this process is spatial in nature in that it is identifying the areas within the site where conditions might range from very unsuitable to very suitable.

A geographic information system performs this task with extreme efficiency. Having defined a spatial unit (i.e., a square cell and its size, 40 acres), the geographic information system gives the appraiser the ability to evaluate, score, and rank each attribute condition occurring within the cell. In this way, the appraiser is freed from the tedious task of mapping and overlaying individual attributes. The geographic information system allows the appraiser to choose which attributes are important for any given proposed use, determine how each attribute is to be considered (scored), and apply a measure of its importance (weighting). The geographic information system then processes this data, evaluates each cell individually and maps the results.

For properties that are complex and extensive, such as the subject property, a geographic information system allows the appraiser to consistently and evenhandedly evaluate each spatial unit comprising the property. The application of this system also provides the appraiser the unique ability to develop alternative land use proposals and match them against each other in order to determine the best combination of possible uses that might occur on the site.

Physical Attributes

General Location

The subject property is located in North Central Alaska, north of the Arctic Circle, within the northern tier of the Endicott Mountains, part of the vast Brooks Range. The subject property lies on both sides of the Village of Anaktuvuk Pass and within the exterior boundaries of the Gates of the Arctic National Park and Preserve. The region is remote, isolated, and sparsely populated.

The subject property is located approximately 250 miles northwest of Fairbanks, 250 miles southeast of Barrow, 170 miles southwest of Prudhoe Bay and 85 miles north of Bettles. Exhibit II-1 shows the location of the subject area and surrounding region.

Regional Setting

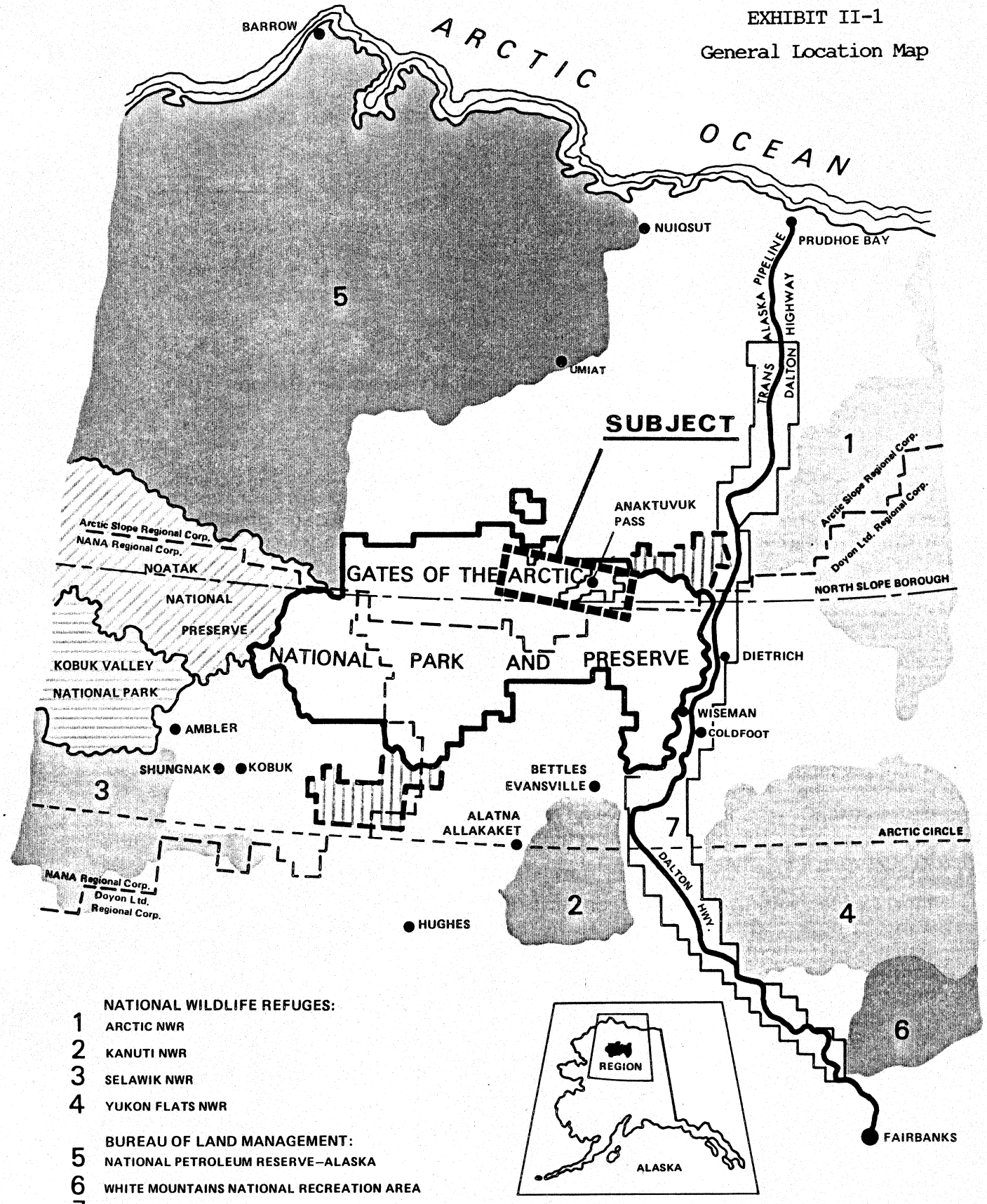
The dominant feature of the region is the Brooks Range, a northern extension of the Rocky Mountains running east and west across Northern Alaska, separating Alaska's interior from the Arctic Coastal Plain, commonly referred to as the North Slope. These steep, rugged mountains vary in elevation with most peaks ranging between 5000 and 6000 feet, and some rising over 8000 feet. The entire range is devoid of trees except for sparse, isolated pockets of trees in protected valley bottoms. The slopes are covered with mountain meadows, tundra, and bare rock fields. Vegetation consists primarily of low shrubs, grasses, and other tundra plants. The ground is permanently frozen starting from approximately one to thirty feet below the surface.

Broad, glaciated valleys wind through the mountains. Numerous rivers and streams flow in all directions from glacier cirques. Lakes are not plentiful in the Brooks Range. However, the region has a few large lakes, including Chandler Lake, located on the western edge of the subject property. Smaller lakes and ponds are distributed along the flood plains of many rivers and streams.

The climate of the Brooks Range is variable. The south side of the range is dominated by a sub-arctic climate that is characterized by great temperature

EXHIBIT II-1

General Location Map



NATIONAL WILDLIFE REFUGES:

1 ARCTIC NWR
2 KANUTI NWR
3 SELAWIK NWR
4 YUKON FLATS NWR

BUREAU OF LAND MANAGEMENT:

5 NATIONAL PETROLEUM RESERVE–ALASKA
6 WHITE MOUNTAINS NATIONAL RECREATION AREA
7 UTILITY CORRIDOR

REGIONAL CORPORATION BOUNDARY

PARK BOUNDARY

PRESERVE BOUNDARY

NORTH

0 10 20 30 40 50 MILES
0 20 40 60 80 KILOMETERS

REGION

GATES OF THE ARCTIC NATIONAL PARK AND PRESERVE
UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

185 | 20032B
DSC | SEPT 85

variations, low precipitation, and surface winds. Summer temperatures range from 32 to 85 degrees Fahrenheit and winter temperatures range from 32 to -60 degrees Fahrenheit. The north side of the Brooks Range has an arctic climate characterized by smaller variations in temperatures with much cooler summers and milder winters. Precipitation is extremely light, but snow can occur during any month of the year. Periods of very strong winds can occur on occasion throughout the year also.

Located above the Arctic Circle, the region receives at least 30 days of continuous sunlight during the summer months as the sun moves around the horizon without setting. In contrast, a maximum of approximately two hours of refracted light is received on the shortest winter days.

Subject Property Description

Each of the physical attributes of the subject property are described in greater detail below. Maps representing the physical attributes of both the subject property and surrounding area are presented at the end of this section. These maps were generated from the Alaskan spatial data base utilizing the SPANS Geographic Information System. In addition, representative photos of the subject property are presented after the maps, providing a visual description of the physical attributes included in this section.

Topography

The topography of the subject property is varied, ranging from steep, jagged mountain peaks to undulating, hilly slopes to low-lying valleys traversed by rivers, creeks, and streams, and dotted with lakes, ponds and drainage areas. Elevations range from just under 3000 feet upwards to 6300 feet. (See Subject Parcel Map, Exhibit I-3.)

Soils

Soil composition varies depending on topography, drainage, permafrost and parent material. The steep mountain slopes consist of rocky land with well drained gravelly soil above shallow bedrock. Lower elevation benches and rolling uplands are covered by a gray to brown silty loam overlaid by a peaty organic layer varying in depth. The soils in the valley areas consist of

alluvial washed sand and gravel with a thin peaty accumulation at the surface. Soils adjacent to the valley floodplains are underlain by permafrost making them highly susceptible to any kind of ground disturbance, since melting of the permafrost during the summer months can result in soil collapse.

Geology

The subject property lies within the Endicott Mountains, part of the central Brooks Range. This mountain range is characterized by rugged, glaciated, east-trending ridges that rise to elevations of 8,000 feet or more. Uplift, erosion, and heavy glaciation account for the rugged mountain profiles and U-shaped valleys.

The upland areas are underlain by sedimentary rocks consisting of Pennsylvanian and Mississippian conglomerate, shale, limestone, dolomite, and chert, as well as Devonian shale, sandstone, chert, conglomerate, limestone, dolomite, quartzite and schist. The valleys are underlain by unconsolidated glacial deposits made up of moraines, kames, kames terraces and other ice-formed features. Sand dunes and bluffs of wind-blown sediments occur along the river courses while rock fields and alluvial fans spread out from the bases of deeply cut hills and mountains.

While rock formations in the region indicate the presence of petroleum and metallic mineral deposits, the potential for significant amounts of these minerals underlying the subject property is considered low. We did not undertake any primary data analysis of the subject's mineral resource potential. However, we did contact an official at Shell Oil, which held oil and gas leases on 45,000 acres of the subject property, and he stated that there was a low probability of energy resource extraction potential in the subject area. (For reference see Bibliography, p. V.) The low potential for gas and oil underlying the subject property is also noted in the Kaktovik Land Exchange, Administrative Record, Sec. 10, "Ascertainment Evaluation Alaska Land Exchange", p. 36.

Hydrology

Surface waterways include numerous rivers, creeks and streams. The most

prominent water body is Chandler Lake, a large glacially formed lake at the western edge of the subject property. At five miles in length, it is one of the largest lakes in the northern Brooks Range. Numerous small ponds and marsh areas are scattered throughout the subject property.

The Continental Divide traverses the subject property area causing the numerous waterways to flow in every direction. Eventually, all the waterways drain into either the Colville River that flows north to the Arctic Ocean, or into the Yukon River that flows southwest to the Pacific Ocean.

Permafrost underlies most of the subject property at variable depths. A thin layer of peaty ground ranging from six inches to several feet in depth, which thaws in the summer, lies atop the permafrost. This thin mantle supports the fragile surface plant life of the Arctic, and this tight mat of plant material holds the thawing soil in place.

Ice wedges are formed when summer meltwater flows into thermal contraction cracks of the ground's surface created during the cold winter. This meltwater freezes, eventually veining the land with massive wedges of ice. These wedges are often tens of feet deep, several feet wide at the top, and separated from one another by more than 100 feet.

Alluvial deposits are the principal aquifers for ground water, which is greatly restricted by permafrost. Absorption of rainfall is also reduced by permafrost, which can result in rapid and severe flooding. Flood waters, racing down steep gradients, can cause heavy channel erosion and scouring. The resulting heavy silt deposits can cause degradation of water quality. Overall, the quality of the ground water and surface water is considered excellent. Water quality is almost totally unaffected by human use except for a portion of the John River which may show some effects from the village of Anaktuvuk Pass.

Vegetation

The major vegetation association occurring in the subject property is tundra. Alpine and moist tundra are the two primary vegetation types.

Alpine tundra occurs in mountainous areas and along well-drained rocky ridges where soils tend to be coarse, rocky, and dry. This community consists of low, mat-forming heather vegetation with plants such as moss, saxifrage and lichens. Other plants include dryas, willows, heather, grasses, sedges, and herbs. The low-growth form of most of these plants protect them from snow and sand abrasion in this windswept environment.

Moist tundra is found in the foothills and in pockets of moderately drained soils on hillsides and along river valleys. Cottongrass tussocks, 6 - 10 inches high, predominate the landscape. Tussocks form as a cottongrass clump which grows then dies back each year, accumulating dead leaves that decompose slowly in the cold temperatures. Mosses and lichens grow in the moist channels between the tussocks. Other plants include grasses, small shrubs (dwarf birch, willow, and labrador tea) and a few herbs.

The entire area is virtually treeless except for a scattered number of stunted willow thickets along watercourses.

Wildlife

Diverse wildlife is present, but species are relatively few, and their populations frequently low due to the severity of the climate. Many populations are characterized by local, seasonal or cyclic abundance. There are no known threatened or endangered wildlife species within the subject property or immediate area.

The most prominent large mammal species in the area is the Western Arctic caribou. Herds of these caribou use the valleys of the subject property as common migration routes during the spring and fall on their way to summer and wintering grounds. Dall sheep are widespread throughout the mountainous alpine areas of the property. Other mammals include the wolf, grizzly bear, moose, fox, wolverine, marmot, arctic hare, porcupine, and squirrel.

Bird species common to the area include jaegers, blue throats, rosy finches, longspurs, snow buntings, tattlers, wheatears, and gyrfalcons. Raptors include species of eagles, hawks, falcons, owls, three jaegers, and the northern shrike. Wildfowl include ducks, geese, and ptarmigan.

Fish populations are abundant, but have very low growth rates and productivity. The most widespread species is the arctic grayling found in almost all streams, and lakes that have an outlet stream. Other fish include arctic char, burbot, lake trout, northern pike, and whitefish.

Climate

Weather patterns in the Anaktuvuk Pass area consist of long severe winters and relatively short cool summers. From November to February the sun does not clear the mountain tops, creating virtually daylong darkness. During the brief summer months the sun moves around the horizon without setting. Temperatures can range from highs of over 90 degrees F to lows in excess of -50 degrees F. Freezing conditions can occur at any time during the year. Mean annual precipitation is scant, averaging only about 11 inches, but much of this falls as snow which accumulates in some instances to depths of 5 feet. Snow covers the ground for approximately nine months of the year. Rainfall is most likely to occur in autumn (particularly in August), but light showers are common throughout the rest of the summer. With the valleys acting as funnels of air, strong winds up to 60 mph and lasting several days, are not at all uncommon and can occur at any time of the year.

Physical Improvements

No improvements or permanent equipment exists on the subject property except for a few dilapidated hunting and fishing shacks scattered throughout the property.

Cultural Resources

The area around Anaktuvuk Pass, particularly the Chandler Lake and Kollutarak Creek drainages, is considered a significant cultural resource zone that offers very high potential for archeological site discovery. Traditional native subsistence activities have occurred for centuries in these areas providing an excellent opportunity for archeological investigation of the processes of cultural change and interaction in the Arctic.

Map Portfolio - Physical Attributes

A portfolio of maps representing the physical attributes of the subject property and surrounding area developed utilizing the geographic information system includes:

Photo Portfolio - Physical Attributes

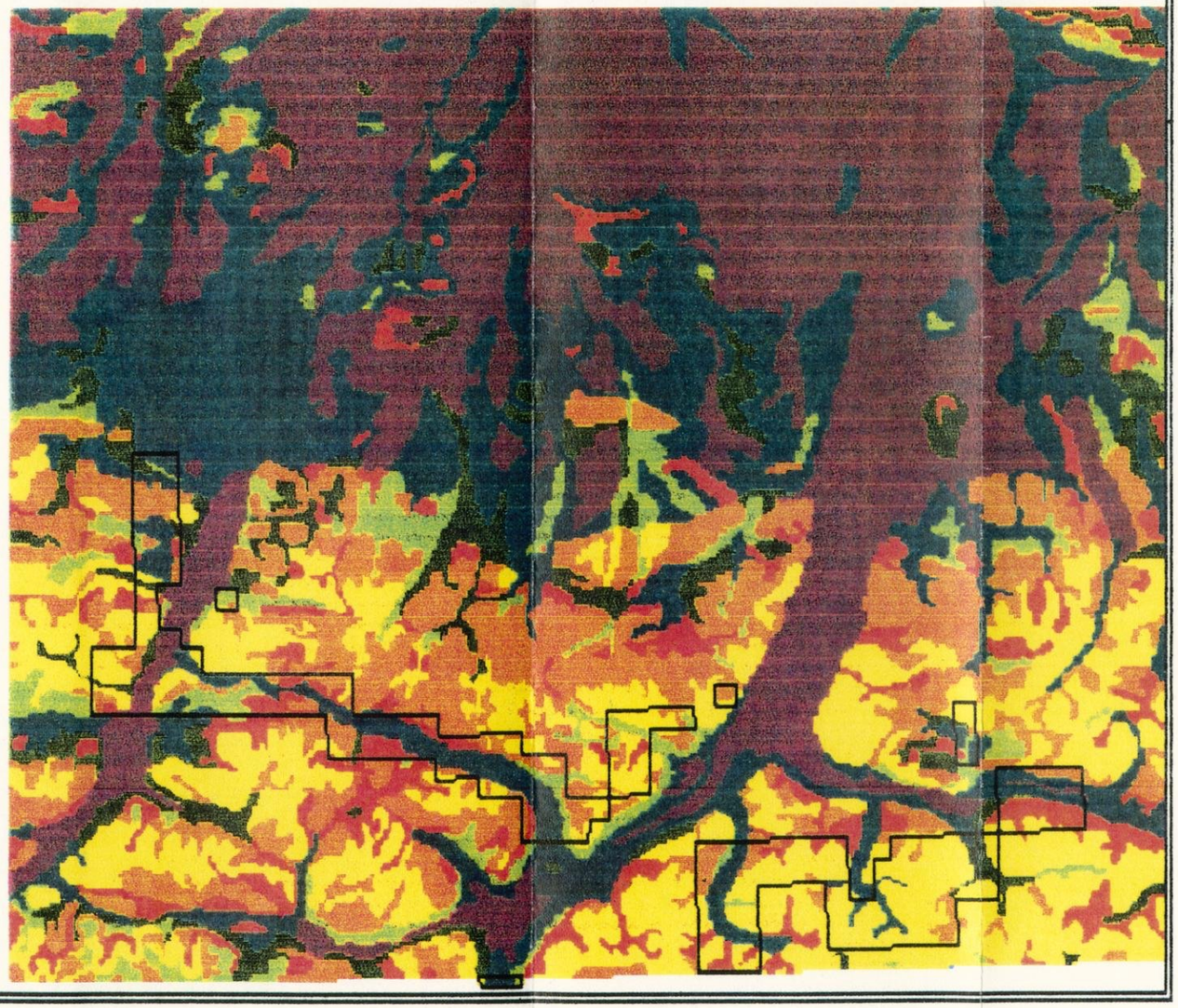
A portfolio of photos, taken at various locations on the subject property, provides a visual description of the physical attributes presented in this section.

EXHIBIT II-2

Slope Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

SLOPE



LEGEND

- 0 TO 5%
- 6 TO 10%
- 11 TO 15%
- 16 TO 20%
- 21 TO 30%
- 31 TO 50%
- 51 TO 75%
- SUBJECT

PREPARED FOR:
ARCTIC SLOPE REGIONAL CORPORATION

10 KM.

NORTH

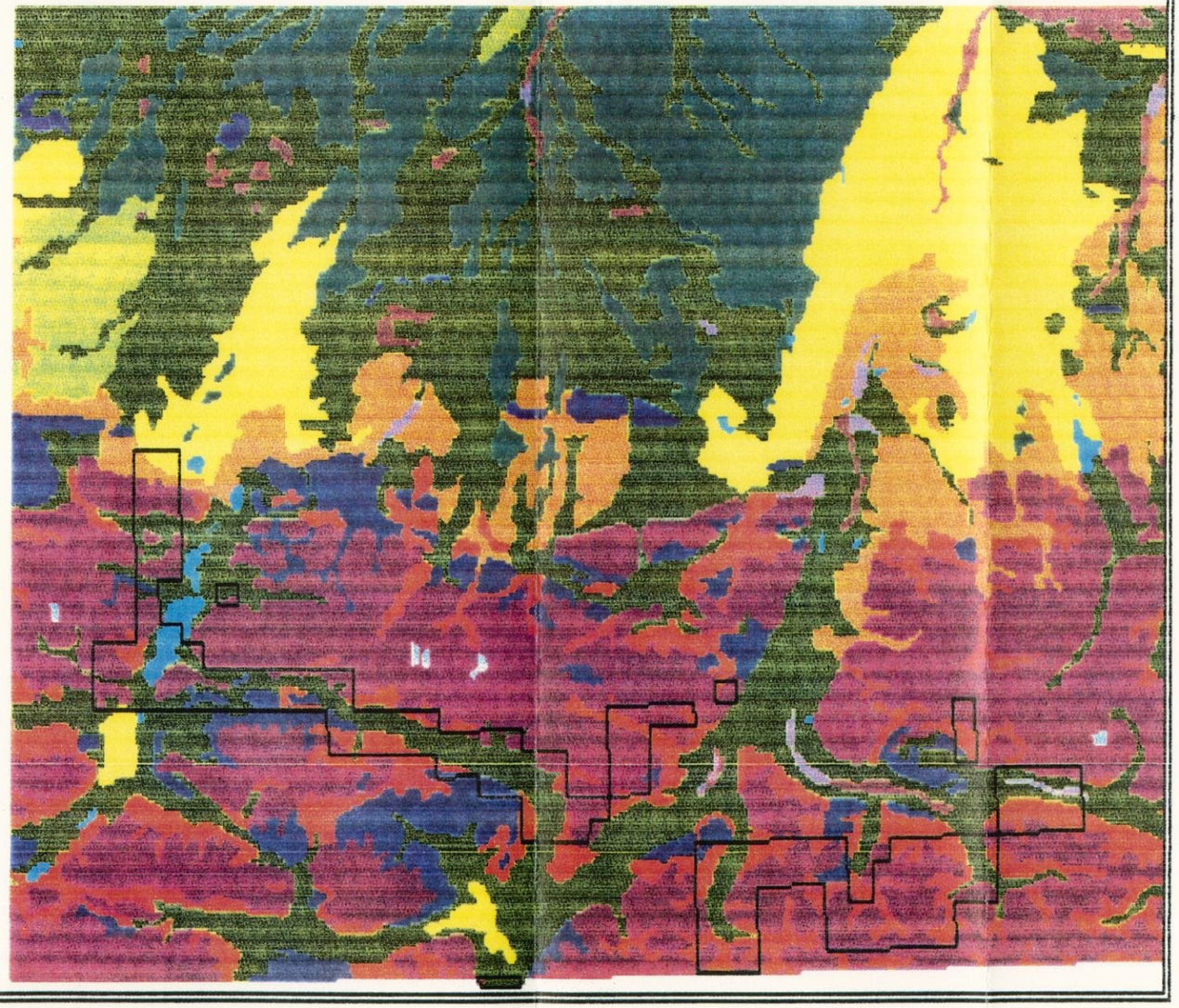
MAPID: SLOP, WIN: MA, PAL: J

EXHIBIT II-3

Primary Soils Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

PRIMARY SOILS



LEGEND

- LITHIC CRYORTHENTS
- PERGELIC CRYORTHENTS
- HISTIC PERGELIC CRYAQUEPTS
- PERGELIC CRYAQUEPTS
- PERGELIC RUPTIC-HIS. CRYAQUEPTS
- PERGELIC CRYOCHREPTS
- PERGELIC CRYAQUOLLS
- PERGELIC CRYOBOROLLS
- MIXED ALLUVIAL LAND
- ROUGH MOUNTAINOUS LAND
- GLACIERS AND PERM. SNOWFIELDS
- WATER
- URBAN LAND
- SUBJECT PROPERTY

PREPARED FOR:
ARCTIC SLOPE REGIONAL CORPORATION

10 KM.

NORTH

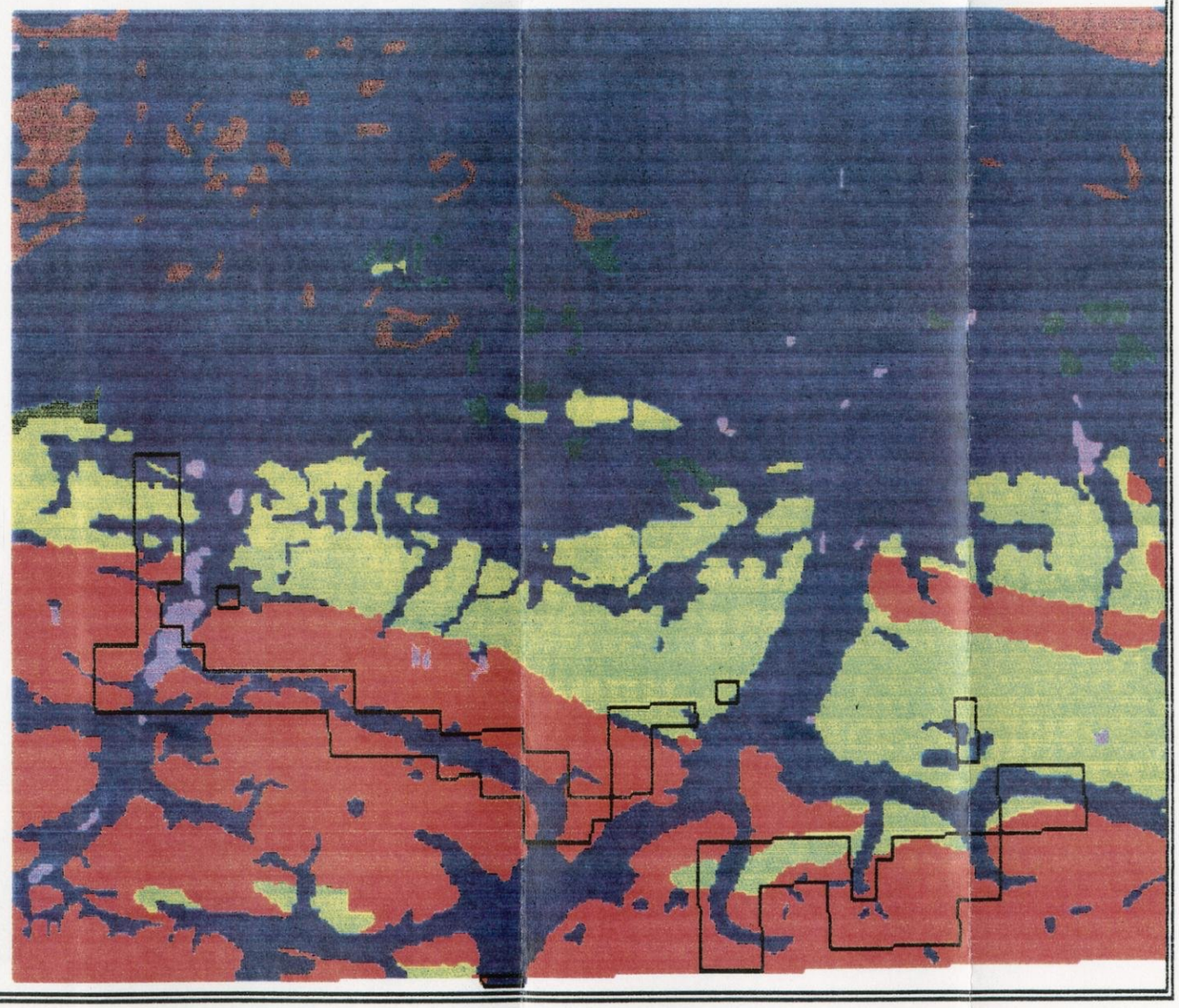
MAPID: SOLI, WIN: MA, PAL: J

EXHIBIT II-4

General Geology Units Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

GENERAL GEOLOGY UNIT



LEGEND

- SEDIMENTARY
- TERTIARY
- JURASSIC
- JURASSIC - TRIASSIC
- MESOZOIC - PALEOZOIC
- PALEOZOIC GRANITIC
- GLACIER/WATER
- SUBJECT PROPERTY

PREPARED FOR:
ARCTIC SLOPE REGIONAL CORPORATION

10 KM.

NORTH

MAPID: GNTL, WIN; MA, PAL; J

EXHIBIT II-5

Landforms Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

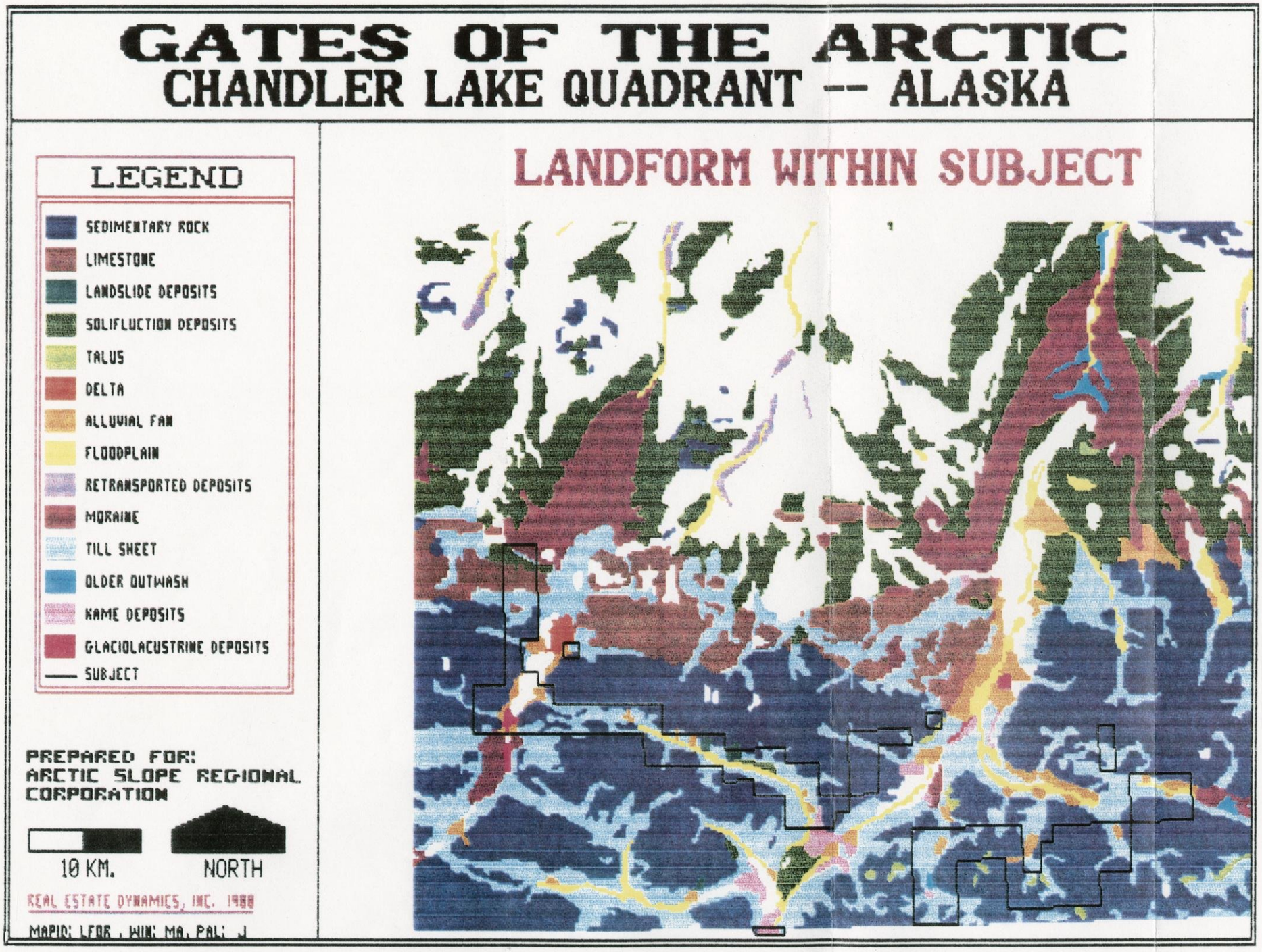
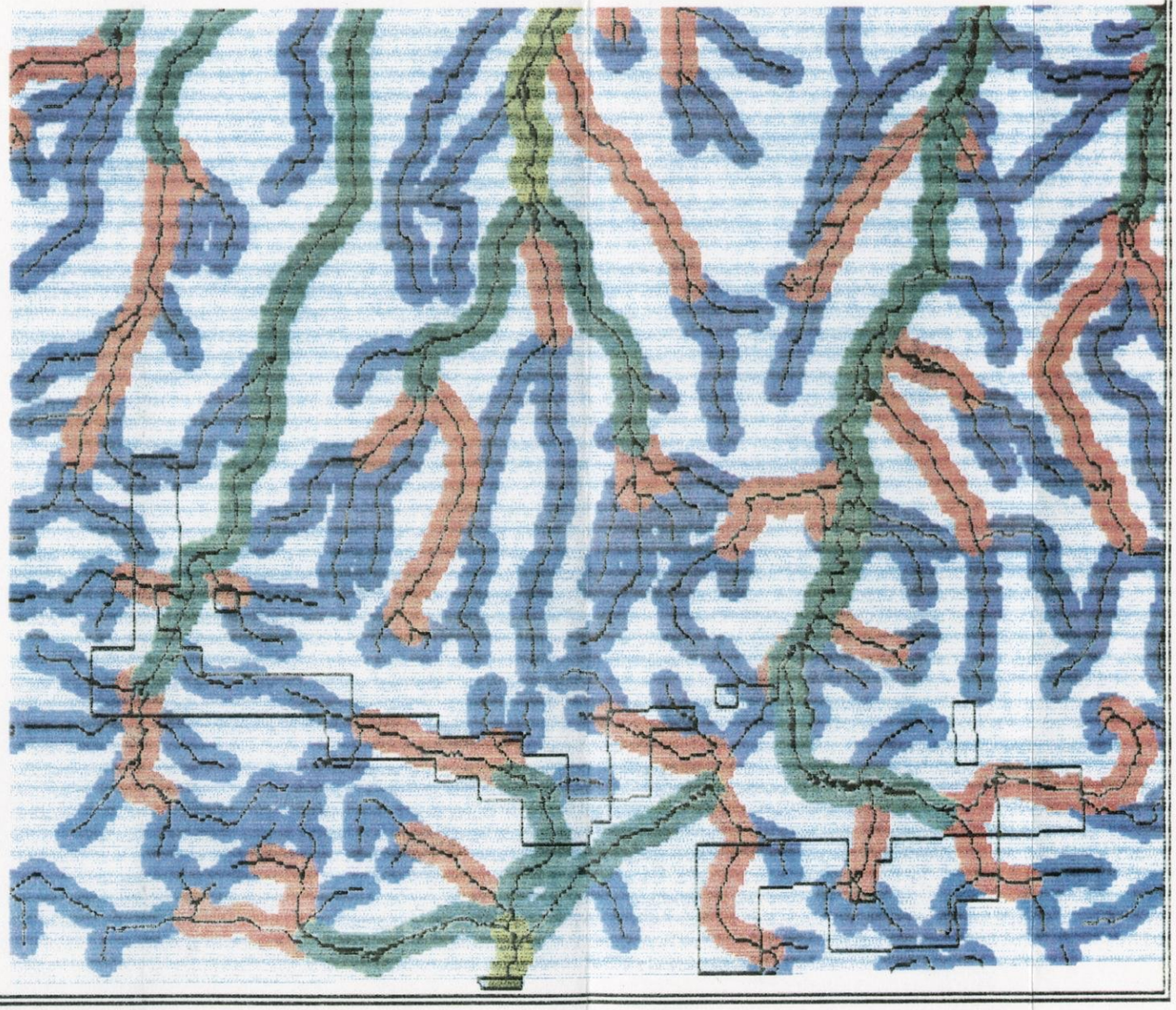


EXHIBIT II-6

Stream Order Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

STREAM ORDER



LEGEND

- FIRST ORDER STREAM
- SECOND ORDER
- THIRD ORDER
- FOURTH ORDER
- SUBJECT PROPERTY

PREPARED FOR:
ARCTIC SLOPE REGIONAL CORPORATION

10 KM.

NORTH

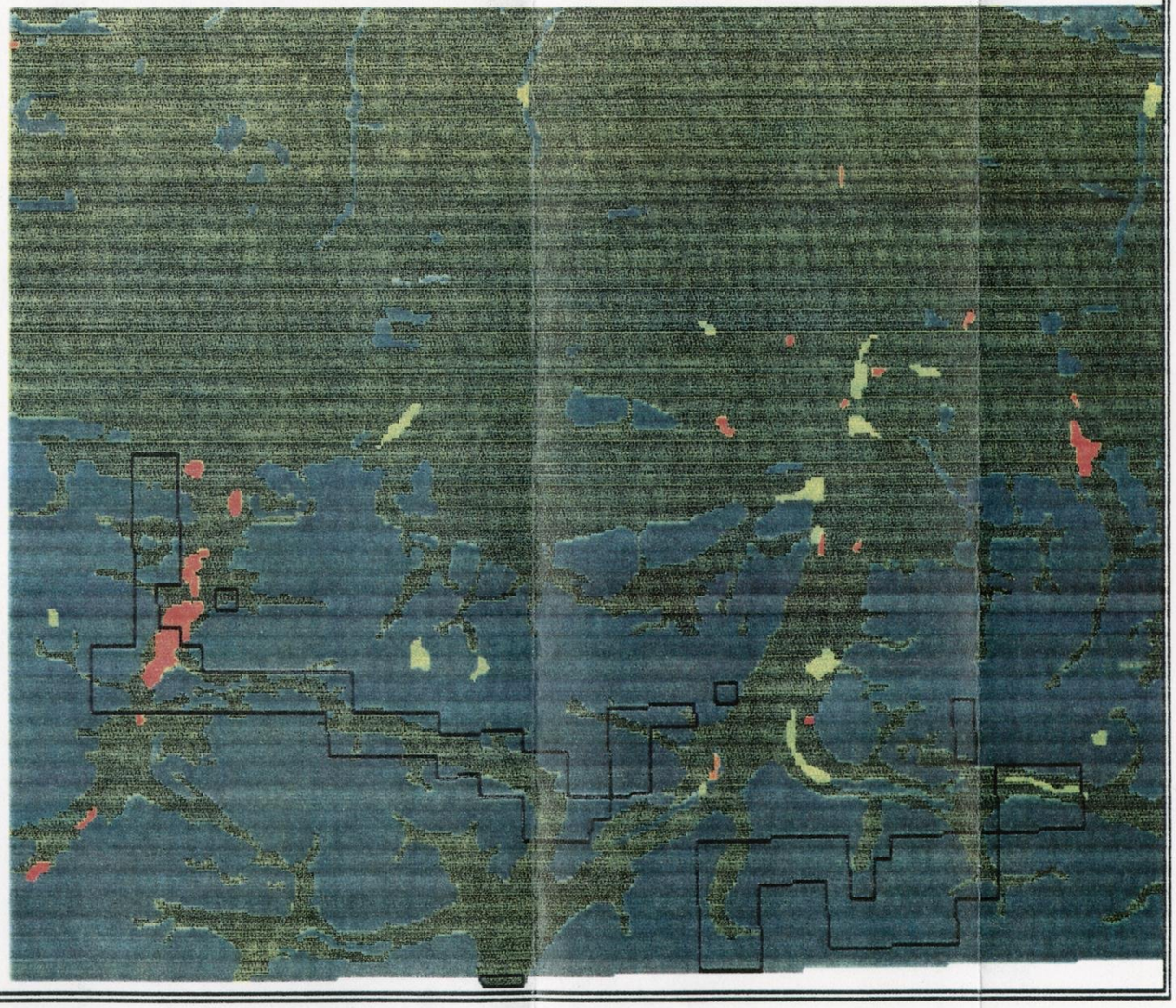
MAPIO: STOR, WIN; MA, PAL; J

EXHIBIT II-7

Primary Vegetation Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

PRIMARY VEGETATION



LEGEND

- SCRUB
- HERBACEOUS
- BARREN
- WATER
- URBAN/DISTURBED

PREPARED FOR:
ARCTIC SLOPE REGIONAL CORPORATION

10 KM.

NORTH

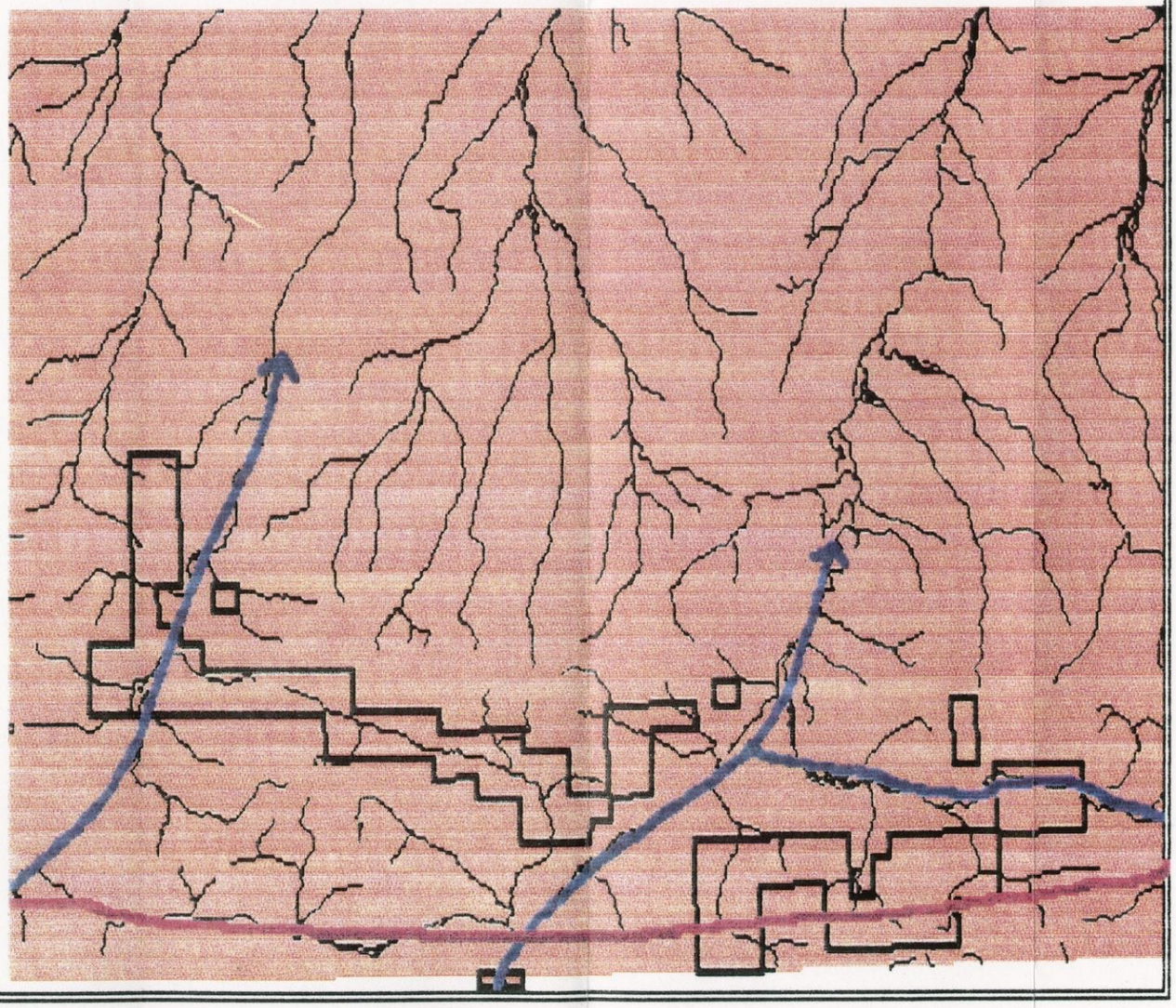
MAPID: VEGI, WIN: MA, PAL: J

EXHIBIT II-8

Caribou-Migration Routes Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

CARIBOU - MIGRATION ROUTES



LEGEND

- COMMON CARIBOU MIGRATION ROUTE
- GENERAL DIVISION - SUMMER AND WINTER RANGES
- SUBJECT PROPERTY

PREPARED FOR:
ARCTIC SLOPE REGIONAL CORPORATION

10 KM.

NORTH

REAL ESTATE DYNAMICS, INC. 1988

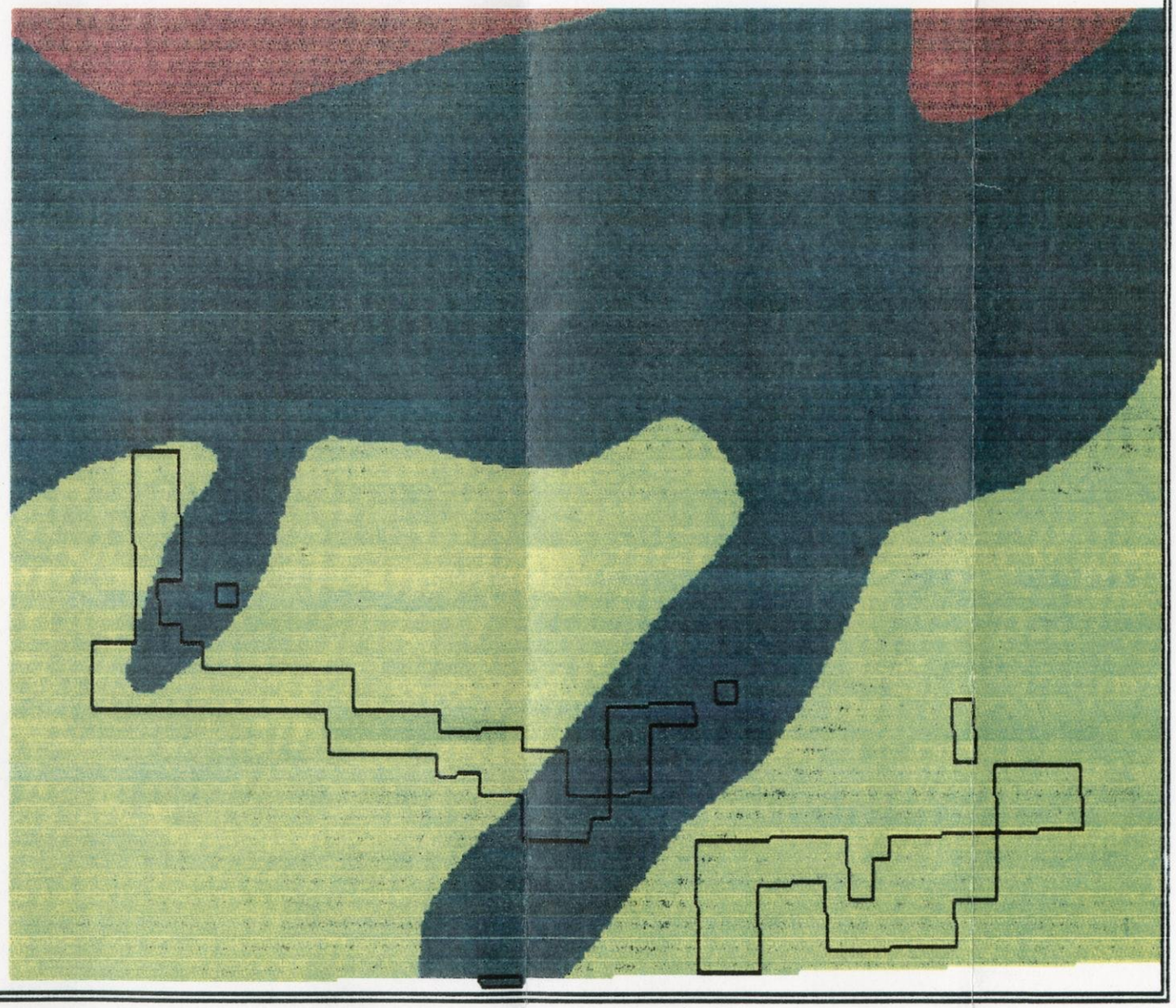
MAPID: CROW , WIN: MA, PAL: J

EXHIBIT II-9

Dall Sheep/Grizzly Bear Habitat Map

GATES OF THE ARCTIC
CHANDLER LAKE QUADRANT -- ALASKA

DALL SHEEP/GRIZZLY BEAR HABITAT



LEGEND

- DALL SHEEP HABITAT
- GRIZZLY BEAR HIGH USE AREA
- NOT A DALL SHEEP OR GRIZZLY AREA
- SUBJECT PROPERTY

PREPARED FOR:
ARCTIC SLOPE REGIONAL CORPORATION

10 KM. NORTH

REAL ESTATE DYNAMICS, INC. 1988

MAPID: DSGB , WIN: MA, PAL: J

EXHIBIT II-10

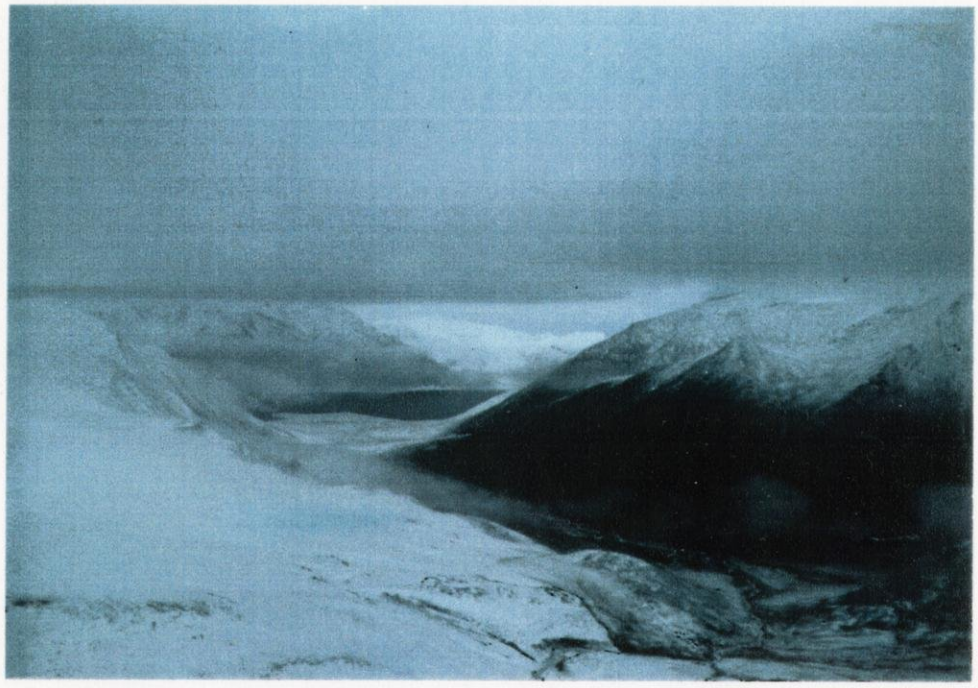
Tract 1

A. Tract 1 - Looking north from south end of Chandler Lake.

B. Tract 1 - Looking northwest towards Chandler Lake near Continental Divide.

EXHIBIT II-11

Tract 1



A. Tract 1 - Looking northwest towards Chandler Lake from Continental Divide.

B. Tract 1 - Kollutarak Creek valley looking northwest near Continental Divide.

EXHIBIT II-12

Tract 1

A. Tract 1 - Looking northwest at Kollutarak Creek valley.

B. Tract 1 - Looking northwest at mouth of Kollutarak Creek drainage.

EXHIBIT II-13

Tract 3 and Tract 4

A. Tract 3 - Looking southwest at John River valley.

B. Tract 4 - Looking southeast at mouth of Inukpasugruk Creek drainage.

Legal/Political Attributes

Defining the legal/political context of an appraisal is paramount to the discussion of most probable use. The overlay of legality takes what is physically feasible and identifies what is legally and politically compatible with the subject property and surrounding environs. This step refines the bundle of rights that will direct the valuation process.

To better understand the legal/political context of the subject property, it is important to review the sequence of events that provided the stimulus for the proposed land exchange. A chronology of the Gates of the Arctic lands, which includes the subject property, is presented in Exhibit II-14.

EXHIBIT II-14

Chronology of Gates of the Arctic Lands

1930'S Public interest in park potential of the Central Brooks Range in Alaska is traceable to writings of Robert Marshall, forester and wilderness proponent who explored there during these years.

Since this time the area became recognized as an outstanding part of the remaining wilderness in the United States, a place of remarkable beauty and ecological importance, having features not represented elsewhere in the National Park System.

1958 Alaska Statehood Act. State selects 104 million acres from total Alaska land area of 375 million acres.

1964 Wilderness Act passed by Congress.

1969-73 Legislation is repeatedly introduced to Congress requesting establishment of a 4.6 million acre two-unit Gates of the Arctic National Park (GOTA).

December 18, 1971
Congress passes Alaska Native Claims Settlement Act granting Natives $965.5 million and 44 million acres of Federal land in Alaska. Section 17(d)(2) of ANCSA authorizes Secretary of Interior to withdraw 80 million acres of land during the next two years to be studied for possible additions to National Park Service, National Wildlife Refuge, Wild and Scenic Rivers, and National Forest Service.

April 1973
Arctic Slope Regional Corporation (ASRC) submits proposal for a "Nunamiut National Park" which would include much of the area originally proposed for GOTA Park.

December 17, 1973
Selections and study findings of "d-2 lands" submitted to Congress. The selections included GOTA lands. Congress given five years to act on d-2 proposals.

1974 A 12.2 million-acre GOTA National Park proposal introduced in Congress as part of Sierra Club's omnibus National Interest Lands Preservation Act.

October 1974
GOTA National Park - Final Environmental Impact Statement published. (Draft EIS statement submitted 12/18/73.)

November 16, 1978
To avoid termination of proposed d-2 legislation the Secretary of Interior exercises authority of Federal Land Policy and Management Act (FLPMA) by withdrawing 105 million acres of Federal land (includes 80 million acres withdrawn in 1971) for 3-year period expiring 11/19/81.

EXHIBIT II-14 (continued)

Chronology of Gates of the Arctic Lands

December 1, 1978
President Carter invokes Antiquities Act withdrawing 55 million acres of Alaskan land designating them as national monuments to be administered by National Park Service, U.S. Fish and Wildlife Service, and U.S. Forest Service.

February 12, 1980
Secretary of Interior withdrew 40 million acres of Alaskan land for 20-year period under authority of FLPMA to extend original 3-year withdrawal period scheduled to expire 11/19/81.

December 2, 1980
Alaska National Interest Lands Conservation Act (ANILCA) passed by Congress and signed by President Carter. This officially established GOTA National Park (7,052,000 acres) and GOTA National Preserve (approx. 900,000 acres). Over 7 million acres of the approximate 8 million total acres were designated wilderness and six rivers as wild.

Congress, recognizing the value of Chandler Lake area (subject property lands) previously selected by ASRC under Section 11(a)(3) of ANCSA, included these lands within the exterior boundaries of GOTA Park. Section 1302 of ANILCA authorized acquisition of these lands by the Secretary of the Interior at some future date upon agreement with ASRC.

March 1, 1983
National Park Service appraisal of GOTA lands (subject property - Chandler Lake area) is submitted for the purpose of effectuating a land exchange between ASRC and National Park Service.

July 19, 1983
Village meeting held in Anaktuvuk Pass to amend proposed land exchange to include ATV and float plane access easements to be retained by ASRC on subject property lands for continued subsistence purposes.

August 9, 1983
GOTA land transfer plus easement agreement completed between ASRC and National Park Service.

January 24, 1984
ASRC reaches agreement with U.S. to exchange subsurface lands (approx. 138,240 acres) for South Walakpa Lands Lands (Barrow Gas Fields Transfer).

EXHIBIT II-14 (continued)

Chronology of Gates of the Arctic Lands

June 22, 1984
Shell Oil terminates leases with ASRC on GOTA subsurface triggering required exchange provision with NPS. Amendment to Barrow Gas Fields Transfer substitutes 69,120 acres of "in-lieu" subsurface for GOTA subsurface (101,272 acres).

July 17, 1984
Congress approves ASRC/NPS subsurface land exchange as part of Barrow Gas Field Transfer Act.

December 1984
Substitution amendment of 6/22/84 executed by ASRC and NPS.

December 1986
National Park Service publishes GOTA National Park general management plan as required by Section 1301 of ANILCA. The report contains wilderness suitability maps (dated 9/85) recommending wilderness designation for lands acquired in exchange with ASRC (subject property) except for ATV easement corridors which do not qualify.

1988-89 (?)
President will make recommendation to Congress regarding wilderness designation for additional lands not so designated by ANILCA. An environmental impact review of these lands, which includes the subject property, is currently being undertaken by the National Park Service.

Source: Real Estate Dynamics, Inc., 1988.

Government Jurisdictions

The subject property is located in the northern Brooks Mountain Range above the Arctic Circle, an area commonly referred to as the North Slope. The regional government taxing unit of this vast northern tier of Alaska is the North Slope Borough headquartered in Barrow.

Most private land ownership in remote Alaskan areas falls into unorganized boroughs and outside the incorporated cities. Outside these organized jurisdictions, no property taxes are paid. The subject property is not assessed for tax purposes. No borough taxes are paid on the subject property.

The State of Alaska maintains jurisdiction over the unorganized areas for police protection, furnishing schools, and other governmental services. Coupled with this are various services (health, education, and welfare), provided for Natives by the federal government.

Land Ownership Patterns

The federal government is the major landowner in the subject area as well as in the State. Most of this land was set aside by the federal government under the Alaska National Interest Land Conservation Act of 1980. This Act established or added to national parks, national wildlife refuges, national forests and other systems, including modification or implementation of the Alaska Native Claims Settlement Act, Alaska Statehood Act and other acts pertaining to Alaska. A number of different federal agencies manage these lands. The most prominent is the National Park Service (NPS), managing the eight million-acre Gates of the Arctic Park and Preserve that almost entirely surrounds the subject property. The U.S. Fish and Wildlife Service manages four national wildlife refuges located in close proximity to the Park. The National Petroleum Reserve-Alaska, northwest of the Park, and the trans-Alaska utility corridor to the east, are managed by the Bureau of Land Management.

The State of Alaska has major landholdings in the subject property region, but none in the immediate area. The majority of State lands lie in the mineral-rich areas north and south of the subject property, and around population centers.

The Arctic Slope Regional Corporation (ASRC), the Inupiat Eskimo-owned Corporation established pursuant to the Alaska Native Claims Settlement Act of 1971 (ANCSA), is a major landholder with strong political, cultural, subsistence, and economic interests in the North Slope region.

Prior to selection by ASRC the subject property lands were under federal ownership. ASRC selected these lands and other adjacent lands because they were traditional hunting areas for the Natives of Anaktuvuk Pass.

One of eight villages on the North Slope within ASRC's region, the Village of Anaktuvuk Pass, is located immediately adjacent to the subject property. Anaktuvuk Pass with a population of approximately 225 (1983 est.), is the permanent village site established in the late 1940's by the once-nomadic Nunamiut-Inupiat Eskimos. Village lands selected pursuant to ANCSA abut the subject property. Individual Native allotments are scattered throughout the area including six parcels located within the exterior boundaries of the subject property. The subject property is used extensively for subsistence hunting, fishing and trapping by the village Natives.

Zoning

The North Slope Borough adopted a comprehensive land use plan in 1983 designating specific land use zone districts for public and private lands within the borough. The subject property and much of the surrounding Park area is zoned primarily in the conservation district, intended to preserve the natural ecosystem for all of the various species upon which the native residents depend for subsistence. The conservation district allows for resource exploration and development on a limited scale, case-by-case basis,

but major resource development would require rezoning. The zoning ordinance is purposely permissive, intended to provide public review and input, while not being overly restrictive on development initiatives. The Village of Anaktuvuk Pass, adjacent to the subject property, is within a village district that encourages development which reinforces traditional values and lifestyles, is in accord with village planning and the desires of village residents.

Native Subsistence Use

Traditionally, the Inupiat have had a subsistence economy in which small bands of people harvested plants and animals for food and raw materials. All members shared in the system, and in this respect the Inupiat culture was communal. Contact with Western Civilization changed the nature of the Inupiat economic system. From initial exploration of the area by white men to more recent gas and oil development on the North Slope, numerous changes have occurred. Throughout these changes, the Inupiat have retained strong ties to their natural surroundings, not only to provide food and the raw materials for clothing, tools, and other items, but also to set the defining patterns of their culture--seasonally, socially, and ceremonially. Despite an ability to adopt and incorporate many elements of Western culture, technology, and economy into their lifestyle, the great majority of Inupiat still participate in subsistence activities as hunters and as sponsors and sharers of the hunt. North Slope residents have made it clear that this is both necessary and preferred for economic, social, and cultural reasons. The Eskimo economy today is a delicate balance between traditional subsistence pursuits and employment in a cash-oriented setting. Local peoples use cash to enhance their subsistence lifestyle, creating a hybrid economy unlike any outside Alaska.

Native people believe that without traditional ties to nature their social and economic patterns would have no basis. The use of wildlife for subsistence makes it necessary for the Natives to live in small villages. The area around larger villages may become overhunted, forcing residents to range farther and farther in search of wildlife and other subsistence resources. Preservation of subsistence resources and access to them are of the highest priority to the Natives.

Access to Park lands for subsistence purposes is guaranteed by ANILCA Title VIII. (See Exhibit II-15.) Continued use of Park lands for subsistence purposes is part of a cooperative agreement between the NPS and Natives. Customary and traditional subsistence use consistent with sound management principles and not threatening to the purposes for which the Park was established is permitted on Park lands. Failure on the part of the Natives to abide by the terms of this cooperative agreement would prove detrimental to the economic and cultural survival of the local village. A subsistence resources commission for Gates of the Arctic Park, with input from local and regional subsistence councils, has implemented and now monitors a management program for subsistence hunting within the Park. In the context of this particular land use, the objectives of the NPS and Natives are compatible.

Changing technology and Western influence have promoted the use of All-Terrain Vehicles (ATVs) for subsistence hunting. ANILCA limits the type of motorized vehicles used on public lands. (See Exhibit II-16.) To guarantee future subsistence access for the Village Natives using ATVs, ASRC entered into an agreement with the NPS on August 5, 1983, establishing special easements on the subject property. (See Exhibit II-17 and Exhibit II-18.) The objective of the ATV access easement agreement was to allow ATV use for subsistence purposes, but to also manage their use as to not cause substantial harm to the terrain. In conversation with NPS management personnel, they indicated that the level of ATV use on the subject property in 1983 was minimal (4-5 trips per year to Chandler Lake). The level of ATV use in 1983 posed no significant threat to the environmental integrity of the subject property.

EXHIBIT II-15

Subsistence Access

Sec. 811. (a) The Secretary shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on public lands.

(b) Notwithstanding any other provision of this Act or other law, the Secretary shall permit on the public lands appropriate use for subsistence purposes of snowmobiles, motorboats, and other means of surface transportation traditionally employed for such purposes by local residents, subject to reasonable regulation.

Source: ANILCA, 16 USC 3121.

EXHIBIT II-16

Special Access and Access to Inholdings

Sec. 1110. (a) Notwithstanding any other provision of this Act or other law, the Secretary shall permit, on conservation system units, national recreation areas, and national conservation areas, and those public lands designated as wilderness study, the use of snowmachines (during periods of adequate snow cover, or frozen river conditions in the case of wild and scenic rivers), motorboats, airplanes, and nonmotorized surface transportation methods for traditional activities (where such activities are permitted by this Act or other law) and for travel to and from villages and homesites. Such use shall be subject to reasonable regulations by the Secretary to protect the natural and other values of the conservation system units, national recreation areas, and national conservation areas, and shall not be prohibited unless, after notice and hearing in the vicinity of the affected unit or area, the Secretary finds that such use would be detrimental to the resource values of the unit or area. Nothing in this section shall be construed as prohibiting the use of other methods of transportation for such travel and activities on conservation system lands where such use is permitted by this Act or other law.

Source: ANILCA, 16 USC 3170.

EXHIBIT II-17

ATV/Float Plane Access Easement

Amendment to GOTA Exchange

The residents of Anaktuvuk Pass, as well as the North Slope Borough and the State of Alaska have expressed their concern that National Park Service regulations might restrict the use of road vehicles and float planes used for access to Chandler Lake and other subsistence hunting areas following the exchange. As a result of a village meeting held in Anaktuvuk Pass on July 19, 1983, the proposed agreement was amended to provide that access easements for off road vehicles and float and ski plane landing at Chandler Lake would be provided to local rural residents who permanently reside in Anaktuvuk Pass. In addition, an access easement shall be retained by ASRC for continued aircraft take-off and landings on Chandler Lake.

Source: U.S. Fish and Wildlife Service, U.S. National Park Service, "Subsistence Evaluation, Proposed Chandler Lake Exchange," Kaktovik Land Exchange, Administrative Record, Sec.10, p.62.

EXHIBIT II-18

Easement Agreement Between Arctic Slope Regional

Corporation and the United States of America

The easements described below: (i) are solely for access by Arctic Slope Regional Corporation, its shareholders and invitees to lands, or interests therein, owned by Arctic Slope Regional Corporation or for subsistence uses. . .and shall not be deemed to increase the burden upon the above-granted lands. . .(iv) shall remain as an unimproved trail and shall not be used by any vehicle that causes substantial harm to the terrain, provided, however, that off road vehicles as defined in 36 C.F.R. S13.1(1), 46 Fed. Reg. 31854 (June 17, 1981), other than those having metal lug tracks, or those exceeding a gross weight of 2,000 pounds or an empty vehicle weight of 1,200 pounds, may use the easements. . .

Source: Arctic Slope Regional Corporation, United States of America, "Agreement Between ASRC and United States of America of August 9, 1983," Kaktovik Land Exchange, Administrative Record, Sec. 1, Warranty Deed (dated August 5, 1983), p.2.

National Park Service Land Protection Plan

The NPS has developed very clear objectives for managing Gates of the Arctic Park which include: maintain the wild undeveloped character of the area, protect nationally significant natural resources, provide recreation opportunities, facilitate public access, eliminate private inholdings and consolidate federal lands. As private inholdings within the exterior boundaries of the Park, the subject property is exposed to additional political and legal pressures regarding its land use. The NPS is charged with protecting the wilderness values of the Park and Preserve from potentially damaging activities on nonfederal lands. A number of alternative methods are available to insure protection of these lands. These include:

1. Agreements - legal instruments defining administrative arrangements among two or more parties, usually an exchange of services or other benefits.
2. Alaska Land Bank - provides for agreements with private owners of land conveyed under ANCSA to manage their lands consistent with Park purposes in exchange for certain property tax exemptions and corporate liabilities, and technical land management assistance.
3. Coordination with other agencies - ensures that actions of other federal and local agencies to permit, license, or provide financial assistance do not have adverse impacts on Park resources.
4. State Land Classification and Zoning - the state government and local jurisdictions have the power to protect public health, safety, and welfare by regulating land use through zoning. Land use classifications establish primary uses for effective management of state lands that are not specifically designated.
5. Regulations - state and federal environmental protection laws that apply to activities and developments on nonfederal lands in the Park and Preserve.
6. Less-than-Fee-Acquisition - conveyance of only specified rights from one owner to another (e.g., easements, mineral interests).
7. Fee Acquisition - all the interests in a parcel of land are acquired (i.e., fee simple ownership). Methods of acquisition include donation, exchange, purchase, relinquishment, and eminent domain.
8. Combination - of above alternatives could be used to obtain the minimum interest to achieve Park purposes.

The NPS-recommended methods for acquisition and/or control of private lands within the Park are the use of agreements and exchanges. These methods prove the most politically compatible and cost-effective.

Federal Land Exchange Authority

ANCSA Section 22(f), as amended, provides legislative authority permitting land exchanges between village and regional corporations and the federal government to consolidate land, or to facilitate better land management or development of the land. Likewise, ANILCA provides a similar exchange provision as outlined in Section 1302(h) (Exhibit II-19). Section 1302(h) authorizes the Interior Secretary to exchange federal lands to acquire lands for the purpose of the Act.

Subsurface Lease

At the time of the land exchange, Shell Oil held subsurface oil and gas leases (since 1981) on approximately 45,000 acres of the subject property, part of a 1.3 million acre selection agreement entered into with ASRC in 1978. These leases had a primary term through 1991, but were terminated by Shell Oil in 1984. Hard rock activity was not permitted in the lease agreement. No other mining claims exist on the property. Sand and gravel excavation is permitted for use by the village. All revenues received by ASRC from subsurface activities must be shared with other regional corporations under ANCSA Section 7(i) (Exhibit II-20).

EXHIBIT II-19

Federal Land Exchange Authority

ANCSA Section 22(f)

(f) The Secretary, the Secretary of Defense, and the Secretary of Agriculture are authorized to exchange any lands or interests therein in Alaska under their jurisdiction for lands or interests therein of the Village Corporations, Regional Corporations, individuals, or the State for the purpose of effecting land consolidations or to facilitate the management or development of the land. Exchanges shall be on the basis of equal value, and either party to the exchange may pay or accept cash in order to equalize the value of the properties exchanged.

ANILCA Section 1302(h)

(h) Exchange Authority. - Notwithstanding any other provision of law, in acquiring lands for the purposes of this Act, the Secretary is authorized to exchange lands (including lands within conservation system units and within the National Forest System) or interests therein (including Native selection rights) with the corporations organized by the Native Groups, Village Corporations, Regional Corporations, and the Urban Corporations, and other municipalities and corporations or individuals, the State (acting free of the restrictions of section 6(i) of the Alaska Statehood Act), or any Federal agency. Exchanges shall be on the basis of equal value, and either party to the exchange may pay or accept cash in order to equalize the value of the property exchanged, except that if the parties agree to an exchange and the Secretary determines it is in the public interest, such exchanges may be made for other than equal value.

(i)(1) The Secretary is authorized to acquire by donation or exchange, lands (A) which are contiguous to any conservation system unit established or expanded by this Act, and (B) which are owned or validly selected by the State of Alaska.

(2) Any such lands so acquired shall become a part of such conservation system unit.

EXHIBIT II-20

Resource Revenue Sharing

(i) Seventy per centum of all revenues received by each Regional Corporation from the timber resources and subsurface estate patented to it pursuant to this Act shall be divided annually by the Regional Corporation among all twelve Regional Corporations organized pursuant to this section according to the number of Natives enrolled in each region pursuant to section 5. The provisions of this subsection shall not apply to the thirteenth Regional Corporation if organized pursuant to subsection (c) hereof.

Source: ANCSA, sec. 7(i), December 18, 1971.

Linkage Attributes

Linkage attributes are the relationships of the site to its immediate environs, activity centers, and surrounding region. The physical environment and remote location of the subject property are the determining factors limiting accessibility to adjacent lands and areas outside the region.

Air Access

Primary access to the area is by air. A small gravelled landing strip is located at Anaktuvuk Pass. Regularly scheduled flights into Anaktuvuk Pass are available from Fairbanks via Bettles. Additional connections can be made north to Barrow and Prudhoe Bay. Aircraft may be chartered from Fairbanks or Bettles. Float plane access is available to the western end of the subject property on Chandler Lake, used primarily for subsistence hunting and fishing, but also for recreational activities.

Most recreational users of Gates of the Arctic Park gain access by light aircraft. Visitors tend to concentrate in areas that provide easily traversable valley bottoms, at aircraft landing sites and primary campsites. This has made Anaktuvuk Pass one of the most popular recreational access points for visitors to the Park. Upon arriving by air, visitors access areas of the Park by hiking or skiing across the subject property lands. The level of visitor use is primarily influenced by the cost of transportation to the Park. The higher cost of airfare necessary to access the Park influences the type and number of users who can afford a trip to this area.

Roads/Trails/Easements

No permanent roads exist on the subject property or adjacent Park lands. Land travel is limited to foot trails, snowmachines, ATVs, and to a lesser extent, dogsleds. The Dalton Highway is a new major source of access into the Brooks Range region, yet it lies approximately 60 miles east of the subject property with no connecting road access. A winter trail up the John River Valley links Anaktuvuk Pass with Umiat to the north and Bettles to the south. This winter trail was constructed from Fairbanks to Umiat in 1968 as a first step in providing transportation to the Arctic Slope and its oil

prospects. This route was abandoned as a potential transportation corridor in favor of the pipeline corridor (Dalton Highway) constructed farther east. This winter trail is now a derelict and partially water-filled scar used by local people as a snowmachine or sled trail. The State of Alaska claims this corridor as a potential transportation/utility right-of-way that may be valid under RS 2477. Originally proposed as the Hickel Highway, disputed rights to this corridor were retained by the State for future needs. Should there be new oil, gas or mining operations on the Arctic Slope farther west from Prudhoe Bay requiring an additional transportation and utility corridor, the John Valley might be considered, despite the less-than-optimum engineering conditions and disruption of wildlife. Any road construction or reconstruction along this route would require special justification and a study of alternatives given the fact that it runs through Gates of the Arctic Park. The ATV, a type of off-road vehicle used to travel overland when there is no snow on the ground, has come into more widespread use by the people of Anaktuvuk Pass. Their use is confined to designated easements which run along streambeds and valley floors of the subject property providing access for subsistence harvesting .

Waterways

Most area rivers, streams, and creeks tend to be shallow, preventing access by motorboat, but recreational access and travel using rafts, canoes and kayaks are feasible in certain areas. The NPS prohibits use of motorboats in the Park other than for subsistence purposes, access to private property, and travel to and from villages and homesites. Motorboats are not used on Chandler Lake.

Utilities

No electric or gas utility lines exist on the subject property or in the immediate area. Electrical power is generated in the Village of Anaktuvuk Pass with no extensions to outlying areas.

Economic Impacts of Linkages on Land Use

Due to the limited access and remote location of the subject property, movement of goods and people in and out of the Anaktuvuk Pass area is difficult and costly. These factors have dictated land use patterns in the past and will be the primary determinants of land use in the future. Native reliance on subsistence harvesting is a matter of historical and cultural tradition, a practice that has changed only moderately despite the introduction of Western culture. The cost savings on food and other materials gained from subsistence harvesting supplants the need to ship these items in by air at a much higher cost. Subsistence harvesting remains a cost-effective means to meet daily needs in an area having few alternative economic opportunities.

Future commercial development of the area is unlikely due primarily to its limited accessibility. The necessary movement of bulk goods by air makes the cost of shipping building materials and equipment very expensive. The extraction and transport of potential resources such as oil and gas, sand and gravel or other hard rock minerals, is economically unfeasible at this time because of access problems and prohibitive transportation costs. In addition, the apparent minimal supply of oil, gas, and hard rock minerals, and the limited demand for sand and gravel, would not justify the development costs that would be incurred.

Dynamic Attributes

Dynamic attributes characterize how people perceive a particular property, it's desirability and utility, and the value they attach to the presence of certain attributes. The appraisal process attempts to determine whether the landowner and potential buyers recognize these special attributes and, if so, what value they ascribe to them.

Dynamic Setting

The subject property is located within the exterior boundaries of Gates of the Arctic National Park and Preserve, containing over 8 million acres of land, of which over 7 million acres are designated Wilderness. Within the broad spectrum of resources and opportunities reserved in national parks, only Gates

of the Arctic was established with such strong emphasis on wilderness purposes. The subject property could not be designated Wilderness when the Park and Preserve was established by ANILCA because they were nonfederal lands. ASRC had selected these lands as part of ANCSA, areas traditionally used by the once-nomadic Nunamiut-Inupiat Eskimos of Anaktuvuk Pass for subsistence hunting and fishing. These areas are still the primary source for subsistence harvesting by the Village Natives.

In establishing Gates of the Arctic, Congress reserved a vast and essentially untouched area of superlative beauty and exceptional scientific value--a maze of glaciated valleys and gaunt, rugged mountains covered with boreal forest and arctic tundra vegetation, cut by wild rivers and inhabited by far-ranging populations of caribou, Dall sheep, wolves, and grizzly bears, and a variety of fish and fowl. Congress recognized a special value of the Park and Preserve to be its wild and undeveloped character and the opportunities it affords for solitude and wilderness travel and adventure. The area is recognized as an outstanding part of the largest and greatest remaining wilderness in North America.

Subject Property Characteristics

The subject property has wilderness qualities similar to, if not greater than, those lands already designated as such in the Park. The value of the subject property has long been recognized by the National Park Service (NPS), and is the primary reason for including these lands within the exterior boundaries of the Park, despite their being private inholdings.

These lands encompass mountainous terrain which provides critical watershed protection for three major Park rivers, the Chandler, John and Anaktuvuk Rivers. The subject property includes a small segment of the John River which is designated a wild river in the National Wild and Scenic River System. The Anaktuvuk River and Kollutarak Creek are major hiking valleys through the subject property providing access for visitors to other areas of the Park. These corridors also protect critical wildlife populations, serving as major migration routes for the Western Arctic caribou herd. Chandler Lake is a spectacular mountain-rimmed lake, one of only eight major glacially formed lakes located in the northern foothills of the Brooks Range. The lake provides

an essential corridor for Park visitors, including hikers, campers, and fishermen, to the northcentral and northwestern reaches of the Park, which have few access points. At five miles in length, the lake is one of the largest in the northern Brooks Range, and provides critical float plane access to this region of the Park. The Chandler Lake and Kollutarak Creek drainages fall within a significant cultural resource zone which offers very high potential for archeological site discovery. Other major considerations of the NPS include acquisition of private inholdings in the Park in order to consolidate federal landholdings, improve Park management and provide a better means to protect Park resources.

NPS Acquisition Authority

In creating the ANILCA legislation Congress recognized that development of private or State-owned property within conservation inholdings could be highly detrimental to the purposes for which they were created. Accordingly, Congress gave the Secretary of the Interior sweeping authority to enter into exchanges for the purposes of acquiring inholdings as provided in ANILCA Section 1302(h). This legislation provided the means for the NPS to acquire, with the owners' consent, lands which were not available to the NPS at the time of withdrawal of lands for inclusion in the conservation units established by ANILCA.

Multiple Property Uses

In addition to the subject property being valued for its wilderness values by the NPS and subsistence benefits by the Natives, these lands are used for recreation access to other areas of the Park by visitors who arrive by airplane in Anaktuvuk Pass. Recreation activitities include river float or canoe trips, backpacking, mountaineering, wildlife viewing, photography, and fishing. Trapping and sport hunting occur in the two preserve units. Winter recreational activities include cross-country skiing, snowshoeing, and dog sledding. These lands are also considered valuable for research because of their unique biological and ecological composition, and the archeological significance of the area. The potential for gas and oil is considered low, but at the time of the surface land exchange Shell Oil held oil and gas lease rights to 45,000 acres underlying the subject property. No attempt was made by Shell Oil to explore or develop the resource potential of these lands.

Dynamic Setting Summary

It is evident that the subject property is important to different groups for different reasons. The NPS desires to acquire these lands to eliminate private inholdings within the Park and protect its valuable resources. The Natives want to insure the access and availability of the subsistence resources found on the property that they have had for thousands of years. ASRC aims to protect the subsistence lifestyle of the Natives, but is also responsible to its shareholders to seek economic opportunity from the lands it selected under ANCSA. Revenues derived from energy exploration, mineral extraction, or commercial development provide the means for tapping the economic potential of the land. Conflicts arise regarding the appropriate use of the land when these type commercial use run counter to the wilderness management objectives of the NPS and subsistence needs of the Natives.

Environmental Attributes

An important component of the subject property analysis is to determine whether environmental conditions exist, both on and off the property, that would preclude use types on the property.

Environmental Setting

The subject property is a very remote, isolated, barren, rugged, and harsh environment, but it is also ecologically diverse and bountiful, uniquely beautiful, pristine, sensitive and fragile. These characteristics limit the utility of the property yet make it a most valuable resource. Understanding this environmental dichotomy is the basis for determining possible uses of the property.

The management objectives for the surrounding Gates of the Arctic Park are quite explicit. The Park was set aside for wilderness preservation, to maintain the integrity of its wilderness qualities. In addition, the Park is to accommodate recreational activities of visitors as well as permit access for subsistence use by the Natives.

Land Use Impacts on the Environment

The tundra surface of the subject property is very sensitive to human impacts such as vehicle access, building activities, mineral extraction, or any activity that would disturb the surface layer or underlying permafrost. Besides scarring of the landscape, additional threats to the environment include deterioration of water and air quality. Adverse human impacts could alter wildlife migration patterns, which would threaten the subsistence lifestyle of the natives. Degradation of the environment runs counter to the purposes of the surrounding Park and lessens the wilderness experience of the visitor.

While the potential for gas and oil is considered low, any consideration of exploration and extraction could have tremendous impacts on the environment. Heavy equipment would be needed for extraction and shipment of the product to market. Likewise, sand and gravel extraction would permanently alter the landscape. These types of use would negatively impact all other possible uses of the property including wilderness, recreation, and subsistence use.

The impacts of various transportation modes have also been noted. The overuse and improper use of snowmachines, ATVs, and aircraft can degrade the fragile environment. Repeated passes by an ATV, or a snowmachine without adequate snowcover, can cause vegetative damage and soil disturbance. Single passes over extended periods of time have little impact. As previously mentioned, the level of ATV use on the subject property in 1983 was minimal and did not negatively impact the environmental integrity of the subject property.

Diverse wildlife is present, but species are relatively few, and their populations are frequently low due to the severity of the climate. Currently, there are no known threatened or endangered species found on the subject property.

Subsistence harvesting takes place at various times of the year. Fall and winter are the time of greatest travel and resource use, as frozen waterways and snow cover allow use of snowmachines for hunting. Caribou are taken in the spring and fall as they migrate through the Anaktuvuk Pass area on their way to summer and wintering grounds. Caribou hides are used for the commercial manufacture of the well-known Anaktuvuk skin masks. Dall sheep are hunted year

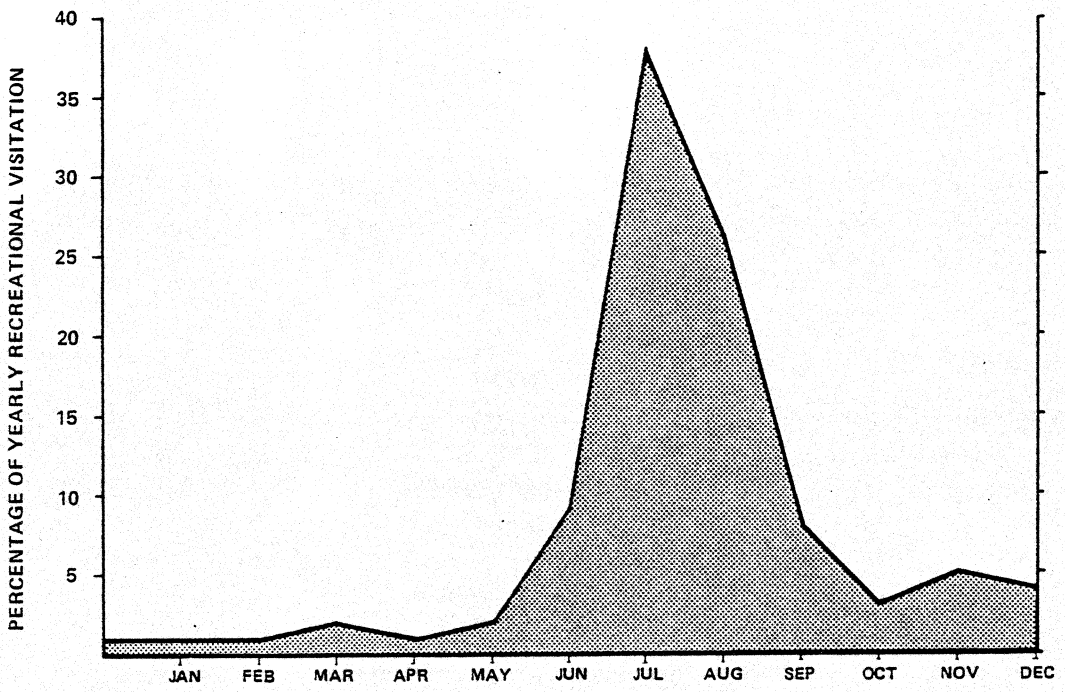
round but traditionally in the fall and winter when caribou are scarce. A registration hunt for sheep in GOTA Park was established with the village in 1981. Wolves are hunted from snowmachines during the winter months; their furs provide an income source. Moose is hunted occasionally, although their primary range is farther south. A limited number of registration permits is available to harvest grizzly bears on Park lands. Other small mammels hunted include Arctic snowshoe hare, marmot, fox, porcupine, ground squirrel, coyote, lynx, and wolverine. Ducks, geese, and ptarmigan are both snared and hunted.

Visitor recreation use is the highest during the summer months, primarily July and August, with a limited amount of winter recreation occurring from late February to mid-April. (See Exhibit II-21.) Yearly visitation to GOTA Park from 1981-83 averaged approximately 2500 visits. The average group size was 5.3 people per group, and the average number of groups was approximately 470 per year. Trips averaged 10.1 days in length. Due to its remote location and higher access costs, overall recreational use of the GOTA Park area is low in comparison to other National Park areas. However, due to the sensitive nature of the surface tundra vegetation, visitor impacts are more noticeable and permanent. The limited capacity of the land to accommodate visitor recreational use may require the NPS to limit or redirect visitor use of certain Park areas. Anaktuvuk Pass is one of the two most popular access points for the Park. Visitors hike across subject property lands to reach the surrounding Park areas. Visitor use of the Park is anticipated to increase 7%-14% annually.

EXHIBIT II-21

Monthly Recreational Visitation

Gates of the Arctic National Park



MONTHLY RECREATIONAL VISITATION

SOURCE: NPS Monthly Use Reports

Summary of Subject Property Attributes

The subject property is comprised of six individual tracts of land aggregating 101,272 acres. The characteristics of each tract are summarized on the following pages. Given the close proximity of each tract to the others, the subject property attributes previously described in this section apply to all of the tracts. However, each tract does possess some unique features, and these are therefore noted within each of the following tract summaries.

Tract 1

Size: 55,274 acres, irregularly shaped parcel, long and linear, west by northwest, approximately 40 miles long by 2-3 miles wide.

Location: 2 miles west of Anaktuvuk Pass.

Access: Hiking trails, ATV trails, boat, float plane (Chandler Lake) helicopter, ski, snowmobile, dog sled. No roads.

Improvements: None. No utilities.

Elevation: 3000 feet - 5200 feet. Continental Divide cuts through tract.

Physical Characteristics: Steep mountain slopes, broad river and creek valleys, a large lake, scattered ponds and streams. Mountain surfaces consist of bare rock on upland slopes with lower slopes having a thin tundra cover of grasses, sedges, mosses and low shrubs. River valleys are broad with rolling hills and ridges covered by tundra grasses, sedges, mosses and small willows. Soils are generally rocky, gravelly and peaty.

Major Features: Chandler Lake--one of the largest lakes in the northern Brooks Range. At five miles in length, it provides critical float plane access to the area and a major link for public access to the scenic and recreational resources in the northern areas of Gates of the Arctic Park. One of only eight glacially formed lakes in the northern Brooks Range, and mountain-rimmed, it has pristine beauty and high wilderness value. The area serves as a wildlife

migratory route, particularly for the Western Arctic caribou herd, and as a primary wildlife habitat for grizzly bear, Dall sheep, wolves and waterfowl. It is a primary hunting and fishing area for Native subsistence purposes. The area is an abundant source of lichen, berries and herbs which serve as an additional food source. Lake waters support Arctic char, whitefish, burbot, arctic grayling, lake trout and northern pike. The area also has high potential as an archeological discovery site.

Kollutarak Creek--wide valley, major drainage basin, major hiking and recreation valley for visitors, and primary access route to Chandler Lake area and parklands beyond. It is a major migratory route for wildlife, a primary hunting and fishing area, and a designated corridor for snowmachines, ATVs, and aircraft. It has high potential as an archeological discovery site.

Other Significant Attributes: Widely recognized as an area of spectacular natural beauty possessing high quality wilderness characteristics. It is a major hiking and recreation area, and provides essential access to western and northern areas of GOTA Park for recreational users who fly into Anaktuvuk Pass or Chandler Lake by floatplane. It is one of the last major private inholdings within GOTA Park.

Tract 2

Size: 640 acres - square parcel.

Location: Approximately 25 air miles northwest of Anaktuvuk Pass, adjacent to Chandler Lake.

Access: Hiking trails, ATV trails, boat, float plane (Chandler Lake-1 mile SW), helicopter, ski, snowmobile, dog sled. No roads.

Improvements: None. No utilities.

Elevation: 3000 feet - 4000 feet.

Physical Characteristics: Undulating rolling hills with Ikagiak Creek traversing the northern portion of the tract. Ikagiak Creek flows into Little Chandler Lake which connects with Chandler Lake. Vegetation cover consists of tundra grasses, sedges, mosses, and small willows.

Major Features: Ikagiak Creek is a hunting and fishing area.

Other Significant Attributes: Recognized as a high quality natural area, it provides watershed protection, and one of the last remaining private inholdings in GOTA Park.

Tract 3

Size: 582 acres - rectangular shaped parcel.

Location: Approximately 14 miles southwest of Anaktuvuk Pass.

Access: Hiking trails, ATV trails, boat (John River), helicopter, ski, snowmobile, dog sled. No roads.

Improvements: None. No utilities.

Elevation: 3000 feet - 3600 feet

Physical Characteristics: Relatively flat surface. It is part of the broad John River Valley, located just the below confluence of Masu Creek, Ekokpuk Creek, Kollutuk Creek, Kollutarak Creek, Inukpasugruk Creek, and Contact Creek, all of which flow into the John River which runs south bisecting the parcel. Vegetation cover consists of tundra grasses, sedges, mosses, and small willows. Pockets of wet marsh areas are present due to seasonal flooding.

Major Features: Contains segment of John River, designated a wild river in the National Wild and Scenic River System. It is part of a major access corridor for scenic and recreational use, hunting and fishing areas, and is designated a snowmachine and aircraft corridor.

Other Significant Attributes: Recognized as a high quality natural area, provides watershed protection, and is one of the last remaining private inholdings in GOTA Park.

Tract 4

Size: 43,403 acres - irregularly shaped parcel.

Location: Approximately 3 miles south by southeast of Anaktuvuk Pass, extending 20 miles at its most distant point.

Access: Hiking trails, ATV trails, boat, helicopter, ski, snowmobile, dog sled. No roads.

Improvements: None. No utilities.

Elevation: 3000 feet - 6300 feet. Continental Divide cuts through tract.

Physical Characteristics: Steep mountain slopes, broad river and creek valleys, scattered ponds and streams. Approximately 75% of the tract is steep mountainous land. Mountain surfaces consist of bare rock on upland slopes with lower slopes having a thin tundra cover of grasses, sedges, mosses and low shrubs. River valleys are broad with rolling hills and ridges covered by tundra grasses, sedges, mosses and small willows. Soils are generally rocky, gravelly and sandy.

Major Features: Anaktuvuk River--major scenic and recreational corridor, wildlife migration route, access route to hunting and fishing areas.

Inukpasugruk Creek--primary hunting and fishing area, scenic and recreation corridor.

Other Significant Attributes: Major scenic and recreation area. The Anaktuvuk River valley provides important access for hikers into the eastern reaches of the Park. One of the last major private inholdings in GOTA Park.

Tract 5

Size: 1920 acres - rectangularly shaped parcel.

Location: Approximately 12 miles east of Anaktuvuk Pass.

Access: Hiking trails, ATV trails, boat, helicopter, ski, snowmobile, dog sled. No roads.

Improvements: None. No utilities.

Elevation: 3000 feet - 5900 feet.

Physical Characteristics: Rolling hills and ridges at lower elevations rising to steep mountainous slopes at higher elevations. Mountain surfaces consist of bare rock on steep upland slopes with lower slopes having a thin tundra cover of grasses, sedges, mosses, and low shrubs.

Major Features: Extension of Anaktuvuk River valley.

Other Significant Attributes: Recognized as a high quality natural area and one of the last remaining private inholdings in GOTA Park.

Tract 6

Size: 640 acres - square parcel.

Location: Approximately 3 miles north of Anaktuvuk Pass.

Access: Hiking trails, ATV trails, boat, helicopter, ski, snowmobile, dog sled. No roads.

Improvements: None. No utilities.

Elevation: 2800 feet - 4800 feet.

Physical Characteristics: Steep mountainous land with a bare rock surface.

Major Features: Steep mountain slopes overlooking Cache Lake in the Anaktuvuk River Valley.

Other Significant Attributes: Recognized as a high quality natural area and one of the last remaining private inholdings in GOTA Park.

Conclusion

Land use patterns of the subject property and surrounding environs have been determined largely by its physical attributes. The area can be characterized as being remote, isolated, sparsely populated, and having limited access, a harsh climate and rugged terrain. On the otherhand, it is an area of pristine beauty and high scenic quality, and an ecologically diverse and fragile environment possessing outstanding wilderness qualities. These factors provide the measure of value to potential users of the subject property and will dictate its future use.

The primary factor influencing future land use of the subject is its neighborhood setting. Located within the exterior boundaries of Gates of the Arctic National Park and Preserve, the subject is almost entirely surrounded by land set aside for wilderness purposes. Having similar, if not greater, wilderness attributes than those lands already designated as such, has made the subject lands highly desirable to the NPS for inclusion in the Park.

The Natives of Anaktuvuk Pass have relied on the subject lands to provide their subsistence needs for centuries. Living off the land, they understand its value as a natural resource and the importance of maintaining the integrity of this fragile environment. In addition, subsistence harvesting is the economic, social, and cultural basis of life for the Native people.

Limited access, remote location, and minimal market potential are the primary factors that have precluded commercial development and mineral resource development of the area. These conditions are not likely to change in the near future.

III. MOST PROBABLE USE AND BUYER OF THE SUBJECT PROPERTY

Introduction

The appraisal process depends on a rational identification of: (1) most probable use of the subject property as a basis for defining the nature of the most probable buyer; (2) characteristics of sales transactions which can be called comparable in terms of purpose of the buyer and alternatives of the seller; and (3) in the absence of appropriate comparable sales, the best method is simulating the investment calculus of the most probable buyer. The reader is referred to the full definition of highest and best use or most probable use provided in Exhibit III-1.

The appraiser is expected to examine a set of plausible alternative use scenarios suggested by the physical character of the property and economic needs of the region. The object is to find the most fitting use consistent with the physical and economic context of the subject property, as of a given date, which will maximize investment returns to the owner, and minimize the fiscal and environmental impact on non-owners of the property.

This normative ideal of a perfect balancing of interests, while optimizing value, is often obstructed by short-term, topical forces in terms of technology, economics, negotiation ability, or politics. Alternative uses suggested by the property analysis in Section II need to be compared on some systematic basis to identify the use representing the best fit and best current return. The definition of best use suggests that basic elements of comparison are physical feasibility, legality, effective demand, financial viability, and consistency with community goals and planning.

Criteria for Determining Most Probable Use

Having completed an inventory of the positive and negative attributes of the property, the significant limitations on future use, and the immediate linkages of the location, the appraiser must identify possible uses. Each use exploits

EXHIBIT III-1

Highest and Best Use Definition

HIGHEST AND BEST USE - That reasonable and probable use that supports the highest present value, as defined, as of the effective date of the appraisal.

Alternatively, that use, from among reasonably probable and legal alternative uses, found to be physically possible, appropriately supported, financially feasible, and which results in highest land value.

The definition immediately above applies specifically to the highest and best use of land. It is to be recognized that in cases where a site has existing improvements on it the highest and best use may very well be determined to be different from the existing use. The existing use will continue, however, unless and until land value in its highest and best use exceeds the total value of the property in its existing use. See Interim Use.

Implied within these definitions is recognition of the contribution of that specific use to community environment or to community development goals in addition to wealth maximization of individual property owners. Also implied is that the determination of highest and best use results from the appraiser's judgement and analytical skill, i.e., that the use determined from analysis represents an opinion, not a fact to be found. In appraisal practice, the concept of highest and best use represents the premise upon which value is based. In the context of most probable selling price (market value) another appropriate term to reflect highest and best use would be most probable use. In the context of investment value an alternative term would be most profitable use. See Most Probable Use, Most Profitable Use.

Source: Byrl N. Boyce, Real Estate Appraisal Terminology Revised Edition, AIREA, SREA, Ballinger, Cambridge, Mass., 1981, p. 126-127.

the marketable attributes of the property, neutralizes negative characteristics, and operates within the limits of a justified prudent investment.

The appraiser must identify a reasonable set of alternative uses suggested by the dominant attributes of the property to be appraised in light of the market context that prevails at the date of valuation. Dominant attributes drawn from the analysis in Section II include:

1. The cumulative size of the subject parcels of over 101,000 acres represents the largest private inholding within the Gates of the Arctic National Park.
2. No permanent improvements, except for several temporary subsistence campsites, are present.
3. There is significant recognition of the unique wilderness beauty of the Gates of the Arctic area.
4. Analysis of the site's subsurface estate has failed to uncover any significant and marketable extraction resources.
5. The physiographic setting of the subject property is depicted by gaunt and rugged mountains, glaciated valleys, and pristine rivers and lakes.
6. Traditional subsistence activities, guaranteed by ANILCA Title VIII, are a significant part of the Native Alaskan way of life on the subject property.
7. The site's wilderness characteristics provide a unique experience for the wilderness recreation user.

Alternative Use Scenarios Exploiting Property Attributes

Alternative use scenarios for the subject property were identified and explored. Possible uses considered included recreational homesites, oil and gas option and lease agreements, energy mineral exploration and production, non-energy mineral exploration and production, natural land, commercial recreation, and subsistence harvesting. Scenarios were evaluated using a net present value measure (NPV). Their fit to the criteria previously specified are summarized in Exhibit III-2 with NPV measures in Exhibit III-3.

EXHIBIT III-2

Alternative Use Matrix

Alternative Use Scenarios	Selection Screens: Physically Possible	Effective Demand	Financially Feasible	Consistent w/ Community Goals	Legality
Recreational Homesites	Mountainous, gravelly terrain, wet areas, limits available bldg. sites. Access difficult, no roads.	Remote, high travel costs, by air only. Duration of activities restricted by climate.	High cost of construction, materials, utilities, transport of goods.	Not compatible-high impact on wilderness character. Limited economic impact on Village.	Surrounding park areas would limit/restrict types of uses in area. Infringement on Native subsistence needs would be politically/socially unacceptable.
Energy Mineral Exploration and Production	Gas and oil potential in area is believed low. Access for equipment difficult.	Shell Oil holds lease agreement w/ ASRC at present. No exploration to date. Other areas more desirable.	Exploration costs would not justify findings. Transport costs high.	Not compatible given low potential and high impact on environment.	Would require strict regulation. Resource revenues would be shared-ANCSA 7(i).
Non-Energy Mineral Exploration and Production	Sand and gravel exists. Access for equipment difficult.	No local market. No means to transport materials out.	Excavation and transport costs too high to be profitable.	Not compatible given low potential and high impact on environment.	Would require strict regulation.
Natural Land	Remote, rugged character. Absence of human impact. One of last true remaining wilderness areas in N.America.	Highly desired by NPS for inclusion to GOTA Park because of unique qualities and public benefits.	Would require few if any improvements. Costs associated w/ management of area as wilderness.	Highly desired public good to be retained as wilderness. Provides access to other park areas. Would ensure subsistence opportunities for natives.	Would align with current management practices of surrounding uses.
Commercial Recreation	Wilderness environment accommodates most uses, restricts others. Resources for hunting and fishing limited due to severity of arctic climate.	Remote, high access costs. Lack of facilities. Activities limited by climate. Rugged environment limits demand.	High cost to construct facilities, transport people and goods. Anticipated number of users would not justify costs.	May create NPS management problems. Would infringe on subsistence needs of Natives. Positive economic impact possible, but negative cultural impact on Village.	Would require cooperative regulation agreement w/ NPS, Village, ASRC to ensure proper use and management of area resources. Infringement on Village subsistence needs would be politically/socially unacceptable.

EXHIBIT III-2 (continued)

Alternative Use Matrix

Alternative Use Scenarios	Selection Screens: Physically Possible	Effective Demand	Financially Feasible	Consistent w/ Community Goals	Legality
Subsistence Harvesting	Existing use resources have limited carrying capacity. Available resources can be inconsistent, dependent on environmental factors.	Native Village relies heavily on subsistence to meet daily needs. Limited alternative economic opportunities.	Fish and wildlife resources are free for the taking by Natives.	Requires cooperative management effort to ensure proper use of limited resources, retain Native survival and cultural heritage. Mutually beneficial.	Politically and socially understood and accepted. ANILCA permits subsistence activities on public lands.

Source: Real Estate Dynamics, Inc., 1988.

EXHIBIT III-3

Net Present Value of Scenarios

Alternative Use Scenarios	Selection Screens: NPV of Project	Probability	% Attributable to Land	NPV
Recreational Homesites	$5,263,157	.25	.50	$657,895
Energy Mineral Exploration and Production	0	.10	.10	0
1. Oil and Gas	$690,567	1.00	1.00	$791,531
Option and Lease	201,929	.50		
Agreements	$892,496			
Non-Energy Mineral Exploration and Production	0	.25	.50	0
Natural Land	73.5 Million	1.00	1.00	73.5 Million
Commercial Recreation	$6,576,548	.25	.50	$822,069
Subsistence Harvesting	$5,804,393	1.00	.25 x .50	$725,549

Source: Real Estate Dynamics, Inc., 1988.

Scenario #1--Recreational Homesites

Statewide demand for recreational homesites is greatest for those lands that are near communities, on roads, or have water frontage. The subject property is adjacent to the Village of Anaktuvuk Pass yet has limited services and facilities beneficial to visitors or part-time residents. No utility service is available to the property. No improvements or equipment exists. There is no road access. Water frontage exists on Chandler Lake and the numerous rivers and creeks.

Potential demand for recreational homesites would come from two sources. The first source would be the residents of Anaktuvuk Pass. The second source would be those individuals from the surrounding region or beyond, who would fly into Anaktuvuk Pass or Chandler Lake by float plane, and access their homesite by hiking or using some form of motorized vehicle.

Local residents would provide a limited market. They already lead a rural lifestyle and spend much of their time outdoors hunting and fishing for their subsistence needs. There would appear little need or desire for recreational property. Although real income for Natives is increasing at a greater rate than for non-Natives, the high cost of goods in Anaktuvuk Pass limits the amount of discretionary income available for Natives to afford the purchase of personal recreation property.

Potential outside users would incur higher transportation costs to access the property, restricting the number of visits to the property. Distance from the state's major population centers limits accessibility for the prime buyer group. Typically, property that is more difficult and costly to reach has lower demand than more accessible areas. Costs for shipment of building materials and furnishings, and building construction would be much higher. The remote location would limit demand to those attracted to an isolated, self-sufficient lifestyle. Climatic conditions limit the duration of many recreational activities. Additional recreational hunting and fishing pressure could conflict with subsistence needs of the Natives or NPS management objectives for the surrounding parklands. Overall, prospective buyers would find other locations more advantageous and compatible with their needs.

Given the limits of market demand, accessibility, and building construction, we conclude that recreational homesites is not a feasible use for the subject property. However, for illustration and comparison purposes we have provided a hypothetical example to verify our conclusion. One could hypothesize a scenario where scattered 40-acre homesites at $2000.00 per acre or $80,000 a parcel were being sold. Dividing 101,000 acres into 40-acre parcels would amount to 2,525 sites. Using a highly optimistic annual absorption rate of 50 sites per year, the sell-off period would be 50 years. Assume 50% of gross sales to be cost and a development risk rate of 40% for an extremely high risk investment. Using a 2% inflation factor, the stabilized gross income would be $4,510,901. Therefore, the net operating income would be $3,383,176. Using a 40% discount rate over 50 years, the net present value of the project would be only $5,263,157. Include probability estimates for occurrences of 25% and 50% of the value attributable to the land, and the resulting present value of the property is $657,895. Value calculations for Scenario #1 are presented in Exhibit III-4.

EXHIBIT III-4

Scenario #1 Recreational Homesites

	Time Period - Years			
	1	2	3	50
Lots Sold	50	50	50	50
Price/lot	80,000	81,600	83,232	211,105
Gross Income*	4,000,000	4,080,000	4,161,600	10,555,247
Cost**	2,000,000	2,040,000	2,080,800	5,277,623
Net Income	2,000,000	2,040,000	2,080,800	5,277,623

Net Present Value of the Project***	$5,263,157
Adjustment for Probability of Occurrence	.25
Adjustment for Value Attributable to the Land	.50
Property Value (NOI x .25 x .50)	$ 657,895

*Gross Income grows two percent annually.
**Costs are 50 percent of gross income.
***Discount Rate is 40 percent.

Source: Real Estate Dynamics, Inc., 1988.

Scenario #2--Energy Mineral Exploration and Production

In 1981 Shell Oil leased 45,000 acres of subsurface land on the subject property as part of a 1.3 million-acre selection agreement entered into with ASRC in 1978. The subject property lands were selected for the purpose of completing the acreage total of the agreement, not based on the oil and gas potential. These leases were scheduled to terminate in 1991, but could be terminated, at the option of Shell Oil Company, prior to that time (the leases were terminated in 1984). As of August 1983 no exploration activity had taken place, indicating no immediate desire by Shell Oil to determine the resource potential of this land. As previously mentioned in Section II, we contacted an official at Shell Oil concerning the leases they terminated and he stated that there was a low probability of energy resource extraction potential in the subject area. The low potential for gas and oil underlying the subject property is also noted in the Kaktovik Land Exchange, Administrative Record, Sec. 10, "Ascertainment Evaluation Alaska Land Exchange", p. 36. We did not undertake any additional independent energy resource analysis. Access of equipment for exploration, extraction and shipment of the resources to market would be difficult and costly. Limited demand could be met serving the energy needs of Anaktuvuk Pass. The value of the Shell lease on the subject was $450,000 in the first year and $45,000 a year for 2 years. ASRC received $10.00 an acre on approximately 45,000 acres of the subject with $1.00 an acre payments in subsequent years for a present value of $892,496, using a 15% discount rate. Shell Oil's option to terminate the lease reduces the probability of future payments. Thus, the resulting present value is $791,531. Based on the available information, we conclude that the potential for leasing the remainder of the subject subsurface is very limited.

Scenario #3--Non-energy Mineral Exploration and Production

An ample supply of sand and gravel resources exists throughout the subject property. However, the local demand for these materials is limited and the cost to export these materials would be prohibitive. Sand and gravel are such an abundant resource statewide that most demand is supplied by local sources. The potential supply of hard rock (metalliferous and non-metalliferous) minerals is minimal. Given the environmental sensitivity of the subject property, lack of local market, and limited means to export the resources, the market potential for this use is very limited.

Scenario #4--Natural Land

Significant evidence exists to demonstrate a major level of activity and high degree of sophistication in the buying and selling of land for the purpose of preserving, managing, and enhancing natural, habitat, and wilderness sites. This activity occurs in both the private and public sectors of the marketplace. As a major component of market processes, highly developed systems are used to rank parcels on both the attributes of a particular site and the degree to which significant resources may be threatened.

Ranking and Rating Procedures-Private

National Audubon Society

The National Audubon Society relies on a detailed statement of policies with respect to the acquisition of interests in real property. These policies are strict, and serve as complete guidelines for Audubon staff in evaluating potential acquisitions, and in preparing acquisition proposals for review by the Audubon Society Board of Directors. These comprehensive guidelines include, in part, the following information:

1. Transactional information--grantor, grantee, title and surveying data, easements, assessments, instrument of transfer, taxes, appraised value, etc.
2. Property description--type, location, natural elements (i.e., plants and wildlife).
3. Management considerations.

The Nature Conservancy

Comprised of 40 Heritage Programs in 38 states, The Nature Conservancy focuses its preservation efforts on the most critically important areas. In cooperation with state governments, the Heritage Programs have three basic tasks: (1) to make up a list of species and natural communities considered rare in the state; (2) to gather point-location information on these species from various sources; and (3) to make recommendations to The Nature Conservancy and to state and federal governments as to which areas should be preserved in order to protect these rarities. Thus, there is really one central criterion for choosing an area: it must include within it a viable and protectable

example of an endangered, threatened or rare species, or a good example of an important natural community. In 1983 The Nature Conservancy had a Land Preservation Fund of approximately $40 million with an $8 million unsecured line of credit. Between 1976 and 1982 the Conservancy acquired, on average, 200 properties per year with a market value between $20 and $40 million.

National Conservation Organizations--Land and Water Conservation Fund

Each year recommendations are made for federal land acquisitions by a national conservation consortium utilizing funds from the Federal Land and Water Conservation Fund. In fiscal year 1983 recommendations were for $398 million in acquisition monies. Federal agencies' outlays from the Land and Water Conservation Fund for fiscal years 1976 through 1982 are presented in Exhibit III-5.

EXHIBIT III-5

Federal Agencies' Outlays from the Land and Water Conservation Fund for Fiscal Years 1976 Through 1982

Fiscal Year	Bureau of Land Management	Fish and Wildlife Service	Forest Service	National Park Service	Total
1976	$ 2,198,174	$ 9,723,633	$ 37,262,884	$ 105,735,403	$ 154,920,094
1977	1,897,273	14,514,232	38,241,500	123,643,520	178,296,525
1978	1,679,191	20,049,335	45,634,334	377,220,449	444,583,309
1979	1,231,533	35,308,200	69,310,074	247,584,850	353,434,657
1980	2,164,939	23,894,627	74,175,113	181,103,121	281,337,800
1981	3,057,074	29,286,294	58,367,359	108,328,636	199,039,363
1982	346,136	13,381,188	20,945,221	82,125,037	116,797,582
Total	$12,574,320	$146,157,509	$381,286,624	$1,225,741,016	$1,728,409,330

Source: U.S. General Accounting Office, Parks and Recreation, Obligations and Outlays from the Land and Water Conservation Fund, May 1986.

The following text is from the annual bulletin issued by the national conservation organizations outlining intent, appropriations, and targeted sites for acquisition.

> In developing this list, we have focused on identifying acquisition priorities where there exists one or more of the following conditions:
>
> 1. Court awards already existing or anticipated for which federal government has an obligation to compensate land owners;
> 2. A serious threat to lands, water, and/or wildlife;
> 3. A likelihood of willing sellers and/or hardships to land owners;
> 4. An ongoing land acquisition program designed to complete a project within a certain time period. [2]

Ranking and Rating Procedures-Public

Land and Water Conservation Fund

The Federal portion of the Land and Water Conservation Fund is used to acquire land, water, and interests necessary to achieve natural, cultural, wildlife, and recreation management objectives of the National Park Service, Fish and Wildlife Service, Bureau of Land Management, and Forest Service. Guidelines for use of the fund are:

1. Identify what land or interests in land need to be in Federal ownership to achieve management unit purposes consistent with public objectives in the unit.
2. Use to the maximum extent practical cost-effective alternatives to direct Federal purchase of private lands and, when acquisition is necessary, acquire or retain only the minimum interests necessary to meet management objectives.
3. Cooperate with landowners, other Federal agencies, State and local governments, and the private sector to manage land for public use or protect it for resource conservation.
4. Formulate, or revise as necessary, plans for land acquisition and resource use or protection to assure that socio-cultural impacts are considered and that most outstanding areas are adequately managed.

Also established is a "Priority Criteria System"; a point system for the ranking of land acquisition projects based on standard information provided by local staff at each agency. This analysis would be used as a starting point for determining agency funding levels.

A list of natural land acquisitions by the U.S. Forest Service between 1976 - 1983 utilizing the Land and Water Conservation Fund is presented in Exhibit III-6. This evidence demonstrates, in part, the existence of a sophisticated, active, but relatively unknown market. Section IV will provide additional documentation of this market as well as the information on comparables in Appendix IV-B and IV-C.

EXHIBIT III-6

U.S. Forest Service

Wilderness Area And Recreation Area Acquisitions*

1976 - 1983

Year	Protect	Type Use	Acres	Price	Price/Acre
1976	Mt. Rogers	Rec.	2,285	$ 869,969	$ 381
	Spruce Knob-Seneca Rock	Rec.	1,654	745,487	451
	Sawtooth	Wild./Rec.	1,276	3,682,813	2,886
	Whiskeytown-Shasta-Trinity	Rec.	707	750,405	1,060
	Lye Brook	Wild.	577	192,190	333
	Dome Land	Wild.	320	354,000	1,106
	Upper Buffalo	Wild.	270	62,902	233
	Misc. Wilderness Areas	Wild.	171	515,520	3,014
1977	Sawtooth	Wild./Rec.	4,095	$6,384,697	$1,559
	Mt. Rogers	Rec.	2,756	1,162,450	422
	Hells Canyon	Wild./Rec.	2,368	641,325	271
	Spruce Knob-Seneca Rocks	Rec.	601	353,042	587
	Whiskeytown-Shasta-Trinity	Rec.	563	902,950	1,604
	Lye Brook	Wild.	381	138,549	364
1978	Boundary Waters Canoe Area	Wild.	3,654	$ 428,000	$117
	Mt. Rogers	Rec.	1,704	1,163,663	683
	Hells Canyon	Wild./Rec.	1,039	479,725	462
	Ventana	Wild.	686	292,375	426
	Spruce Knob-Seneca Rocks	Rec.	378	205,821	545
1979	Spruce Knob-Seneca Rocks	Rec.	1,470	$592,510	$ 403
	Mt. Rogers	Rec.	592	453,914	767
	Oregon Dunes	Rec.	268	297,500	1,110
	Whiskeytown-Shasta-Trinity	Rec.	213	160,750	755
	Hells Canyon	Wild./Rec.	130	156,000	1,200
	Ventana	Wild.	120	36,000	300
	Misc. Wilderness Areas	Wild.	312	102,715	329

EXHIBIT III-6 (continued)

U.S. Forest Service

Wilderness Area And Recreation Area Acquisitions*

1976 - 1983

Year	Protect	Type Use	Acres	Price	Price/Acre
1980	Sawtooth	Wild./Rec.	2,655	$5,299,172	$1,996
	Spruce Knob-Seneca Rocks	Rec.	826	602,314	729
	Hells Canyon	Wild./Rec.	488	87,500	179
	Whiskeytown-Shasta-Trinity	Rec.	487	475,000	975
	Boundary Waters Canoe Area	Wild.	150	1,200,540	8,004
1981	Sawtooth	Wild./Rec.	3,683	$3,944,000	$1,070
	Spruce Knob-Seneca Rocks	Rec.	602	454,225	755
	Gila	Wild.	591	269,710	456
	Mt. Rogers	Rec.	421	340,299	808
	Boundary Water Canoe Area	Wild.	226	1,918,463	8489
	Misc. Wilderness Areas	Wild.	450	401,000	891
1982	Spruce Knob-Seneca Rocks	Rec.	1,743	$1,227,659	$ 704
	Sawtooth	Wild./Rec.	287	676,836	2,358
	Hells Canyon	Wild./Rec.	200	127,000	635
	Mt. Rogers	Rec.	129	73,702	571
1983	Sawtooth	Wild./Rec.	2,705	$4,223,207	$1,561
	Mt. Rogers	Rec.	375	223,711	597
	Spruce Knob-Seneca Rocks	Rec.	347	116,500	336
	Boundary Waters Canoe Area	Wild.	181	1,723,000	9,519
	Whiskeytown/Shasta-Trinity	Rec.	118	227,000	1,924

* Note: This exhibit lists U.S. Forest Service land acquisitions greater than 100 acres for inclusion in existing wilderness and recreation areas. This exhibit was compiled to provide examples of natural land acquisition transactions. No attempt is made to compare price/acre between acquisitions without making price adjustments to reflect differences in property characteristics, market conditions, or transaction dates.

Source: Parks and Recreation: Obligations and Outlays From the Land and Water Conservation Fund, U.S. General Accounting Office, May 1986.

Scenario #5--Commercial Recreation

Recreational development for those attracted primarily by Gates of the Arctic National Park represents an extremely small demand population. Although some facilities such as staging areas for entry into wilderness areas may be developed by the Park Service, any attempt to develop commercial recreation would be opposed by environmental groups like the Sierra Club and The Nature Conservancy as well as the Park Service. Therefore, it is doubtful that there would be legal/political encouragement or effective demand to justify expansive development of the 101,000 acres in the subject property. However, for illustrative and comparative purposes, one might hypothesize sites that could be sold in 1000 acre tracts to be developed as recreation sites at $5000.00 per acre or $5,000,000 per site. One might project in the most optimistic of scenarios that one of these sites could be sold per year for 25 years. Following the same logic of Scenario #1 with costs, discount and appreciation, the annualized net income would be $3,203,029, producing a net present value of $6,576,548. With probability for occurrence of 25% and 50% value to the land, the net present value of the land would be $822,069. Value calculations for Scenario #5 are presented in Exhibit III-7.

EXHIBIT III-7

Scenario #5 Commercial Recreation

	Time Period - Years			
	1	2	3.	25
Lots Sold	1	1	1	1
Price/lot	5,000,000	5,100,000	5,202,000	8,042,186
Gross Income*	5,000,000	5,100,000	5,202,000	8,042,186
Costs**	2,500,000	2,550,000	2,601,000	4,021,093
Net Income	2,500,000	2,550,000	2,601,000	4,021,093

Net Present Value of the Project***	$ 6,576,548
Adjustment for Probability of Occurrence	.25
Adjustment for Value Attributable to the Land	.50
Property Value (NPV x .25 x .50)	$ 822,069

*Gross Income grows two percent annually.
**Costs are 50 percent of gross income.
***Discount Rate is 40 percent.

Source: Real Estate Dynamics, Inc., 1988.

Scenario #6--Subsistence Harvesting

As they have for centuries, the Natives of Anaktuvuk Pass rely heavily on subsistence harvesting, not only to provide food and the raw materials for clothing, tools, and other items, but also to set the patterns of their culture. Despite the increasing influence and acceptance of Western culture, technology, and economy, nearly all of the village people participate in subsistence harvesting as hunters, sponsors or sharers of the hunt. The majority of their total household food is derived from hunting and fishing. Although subsistence participation is high, given current trends, the Natives will continue to develop a greater dependence on imported goods and reduce their reliance on subsistence harvesting. However, because there are few alternative economic opportunities in the area, the number of Natives who can afford not to rely on subsistence to meet their daily needs or supplement other income, may be limited.

The mountain valleys, lakes, and streams of the subject property have been traditional Native hunting grounds for centuries. The subject property is located in close proximity to the village and contains natural migration routes for wildlife, particularly the Western Arctic caribou herd. These factors should ensure the continued need and use of the subject property for subsistence purposes.

The value of subsistence harvesting can be measured as the replacement cost of subsistence-derived food items and non-food items if they had to be purchased. On this basis, the annual subsistence value for residents of Anaktuvuk Pass would be $756,450. For a presentation and explanation of subsistence value calculations, refer to Exhibit III-8 and corresponding footnotes. Applying a growth factor of two percent over a period of 50 years at a discount rate of 15%, the net present value of subsistence would be $5,804,393. Subsistence value is the product of three primary sources: labor, materials, and land. Attributing 25% of subsistence value to the land, with the subject property representing 50% of this land value, the net present value of subsistence for the subject property would be $725,549. The ATV access easements retained by ASRC are for subsistence purposes, therefore, their value is a component of the land and included in this figure.

Exhibit III-8

Scenario #6 Subsistence Value

Average Annual Household Expenditure for Non-Subsistence Food, Anaktuvuk Pass, 1977[a]	$ 3,360
CPI Adjustment (1977 - 1983)	x 1.51
Average Annual Household Expenditure for Non-Subsistence Food, Anaktuvuk Pass, 1983	$ 5,073
Non-Subsistence Food Costs/Total Household Food Costs[b]	/ .43
Average Household Food Costs, Anaktuvuk Pass, 1983	$ 11,799
Percentage Food Value from Subsistence Harvesting	x .57
Subsistence Food Value per Household	$ 6,725
Average Persons per Household	/ 4.0
Subsistence Food Value per Capita	$ 1,681
Percent Value from Non-Food Subsistence Harvesting[c]	x 2.0
Annual Subsistence Harvesting Value per Capita, Anaktuvuk Pass, 1983	$ 3,362
Estimated Population, Anaktuvuk Pass, 1983	x 225
Annual Subsistence Value, Anaktuvuk Pass, 1983	$ 756,450

[a]Monthly food expense converted to annual food expense. Derived from: Judith Kleinfeld, John Kruse, and Robert Travis, "Energy Development and the North Slope Inupiat: Quantitative Analysis of Social and Economic Change." Man in the Arctic Program, Monograph 1. Institute of Social and Economic Research, University of Alaska. 1977, Table 3-11, p. 28.

[b]Percentage of total household food expenses attributable to non-subsistence food items. Calculated on the basis of the percentage of total household food derived from subsistence hunting and fishing (.57). Ibid., Table 5-13, p. 73.

[c]Clothing, tools, craft materials, cultural value, etc.

Exhibit III-8 (continued)

Scenario #6 Subsistence Value

	TIME PERIOD - YEARS			
	1	2	3	50
Total Subsistence Value[d]	$756,450	$771,579	$787,011	$1,996,129
Net Present Value of Subsistence, Anaktuvuk Pass, 1983[e] . .				$5,804,393
Percentage of Subsistence Attributable to the Land[f]				.25
Total Subsistence Value Attributable to the Land				$1,451,098
Percentage of Subsistence Value Attributable to Subject Property[g]				.50
Total Subsistence Value of the Subject Property				$ 725,549

[d]Annual growth rate of two percent based on combined factors of inflation, population growth, decreasing reliance on subsistence, and limited resource harvesting capacity of the environment (resulting in hunting restrictions).

[e]Discount Rate is 15 percent.

[f]Subsistence value is comprised of three primary value components: Labor (.50), materials (.25), and land (.25).

[g]The subject property contains primary subsistence hunting and fishing areas for the Village of Anaktuvuk Pass and provides access to other subsistence areas. Subject property provides approximately 50% of village and subsistence resources. Derived from North Slope Borough, "Native Livelihood and Dependence, a Study of Land Use Values through Time." Field Study 1. June, 1979. Plate 2-Village Land Use Areas.

Source: Real Estate Dynamics Inc., 1988.

Summary

Reviewing our alternative use scenario analysis, we have determined that the use of the subject property surface estate for wilderness and subsistence is the best fit, relative to topical constraints, and is consistent with appraisal methodology. The value of the surface attributes that define wilderness produce the greatest NPV. At the same time, our alternative use matrix process has determined the subsurface to be for resource extraction, but the use has no market value within a prudent man investment horizon. Time, risk, and probability discounts render the subsurface essentially valueless to the next buyer. Therefore, the surface rights possess all the value contained within the subject property.

Conclusion

A review of possible alternative uses reveals that a limited mix of uses emerges as plausible and compatible for the subject property, given the attributes of the property and viability of alternatives. Therefore, **THE MOST PROBABLE USE OF THE SUBJECT PROPERTY IS AS NATURAL LAND FOR THE PURPOSE OF PRESERVING, ENHANCING, AND MANAGING THE WILDERNESS ATTRIBUTES, AND PROVIDING FOR NATIVE SUBSISTENCE ACTIVITIES.**

Probable Buyers of the Subject Property

Having determined the most probable use of the subject property provides the basis for determining the most probable buyer. Government agencies such as the National Park Service, U.S. Fish and Wildlife Service, U.S. Forest Service, State Departments of Natural Resources, etc., and private agencies such as The Nature Conservancy, The Wilderness Society, Audubon Society, and other conservancy groups, who act as end purchasers and interim purchasers of natural land, represent the majority of the groups who are buyers and sellers of large acreage natural/habitat/preservation/wilderness lands.

The subject property attributes and setting described in Section II also help distinguish the most probable buyer. The primary factors considered in selecting the most probable buyer included: location of the property, surrounding ownership pattern, legal and political interests, unique physical attributes to be acquired, and historical interest expressed in the subject property.

Conclusion

Recent market sales of properties acquired for a common purpose with similar attributes and setting are the most reliable predictors of the most probable buyer, and what they might be willing to pay for a comparable property. Therefore, **THE MOST PROBABLE BUYER OF THE SUBJECT PROPERTY IS THE NATIONAL PARK SERVICE, WITH THE INTENTION OF HOLDING IN PERPETUITY FOR PURPOSES OF PRESERVING AND MAINTAINING WILDERNESS QUALITY.**

IV. ESTIMATING VALUE OF THE SUBJECT PROPERTY

Appraisal Methodology

The valuation process as proposed by Ratcliff (Exhibit IV-1) compares a subject property in terms of specific, physically ascertainable attributes to broadly similar properties that have been sold to a class of buyers with similar motivation. Therefore, to identify a subject's highest and best (most probable) use, it is necessary to describe in detail the physical attributes of the property that may be significantly related to alternative uses. Comparison of scale, physical diversity, ruggedness, and quality of the properties in question creates a data problem of unusual proportions. Nevertheless, the distinctions between subject properties and comparables must be retained if pricing inferences are to be equitable.

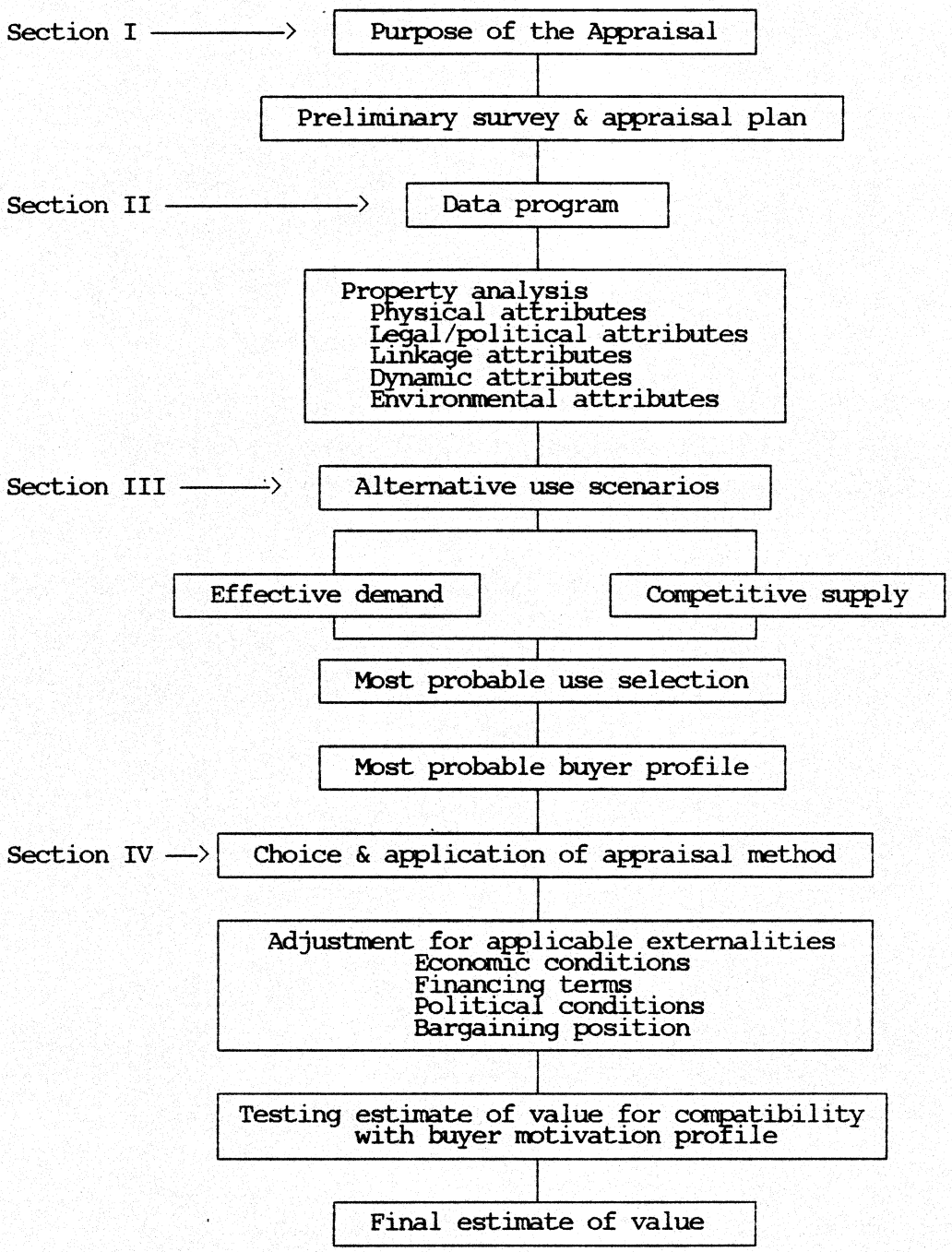
Following identification of a subject property's most probable use and most probable buyer, the next step is to determine an appraisal method. (See Exhibit IV-1.) Of the three most likely methods of appraisal, Cost Approach, Income Approach, and Sales Comparison Approach, the most desirable method is to estimate value from inference--what buyers and sellers have done in prior transactions. This preferred method of determining most probable selling price is to infer future market behavior from recently completed market transactions.

This method, commonly referred to as the Sales Comparison Approach, is based on the economic principle of substitution. The method implies that a prudent person will not pay more to buy a property than it will cost to buy a comparable substitute property. The concept of comparable substitute implies that buyers have personal values which they attach to combinations of specific attributes. Through a process of evaluation and elimination, buyers match attributes from one property to another in deciding which property (if any) provides the greatest amount of satisfaction relative to cost.

The determination of natural/wilderness land as the most probable use of the subject property and an active, established market for wilderness land transactions, make selection of the sales comparison approach the most appropriate appraisal method for the subject property.

EXHIBIT IV-1

Ratcliff's Appraisal Process



Source: James A. Graaskamp, SREA, CRE, The Appraisal of 25 N. Pinckney: A Demonstration Case For Contemporary Appraisal Methods, July 1977.

Sales Comparison Approach To Value

The basic concept of the sales comparison approach is to search for properties that might have served the same use as the indicated highest and best use for the subject property, on the principle that a buyer's top price will be only as much as they would pay for reasonable substitutes. The three major conditions for executing this task for wilderness land are:

1. An orderly market for parcels of singular wilderness and scenic attributes producing arm's length transactions without recourse to eminent domain.
2. Adequate information to adjust sale prices of transactions meeting the first condition for external factors such as time of sale, financial terms and conditions other than a cash sale in fee simple. The appraiser must have enough information to exercise reasonable judgment in the application of adjustments for differences in location, or imbalances in the market, to the degree that these differences are unique to only some of the comparables.
3. A common denominator for comparison of sales once adjusted for condition 2 above, that will overcome differences in both size and quality or suitability for the presumed use.

In selecting market transactions, comparability must consider location, physical attributes, and motivation of buyer and seller. These issues can be addressed through application of the following five steps:

1. Research the market to identify similar properties for which data are available and pertinent; sales, listings, offerings, and so forth.
2. Qualify the prices as to terms, motivating forces, and bona fide nature.
3. Compare each of the comparable properties' important attributes to the corresponding ones of the subject property under the general categories of time, location, physical characteristics, and conditions of sale.

4. Consider all dissimilarities and their probable effect on the price of each sale property, and then derive individual market value indications for the subject property.
5. From the pattern developed by all of the sales, formulate an opinion of market value for the subject property.

The determination of the comparability of individual sales is the most general and difficult problem in the application of the sales comparison method because each parcel of real estate is unique. Land may vary in its locational features, topography, views, soil conditions, and so forth. Consequently, the appraiser employing the sales comparison approach must consider all these factors in using market sales of differing parcels to estimate the value of the subject property.

Sales Comparison Valuation Process

The valuation process is initiated with the search and selection of comparable properties. The data from the selected comparable properties are analyzed by the appraiser, with the help of a series of computer programs, to derive a final value estimate. Exhibit IV-2 is a diagram of the basic process. A brief description of each step provides an overview of the valuation methodology.

Step #1 Search and Selection of Comparable Properties - The selection, analysis, and adaptation of information on past market transactions having similar characteristics as the subject provides the basis for predicting what the subject will sell for.

Step #2 The Wilderness Evaluation System - A systematic data analysis procedure to inventory the wilderness attributes of the comparables and the subject property.

Step #3 Appraiser Defined Attributes - Additional property attributes are included in the evaluation process to measure the value differences attributable to urban, rural, and regional characteristics of each property.

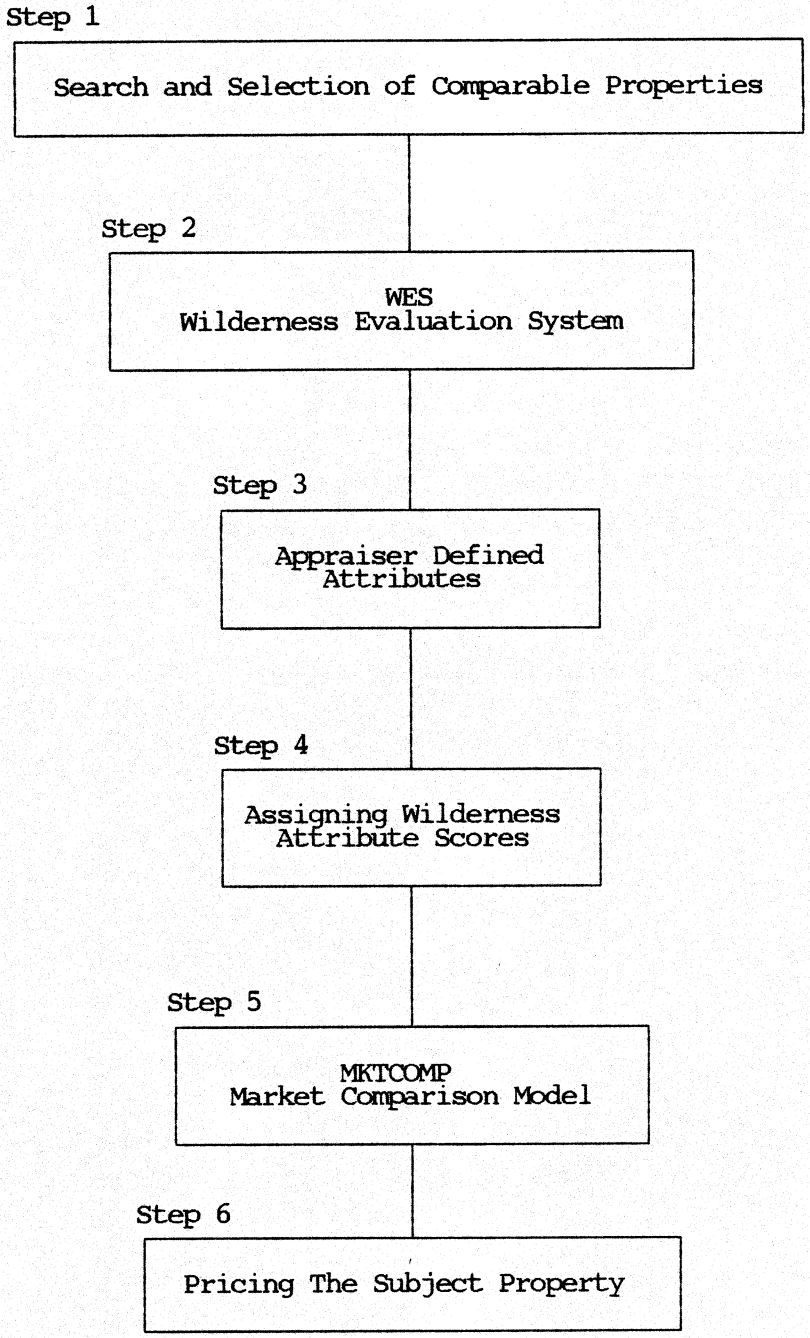
Step #4 Assigning Wilderness Attribute Scores - After identifying the appropriate comparative wilderness attributes in Steps 3 and 4, the appraiser assesses and rates the quality of each attribute for both the comparable properties and six subject tracts. These attribute scores provide the basis for evaluating the physical similarities and differences between the comparables and subject tracts.

Step #5 Market Comparison Model (MKTCOMP) - Applying the attribute scores derived in Step 4, the MKTCOMP model is an attribute matching process used to identify, select, and rank a set of comparables that are most similar to each of the individual subject tracts. Each unique set of comparables selected through this process is then used to price the subject tracts.

Step #6 Pricing the Subject Property - An average price measure (price per acre) for each subject tract is estimated using the average adjustment to the price per acre of the set of comparables selected in MKTCOMP. This average price per acre for each subject tract is multiplied by the acreage of each tract and their sum value provides the total value estimate of the subject property.

Exhibit IV-2

Sales Comparison Valuation Process



Source: Real Estate Dynamics, Inc., 1988.

Step 1

Search and Selection of Comparable Properties

The conclusions reached in Section III regarding the determination of most probable use and most probable buyer of the subject, provide the focus for the comparable selection process. Recognition and understanding of the general market dynamics for natural/wilderness lands as discussed in Scenario #5, Section III, provide direction in our search for comparables.

Criteria for the Selection of Comparable Properties

A thorough investigation of comparable properties involves an analysis of the property attributes, buyer motivation for purchase, and conditions of sale. A detailed search for comparable properties was undertaken based on the factors presented below.

Date of Sale

The exchange agreement between the ASRC and the NPS was executed on August 9, 1983. To more accurately reflect the market conditions and economic trends that were known to both buyer and seller at the time of the exchange agreement, all comparable sales must have occurred prior to this date.

Parcel Size

The search for comparable properties involved a prioritization of large, natural land sales. For purposes of efficiency, a hierarchical approach to the investigation of these parcels was undertaken. In order of prioritization, properties were grouped into three categories: over 1000 acres, 500 to 999 acres, and 100 to 499 acres; and researched for comparability to the subject property. It is important to emphasize that size was initially used as a screening variable only to the extent that the probability of finding properties with attributes similar to the subject was higher among larger parcels.

Remoteness

The subject property is considered a remote, wilderness area; the subject parcels are distant from major human population concentrations, road networks, and utility systems. Primary access to the region is by air. Surface movement in the area is on foot, by ATV, snowmachine, or boat. The possibility of

excess recreational use of the site and associated disturbance of the sensitive ecosystem is minimized due to the distance from population concentrations, limited modes of access, and current management of the property. Natural resource extraction is currently uneconomical due to access and transport constraints. Comparable properties were evaluated based on the remoteness factors of, distance to the nearest Standard Metropolitan Area (SMA), distance to roads, available modes of access, and proximity to utility networks.

Buyer Motivation

Motivation of the most probable buyer of a site is an essential factor in selecting comparable properties. The most probable use of the subject property has been identified as wilderness land for the purpose of enhancing and managing its wilderness attributes and providing for native subsistence activity. Several public and private agencies have been identified as most probable buyers of the subject property. These organizations are actively involved in the identification and purchase of properties with unique, natural attributes. Organizations acquiring potentially comparable properties prior to August 9, 1983 included the National Park Service, Forest Service, Bureau of Land Management, Fish and Wildlife Service, The Nature Conservancy, The Wilderness Society, Sierra Club, and Trust for Public Land.

Physical Attributes

The comparable selection process involved a detailed analysis of the physical attributes of past sales. Properties were judged on the basis of physical similarity to the subject property. The physical characteristics of a site are determined primarily by the geologic and climatic elements of the area. Therefore, the search for comparable properties was initiated in the general locale of the subject property. Priority was given to sales of inholdings of wilderness areas having physical characteristics similar to the subject property. Sites purchased as part of ongoing land acquisition programs to consolidate land holdings or to improve management of natural areas, were also sought. Furthermore, environments with minimal timber value, or uneconomical timber potential were desired. All potential comparable sales were investigated for similar topographic, hydrologic, and vegetative characteristics.

Conditions of Sale

Properties were considered for comparison if the sale was a fee simple, arm's length transaction. When the conditions of sale are atypical, the result may be a price that is higher or lower than that of a normal market transaction. Partial interests in properties, such as scenic easements, were not considered as comparables. The ATV access easements (365 acres) retained by ASRC as part of the exchange agreement do not have an impact on the overall value of the subject property great enough to warrant the search for comparables with similar type easements. Typically, value adjustments are made for the existence of minimal interests such as access easements. In this case, the value of the ATV easements is included as a component of the value adjustment made for the retained rights of subsistence harvesting. All sales were investigated for the presence of negotiated transactions between willing buyers and sellers. Sales in which eminent domain or recreational development pressures affected value were eliminated. In addition, the authority of Section 1302(b) of ANILCA, applicable to the subject property, precludes the consideration of sales involving eminent domain.

Definition of Acceptable Arm's Length Transactions

Real estate transactions often occur in a market where a group representing individual interests is the buyer or seller. Several local and national conservancy groups, such as The Nature Conservancy, raise money to buy, hold, or gift landmarks and open space to the public interest. As such, they are customers in the market for wildlife habitat, natural lands, and wilderness.

These organizations receive donations, land or cash in lieu of land, that are tax deductible. It has been argued that their acquisitions and transfers are not arms-length transactions. The appraiser has assumed, on the basis of discussions with grantors and grantees that, for properties acquired through some combination of cash, trade, and gift, if there is evidence of hard negotiation to accomplish the transaction, the transaction is recognized as arm's length and the cash price on the deed is approximately market value. An adjustment for possible tax savings attributed to charitable donation can be made if the discount from agreed upon value is known.

Further support for the assumption of market value is the transacting parties' desire to avoid exposure to political criticism. A purchase price close to market value limits this exposure. In addition, the appraised price for a charitable donation must meet the scrutiny of the IRS. When a person donates land to a conservancy group, the charitable deduction is based on the appraised value of the land, subject to IRS judgement. The appraised value must be close to market value to meet IRS criteria. If the group subsequently sells this land to the government, the selling price will be necessarily based on this appraisal. Finally, if conservancy groups have acquired property at a reduced price, it will be marked up to market value when sold to the government. This allows the group to recover acquisition costs, administrative and interest costs, and holding costs expensed while negotiating the sale with the government.

However, the primary support for the government paying market value for its land purchases revolves around the eminent domain issue. It is cheaper, faster, and easier for the government to pay market value than to initiate and complete condemnation. This is illustrated in a Report to the Congress of the United States by the Comptroller General:

> The Federal Government has a backlog of over 20,000 court cases in which it seeks to acquire by condemnation private land for public use. At the close of the fiscal year 1978, the land in question was appraised at $481 million. Actual acquisition costs probably will be much higher because of administrative costs, awards, or settlements in excess of Government appraisals, and long delays in court.
>
> The large case load arises from the many sizable land acquisition programs for such public purposes as recreation, environmental and wildlife protection, civil and military public works, and various other programs authorized by the Congress. One large National Park Service land preservation project alone accounted for over 10,000 cases pending in September 1979.
>
> Sharply rising real estate prices and administrative expenses make it particularly desirable to expedite acquisitions, although the condemnation of real estate property is a complex process that cannot be easily simplified.

The same report indicated that of all properties targeted for government acquisition, only 10 percent are taken by eminent domain. This illustrates the willingness of the government to engage in negotiations to reach a fair purchase price. Condemnation action is required only when the owner is so unwilling to sell or so aggrieved at the Government's offering price that he/she is willing to endure years of delay and risk of considerable expense for a judicial determination. From the report:

> Condemnation action is generally needed when a landowner is unwilling to sell at the Government's offered price or when the Government cannot acquire clear title to the property without judicial determination. Acquisition by condemnation is a means of last resort. To avoid litigation and relieve congestion in the courts, Federal agencies are required by law (P.L. 91-646 (42 U.S. C., 4651)), to the greatest extent practicable, to make every reasonable effort to acquire expeditiously real property by negotiation.

To summarize, conservancy group acquisitions and congressionally mandated natural land purchases represent a significant proportion of the market for wilderness, natural lands, and wildlife habitat. The appraiser will recognize transactions between individuals and conservancy groups, and conservancy groups and the government as arm's length if certain criteria are met. Any transaction accomplished through extended negotiations is assumed to be arm's length and the purchase price is approximately market value. This includes government purchases where eminent domain is not an option as in the case of the subject property exchange agreement. If the government (state or federal) has been given powers of eminent domain, it is assumed that this will compel the parties to reach an arm's length transaction where the purchase price is approximately market value.

The comparable sales in this appraisal meet the above criteria and are a common denominator from which to draw information about wilderness acquisitions for preservation purposes.

Initial Search for Comparables

Considering the physical attributes of the subject property, the search for comparable properties began in Alaska. Public and private organizations involved in the acquisition of natural lands were contacted. Several Alaskan appraisers were also contacted. Fifteen Alaskan sales that transpired between June, 1971, and July, 1983, with similar property attributes and conditions of sale to the subject property, are presented in Exhibit IV-3. However, these parcels are not comparable to the subject property. The most probable use for each of these properties is not consistent with the highest and best use of the subject property. There is no evidence that the buyers of these properties intend to maintain them in their natural state (i.e., for wilderness purposes). Moreover, with the exception of Parcel 14, no evidence is presented that the purchasers are extending value to the unique physical attributes, remoteness, and solitude of the properties. Comparable Number 14, part of the Seldovia Native Association exchange with the State of Alaska, is a transaction that, in general, represents market prices in natural, habitat, and recreation lands (Exhibit IV-4). This transaction, which consists of lands located within Kachemak Bay State Park, is similar to the subject, but fails as a reasonable comparable because these lands were acquired for inclusion in a scenic park which, by definition, lacks a wilderness component (Appendix IV-A). As we demonstrate later in the report, natural properties acquired for wilderness purposes are more comparable. However, this transaction does represent a component of the market in natural land and provides an indication of value for lands similar to the subject.

EXHIBIT IV-3

Alaskan Sales

COMP #	SALE PRICE	ACRES	$/Acre	Date	GRANTOR GRANTEE	LOCATION DESCRIPTION
1	$52,000	160.00	$325.00	7-5-78	A John D Burnett	2mi NE of Anderson & 1/4mi W of Alaska RR
2	58,600	146.50	400.00	5- -75	G & D Trim Wrangell Mountain Enterprises	3mi SW of McCarthy, AK on Kennicott River
3	19,000	154.50	122.98	6-1-71	State of Alaska W D McGehee & F Glynn	4mi SW of McCarthy, at Kennicott & Nizina Rivers
4	35,000	80.24	436.19	9-4-75	W Shuros K E Wooten	6 air miles SW of Livengood, AK, at West Fork & Tolovana Rivers
5	10,500	106.80	98.31	9-27-76	J Laverne & S S Langton J P Haggland	40 air miles N of Bettles
6	96,000	160.00	600.00	1-15-82	G Probest S & K Farms	Mile post 1379 of Alaska Hwy, across the Tenana River
7	30,000	214.56	139.82	6- -78	J Smith (Rampart Invest Corp) J Vogler	70mi NW of Fairbanks, N side of Yukon River
8	160,000	240.00	666.67	10-31-81	State of Alaska J Flodin	9mi N of Fairbanks & 1 1/2mi W of Elliot Hwy
9	100,000	115.51	865.73	12-12-75	D & N Kendall A Smith & V Leinen	59mi S of Glennallen, E side Tiekel River, near Mile 56 Richardson Hwy
10	300,000	316.60	947.57	3- -79	B Bolstridge & A Derkavorkian Devel, Inc (Rare Earth)	LaTouche Island, Prince William Sound, AK
11	350,000	2,057.71	170.09	10-22-82	Anchor Nome 2,000 AK Lmt Partnership	6mi NE of Nome on Taylor Hwy
12	3,000	109.15	27.49	4-10-73	Northern Commercial Co R A Kreig	Yukon River, 16mi NW of Eagle, Alaska
13	80,000	505.00	158.42	11- -79	B Smith Casa Six	60mi NE of Nome on Casadepaga & Niukluk Rivers
14	3,303,500	3,578.00	923.28	3-15-83	Seldovia Native Assoc State of Alaska	Seldovia, Alaska
15	40,000	318.56	125.57	2-19-76	U M Leininger J Porelite, T Truitt, T Barker & E Sprade	Head of Ugak Bay on Kodiak Island
Mean $/Acre			$400.47			
Standard Deviation $/Acre			$323.97			
Weighted Mean $/Acre			$469.01			

Source: Real Estate Dynamics, Inc., 1988.

EXHIBIT IV-4

Seldovia Land Exchange

1983

Appraisal Designation	Acreage/Appraisal	Total Appraised Value
Lands to be acquired by the State from Seldovia:		
SNC Unit #9 (portion)		
(Sec.29, T. 8S, R. 12 W., S.M.)	590acres @ $1000/acre	$ 590,000
(Sec.30, T. 8S, R. 12 W., S.M.)	340acres @ $1200/acre	408,000
(Sec.31, T. 8S, R. 12 W., S.M.)	30acres @ $1200/acre (North Shore Tutka Bay)	36,000
(Sec.32, T. 8S, R. 12 W., S.M.)	260acres @ $1000/acre (North Shore Tutka Bay)	260,000
(Sec.33, T. 8S, R. 12 W., S.M.)	580acres @ $1000/acre	580,000
(Sec.34, T. 8S, R. 12 W., S.M.)	* 285acres @ $ 300/acre	85,500
Seldovia Native Corporation #14	1493acres @ $ 900/acre	1,344,000
TOTAL	3578acres @ $ 923/acre	$3,303,500
Lands to be acquired by Seldovia from the State:		
Gray Cliff	18.00acres @ $7000/acre	$ 126,000
Martin River	240.00acres @ $1800/acre	432,000
Bing Brown's Landing	15.20acres @ $3000/acre	45,750
Funny River Road	135.80acres @ $2000/acre	271,500
State Unit #3	2.84acres @ $14000/acre	39,750
State Unit #6	3.38acres @ $25000/acre	84,500
State Unit #7	8.93acres @ $25000/acre	223,000
State Unit #10	* 950.00acres	$1,012,000
* 310 +/- acres @ $1200/acre (N 1/2 Sec.33, T. 8S., R. 13 W., S.M.)	$372,000	
640 +/- acres @ $1000/acre (Sec.34, T. 8S., R. 13 W., S.M.)	$640,000	
	$1,012,000	
State Unit #14	280.00acres @ $1800/acre	$ 504,000
State Unit #15	313.66acres @ $1800/acre	565,000
TOTAL	1967.81acres	$3,303,500

* Portion of Sec.34, Township 8 South, Range 12 West, Seward Meridian, more particularly described as E 1/2 SE 1/4 NW 1/4 NE 1/4, NE 1/4 NE 1/4, S 1/2 NE 1/4, SE 1/4, Totaling 285 acres.

Kachemak Bay State Park was established by the Alaska State Legislature in 1970 for protection of the unique wildlife, recreational and scenic values contained in those lands and waters.

Source: Memorandum of Understanding, Exchange Agreement Negotiated Pursuant to A.S. 38.50. Attachments A and B. March, 1983.

Extended Search for Comparables

Due to the lack of comparable properties in Alaska, the search was extended to the lower forty-eight states. The practice of extending the search range for comparable properties is an accepted methodology of market valuation. As stated in The Appraisal of Real Estate, 8th Edition (p.273), "When comparable sale data in the subject property's area are limited, an appraiser may have to extend the data search to adjacent neighborhoods and communities that are similar to that of the subject property".

The search parameters for the lower forty-eight states utilized the same methodology of investigation as the Alaska comparable search. To maintain the physical relationship of the subject property and comparable properties, the search was initiated in the mountainous areas of the Northwestern United States. As the result of previous natural land appraisal work conducted in this part of the country, Real Estate Dynamics, Inc. (REDI) has maintained an existing file of comparable wilderness properties, complied since 1980, that provides a significant pool of comparable properties. To expand on this list, the appraisers contacted public organizations, private agencies, and local appraisers regarding acquisitions of natural land greater than 100 acres in the states of Washington, Oregon, Montana, Idaho, Wyoming, Colorado, and in northern California. The objective of the search was to find properties that were purchased for the purpose of maintaining the unique, natural qualities of the property. The most probable purchasers of large tracts of wilderness land are public and private organizations intent on preserving and maintaining the wilderness integrity of the land.

Public and private agencies actively involved in the search and purchase of natural land were identified. Organizations that acquired potentially comparable properties prior to August 9, 1983 included the National Park Service, Forest Service, Bureau of Land Management, Fish and Wildlife Service, The Nature Conservancy, The Wilderness Society, Sierra Club, and Trust for Public Land.

The National Park Service currently manages over seven million acres of wilderness land surrounding the subject property. A primary management

objective of the NPS is the purchase of private inholdings within national park boundaries. Therefore, the land acquisitions of this organization was a logical starting point for the comparable search. The National Park Service Master Deed Listing of Acquisitions from 1975-1983 was investigated for comparable properties (Appendix IV-B). No comparable properties were discovered in these analyses. Parcels were eliminated as comparables for reasons of development pressure, lack of remoteness, conditions of sale, and missing data.

The Forest Service is actively involved in the acquisition of properties within FS boundaries. The Forest Service List of Acquisitions from 1979-1983 was investigated for comparable sales (Appendix IV-C). Two properties were found to be comparable to the subject property (Identified as Comparables #19 and #20 in Exhibit IV-4). These two parcels are located in designated wilderness areas and were purchased in recognition of their unique natural attributes.

Officials of the Bureau of Land Management were contacted in regard to acquisitions of wilderness areas. Although the BLM is the nation's largest landowner, they did not acquire any parcels for wilderness purposes prior to the appraisal date of the subject property.

The Fish and Wildlife Service acquires natural land and water areas for various functions. These include wildlife refuges, waterfowl production areas, wildlife research centers, fish hatcheries, fish research and control stations, and coordination areas. The acquisition list of Wilderness Areas in the Wildlife Refuge System (U.S. Dept. of Interior, Annual Report of Lands Under The Control Of the Fish and Wildlife Service as of September 30, 1986) was investigated for potential comparables. No comparable properties were found during this process; the majority were eliminated because of dissimilar physical attributes and lack of remoteness.

Private organizations researched for potential comparable transactions include The Nature Conservancy, Sierra Club, The Wilderness Society, and The Trust for Public Land. These organizations are recognized as customers in the market for

wildlife habitat, natural lands, and wilderness. The search for comparable properties from private organizations revealed a number of lands in their natural state purchased for preservation of wild flora and fauna and maintenance of the unique qualities of the land. However, none of these parcels was purchased for the specific purpose of wilderness, as defined by the Wilderness Act of 1964.

Selection of Subject Property Comparables

After a thorough and exhaustive search for additional comparables among these organizations, two comparables were found that met the selection criteria for wilderness comparables as established earlier in this section. These two new comparables were added to REDI's existing list of comparable wilderness properties (Exhibit IV-5). The appraisers consider this data base the most complete and appropriate list of wilderness comparables available to estimate the value of the subject property. A hinderance to uncovering additional comparables was that, given a 1983 postdated appraisal, many of the records for past transactions were not readily available or were no longer on file with the originating agency or organization.

REDI's existing set of comparables, derived from various government agencies and private conservation organizations, was selected primarily because their highest and best use and physical characteristics are most similar to the subject. Each of these properties were acquired for the purpose of maintaining their unique, natural wilderness qualities, and each acquisition was determined to be an arm's length transaction. Summary documentation of each comparable property is presented in Appendix IV-D.

EXHIBIT IV-5

List of Comparable Properties
for Subject Property

COMP #	Property Name	State	County	Date of Sale	Grantor/Grantee	Size in Acres
1	Phelps Creek	WA	Chelan	7-15-79	Smith/Two Rivers, Inc.	357
2	Sunset Lake	WA	Snohomish	5-19-76	Clausing & Work/Seattle Water Dept.	320
3	Lanham	ID	Valley	8-20-74	Lanham/USA	620
4	Matteson	ID	Idaho	11-05-75	Matteson/USA	82
5	Wolfinbarger	ID	Idaho	1-02-76	Wolfinbarger/USA	88
6	National Wildlife	MT	Lewis-Clark	9-10-79	Babcock/National Wildlife Federation	336
7	Mueller Ranch	CO	Teller	10- -78	The Nature Conservancy/State of CO DNR	640
8	Pack River #1	WA	Chelan	12- -82	Chastek Etal./US Forest Service	2,549
9	Pack River #2	WA	Chelan	12- -82	Chastek Etal./US Forest Service	1,028
10	Pack River #3	WA	Chelan	12- -82	Chastek Etal./US Forest Service	3,697
11	Pack River #4	WA	Chelan	12- -82	Chastek Etal./US Forest Service	15,183
12	Marble Creek	WA	Skagit	11-14-73	Cresent Marble Mining Co./USA	120
13	Bench-Caroline Lake	WA	Chelan	1- 1-76	Pack River Co./Mt. Cashmere, Inc.	42
14	Bettis	ID	Valley	8-12-79	Bettis & Jager/USA	160
15	Taylor Ranch	ID	Valley	2- -69	Taylor/University of Idaho	65
16	Sloan Kettering	WY	Teton	8- 9-76	Sloan Kettering/USA	463
17	Nature Conservancy	MT	Gallatin	4-12-79	The Nature Conservancy/US Forest Service	3,677
18	Lone Peak-Ankeny	MT	Gallatin & Madison	4- 5-79	Lone Peak, Inc./Ankeny	1,760
19	Taylor Lake	CA	Siskiyou	1- -79	Erlandson/US Forest Service	640
20	Kennedy-Meadow	CA	Touleme	2-14-79	PG&E/US Forest Service	832

Source: Real Estate Dynamics, Inc., 1988.

Adjustment Of Comparable Sales For Externalities

It is necessary for the appraiser to make adjustments to equalize the comparables for differing sales conditions or other external factors. Adjustments to the comparables were made for terms of sale, and improvements included with the land. The adjusted prices are reflected in Exhibit IV-6. Time and size adjustments were determined to be inappropriate for this appraisal as explained in the following text.

EXHIBIT IV-6

Comparable Sales External Adjustments Matrix

Comp #	Comparable Name	Nominal Sales Price	Sale Price Adjustment For Terms	Sale Price Adjustment For Improvements	Adjusted Sales Price	Acres	Price Per Acre
1	Phelps Creek	$350,000	-$70,000	-$25,000	$255,000	357	$714
2	Sunset Lake	92,500	+3,500	0	96,000	320	300
3	Lanham	1,450,000	0	-210,000	1,240,000	620	2,000
4	Matteson	327,320	-49,098	0	278,222	82	3,393
5	Wolfinbarger	350,800	0	0	350,800	88	3,986
6	National Wildlife	400,000	-265,000	0	135,000	336	402
7	Mueller Ranch	360,000	+154,480	0	514,480	640	804
8	Pack River #1	3,337,554	0	0	3,337,554	2,549	1,309
9	Pack River #2	1,483,167	0	0	1,483,167	1,028	1,443
10	Pack River #3	4,545,229	0	0	4,545,229	3,697	1,229
11	Pack River #4	19,617,293	0	0	19,617,293	15,183	1,292
12	Marble Creek	290,000	0	0	290,000	120	2,417
13	Bench-Caroline Lake	34,025	-1,700	0	32,325	42	775
14	Bettis	880,000	0	-100,000	780,000	160	4,875
15	Taylor Ranch	100,000	0	-20,000	80,000	65	1,234
16	Sloan Kettering	1,300,000	0	0	1,300,000	463	2,809
17	Nature Conservancy	950,000	0	0	950,000	3,677	258
18	Lone Peak-Ankeny	600,000	0	0	600,000	1,760	341
19	Taylor Lake	194,000	0	0	194,000	640	303
20	Kennedy-Meadow	500,000	0	0	500,000	832	601

Source: Real Estate Dynamics, Inc., 1988.

Terms of Sale Adjustment

A terms of sale adjustment accounts for the value of inducements (i.e., favorable conditions, special considerations, incentives, agreements) made by, or to either the buyer or seller as a means to bring about the sale of the property (e.g., financing arrangements, tax advantages, retained access, occupancy, or extraction rights).

Improvements Adjustment

An improvements adjustment accounts for the value of buildings or other more or less permanent structures or developments located upon or attached to the land.

Time Adjustment

Time adjustments to the transaction price of comparable sales are usually made in reference to overall economic factors affecting price. This can be accounted for by determining the inflation effects and/or real growth/decline in price levels over a finite time frame. Price deflators, Consumer Price Index (CPI), or a standardized basis of adjustment place historical transaction prices in terms of "current dollars" or some price level different from that at the time of transaction.

These price adjustments are reasonable and appropriate in the refinement of comparable adjustments leading to the selection of suitable comparables. However, a time adjustment is only appropriate if it is warranted by a change in market conditions. In the case of our wilderness land comparables, the market lacks sufficient efficiency in reacting to economic change to reflect a systematic price/time relationship. Exhibit IV-7 is the summary of a regression between time in years and price per acre for sets of natural land properties. No discernible pattern emerges that reflects change in price over time to warrant a price adjustment to the comparables.

EXHIBIT IV-7
Price/Time Regression Analysis
for Sets of
Natural Land Properties

Set #1: US Forest Service Wilderness and Recreation Area Acquisitions (1976-1983)

Regression Output

Constant	539.927300
Std Err of Y Est	1742.474000
R Squared	**0.046822**
No. of Observations	46.000000
Degrees of Freedom	44.000000
X Coefficient(s)	163.793459
Std Err of Coef	111.411621

Set #2: Federal Agencies' Public Park and Recreation Land Acquisitions (1976-1983)

Regression Output

Constant	713.719810
Std Err of Y Est	732.316310
R Squared	**0.001704**
No. of Observations	34.000000
Degrees of Freedom	32.000000
X Coefficient(s)	13.890000
Std Err of Coef	58.830000

Set #3: Real Estate Dynamics - Wilderness Land Comparables (1969-1979)

Regression Output

Constant	2502.330000
Std Err of Y Est	1624.030000
R Squared	**0.020000**
No. of Observations	17.000000
Degrees of Freedom	15.000000
X Coefficient(s)	-79.530000
Std Err of Coef	145.910000

Note: Complete lists of properties included in each regression set are presented in Appendix IV-E.

Source: Real Estate Dynamics, Inc., 1988.

Size Adjustment

The commonly applied size adjustment when valuing wilderness land is not appropriate. Typically size is a surrogate to reflect price phenomena the appraiser is unable to explain or define appropriately. As commonly applied, size/price has reflected an inverse relationship, that is, as size increased

the price per acre declined. Up to some factitious size level, price and size were shown to have little relationship, or size adjustments were considered less significant than in loosely defined "large parcels". However, these large parcels were assumed to be more price/size sensitive. Nevertheless, the fundamental implicit assumption has been that size and price had a significant and direct measurable relationship in large parcels.

Alternatively, size adjustments more appropriately reflect discounts associated with investment risk where larger size implies a longer development period and greater uncertainty.

The conversion of raw land to a developed site takes time. Therefore, until a measurable return is received, the price discount is reflected in the land. Size differentials are then really time and risk adjustments, and the amount of the discount is determined by the speed with which the raw land conversion to improved site occurs.

The price differential of size is also directly correlated to the use of the site. Different uses have different site size requirements or use/size dynamics. For example, a 10 acre residential parcel may make the conversion from raw land to improved sites over 5 years whereas a different 10 acre parcel may be converted from raw land to a large convention complex in 2 years. Applying this concept to natural land presents an interesting perspective to so-called size/price relationships. Since the conversion of raw land to natural land, in most cases, takes place instantaneously there is little, if any, discount for the time/risk conversion of land.

Another phenomenon of natural land use is that in some cases size, on an increasing scale, can be a positive attribute. In accordance with the Wilderness Act of 1964, the establishment of a wilderness area requires a synergy of size in the amount of at least 5000 acres. Therefore, the value of land may actually <u>increase</u> as one approaches 5000 acres in size. Beyond 5,000 acres size/price relationships may be difficult to quantify. Clearly, 5,000 acres is a minimum requirement for wilderness area designation, so that beyond the 5000 acre size, prices should at least remain at the 5000 acre price level.

Step 2

The Wilderness Evaluation System

The need to develop a systematic data analysis procedure for land with a highest and best use of wilderness resulted in establishing a Wilderness Evaluation System (WES). The WES is modeled after the Wilderness Attribute Rating System (WARS), which was developed as a component of the Roadless Area Review and Evaluation process (RARE-II) by the U.S. Forest Service, United States Department of Agriculture.

The WES was developed to specifically address the problem of representing the significant physical characteristics of the comparables and the subject property that wilderness buyers were most likely purchasing. The WES was designed to provide an inventory of facts describing the physical characteristics of the land that are important to buyers of wilderness properties.

The WES shares three components of the WARS model: apparent naturalness, opportunity for solitude, and opportunity for primitive recreational experience. In addition, the WES includes a component for the evaluation of visual quality. Each component contains several attributes related to recognized wilderness qualities. A list of the WES attributes used for this appraisal is contained in Exhibit IV-8. A more detailed explanation of the attributes contained within the WES model are presented in Appendix IV-F.

Step 3

Appraiser Defined Attributes

The appraiser has defined four additional attributes to measure the value differences between urban, rural, and regional characteristics of each property. These attributes are listed in Exhibit IV-9. By including these attributes the appraiser recognizes the importance of evaluating the locational context of each property, and historical evidence suggests these attributes may influence price. In addition, they define the "Alaskan factor", providing consideration of the characteristic differences between the market dynamics of Alaska and the lower 48 states.

EXHIBIT IV-8

Attributes from the Wilderness Evaluation System

Used to Represent the Subject and Comparable Properties

1. Natural Integrity - Apparent Naturalness
   A measure of negative impacts on the natural integrity of the property (roads, buildings, trails, etc.).
2. Distance Perimeter to Core
   A measure of the distance from the property to the Wilderness Area boundary.
3. Vegetation Screening
   A measure of the degree to which vegetative cover adds to solitude.
4. Challenge
   The number and extent of rockforms, 40 percent or more vegetative overstory, and percent slope.
5. Diversity - Percent Slope
   A measure of the diversity of percent slope within the property.
6. Diversity - Terrain
   The degree to which a landscape exhibits multiple combinations of landscape features: physiography, rockform, vegetation, and waterform.
7. Scenic Quality
   The degree to which a landscape exhibits multiple combinations of physiography, rockform, vegetation, and surface water.

Source: Real Estate Dynamics, Inc., 1988.

EXHIBIT IV-9

Additional Appraiser Defined Attributes

Used to Represent the Subject and Comparable Properties

1. Demand Proximity
   A measure of distance (travel time) to an urban area. Urban area is defined as a Standard Metropolitan Area (SMA) or city with population greater than 250,000.
2. Demand Density
   A measure of population of the above SMA or city.
3. Prior Use
   Use at the time of purchase.
4. Access to Property Boundary
   A measure of the economic efficiency of access.

Source: Real Estate Dynamics, Inc., 1988.

Step 4

Assigning Wilderness Attribute Scores

Identifying Comparative Wilderness Attributes

In Step 2 of the valuation process, we indicated that the key to the sales comparison approach is selecting a relevant unit of comparison, a unit that measures the utility buyers are purchasing. A principal component of this appraisal was the utilization of a wilderness evaluation process (i.e., WES) to identify a relevant unit of comparison and allow implementation of the sales comparison approach. To this list of wilderness evaluation attributes we added other variables that the appraiser found contribute to differences in price between comparables. What results from this analysis is a list of attributes that bear a significant relationship to differences in the per unit price paid for individual comparable properties.

Establishing Comparative Wilderness Attribute Scores

Assisted by the WES, the appraiser assesses and rates the quality of each attribute for both the comparable properties and six subject tracts. These attribute ratings are numerically scored, representing a qualitative measure of each individual attribute that, in the aggregate, reflects the relative desirability of each property. Attribute scores provide the basis for evaluating the physical similarities and differences between the comparables and subject tracts in selecting those comparables most similar to the subject property, as applied in the MKTCOMP program. The attribute scores for the comparables and each subject tract are presented in Exhibit IV-10 and Exhibit IV-11. Refer to Appendix IV-F for a detailed explanation of the criteria used to derive these scores.

EXHIBIT IV-10

Wilderness Attribute Scores - Comparable Properties

FEATURE OR ATTRIBUTE		PHELPS (1)	SUNSET (2)	LANHAM (3)	MATTESON (4)	WOLFINBAR (5)	NTLWILD (6)	MUELLER (7)	PACKRIV1 (8)	PACKRIV2 (9)	PACKRIV3 (10)
NATURAL INTEGRITY	(1)	9.438	10.000	6.158	6.791	7.083	10.000	10.000	9.890	9.928	9.887
DIST. TO PERIMETER	(2)	0.000	10.000	10.000	10.000	10.000	0.000	0.000	0.875	0.000	3.134
VEGETATION SCREENING	(3)	2.429	2.875	0.844	0.909	1.056	0.750	2.297	6.313	3.757	3.154
CHALLENGE	(4)	8.571	8.750	0.859	2.045	1.944	3.068	5.623	3.682	6.841	4.239
DIVERSITY - % SLOPE	(5)	4.095	7.281	4.953	4.773	4.611	4.864	8.219	4.006	4.949	3.523
DIVERSITY - TERRAIN	(6)	6.833	6.906	4.547	5.773	5.500	5.614	6.594	4.631	5.687	4.270
SCENIC QUALITY	(7)	5.810	5.969	3.109	4.455	3.944	4.636	5.703	3.988	4.548	3.860
DEMAND PROXIMITY	(8)	4.000	5.000	1.000	1.000	1.000	1.000	5.000	4.000	4.000	4.000
DEMAND DENSITY	(9)	5.000	5.000	2.000	5.000	5.000	2.000	1.000	5.000	5.000	5.000
PRIOR USE	(10)	4.000	2.000	5.000	5.000	4.000	1.000	2.000	1.000	1.000	1.000
ACCESS EFFICIENCY	(11)	3.000	1.000	2.000	2.000	2.000	1.000	4.000	5.000	5.000	5.000

FEATURE OR ATTRIBUTE		PACKRIV4 (11)	MARBLE (12)	BENCH-CAR (13)	BETTIS (14)	TAYLOR (15)	SLOAN KET (16)	NATURE (17)	ANKENY (18)	TAYLOR L. (19)	KENNEDY (20)
NATURAL INTEGRITY	(1)	9.470	9.292	7.778	8.300	5.559	9.540	6.502	9.913	8.800	9.690
DIST. TO PERIMETER	(2)	4.100	5.000	0.000	10.000	10.000	0.000	0.000	5.000	0.000	0.000
VEGETATION SCREENING	(3)	3.660	1.917	0.333	2.125	1.235	3.938	4.663	3.972	1.190	0.660
CHALLENGE	(4)	4.182	1.667	8.889	2.188	0.882	5.625	0.285	4.432	3.390	1.630
DIVERSITY - % SLOPE	(5)	3.111	7.750	3.556	4.000	5.765	6.854	1.639	6.148	3.000	1.000
DIVERSITY - TERRAIN	(6)	4.879	3.000	4.556	6.125	4.588	5.333	2.660	4.716	3.800	0.650
SCENIC QUALITY	(7)	4.333	1.883	3.444	5.500	3.000	4.708	1.842	4.040	3.880	0.990
DEMAND PROXIMITY	(8)	4.000	4.000	4.000	1.000	1.000	2.000	1.000	1.000	2.000	4.000
DEMAND DENSITY	(9)	5.000	5.000	5.000	2.000	2.000	2.000	2.000	2.000	3.000	1.000
PRIOR USE	(10)	1.000	2.000	2.000	4.000	4.000	2.000	2.000	4.000	1.000	1.000
ACCESS EFFICIENCY	(11)	5.000	1.000	2.000	3.000	3.000	1.000	3.000	3.000	3.000	1.000

EXHIBIT IV-11

Wilderness Attribute Scores - Subject Property

FEATURE OR ATTRIBUTE		TRACT 1	TRACT 2	TRACT 3	TRACT 4	TRACT 5	TRACT 6
NATURAL INTEGRITY	(1)	9.960	10.000	10.000	9.956	10.000	10.000
DIST. TO PERIMETER	(2)	6.235	0.000	0.000	4.925	0.000	0.000
VEGETATION SCREENING	(3)	0.000	0.000	0.000	0.000	0.000	0.000
CHALLENGE	(4)	1.960	1.430	0.480	3.015	1.990	4.650
DIVERSITY - % SLOPE	(5)	1.900	1.430	0.480	2.900	1.990	3.800
DIVERSITY - TERRAIN	(6)	3.753	2.800	3.140	3.354	1.400	3.100
SCENIC QUALITY	(7)	5.022	4.070	4.410	4.624	2.670	4.370
DEMAND PROXIMITY	(8)	1.000	1.000	1.000	1.000	1.000	1.000
DEMAND DENSITY	(9)	1.000	1.000	1.000	1.000	1.000	1.000
PRIOR USE	(10)	1.000	1.000	1.000	1.000	1.000	1.000
ACCESS EFFICIENCY	(11)	1.000	1.000	1.000	1.000	1.000	1.000

Ordinal Attribute Scores

For each wilderness attribute of both the comparable properties and subject property (Exhibit IV-10 and Exhibit IV-11, #1-#7), the WES derived an average score between 1 and 10. The supplemental variables added by the appraiser (Exhibit IV-10 and Exhibit IV-11, #8-#10) were scored on a scale of 1-5. To place the wilderness attribute scores on the same scale as the supplemental variables and retain the relative distribution within an attribute, a transformation process was used. The result of this transformation was to scale the scores such that "1" represented the lowest attribute score and "5" represented the highest attribute score with "2","3", and "4" representing intermediate scores. An example of one such transformation is shown as follows:

Step 1	Compute mean wilderness score (8.5).
Step 2	Compute minimum wilderness score (2.0).
Step 3	Compute maximum wilderness score (10.0).
Step 4	Subtract mean from maximum (10.0 - 8.5 = 1.5).
Step 5	Divide upper range by 5 (1.5/5 = .30).
Step 6	Add upper level increment to mean (8.5 + .30 = 8.80). This is the upper cutoff for "3".
Step 7	Add 2 X upper increment to Step 6 above (8.80 + .60 = 9.40). This is upper cutoff for "4".
Step 8	Add 2 X upper increment to Step 7 above (9.40 + .60 = 10.00). This is upper cutoff for "5" (should be equal to maximum).
Step 9	Repeat Steps 6-8 for lower increment except, subtract increment instead of adding increment.

Resulting Range:
1 = 2.00 - 4.59
2 = 4.60 - 7.19
3 = 7.20 - 8.80
4 = 8.81 - 9.40
5 = 9.41 -10.00

The results of this process are referred to as Ordinally Scaled Attribute Scores. These are presented for each comparable property in Exhibit IV-12 and for each of the subject property's six tracts in Exhibit IV-13.

EXHIBIT IV - 12
Wilderness Attribute Scores - Comparable Properties
(After Transformation)

FEATURE or ATTRIBUTE		PHELPS (1)	SUNSET (2)	LANHAM (3)	MATTESON (4)	WOLFINBAR (5)	NTL WILD (6)	MUELLER (7)	PACKRIV1 (8)	PACKRIV2 (9)	PACKRIV3 (10)
NATURAL INTEGRITY	(1)	4.00	5.00	1.00	1.00	2.00	5.00	5.00	5.00	5.00	5.00
DIST. TO PERIMETER	(2)	1.00	5.00	5.00	5.00	5.00	1.00	1.00	1.00	1.00	3.00
VEGETATION SCREENING	(3)	3.00	4.00	2.00	2.00	2.00	2.00	3.00	5.00	4.00	4.00
CHALLENGE	(4)	5.00	5.00	1.00	2.00	2.00	3.00	4.00	3.00	5.00	3.00
DIVERSITY-%SLOPE	(5)	3.00	5.00	4.00	3.00	3.00	3.00	5.00	3.00	4.00	3.00
DIVERSITY-TERRAIN	(6)	5.00	5.00	3.00	4.00	4.00	4.00	5.00	3.00	4.00	3.00
SCENIC QUALITY	(7)	4.00	4.00	2.00	3.00	3.00	3.00	4.00	3.00	3.00	3.00
DEMAND PROXIMITY	(8)	4.00	5.00	1.00	1.00	1.00	1.00	5.00	4.00	4.00	4.00
DEMAND DENSITY	(9)	5.00	5.00	2.00	5.00	5.00	2.00	1.00	5.00	5.00	5.00
PRIOR USE	(10)	4.00	2.00	5.00	5.00	4.00	1.00	2.00	1.00	1.00	1.00
ACCESS EFFICIENCY	(11)	3.00	1.00	2.00	2.00	2.00	1.00	4.00	5.00	5.00	5.00

FEATURE or ATTRIBUTE		PACKRIV4 (11)	MARBLE (12)	BENCH-CAR (13)	BETTIS (14)	TAYLOR (15)	SLOAN KET (16)	NATURE (17)	ANKENY (18)	TAYLOR L. (19)	KENNEDY (20)
NATURAL INTEGRITY	(1)	4.00	4.00	2.00	2.00	1.00	4.00	1.00	5.00	3.00	5.00
DIST. TO PERIMETER	(2)	3.00	4.00	1.00	5.00	5.00	1.00	1.00	4.00	1.00	1.00
VEGETATION SCREENING	(3)	4.00	3.00	1.00	3.00	2.00	4.00	5.00	4.00	2.00	1.00
CHALLENGE	(4)	3.00	2.00	5.00	2.00	1.00	4.00	1.00	3.00	3.00	2.00
DIVERSITY-%SLOPE	(5)	2.00	5.00	3.00	3.00	4.00	5.00	1.00	4.00	2.00	1.00
DIVERSITY-TERRAIN	(6)	3.00	2.00	3.00	5.00	3.00	4.00	2.00	3.00	3.00	1.00
SCENIC QUALITY	(7)	3.00	1.00	2.00	4.00	2.00	3.00	1.00	3.00	3.00	1.00
DEMAND PROXIMITY	(8)	4.00	4.00	4.00	1.00	1.00	2.00	1.00	1.00	2.00	4.00
DEMAND DENSITY	(9)	5.00	5.00	5.00	2.00	2.00	2.00	2.00	2.00	3.00	1.00
PRIOR USE	(10)	1.00	2.00	2.00	4.00	4.00	2.00	2.00	4.00	1.00	1.00
ACCESS EFFICIENCY	(11)	5.00	1.00	2.00	3.00	3.00	1.00	3.00	3.00	3.00	1.00

EXHIBIT IV - 13
Wilderness Attribute Scores
(After Transformation)

FEATURE or ATTRIBUTE		TRACT 1	TRACT 2	TRACT 3	TRACT 4	TRACT 5	TRACT 6
NATURAL INTEGRITY	(1)	5.00	5.00	5.00	5.00	5.00	5.00
DIST. TO PERIMETER	(2)	4.00	1.00	1.00	4.00	1.00	1.00
VEGETATION SCREENING	(3)	1.00	1.00	1.00	1.00	1.00	1.00
CHALLENGE	(4)	2.00	1.00	1.00	3.00	2.00	4.00
DIVERSITY-%SLOPE	(5)	1.00	1.00	1.00	2.00	2.00	3.00
DIVERSITY-TERRAIN	(6)	3.00	2.00	2.00	2.00	1.00	2.00
SCENIC QUALITY	(7)	4.00	3.00	3.00	3.00	2.00	3.00
DEMAND PROXIMITY	(8)	1.00	1.00	1.00	1.00	1.00	1.00
DEMAND DENSITY	(9)	1.00	1.00	1.00	1.00	1.00	1.00
PRIOR USE	(10)	1.00	1.00	1.00	1.00	1.00	1.00
ACCESS EFFICIENCY	(11)	1.00	1.00	1.00	1.00	1.00	1.00

Examining Wilderness Attribute Relationships

Having scored the attributes, the appraiser examined the relationships (correlation) between attributes. Attribute correlations provide a better understanding of the influence attributes have on price. The correlation analysis indicated no highly correlated attributes. However, a relationship existed between prior use and price per acre, as well as, prior use and other attributes.

The appraiser also examined the data to determine if there were any weighted relationships between attributes and price. Weights reflect the relative importance each attribute has on the choice of buyers when evaluating competing properties and are a measure of the differences in price among comparable properties. Attempts to formulate an optimum set of weights to apply to the attributes were not successful. As indicators of price differences among the set of comparables, the weights were unstable.

Having determined in this case, that a weighted set of attributes was not appropriate, the appraiser used the relationship of the prior use attribute and comparable data set to derive a smaller subset of comparable properties. The appraiser established a decision rule to choose those properties with a prior use attribute score of 1.0, that is, those properties that were wilderness land prior to sale. This criterion provides for the selection of comparables that have attributes most similar to the subject property as applied in the MKTCOMP program.

Step 5

Market Comparison Program, (MKTCOMP)

Attribute Matching-The Pricing Process

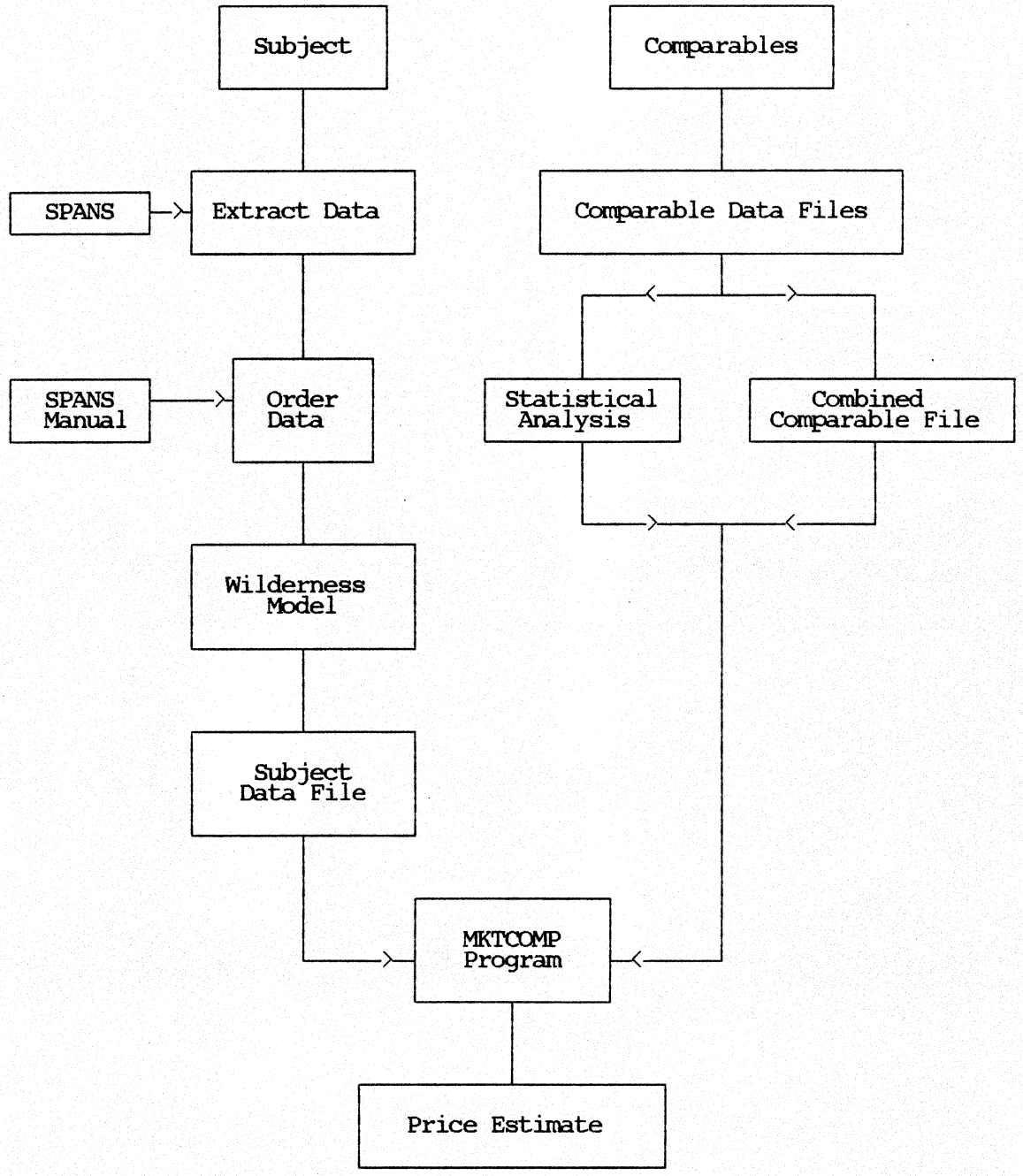
Applying the wilderness attribute scores established in Step 4, the market comparison program provides for identification and selection of a set of comparables that have property attributes most similar to each of the six subject tracts. The implementation of this attribute matching process utilized an automated market comparison model called MKTCOMP. The MKTCOMP process selects a set of comparable properties using the square root of the sum of the squared dollar adjustments. Lower adjustment sums reflect a higher degree of comparability. A second refinement of the set ranks the comparables in order of similarity to each of the subject parcels. A flow chart of the attribute matching process is presented in Exhibit IV-14. To execute the process without placing too many constraints on the appraiser's judgment, experience, and insight, the following components were incorporated into the MKTCOMP system:

1. A subject file providing the attributes' scores making up the subject property.
2. A comparable sale file consisting of attributes in the same sequence and scale as the subject file.
3. A factor file identifying each attribute's adjustment amount in dollars of selling price, to measure the difference between the comparables' and subject's attributes.
4. A ranking procedure displaying the comparable property landscape units in order of their similarity to the subject property being evaluated.

EXHIBIT IV-14

Attribute Matching Pricing Methodology

Data Structure



Source: Real Estate Dynamics, Inc., 1988.

In the attribute matching method, an adjustment is applied only to the difference between attributes; thus, when the subject and comparables are identical with respect to a particular attribute, no adjustment is made. When attribute scores differ, the difference is multiplied by an adjustment factor of 0.1. The adjustments are then combined and added to the per unit selling price (i.e. price per acre) of the comparable. When the net adjustments are negative the selling price is reduced; when the net adjustments are positive the selling price is increased. In this way, the attributes of the comparable are made similar to the subject, and any difference is used to adjust the unit of comparison selling price. The result is an estimate of the price that would have been paid for the comparable if it was essentially identical to the subject with respect to all significant attributes.

The last step ranks a set of market comparables in order of similarity to each of the subject parcels. Selection is based on those comparables most similar to the subject in physical characteristics as represented by their adjusted attribute scores.

An index for selection can be determined for each comparable by summing the squares of the adjustments made for differences between the subject and the comparable, and then taking the square root of the sum. The resulting number is referred to as the selection index (C-Index) and is the basis for determining the level of similarity between the subject and comparable measured in absolute dollars. Lower C-Index values indicate a higher degree of similarity between the subject and the comparable property and, all other things equal, a more reliable comparable sale.

The MKTCOMP program was initially applied to the pool of twenty comparables. The ranking of most similar properties and associated C-Index values for Tract-1 are presented in Exhibit IV-15. The ranking of comparables and C-Index values for Tract-1 are representative of the other five subject tracts. Full detailed MKTCOMP output for each of the six subject tracts using the twenty comparables is presented in Appendix IV-G.

The decision rule on the prior use attribute, as established in Step 4, was then applied to the twenty comparables. Seven comparables were identified as having a prior use of wilderness land. The MKTCOMP program was then applied to these seven comparables. The ranking of most similar properties and associated C-Index values of these seven comparables for all six subject tracts are presented in Exhibit IV-16. Full detailed MKTCOMP output for the six subject tracts using the seven comparables is presented in Appendix IV-H.

The selection of this subset of seven comparables from the initial pool of twenty comparables is a refinement of the data set to include those properties most similar to the subject property. The objective of selecting the most similar comparables is to more accurately reflect the value of the subject based on its property attributes. These seven comparables provide the basis for pricing the subject property.

EXHIBIT IV-15
Comparable Property Ranking and C-Index Values
for Tract-1 (20 Comparables)

LIST OF SELECTED COMPARABLE ID'S (BEST TO WORST):

#	COMP. ID	C-INDEX
1	NATIONAL WILDLIFE-06-402	.13
2	TAYLOR LAKE-19-303	.15
3	KENNEDY MEADOW-20-601	.17
4	ANKENY-18-341	.18
5	BETTIS-14-4875	.18
6	WOLFINBARGER-05-3986	.20
7	SLOAN KETTERING-16-2809	.20
8	TAYLOR RANCH-15-1234	.20
9	LANHAM-03-2000	.21
10	PACK RIVER04-11-1292	.22
11	MARBLE CREEK-12-2417	.23
12	PACK RIVER03-10-1229	.23
13	MATTESON-04-3393	.23
14	NATURE CONSERVANCY-17-258	.23
15	BENCH-CAROLINE-13-775	.24
16	MUELLER RANCH-07-804	.24
17	PHELPS-01-714	.25
18	PACK RIVER01-08-1309	.26
19	SUNSET-02-300	.26
20	PACK RIVER02-09-1443	.27

EXHIBIT IV-16
Comparable Property Ranking, C-Index Values
and Price/Acre Contribution
for Subject Tracts (7 Comparables)

TRACT 1

LIST OF SELECTED COMPARABLE ID'S (BEST TO WORST)

#	COMP. ID	C-INDEX	SALE PRICE/ ACRE	ADJUSTED SALE PRICE/ ACRE	WEIGHT	PRICE/ACRE CONTRIBUTION PER COMP.
1	NATIONAL WILDLIFE (06)	.13	$ 402	$ 401.88	.2500	$ 100.45
2	TAYLOR LAKE (19)	.15	303	302.80	.2143	64.89
3	KENNEDY MEADOW (20)	.17	601	601.50	.1786	107.43
4	PACK RIVER 4 (11)	.22	1292	1290.70	.1429	184.44
5	PACK RIVER 3 (10)	.23	1229	1227.50	.1071	131.47
6	PACK RIVER 1 (08)	.26	1309	1307.60	.0714	93.36
7	PACK RIVER 2 (09)	.27	1443	1441.30	.0357	51.45
				WEIGHTED AVERAGE PRICE/ACRE-TRACT 1		$ 733

TRACT 2

LIST OF SELECTED COMPARABLE ID'S (BEST TO WORST)

#	COMP. ID	C-INDEX	SALE PRICE/ ACRE	ADJUSTED SALE PRICE/ ACRE	WEIGHT	PRICE/ACRE CONTRIBUTION PER COMP.
1	NATIONAL WILDLIFE (06)	.11	$ 402	$ 401.20	.2500	$ 100.30
2	KENNEDY MEADOW (20)	.12	601	600.90	.2143	128.77
3	TAYLOR LAKE (19)	.13	303	302.20	.1786	53.97
4	PACK RIVER 4 (11)	.24	1292	1290.10	.1429	184.36
5	PACK RIVER 3 (10)	.24	1229	1226.90	.1071	131.40
6	PACK RIVER 1 (08)	.24	1309	1307.00	.0714	93.32
7	PACK RIVER 2 (09)	.27	1443	1440.70	.0357	51.43
				WEIGHTED AVERAGE PRICE/ACRE-TRACT 2		$ 744

TRACT 3

LIST OF SELECTED COMPARABLE ID'S (BEST TO WORST)

#	COMP. ID	C-INDEX	SALE PRICE/ ACRE	ADJUSTED SALE PRICE/ ACRE	WEIGHT	PRICE/ACRE CONTRIBUTION PER COMP.
1	NATIONAL WILDLIFE (06)	.11	$ 402	$ 401.20	.2500	$ 100.30
2	KENNEDY MEADOW (20)	.12	601	600.90	.2143	128.77
3	TAYLOR LAKE (19)	.13	303	302.20	.1786	53.97
4	PACK RIVER 4 (11)	.24	1292	1290.10	.1429	184.36
5	PACK RIVER 3 (10)	.24	1229	1226.90	.1071	131.40
6	PACK RIVER 1 (08)	.24	1309	1307.00	.0714	93.32
7	PACK RIVER 2 (09)	.27	1443	1440.70	.0357	51.43
				WEIGHTED AVERAGE PRICE/ACRE-TRACT 3		$ 744

EXHIBIT IV-16 (Continued)
Comparable Property Ranking and C-Index Values
and Price/Acre Contribution
for Subject Tracts (7 Comparables)

TRACT 4

LIST OF SELECTED COMPARABLE ID'S (BEST TO WORST)

#	COMP. ID	C-INDEX	SALE PRICE/ ACRE	ADJUSTED SALE PRICE/ ACRE	WEIGHT	PRICE/ACRE CONTRIBUTION PER COMP.
1	NATIONAL WILDLIFE (06)	.12	$ 402	$ 401.80	.2500	$ 100.45
2	TAYLOR LAKE (19)	.15	303	302.80	.2143	64.89
3	KENNEDY MEADOW (20)	.15	601	601.50	.1786	107.43
4	PACK RIVER 3 (10)	.22	1229	1227.50	.1429	175.41
5	PACK RIVER 4 (11)	.22	1292	1290.70	.1071	138.23
6	PACK RIVER 1 (08)	.25	1309	1307.60	.0714	93.36
7	PACK RIVER 2 (09)	.25	1443	1441.30	.0357	51.45
				WEIGHTED AVERAGE PRICE/ACRE-TRACT 4		$ 731

TRACT 5

LIST OF SELECTED COMPARABLE ID'S (BEST TO WORST)

#	COMP. ID	C-INDEX	SALE PRICE/ ACRE	ADJUSTED SALE PRICE/ ACRE	WEIGHT	PRICE/ACRE CONTRIBUTION PER COMP.
1	KENNEDY MEADOW (20)	.10	$ 601	$ 600.90	.2500	$ 150.23
2	NATIONAL WILDLIFE (06)	.11	402	401.20	.2143	85.98
3	TAYLOR LAKE (19)	.13	303	302.20	.1786	53.97
4	PACK RIVER 3 (10)	.24	1229	1226.90	.1429	175.32
5	PACK RIVER 4 (11)	.24	1292	1290.10	.1071	138.17
6	PACK RIVER 1 (08)	.24	1309	1307.00	.0714	93.32
7	PACK RIVER 2 (09)	.26	1443	1440.70	.0357	51.43
				WEIGHTED AVERAGE PRICE/ACRE-TRACT-5		$ 748

TRACT 6

LIST OF SELECTED COMPARABLE ID'S (BEST TO WORST)

#	COMP. ID	C-INDEX	SALE PRICE/ ACRE	ADJUSTED SALE PRICE/ ACRE	WEIGHT	PRICE/ACRE CONTRIBUTION PER COMP.
1	NATIONAL WILDLIFE (06)	.08	$ 402	$ 401.70	.2500	$ 100.43
2	TAYLOR LAKE (19)	.12	303	302.70	.2143	64.87
3	KENNEDY MEADOW (20)	.14	601	601.40	.1786	107.41
4	PACK RIVER 3 (10)	.23	1229	1227.40	.1429	175.40
5	PACK RIVER 2 (09)	.23	1443	1441.20	.1071	154.35
6	PACK RIVER 4 (11)	.23	1292	1290.60	.0714	92.15
7	PACK RIVER 1 (08)	.23	1309	1307.50	.0357	46.68
				WEIGHTED AVERAGE PRICE/ACRE-TRACT 6		$ 741

Step 6

Pricing The Subject Property

The selection and rank order of the seven comparables and their associated C-Index values provide the basis for calculating the weighted average price per acre for each subject tract, as derived from the MKTCOMP process. The weighted average price is computed by placing the greatest price per acre contribution on the comparables in rank order of their similarity to each subject tract. These weighted average per acre prices are then applied to the total acreage of each subject tract to derive a value estimate for each subject tract as presented in Exhibit IV-17.

EXHIBIT IV-17

Value Allocations to Subject Tracts

SUBJECT TRACT	WEIGHTED AVERAGE PRICE/ACRE BASED ON 7 COMPARABLES	NUMBER OF ACRES	PRICE
TRACT 1	$733	54,163	$39,701,479
TRACT 2	$744	640	$476,160
TRACT 3	$744	582	$433,008
TRACT 4	$731	43,403	$31,727,593
TRACT 5	$748	1,844	$1,379,312
TRACT 6	$741	640	$474,240
		TOTAL	$74,191,792
	ADJUSTMENT FOR SUBSISTENCE LAND VALUE		- 725,549
		FINAL TOTAL	$73,466,243
		ROUNDED TOTAL	$73,500,000

The comparable data indicates a range in weighted average property values for the six subject tracts from $731 per acre to $748 per acre. When applied to the 101,272 acres of the subject property, this converts to a weighted average price of $74,191,792. Deducting from this figure the value of subsistence harvesting attributable to the subject property, which includes the value of

the ATV easements retained by ASRC as part of the exchange agreement (Scenario #6, Section III), results in a final price of $73,466,243 or $73,500,000 rounded. Therefore, the estimated market value of the subject property surface estate described herein as of August 9, 1983 is:

SEVENTY THREE MILLION FIVE HUNDRED THOUSAND DOLLARS

($73,500,000)

The individual subject tract prices and total prices presented in Exhibit IV-17 represent the estimated market value of the subject property attributable to the surface estate. No incremental value is contributed by the subsurface based on the conclusions drawn from the subsurface development scenarios presented in Section III. The subsurface resource potential is considered low and the value as-of-date recognizes current technology constraints relative to profitable resource extraction on the subject. Therefore, the estimated market value of the subject property subsurface estate described herein as of August 9, 1983 is:

ZERO

($0)

CERTIFICATION OF VALUE

The appraisers further certify that, to the best of our knowledge, the statements made in this report are true and we have not knowingly withheld any significant information; that we have personally inspected the subject property, that we have no interest, present or contemplated in the subject property or the participants in the impending transaction; that neither the employment nor compensation to make said appraisal is contingent on our value estimate; and that all contingent and limiting conditions are stated herein; and the fee charged is consistent with our usual charge for appraisal services.

Estimated Market Value, as defined, of the subject property is:

SEVENTY THREE MILLION FIVE HUNDRED THOUSAND DOLLARS
($73,500,000)

Michael L. Robbins, Ph.D., CRE
President

Craig D. Hungerford, M.S.
Vice President

STATEMENT OF GENERAL ASSUMPTIONS AND LIMITING CONDITIONS

Contributions of Other Professionals

Information furnished by others in the report, while believed to be reliable, is in no sense guaranteed by the appraisers.

The appraisers assume no responsibility for legal matters.

All information furnished regarding property for sale or rent, financing, or projections of income and expenses is from sources deemed reliable. No warranty or representation is made regarding the accuracy thereof, and it is submitted subject to errors, prior sale, lease, financing, or withdrawal without notice.

Facts and Forecasts Under Conditions of Uncertainty

The comparable sales data relied upon in the appraisal is believed to be from reliable sources. Though all the comparables were examined, it was not possible to inspect them all in detail. The value conclusions are subject to the accuracy of said data.

Forecasts of the effective demand for space are based upon the best available data concerning the market, but are projected under conditions of uncertainty.

Engineering analyses of the subject property were neither provided for use nor made as a part of this appraisal contract. Any representation as to the suitability of the property for uses suggested in this analysis is therefore based only on a rudimentary investigation by the appraisers and the value conclusions are subject to said limitations.

Since the projected mathematical models are based on estimates and assumptions, which are inherently subject to uncertainty and variation depending upon evolving events, we do not represent them as results that will actually be achieved.

Sketches in the report are included to assist the reader in visualizing the property. These drawings are for illustrative purposes only and do not represent an actual survey of the property.

Controls on Use of Appraisal

Values for various components of the subject parcel as contained within the report are valid only when making a summation and are not to be used independently for any purpose and must be considered invalid if so used.

Possession of the report or any copy thereof does not carry with it the right of publication nor may the same be used for any other purpose by anyone without the previous written consent of the appraiser or the applicant and, in any event, only in its entirety.

Neither all nor any part of the contents of the report shall be conveyed to the public through advertising, public relations, news, sales, or other media without the written consent and approval of the author, particularly regarding the valuation conclusions and the identity of the appraiser, of the firm with which he is connected, or any of his associates.

The report shall not be used in the client's reports or financial statements or in any documents filed with any governmental agency, unless: (1) prior to making any such reference in any report or statement or any documents filed with the Securities and Exchange Commission or other governmental agency, the appraisers are allowed to review the text of such reference to determine the accuracy and adequacy of such reference to the appraisal report prepared by the appraisers; (2) in the appraiser's opinion the proposed reference is not untrue or misleading in light of the circumstances under which it is made; and (3) written permission has been obtained by the client from the appraiser for these uses.

The appraisers shall not be required to give testimony or to attend any governmental hearing regarding the subject matter of this appraisal without agreement as to additional compensation and without sufficient notice to allow adequate preparation.

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QUALIFICATIONS OF THE APPRAISERS

MICHAEL L. ROBBINS

President and co-founder of Real Estate Dynamics, Incorporated, Dr. Robbins has a long term association with academic and professional real estate communities. His expertise spans microcomputer applications for real estate decision making to valuation of large scale natural landscapes. His innovative work in spatial data applications to the real estate decision process is instrumental to the contemporary analysis techniques employed at Real Estate Dynamics, Incorporated.

PROFESSIONAL EXPERIENCE

President, Consultant/Appraiser, Real Estate Dynamics, Incorporated, Madison, Wisconsin.

Assistant Professor, Department of Real Estate and Urban Land Economics, School of Business, University of Wisconsin, Madison, Wisconsin.

Instructor, American Banking School, Urban Land Institute Development School and Chemical Bank Real Estate School.

Appraiser/Real Estate Analyst, Landmark Research, Incorporated, Madison, Wisconsin.

EDUCATION

Doctor of Philosophy (Ph.D.), Civil and Environmental Engineering, University of Wisconsin-Madison.

Master of Science (M.S.), Landscape Architecture, Major in Natural Resources, University of Wisconsin-Madison.

Bachelor of Science (B.S.), Landscape Architecture, University of Wisconsin-Madison.

HONORS

Pack River Project, Award/Landscape Planning and Analysis, presented by American Society of Landscape Architects, 1985.

International Lambda Alpha Award, An Honorary Land Economics Society, 1985 International Doctoral Paper Award.

Land Economics Foundation Award, 1976.

AFFILIATIONS

American Society of Real Estate Counselors
Society of Real Estate Appraisers
Madison Board of Realtors
Urban Land Institute
American Real Estate Society

CRAIG D. HUNGERFORD

As Vice President and co-founder of Real Estate Dynamics, Incorporated, Craig's real estate expertise encompasses a wide variety of urban land economic issues from wilderness valuation to the development of customized computerized valuation systems for market analysis, portfolio management, site selection, lease analysis, etc. Also a frequent guest lecturer for the University of Wisconsin Real Estate Department covering such topics as real estate appraisal, commercial and residential development, and microcomputer applications in real estate.

PROFESSIONAL EXPERIENCE

Vice President, Consultant/Appraiser, Real Estate Dynamics, Incorporated, Madison, Wisconsin.

Appraiser/Real Estate Analyst, Landmark Research, Incorporated, Madison, Wisconsin.

Financial/Feasibility Consultant, City of Monona, Monona, Wisconsin.

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Master of Science in Business (M.S.), Real Estate Appraisal and Investment Analysis, University of Wisconsin-Madison.

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AFFILIATIONS

Member Board of Directors and Finance Committee and chair for Capital Improvements Committee of University YMCA-Madison.

Member University of Wisconsin Real Estate Alumni.