INCLINE VILLAGE
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Draft Environmental Impact Statement

SKI INCLINE
Incline Village, Nevada

October 14, 1986

SKI INCLINE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

ISSUED OCTOBER 14, 1986

Prepared for: Washoe County, Department of
Comprehensive Planning
Tahoe Regional Planning Agency
USFS Lake Tahoe Basin Management Unit

Preparers: Design Workshop, Inc.
Resource Concepts, Inc.
Omni-Means, Ltd.
Alpengroup

SKI INCLINE EIS

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G. Traffic Noise Prediction Model
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1.0 INTRODUCTION

This Environmental Impact Statement addresses the effects of a proposed master plan for the redevelopment, modernization and moderate expansion of Ski Incline. This document also evaluates the environmental impacts of three alternatives to the proposed plan. The focus of this effort is to adopt a plan for the resort which will meet with the objectives of the owners, the Incline Village General Improvement District (IVGID), and constitute an acceptable amendment to the Lake Tahoe Basin Regional Land Use Plan.

Because of the pending status of the Regional Land Use Plan, this activity deals with presentation and evaluation of a long range master plan. For this reason, this analysis does not view the proposal as a "project" but as a plan amendment.

This planning activity involves four principal public entities:

1. Tahoe Regional Planning Agency (TRPA)
2. Washoe County, Nevada
3. U.S. Forest Service, Lake Tahoe Basin Management Unit (USFS)
4. Incline Village General Improvement District (IVGID)

Due to the fact that the proponent for this plan change is a public agency and given the strong county interest in this

portion of Lake Tahoe, it was determined and agree
parties that Washoe County serve as the lead review

This document conforms to the rules regarding prepar
documents for Washoe County (major project review),
(compact), and the US Forest Service (NEPA, CEQ).

Two scoping meetings were held to identify the ran
significant issues and concerns. An informal scopin
conducted with TRPA staff on March 12, 1986 and a
scoping meeting was held at Incline Village at 9:0
30, 1986. A copy of the scoping notice is attached
A. The list of issues and concerns generated at t
also attached as meeting notes, Appendix B.
concerns deals generally with the following impact

1. Biophysical
2. Transportation/Vehicle Miles Traveled
3. Hydrology/Water Quality
4. Cultural Resources

While many environmental settings are investigated
disclosed, the areas outlined above constitute scope
as such have had specialized, professional consult

The proposed plan and alternatives 2 and 3 would be
on a phased basis over a 7 to 10 year period. The

to allow improvements to take place only when economic performance of the ski area permits.

Upon completion of the Draft EIS, there is a 60 day public comment period, after which no further public comment will be received. Upon the completion of the comment period, the Final EIS is prepared and includes the Draft EIS, responses to comments, and the certification document.

The Final EIS (FEIS) is a record of the environmental setting, impacts and mitigation measures for the selected plan. The TRPA Advisory Planning Commission (APC) will review the Final EIS and recommend for or against certification of the FEIS. If the FEIS is found to be defective, a new 60 day public comment period must be established after correction of deficiencies.

Once the APC has recommended certification, the FEIS is sent to the TRPA Governing Board for final certification. Upon certification, the TRPA Governing Board may complete the first reading of an ordinance amending the regional plan, which would have the effect of adopting the Ski Incline Master Plan. The ordinance becomes effective 30 days after approval of second reading, which occurs no sooner than four weeks after first reading.

2.0 PROJECT DESCRIPTION

2.1 LOCATION

Ski Incline is located in Washoe County, Nevada a
corner of Lake Tahoe. The existing ski area and th
proposed for expansion lie just inside the Tahoe
Road in Incline Village. This area lies in section
and 14 T16N, R18E, and sections 7 and 18 of T16N,
mapped on the Mt. Rose, Nevada and Marlette Lake,
USGS topographic quadrangles. The vicinity sketch
2.1) depicts the site relative to the northeast p
Lake Tahoe Basin.

2.2 DESCRIPTION

Ski Incline is located in Incline Village, a planne
community on the northeast shore of Lake Tahoe.
constructed in 1966 by Crystal Bay Development, Ski
sold to Boise Cascade in 1974 and was subsequentl
Golf Promotion in 1976 before it was acquired in 19
(Wetzstein p.c.). Ski Incline is situated on a 36
which 114 acres are currently accessible by lifts.
feet of vertical elevation change served by seven d
lifts. Support facilities include a base lodge wi
rental and repair shop, retail shop and related se
adminstration and ski patrol building; and a warmi
snack and cocktail bar overlooking Lake Tahoe.

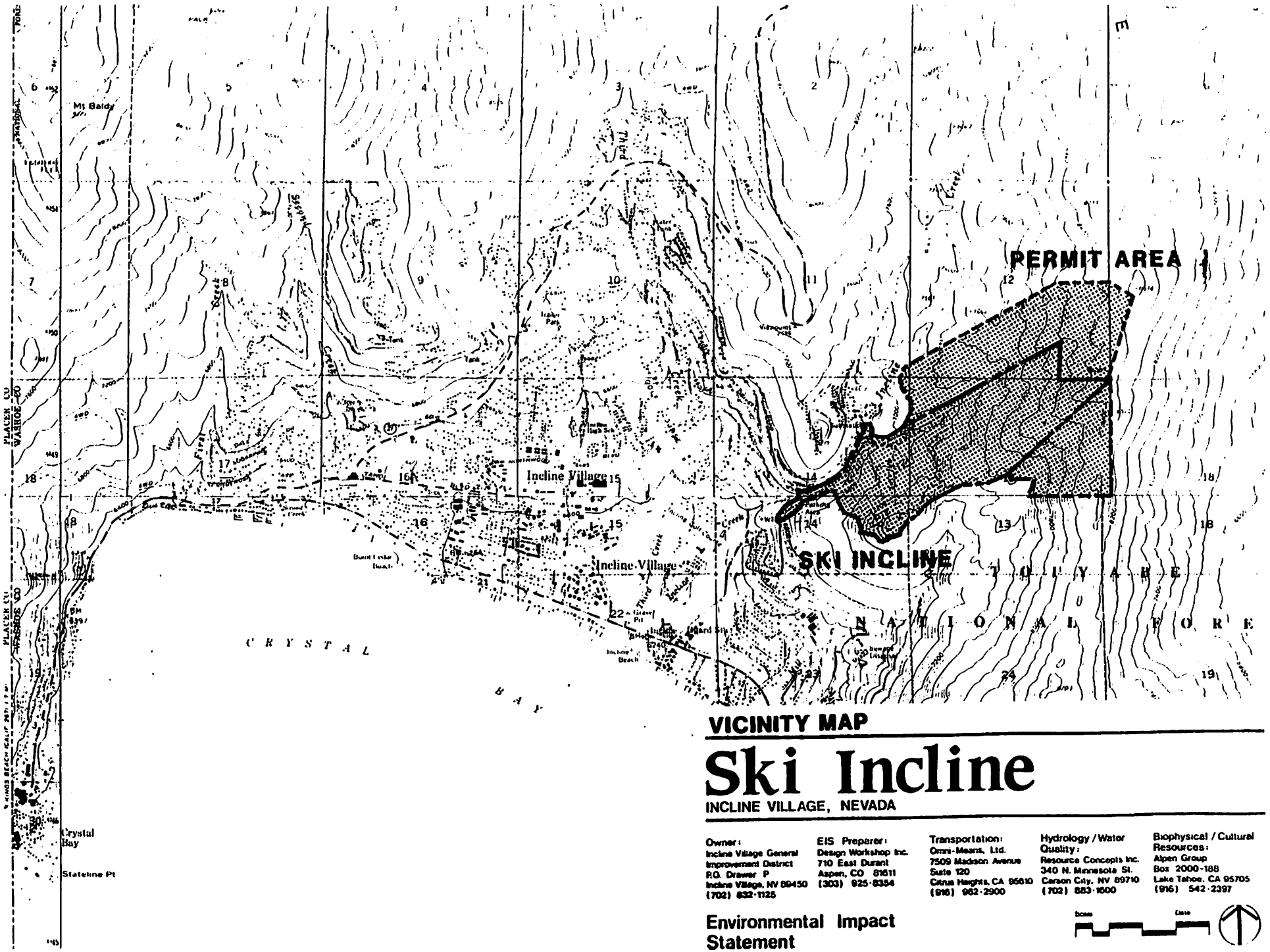
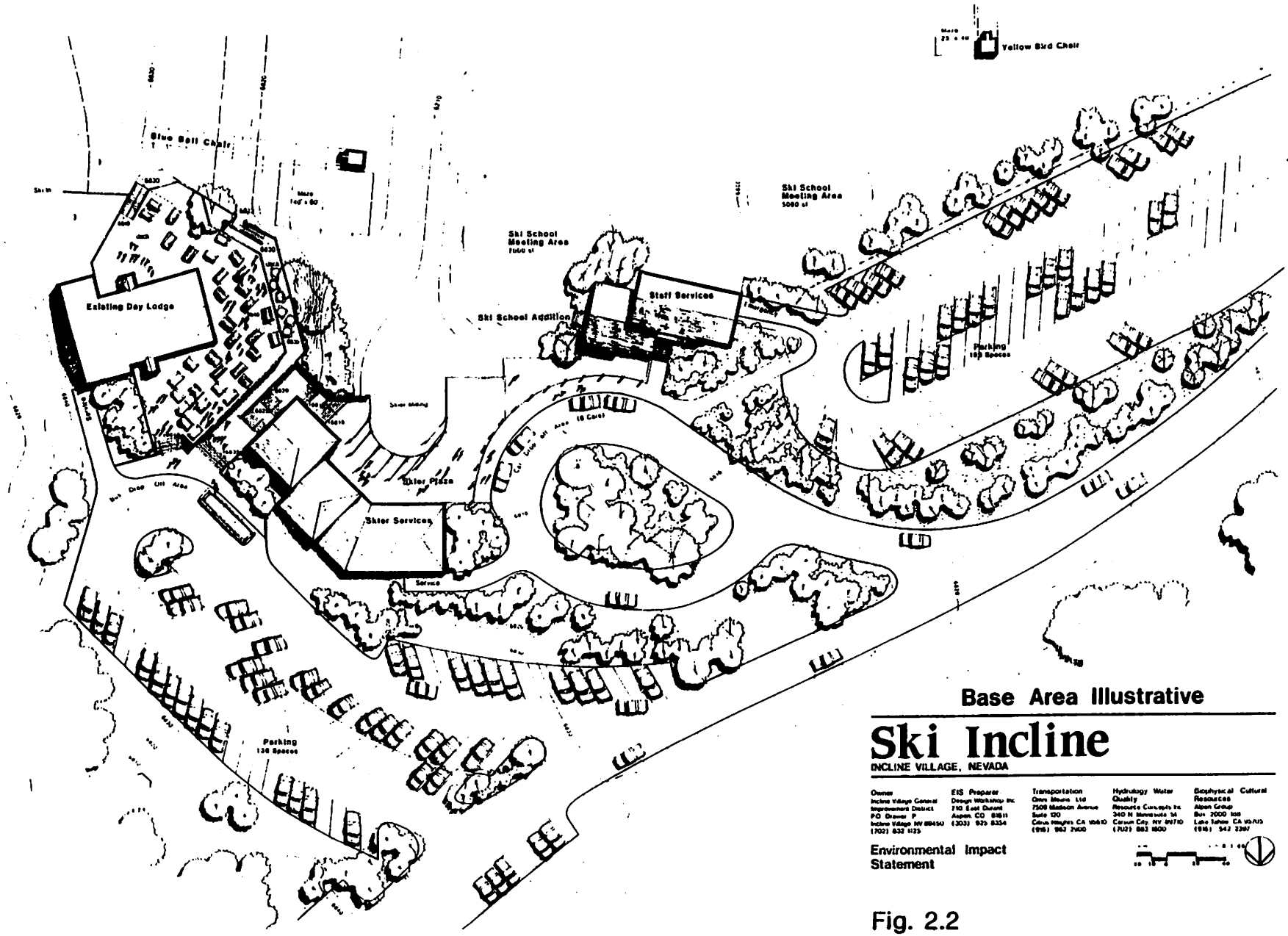

PERMIT AREA
SKI INCLINE
TAHOE
NATIONAL FOREST
Incline Village
Incline Village
CRYSTAL BAY
Mt Baldy
Crystal Bay
Stateline Pt
VICINITY MAP
Ski Incline
INCLINE VILLAGE, NEVADA
Owner:
Incline Village General Improvement District
P.O. Drawer P
Incline Village, NV 89450
(702) 832-1125
EIS Preparer:
Design Workshop Inc.
710 East Durant
Aspen, CO 81611
(303) 925-8354
Transportation:
Omni-Means, Ltd.
7509 Madison Avenue
Suite 120
Citrus Heights, CA 95610
(916) 962-2900
Hydrology / Water Quality:
Resource Concepts Inc.
340 N. Minnesota St.
Carson City, NV 89710
(702) 883-1600
Biophysical / Cultural Resources:
Alpen Group
Box 2000-188
Lake Tahoe, CA 95705
(916) 542-2397
Environmental Impact Statement

Fig. 2.1

The following section outlines the specific list of
improvements for the mountain operations portion o
This set of lift and trail improvements makes use
by IVGID and adjacent land owned by the USFS. In su
list of planned mountain improvements is as follow

- o new summit chair lift, 4,635 lineal feet
  vertical feet, fixed grip, quad chair, 2
- o new lakeview chair lift, 5,050 lineal fe
  vertical feet, fixed grip, triple chair,
  capacity
- o replace Bluebell chair lift with an 1800/
  quad chair and extend lower and upper te
- o replace Yellowbird with 1800/hr triple c
  relocate lower terminal
- o remove Blue Dolphin chair lift
- o remove Red Baron chair lift after construc
  Summit chair lift.
- o new "Twin Lakes" mountain lodge for food
  8,540' elevation with views of Lakes Washo
- o extension of an existing 20' access road
  Lakes site
- o renovated, expanded Snowflake Lodge
- o two new full-sized grooming vehicles
- o relocated mountain maintenance site with
  of 4,000 sq. ft. a site near the exiting w
- o expand snowmaking an additional 46.6 acre
  existing).

The proposed master plan for the base area at Ski Inc
2.2) is a direct result of a projected expansion of
capacity to 3700 skiers and its impact on skier and


Yellow Bird Chair
Blue Bell Chair
Existing Day Lodge
Ski School Meeting Area
5080 sf
Ski School Meeting Area
Ski School Addition
Staff Services
Parking
Skier Plaza
Skier Services
Service
Parking
Base Area Illustrative
Ski Incline
INCLINE VILLAGE, NEVADA
Owner
Incline Village General Improvement District
P.O. Drawer P
Incline Village, NV 89450
(702) 832-1125
EIS Preparer
Design Workshop Inc
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Aspen, CO 81611
(303) 925-8354
Transportation
Crain Moore, Ltd
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Suite 120
Colora Heights, CA 94610
(916) 962-2400
Hydrology Water Quality
Resource Concepts Inc
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Carson City, NV 89703
(702) 882-1800
Biophysical Cultural Resources
Alpen Group
Box 2000 108
Lake Tahoe, CA 95705
(916) 542-2307
Environmental Impact Statement

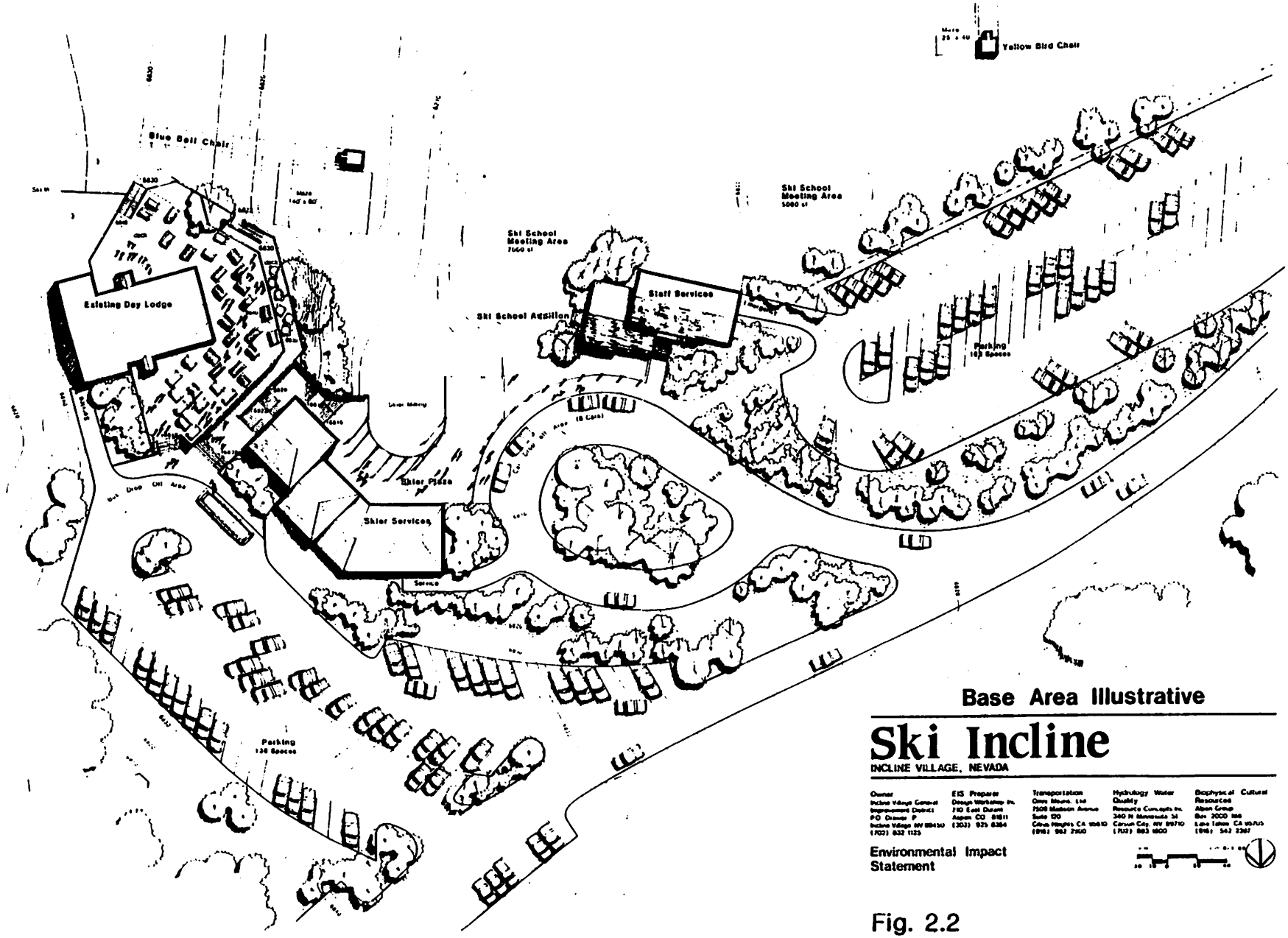
Fig. 2.2

services, as well as an effort by IVGID to provide a positive high quality skier experience on the mounta ski base where the proposed improvements respond to f and aesthetic conditions which presently exist. In s following improvements are proposed for the base area Incline:

- o remodel of staff services building for cons mountain employee activities
- o remodel and upgrade of lower level in exist lodge to accomodate ski-in/ski-out activiti arrival and circulation
- o construction of a new "skier services" buil contains most skier services such as ticket shops, etc. as well as administrative space intended to become the focus of the ski bas
- o construction of a skier plaza which ties al together and provides space for a variety o non-skier activities
- o provide for a heightened arrival experience improvements to roadway and parking lot cir the construction of a primary skier arrival court
- o reconfigure parking area to consolidate par extent of pavement where possible
- o upgrade visual quality of the base area by chainlink fencing and through the use of la accent positive features and screen negativ

2.3 BACKGROUND

In early spring of 1985, Ski Incline embarked upon a long-range planning process for the ski area. These outlined as follows:


Yellow Bird Chair
Blue Bell Chair
Ski School Meeting Area
5000 sf
Ski School Meeting Area
7000 sf
Existing Day Lodge
Staff Services
Ski School Addition
Parking
Skier Plaza
Skier Services
Service
Parking
Base Area Illustrative
Ski Incline
INCLINE VILLAGE, NEVADA
Owner
EIS Preparer
Transportation
Hydrology Water Quality
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Environmental Impact Statement

Fig. 2.2

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- o remodel and upgrade of lower level in exi... lodge to accomodate ski-in/ski-out activit... arrival and circulation
- o construction of a new "skier services" bui... contains most skier services such as ticke... shops, etc. as well as administrative spa... intended to become the focus of the ski b...
- o construction of a skier plaza which ties ... together and provides space for a variety ... non-skier activities
- o provide for a heightened arrival experien... improvements to roadway and parking lot c... the construction of a primary skier arriva... court
- o reconfigure parking area to consolidate pa... extent of pavement where possible
- o upgrade visual quality of the base area by ... chainlink fencing and through the use of l... accent positive features and screen negat...

2.3 BACKGROUND

In early spring of 1985, Ski Incline embarked upon a long-range planning process for the ski area. Thes... outlined as follows:

1. Analysis of Existing Conditions
2. Economic Feasibility Study (Alternatives Study)
3. Adoption of Planning Direction
4. Master Planning and Preliminary Design
5. Physical and Financial Implementation

The analysis of existing conditions was completed in the spring of 1985, the feasibility study was completed in November and the IVGID Board of Trustees selected a planning direction alternative of general expansion in December of 1985.

The feasibility study analyzed four major alternatives for the long-range management of the ski area. These included:

1. Remain "as is" with modernization of mountain facilities.
2. Reduce operations.
3. Moderate expansion with modernization.
4. Full expansion with modernization.

After careful review and extensive public involvement with review and advice from the Ski Advisory Committee, the Board selected, in general, an expansion alternative. The analysis of alternatives clearly illustrated that both no-growth and reduced operations alternatives would produce long term negative cash flow and significant economic hardship to local residents and the district in general. Therefore, in December of 1985 the IVGID Board commenced a process of planning for the further development and growth of the area.

3.0 PROPOSED ALTERNATIVES

The proposed plan alternatives are summarized as fol.c

THE PROPOSED PLAN - MODERNIZATION OF EXISTING FACILI I
MODERATE EXPANSION (fig. 3.1)

1. Expanded daily capacity at Ski Incline fro to 3700 (PAOT) for a net increase of 900 s i capacity. (See Appendix J for a descriptior capacity calculation methodology).

2. 208.8 total acres of ski trails, including 9 of new ski trails with 70 acres in cleared t 24.8 acres in glades (trees thinned to all w between them), approximately 23 acres of U F ponderosa side will be skied under good snow for a portion of the season with no trail im to be included in the acreage total.

3. 2 new lifts (Summit, Lakeview).

4. 3 existing lifts removed (Blue Dolphin, Re- Yellow Jacket).

5. 6 lifts total.

6. New Twin Lakes Lodge with 250 seats (150 sea 100 outdoor), remodeled, expanded Snowflak 1000 sf existing to 1500 sf total, 50 seats outdoor). Uses include ski patrol office, r and a restaurant. This lodge will be oper t during the skiing season.

7. Relocated maintenance site with a new shop c 4,900 sq. ft.

8. New skier services building (11,000 sq. ft.) staff services building, skier plaza.

9. 1,840 total vertical feet of skiing.

10. Additional 46.6 acres of snowmaking.

11. Extend existing 20' access road to the new s

MOUNTAIN IMPROVEMENTS

- 94.8 Acres of New Terrain
- 2 New Lifts
  - Ridge Chair as 2400/Hr Fixed Grip Quad
  - Lakeview Chair as 1800/Hr Triple
- 3 Lifts Removed (Blue Dolphin, Red Baron, Yellow Jacket)
- Remodeled Snowflake Lodge
- Twin Lakes Lodge
- 3700 Daily Capacity
- 1840 Vertical Feet of Skiing
- Maintenance to On-Mountain Site
- Access Road to Summit

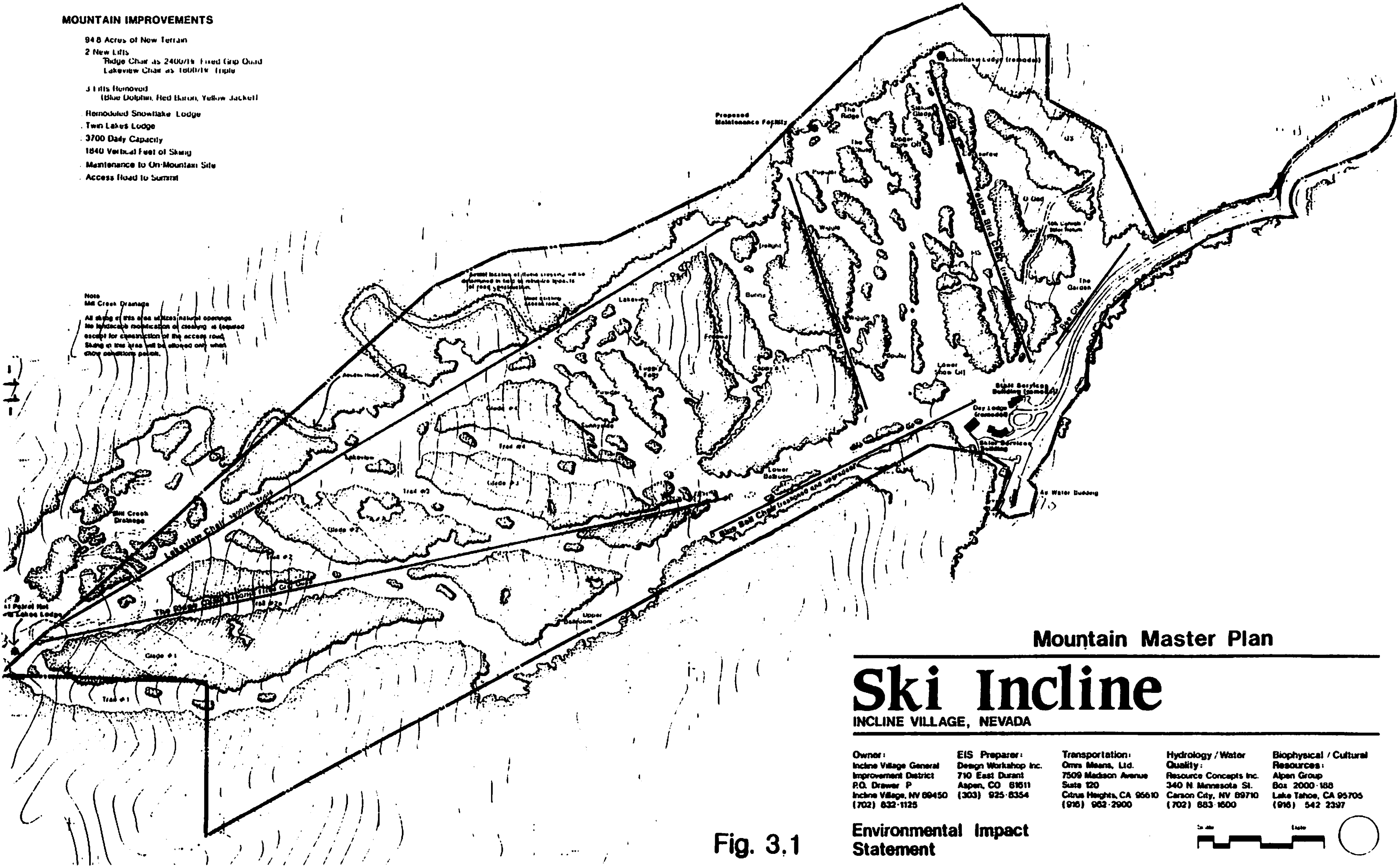


Fig. 3.1

Mountain Master Plan

Ski Incline

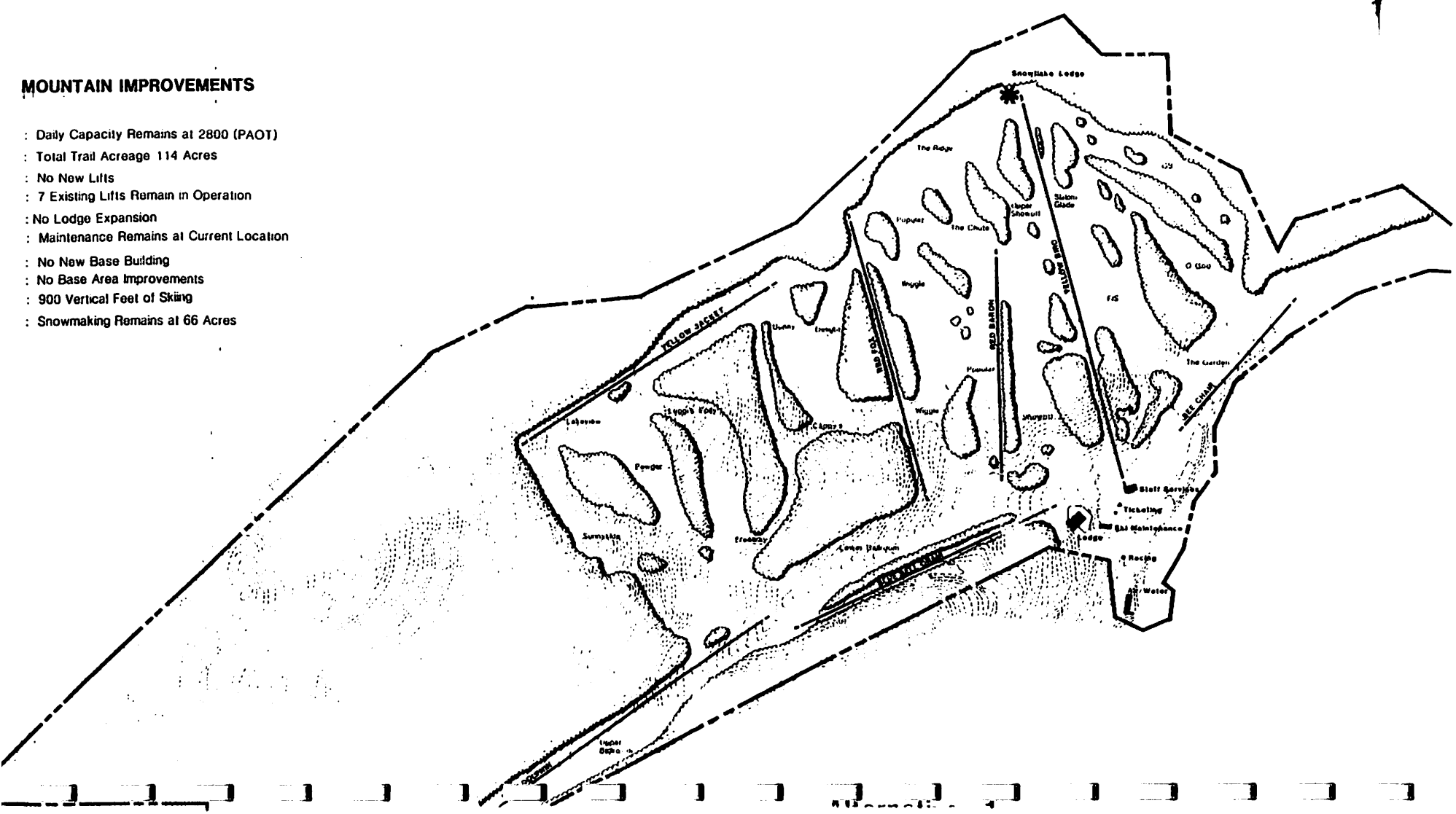
INCLINE VILLAGE, NEVADA

Owner:	EIS Preparer:	Transportation:	Hydrology / Water Quality:	Biophysical / Cultural Resources:
Incline Village General Improvement District P.O. Drawer P Incline Village, NV 89450 (702) 832-1125	Design Workshop Inc. 710 East Durant Aspen, CO 81611 (303) 925-8354	Omni Means, Ltd. 7509 Madison Avenue Suite 120 Citrus Heights, CA 95610 (916) 962-2900	Resource Concepts Inc. 340 N Minnesota St. Carson City, NV 89710 (702) 883-1600	Alpen Group Box 2000-188 Lake Tahoe, CA 95705 (916) 542-2397

Environmental Impact Statement

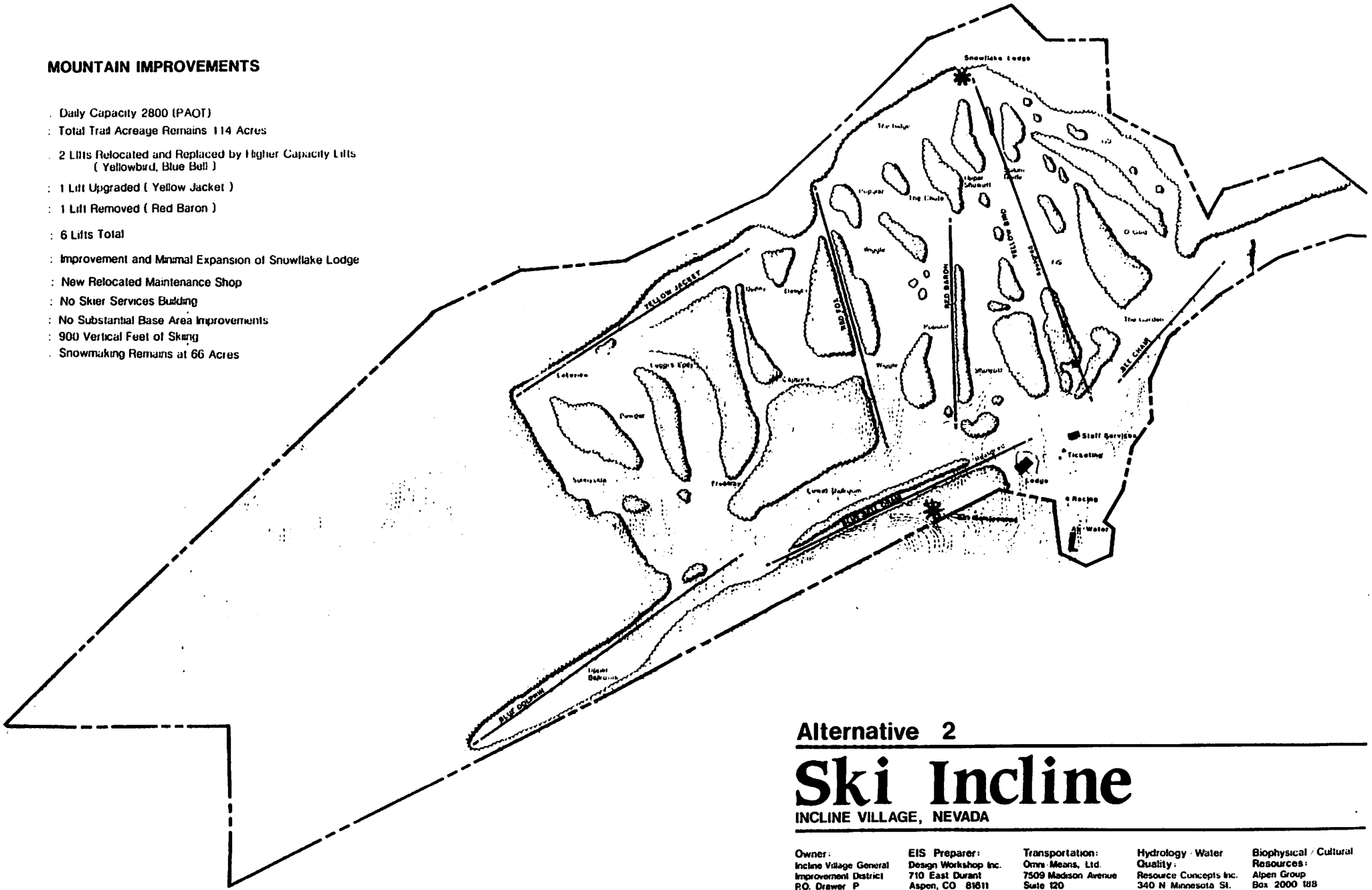
MOUNTAIN IMPROVEMENTS

: Daily Capacity Remains at 2800 (PAOT)
: Total Trail Acreage 114 Acres
: No New Lifts
: 7 Existing Lifts Remain in Operation
: No Lodge Expansion
: Maintenance Remains at Current Location
: No New Base Building
: No Base Area Improvements
: 900 Vertical Feet of Skiing
: Snowmaking Remains at 66 Acres



MOUNTAIN IMPROVEMENTS

- Daily Capacity 2800 (PAOT)
- Total Trail Acreage Remains 114 Acres
- 2 Lifts Relocated and Replaced by Higher Capacity Lifts (Yellowbird, Blue Bell)
- 1 Lift Upgraded (Yellow Jacket)
- 1 Lift Removed (Red Baron)
- 6 Lifts Total
- Improvement and Minimal Expansion of Snowflake Lodge
- New Relocated Maintenance Shop
- No Skier Services Building
- No Substantial Base Area Improvements
- 900 Vertical Feet of Skiing
- Snowmaking Remains at 66 Acres



Alternative 2

Ski Incline

INCLINE VILLAGE, NEVADA

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Transportation:
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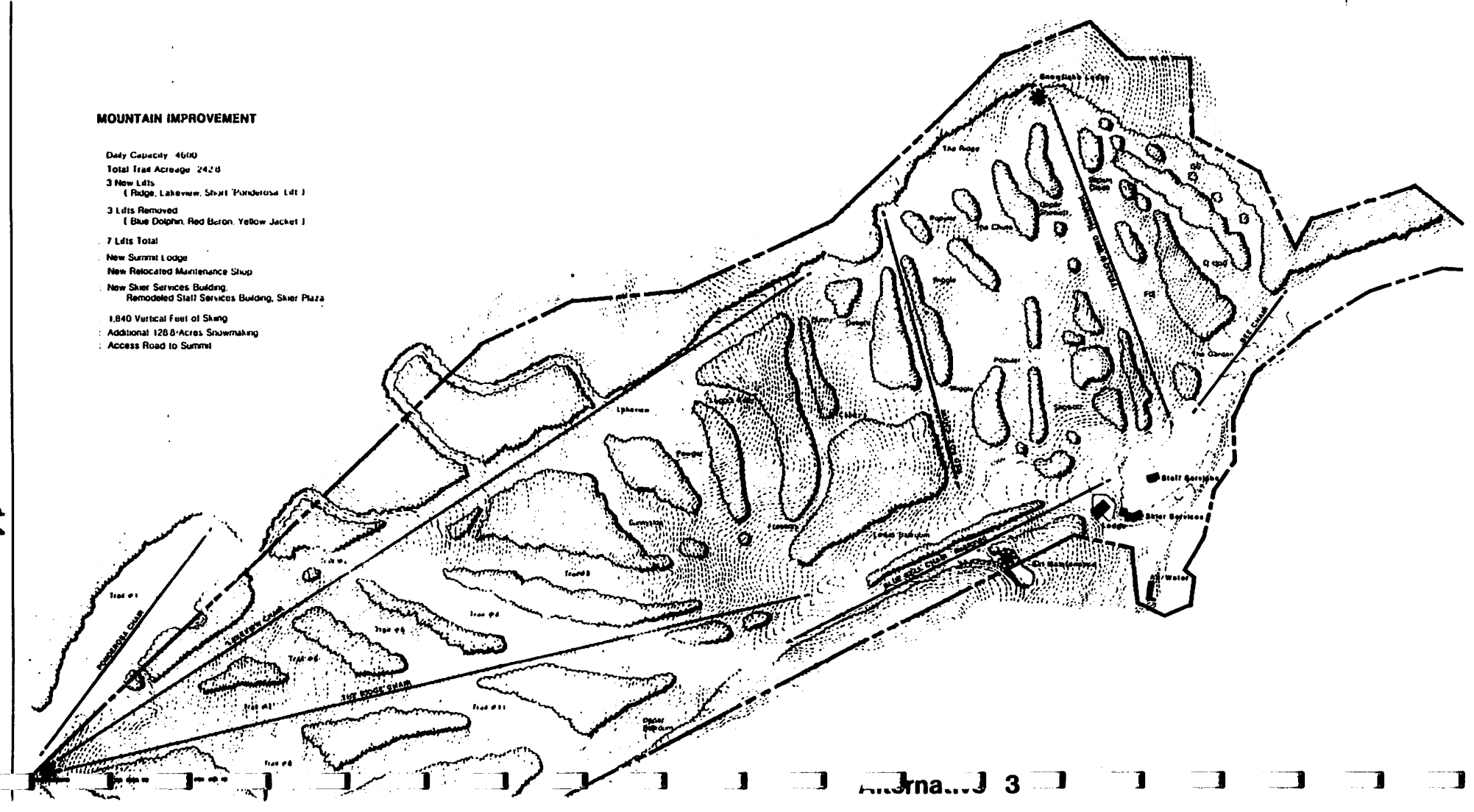
Citrus Heights, CA 95610
(916) 962-2900

Hydrology - Water Quality:
Resource Concepts Inc.
340 N Minnesota St.
Carson City, NV 89710
(702) 883-1600

Biophysical / Cultural Resources:
Alpen Group
Box 2000 188
Lake Tahoe, CA 95705
(916) 542-2397

Fig. 3.3 **Environmental Impact Statement**


MOUNTAIN IMPROVEMENT
Daily Capacity 4600
Total Trail Acreage 242.8
3 New Lifts
(Ridge, Lakeview, Short Ponderosa Lift)
3 Lifts Removed
(Blue Dolphin, Red Baron, Yellow Jacket)
7 Lifts Total
New Summit Lodge
New Relocated Maintenance Shop
New Skier Services Building,
Remodeled Staff Services Building, Skier Plaza
1,840 Vertical Feet of Skiing
Additional 128.8 Acres Snowmaking
Access Road to Summit
The Ridge
The Chute
Ephemer
Staff Services
Skier Services
Lodge
Maintenance
Water
Trail #1
Trail #2
Trail #3
Trail #4
Trail #5
Trail #6
Trail #7
Trail #8
Trail #9
Trail #10
Trail #11
PONDEROSA CHAIR
ASPEN CHAIR
SUN ROOST CHAIR
BLUE DOLPHIN CHAIR
RED CHAIR

Alternative 1 - No Action (fig. 3.2)

1. Daily capacity to remain at 2800 (PAOT).
2. Total trail acreage of 114 acres.
3. No new lifts.
4. 7 lifts total to remain in operation.
5. No lodge expansion.
6. Maintenance shop to remain at current size in current location.
7. No new base buildings.
8. No base area improvements to include circulation, parking, landscaping, signage, etc.
9. 900 total vertical feet of skiing.
10. Snowmaking to remain at 66 acres.

Alternative 2 - Modernization of Existing Facilities and No Expansion of Ski Area (fig. 3.3)

1. Daily capacity to remain at 2800 (PAOT).
2. Total trail acreage to remain at 114 acres.
3. 2 lifts relocated (slightly) and replaced by higher capacity lifts (Yellowbird, Bluebell).
4. 1 lift upgraded (Yellow Jacket).
5. 1 lift removed (Red Baron).
6. 6 lifts total.
7. Improvement and minimal expansion of Snowflake Lodge.
8. Relocated maintenance site with new shop building (4,900 sf).
9. No skier services building.
10. No substantial base area improvements to include circulation, parking, landscaping, signage, etc.
11. 900 total vertical feet of skiing.
12. Snowmaking to remain at 66 acres with replacement.

Alternative 3 - Modernization of Existing Facilities Expansion (fig. 3.4)

1. Daily capacity expanded to 4600 (PAOT).

2. Total trail acreage of 242.8 acres. 128 trails, development of 23.9 acres on USFS ponderosa side, 10.9 acres in Trail 1-A and development of all trails with cleared ac glades.

3. 3 new lifts (Summit, Lakeview, Short "Pom

4. 3 lifts removed (Blue Dolphin, Red Baron, Jacket).

5. 7 lifts total.

6. New Summit Lodge with 350 seats, remodele

7. Relocated maintenance site with new shop b (5,000 sf).

8. New skier services building (13,600 sf), re staff services building, skier plaza.

9. 1,840 total vertical feet of skiing.

10. Additional 128.8 acres of snowmaking.

11. Extend existing 20' access road to the new

4.0 ENVIRONMENTAL SETTING, IMPACTS AND MITIGATIONS

4.1 EARTH

4.1.1 TOPOGRAPHY

Setting:

The Ski Incline setting consists of 366 acres of privately owned land and 292 acres within LTBMU USFS land in rugged mountain terrain. The site ranges in elevation from a low of 6700' at the bottom of Bee chair to an eventual summit elevation of 8540' given the project proposal. Development of the proposal would result in a total of 1840 vertical feet of skiing.

Topography of the site consists of an elongated ridge with steep mountainous terrain flowing into the left hand drainage of Incline Creek. Land slopes in the proposed expansion area range from 20% to upwards of 60% in grade. The summit of the mountain is located along the summit ridge of the Tahoe Basin drainage. Land to the east of this summit falls directly into Little Valley in Washoe County and land immediately to the west of the summit falls into Incline Creek and Mill Creek drainages of the Tahoe Basin.

The site is generally well forested, sloping mountainous terrain with interspersed outcrops with young granite boulders. The majority of the site is tributary to Incline Creek. A small portion of U.S. Forest Service land is proposed for skiing in the Mill Creek drainage, however no physical landscape alterations are proposed for this portion of the study area.

Impacts:

Regrading of outcropped granite boulders for limited trails and regrading associated with roads, lifts and structures. Construction activity to perform regrading will include some blasting and bull dozing as well as the use of equipment for excavation/preparation of foundations.

Mitigation:

Temporary and permanent erosion control measures should be installed with TRPA 208 BMP standards.

4.1.2 GEOLOGY/SEISMOLOGY

Setting:

The area of the Lake Tahoe Basin is el
than 500 square miles; 315 square mi e
and the remaining 191 square miles is
surface. This alpine basin is in an e
bulge of the Sierra Nevada; the Cars n
highlands to the east, and the true i
the highlands to the west.

Elevation ranges from about 6,225 fe
of the lake) to 10,887 feet at Freel P
southeastern part of the basin. Sever
more than 9,000 feet high rise along
the ranges that rim the basin. Maximu
elevation of the Lake's surface is 6,2
minimum legal elevation is 6,223 fee
dam built in 1865 controls release o
Tahoe water to the Truckee River, its
which drains into Pyramid Lake northe

With a maximum depth of about 1,645 fe
the third deepest lake in North Americ
volume is about 122 million acre feet
gallons); it is fed by some sixty tri
streams. Annual precipitation, princi
ranges from about 15 inches in the ce
the lake to more than 45 inches alon
crest of the basin. Average temperatu
from 25 to 30 degrees F. in winter t
degrees in summer.

The surrounding U.S. Forest Service pe
the north and south contains the same
rock unit found within the IVGID prope
granitic rock is granodiorite, which i
extensive throughout the basin. The
contains the largest percentage of ro
of the project site. The slope angle,
and orientation of some of the slopes
northern and southern permit areas ex
characteristics that may be potential
avalanche hazard zones. The smooth ro
absence of vegetation located in the
zones of the northern facing slopes ma
hazard during storms with large accumul
snow. The same characteristics are p
southern permit area but may pose a p

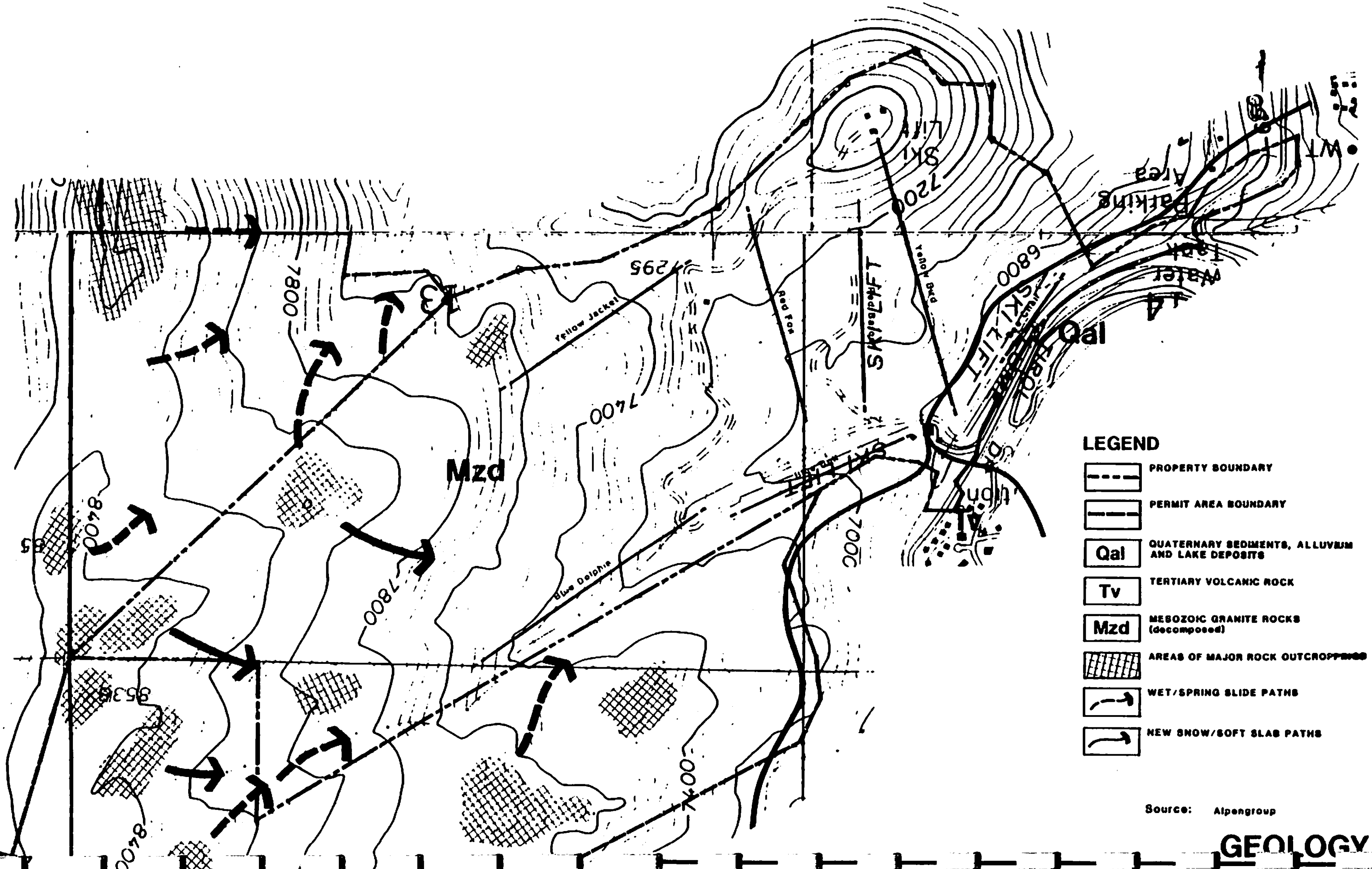
during warm weather or in springtime, in the form of wet snow avalanches. The latter being the most destructive in reference to geological degradation.

Geologic Features

The northern part of the Tahoe basin is mantled by extensive volcanic rocks. The basin was formed by faulting, and the lake occupies a down-dropped block or graben that is bordered by steep faults. The box-like configuration is characteristic of other basins in Basin and Range structures to the east.

Major landforms within the Lake Tahoe Basin and nearby areas were formed by faulting, warping, and combination of both. Faults along the margins have not been delineated in detail. However, the physiographic expression of the steep, near vertical drop-off areas along the shoreline clearly suggest that steep faults bound the basin. Results of the U.S. Coast and Geodetic hydrologic survey of about 1906 and later air-gun profiles (1969) of the lake basin show steep faults along the margins of the lake. The oldest rocks here are sedimentary and volcanic rocks that have been metamorphosed and are now preserved as remnants in granitic rocks. These older rocks are sporadically exposed in the eastern and western parts of the project area, mainly along the crest of the basin divide.

Granitic rocks underlie the entire basin; however, in the northern and northwestern parts the basement rocks are covered by younger Tertiary and Quaternary volcanic rocks. These are mainly mudflow breccias, basaltic flows, and minor masses of intrusive volcanic rocks and sedimentary rocks that were derived through the erosions of the volcanic and granitic rocks. Younger glacial moraines, tills, glacial outwash, and lakebed sediments form extensive deposits in the southern part of the basin; similar but less extensive deposits lie to the northwest but are much less common in the eastern part of the basin in Nevada.


LEGEND
PROPERTY BOUNDARY
PERMIT AREA BOUNDARY
Qal QUATERNARY SEDIMENTS, ALLUVIUM AND LAKE DEPOSITS
Tv TERTIARY VOLCANIC ROCK
Mzd MESOZOIC GRANITE ROCKS (decomposed)
AREAS OF MAJOR ROCK OUTCROPPINGS
WET/SPRING SLIDE PATHS
NEW SNOW/SOFT SLAB PATHS
Source: Alpengroup
Qal
Mzd
Water Tank
Parking Area
SKI LIFT
Ski Lift
Yellow Jacket
Blue Dolphin
Red Fox
Yellow Bird
6800
7000
7200
7400
7800
8400
9538
7295

GEOLOGY

GEOLOGIC UNITS

Granitic Rocks

The principal rock unit that forms the basement or bedrock of the Lake Tahoe Basin is granitic rock. This is the principal rock unit in the project area. The term "granitic" is used here to describe all intrusive rocks that range in composition from granite to gabbro. Granitic rocks are relatively common in the Sierra Nevada and other parts of California. The principal granitic rock in this area is granodiorite, which is the most extensive through the Sierra Nevada. There is an extensive occurrence of granodiorite in the project area that have been mapped (Geologic map, fig. 4.1.1). In this part of the basin many of these rocks underlie the younger volcanic rocks of this area and constitute more than 55 percent of the exposed rock in the remaining portions of the basin.

Physical Characteristics

A fresh unweathered surface of granite rocks is typically coarse grained; that is, the individual mineral grains are visible to the eye without magnification. These mineral grains are mainly light-colored feldspar and quartz, but they also contain darker (green and greenish black) biotite and hornblende minerals on an intermeshing mass of minerals; some show well formed crystal faces but others are poorly developed; some have no visible crystal form. Such granitic rock is tough, firm, and relatively durable. Deeply weathered granitic rock may appear to greatly resemble the fresh unweathered rock, but close observation or testing shows absence of the tough, durable, cohesive character of the intermeshing mineral grains. Alteration, both chemical and/or physical, destroyed the bond between grains and the rock may readily crumple with little disturbance. Chemical alteration generally attacks the feldspar minerals of the granitic rocks and may alter these minerals to clay. This alteration results from the action of water charged with organic acids present in soils overlying the granitic rock. Physical alteration may supplement or accelerate chemical alteration. Much of this type of alteration is

the result of water and cracks or fra
rock. Water seeps into the cracks an
cold season freezes and disintegrat s
frost wedging (expansion in volume wh
crystallizes to ice). This effective
which is quite common in high alpin
a very unstable situation and is th
numerous geologic hazards. These roc
earlier, are very extensive in the
eastern parts of the basin.

The hazards associated with alpine ar
terrains in the Tahoe Basin are of
types; rockfalls on steep slopes of m
granite and erosion of decomposed gra
gentle and steep slopes.

Natural Hazards

Rock units within the Tahoe Basin c
into the following four general group
order of their abundance: granitic i
volcanic rocks, glacio-fluvial depo
metamorphic rocks.

Granitic rocks on the western side
are generally more indurated and le
eroded than similar rocks on the east
to the scouring action of past glac
removed the loose, weathered surfac

In areas of deeply weathered and dec
granite, especially where the protec
vegetative cover has been removed, e
sedimentation can be a serious proble
Oversteeped, fractured, faulted and
granitic slopes are susceptible to l
rockfall hazards. In 1953, a rockslid
in fractured granitic rock along a ma
Emerald Bay. During the winter of 1
second slide occurred at this locatio
least 200,000 cubic yards of material
the road and into Emerald Bay (Matth

Poorly indurated volcanic rocks (mudf
and tuffs) easily weather and break
relatively unstable clayey soils. H
indurated volcanic rocks (latie, ande
where not fractured or faulted, gene
stable slopes. In 1967, a mudflow i

than 50,000 cubic yards of material occurred due to excessive storm water flowing across poorly indurated volcanic rocks adjacent to Second Creek near Incline Village (Glancy, 1969, USGS Professional Paper).

Five advances of glacial ice, 1,000 feet thick in some areas along the western side of the basin, have been recorded in the morainal deposits of the Tahoe Basin during the past 3 million years. As the glaciers retreated, they left behind large moraines (piles of broken and finely-ground rock). The finer sediments, carried by subglacial streams, formed an extensive outwash plain (or delts) at the southern end of the lake. This outwash material is easily eroded when excavated or otherwise disturbed. Also, the response of glacio-fluvial deposits to seismic ground shaking can be most hazardous, as indicated by the disastrous 1964 Alaskan Earthquake (Ecketl, et.al. 1971).

Scattered outcrops of metamorphic rocks are found on the higher peaks which were preserved from the scouring action of the glacial ice. The steep glaciated slopes, joints, and weathered bedding planes are responsible for the rockfall hazard associated with these rocks.

NATURAL GROUND STABILITY HAZARDS

Erosion-Sedimentation

The potential for erosion and sedimentation presents a serious hazard to the delicate environmental balance of the Lake Tahoe Basin. Erosion denudes the slopes of their valuable shallow soil cover (the soil cover is less than three feet thick in most of the Basin), and makes it difficult for vegetative cover to be restored once the soil has washed away. Sedimentation reduces the clarity of the lake, contributes to lake eutrophication, and clogs drainage courses and culverts, with consequent flooding. This hazard is most pronounced in areas consisting of poorly indurated, unconsolidated and deeply weathered rocks, such as decomposed granite, volcanic mudflow-breccias and tuffs.

Steep topography, moderate to high pr
loss of vegetative cover by lumberin
and man-made improvements all contri
potential erosion hazard. A sedimenta
of the Upper Truckee River in 1969 b
California showed that, of the total
of sediment annually transported by th
percent comes from roadways, 39 perce
natural streambanks, and 13 percent
flow across slopes. This study furthe
that the natural rate of sedimentatio
as a result of man's activity.

A considerable amount of study has bee
the erodibility of soils within the
the U.S. Department of Agriculture -
Conservation Service. One of the impo
parameters used by the Soil Conserva
in determining erosion potential is t
soil-water storage. Bailey in 1974 al
the importance of the soil's potentia
storage ability in the control of run
erosion patterns.

Mass Wasting

The general term "mass wasting" applie
dislodgement and downslope transport
soil under the influence of gravity.
under this heading, depending on the
movement (fall, slide, flows) and size
involved, are rockfalls, landslides,
avalanches, and mudflows. The volume
can vary from minor slumps of only a f
yards to extensive landslides involvi
of cubic yards. Such a massive lands
in the poorly-indurated volcanic rocks
Mountain in 1852, just northeast of t
Basin. This earthquake-triggered lan
involved an estimated 125 million cubi
material (Slemmons, 1965; Matthews, 19

Landslides and other types of mass wa
appear to be a common hazard within th
Basin. However, the potential for sl
exist where there are steep slopes l
poorly consolidated soils or rock
fractured and faulted rocks, and h
precipitation. Seismic activity and

engineered grading can also increase the sliding potential of a particular area.

In recent years, the Basin has experienced rockslides and avalanches along Highway 89 at Emerald Bay resulting in loss of life and property damage and substantial environmental damage to the area and major avalanches during February of 1986 caused enormous loss of vegetation and soil in areas near South Lake Tahoe and Incline Village.

Snow Avalanches

Snow avalanches occur more frequently along the western side of the Basin where the average depth of the snow pack is from 100 to 200 inches. Hazardous avalanches regularly occur along Highway 89 at Emerald Bay and along Highway 50 at Meyers Grade. The Nevada, or eastern side of the Basin is in the "rain shadow" of the western mountains and, therefore, receives less precipitation; the average depth of the snowpack on the eastern side of the Basin is from 16 to 66 inches (U.S. Department of Agriculture, 1970).

In determining potential snow avalanche hazard zones, you must know that slope angle, profile, and orientation are important factors in avalanche development. Ground surface roughness and an absence of vegetation are also major factors.

The type of area where an avalanche would most likely occur due to topographic conditions in the project area would be the north and northeastern slopes and portions of the south slopes. Glaciated slopes of 25 to 60 degrees which have no vegetative cover and are curved outward (convex). On slopes which are convex, the compacted snow tends to develop tension cracks and creep downhill more easily under the influence of gravity.

Frozen Ground

For most soil types, freezing causes the soil to heave and/or an impervious ice sheet (frost concrete) to form near the surface. This phenomenon is especially common in the northern portion of the Basin where the volcanic rocks break down into a clayey soil which tends to retain water. The formation of ice in wet, poorly drained soils contributes to and accelerates

downhill creep of soil, and it damage
buildings foundations by its expans
during freezing. A thick layer of
will form an impervious surface on ur
slopes, thereby preventing storm wa
infiltration into the ground and in
surface water runoff. Excess water
increases sheet and gully erosion and
to flooding. Also, reduced water i
into the soil may ultimately affect t
water available for plant growth. St
University of Nevada (Skau, et. al.
that ground insulated by either snc
of two inches of litter generally dev
concrete.

Expansive and Weak Soils

Expansive soil does not appear to b
problem in the project area. However
soils occur in areas of weathered vol
such as are found in the northern p
region. Weathering of these tuffs
produces large amounts of montmorillc
which expands when wet and shrinks

Weak soils, or those soils subject tc
settlement, occur in the poorly consc
moraines and outwash deposits. Thi
the case for those deposits around
of the lake, because of high groundwa

Volcanic Hazards

A potential volcanic hazard is indi
Tahoe-Truckee Area by the relativel
volcanic rocks in the northern portio
and the presence of a geothermal spri
Brockway (Alfos, et. al., 1973). T
of a volcano erupting in the area i
in any case, there is no preventive a
can be taken to avert, or means ava
predict where it might occur. Volc
are generally preceded by numerous ea
which usually provide ample warning
may be in the affected area.

SEISMIC SETTING

Historic Fault Movement

The major north-south fault zone which separates the eastern edge of the Sierra Nevada Mountains from the sequence of parallel fault block mountains of Nevada and Utah is located about 6 miles east of the Lake Tahoe Basin. Lawson (1912) observed that this Sierran frontal fault experienced 44 feet of vertical ground displacement during an earthquake some time within the past 200 years. It is possible that major fault movement along the Sierra frontal fault could occur again, with resultant ground failure and severe ground shaking within the Tahoe Basin.

A magnitude 6 earthquake occurred in 1966 at Boca Reservoir, about 16 miles northeast of Tahoe City (Kachadoorian, et. al., 1967). Resultant ground shaking within the Tahoe Basin lasted only 15 seconds and damage was relatively light; however, prolonged ground shaking (2 to 3 minutes) could have caused considerable damage due to landslides and liquefaction of some sediments.

Topographic Features Indicative of Active Faults

Although direct evidence is obscured by volcanic flows, glacial moraines and water, Lindgren (1896, 1897) noted in his extensive geological study of the area that the following topographic features could only be explained by faulting:

1. Surface evidence of active fault movement is apparent north of the Basin, along projections of the major Basin faults.
2. Recent lakebed deposits in the Truckee Valley have been tilted 25 degrees southward.
3. Pleistocene (within the last 3 million years) lake gravels in the Truckee Valley north of Lake Tahoe are 200 feet higher on the northeast side of the valley, indicating that some deformation has taken place along the eastern side of the valley.
4. Six hot springs (some as hot as 138 degrees) are located in the lake about 20 feet west of Brockway. These springs are believed to be

related to a fault contact betwee
and granitic rocks.

5. Steep scarps in granitic rock, a
2,000 feet high, border and exte
the lake. If these slopes had be
continuously exposed since the o
granitic rocks some 100 million
they would be less steep due to t
weathering process.

Bireland (1963), in agreement with Li
findings, mapped several faults which
1/2 million year old volcanic rocks o
shore of Lake Tahoe near Dollar Point
Stateline. Pakiser (1960) suggested t
the volcanic flows in the northern po
Basin are a result of tension cracks
developed along the major boundary fau
providing access zones through which la
the ground surface.

Other physiographic evidence which may
indicative of geologically recent fau
the Basin is seen in the capture of t
Truckee River at Meyers Grade; normall
should drain through the South Fork o
American River (Mathews and Burnett,

Epicenter Data

Earthquake epicenter data for the gen
Tahoe Basin region located between lati
degrees and 39.40 degrees and longitud
degrees and 120.33 degrees west were
the University of California's Seismogr
Station at Berkeley, California. Withi
coordinates, the data indicate that 1
earthquakes have originated in the vic
Basin since 1855. It should be noted t
the epicenter locations, especially o
earthquakes, were roughly estimated
questionable. Even recent epicenter lo
only approximate and may be up to 3 mi
error.

SEISMIC HAZARDS

Ground Rupture

Earthquakes are usually generated by movement along fault planes or by volcanic activity. Surface rupture occurs during an earthquake when fault displacement extends upward and intersects the ground surface. However, surface rupture does not occur everytime a fault moves.

The length of surface rupture occurring along a fault trace, the width of the zone of surface rupturing, and the amount of displacement between opposite sides of the fault at the surface during a single earthquake are highly variable. These factors are believed to be related to the length of the fault. Studies have shown that the longer the active fault, the greater the potential for a high magnitude or great earthquake. The greater the earthquake, the greater the possibility that a larger amount of surface displacement will occur. The greatest displacment during a single earthquake documented in California occurred along the Owens Valley Fault during the 1872 earthquake, when 23 feet of movement occurred.

All faults within the Basin are considered potentially active. Based on historical information and assuming that similar patterns of earthquake activity will occur in the future, it is estimated that a 7.0 magnitude earthquake or greater will occur on the average of every 110 years within 25 miles of the center of Lake Tahoe (R. Greensfelder, 1971). The major north-south faults along the boundary of Lake Tahoe appear to be the longest continuous faults traversing the Basin area. Of these faults, the fault along the west side of the Lake appears to be the longest, with a surface length of perhaps 50 miles. Theoretically, a fault of this length could generate a 7.5 magnitude earthquake with a probable maximum surface displacement of 10 feet (Bonilla, 1970).

Ground Failure

Liquefaction is the type of ground failure most likely to occur in water-saturated silts, sands

and gravels having low to medium in-
When a soil of this type is subjecte
vibration, it tends to compact and de
volume. If the groundwater is unable
during the vibration, the tendency c
decrease in volume results in an inc
water pressure. When the pore-water
builds up to the point where it is e
overburden pressure (effective weigh
soil) the effective stress becomes ze
condition, the soil loses all of its
strength and assumes the properties
liquid.

Liquefaction during major earthquake
severe damage to structures on the l
a result of settling, tilting or floa
structures settled 3 feet or more an
structure titled 80 degrees from the
during the 7.5 magnitude 1964 earthqu
Niigata, Japan. (Wiegel, 1970).

If liquefaction occurs in or under a
mass, the entire mass will likely flo
translate laterally toward a lower e
example of this type of slide occurr
coastline near the town of Seward dur
Alaskan earthquake. The slide involv
feet of coastline which moved seawar
earthquake. Numerous landslides in c
have also occurred as a result of lig
thin sand layers and lenses included
clay mass. Liquefaction of such lay
not only reduces the shear strength o
itself, but it also causes reduction
strength of the surrounding clayey s
the induced pore-water pressures. La
spreading induced by earthquake shak
as a result of soils moving toward a
surface or slope, even though the slo
steep. Lateral displacement has occu
saturated clays, such as bay and lag
During ground shaking, these soft ma
flow, form wave-shaped masses, or sque
laterally. This type of ground fail
occur beneath fills, with the fill m
developing severe longitudinal cracks.
Considerable damage occurred as a res
type of lateral spreading during the
Francisco Earthquake (Lawson, 1908).

Thresholds:

This geology element pertains to portions of the water quality, soil conservation, and vegetation thresholds. Its relationship to these portions is based on the erosion potential and on the natural hazards potential, i.e. that a mass wasting event (in event of an avalanche) may degrade the existing vegetation which may lead to an unstable slope resulting in soil loss and ultimately in degradation of water quality.

Impacts:

From all published data reviewed and from field inspection, the underlying geologic character of the site appears to be in a stable condition. Other areas of the developed ski resort that have had timber cleared for trails and had removed all existing vegetation show no signs of potential mass wasting or movement. Since the proposed permit area will have no trails developed, there will be no impacts on the geological stability from the proposed trails. The underlying geological composition of the proposed access road is made up of mesozoic granite rock and appears to be in stable condition. Areas of roadway that exist within the developed ski area are stable and only show signs of erosion where the granite has decomposed from physical alteration or frost wedging. Where the road crosses portions that have exposed rock, care must be given to the erosion of the decomposed granite caused by vehicle use. While the underlying geologic structure appears stable, there may be conditions which will require adherence to the mitigations which follow in order to avoid localized instability.

In consideration of Alternative #3 the consequences of previous ski trail development, which consisted of the use of heavy machinery on the steep slopes to clear the trail which usually involved the complete removal of the topsoil, is evident in the Tahoe Basin. However, under Alternative #3 the trail development plan proposes to use a flush cutting system whereby all the soil is left intact, all the root structures are left in place, and runs are cleared completely by hand, with no use of heavy equipment and no heavy

machinery. Alternative #3 will help r
extensive stand of shrubs on the proje

Alternative #3 will also provide a f r
between the conifer forest and in the
wildfire and prevent a mass wasting th
after fire has removed all vegetatio
slopes.

Mitigation:

For Alternatives #1 and #2 mitigation
maintaining the current revegetation p
Ski Incline has in use. The plantin s
taken on the current developed slopes
very good response to their maintenanc
to have stabilized the slope quite w l

For Alternative #3 and the proposed pl
recommended that in areas inaccessib e
proposed access road, or in areas of s
that ski lifts are placed with a helic
avoid having any heavy equipment or ma
the slope itself. Whil this is an
expensive operation (approx. $5,000 an
an environmentally acceptable procedur
used currently all over the United S a
install ski lifts and trams. (p.c. e
Colorado; p.c. Berry, California, p.c.
Nevada).

It is recommended that where grades ar
for conventional logging methods that
performed during the winter months w e
snowpack cushions and protects the un
degradation. Then, in summer, come ba
flush cut the stumps by hand, leavin
system of all vegetation and the soi
in tact and undisturbed. While this i
expensive and dangerous method of tra l
construction, it is necessary to be n
with the Thresholds and the Draft Goal
Policies (June, 1986) of TRPA.

Revegetate slope cuts created by the ac
by seeding, mulching, and stabilizatio
necessary, temporary irrigation shou
installed to insure rapid establishme t
vegetation. State of the art erosion c

measures should be used to assure establishment of vegetation.

Since this proposal will include human presence into a new area during the winter months, a snow safety plan and an avalanche hazard forecasting program should be implemented for the developed area and permit area to evaluate the hazard potential of the new area. This should help control the degradation to the site geology from destructive climax avalanches.

If any development is proposed in the future for the permit area, it is recommended that ski lifts be placed with the aid of helicopters to avoid any heavy equipment or machinery on slope.

4.1.3 SOILS

Setting:

The existing ski area site is compo
Rock outcrop complex, Toem-Rock out
limited areas of marsh. The base ar
of fill material as a result of exte
during installation of the 6' culve
Creek. The area proposed for ski e
composed of Toem-Rock outcrop and Ro
Toem complex.

All four soils are in the U.S. Dept
Soil Conservation Service land capa
VII. The capability groups indicat
suitability for field crops. Class
severe limititations that make them
cultivation and limit their use lar
or range, recreation, woodland or w

The description from the SCS survey
each soil on the site is as follows

Cagwin-Rock outcrop complex, 30
slopes (CaF). -- This complex consi
granitic uplands, mainly in the sou
eastern parts of the survey area. I
to 95 percent soil material and 5 t
granitic rock outcrop. The soil ma
60 percent Cagwin soil; 10 percent To
sand; 5 percent Graylock extremely
coarse sand; and about 25 percent a
to the Cagwin soil, but deeper than
weathered rock.

This Cagwin soil has the profil
respresentative of the Cagwin series.
layer does not absorb water readily
is bare of vegetation, runoff is ra
erosion hazard is high. Under natur
runoff is medium.

Rock outcrop consists of slightl
to hard granitic rock. The outcrops
scattered rocks 1 to 5 feet in diame
expanses of rock 100 to 500 feet squ
is very rapid, and the erosion hazard

This complex is suitable for watershed, timber, and recreation uses. Capability subclass VIIs.

Cagwin-Rock outcrop complex, 15 to 30 percent slopes (CaE). -- This complex consists of hilly soils on granitic uplands. It is about 75 to 95 percent soil material and 5 to 25 percent granitic outcrop. The soil material is about 70 percent Cagwin soil; 5 percent Toem coarse sand; and about 25 percent a soil that is similar to the Cagwin soil, but is deeper than 40 inches over weathered granitic rock.

The surface layer of the Cagwin soil does not absorb water readily. In disturbed areas, runoff is rapid and the erosion hazard is high.

Rock outcrop has very rapid runoff, but the erosion hazard is only slight.

This complex is suitable for watershed, timber and recreation uses. Capability subclass VIs.

Marsh (Mh). Marsh occurs in the Upper Truckee Marsh and in very poorly drained and ponded meadows. It is mostly nearly level. The vegetation is reeds, sedges and tules in the ponded areas, and sedges, meadow grasses, and scattered thickets of willow and lodgepole pine in the very poorly drained areas.

Most of the acreage is under water for at least 10 months of the year. In the very poorly drained areas, the surface is covered with about 6 to 8 inches of reddish-brown peat. Below this is about 6 to 10 inches of black peat, which is underlain by black muck. The substratum, at a depth of 30 to 60 inches, is gleyed sand and gravel.

Permeability varies. Runoff is ponded, and the erosion hazard is slight.

Included in mapping are scattered areas of Elmira soils, wet variant, and Loamy alluvial land.

Marsh is suitable for recreation, and limited grazing uses. Some areas filled and used for homesites (pl. IV Capability subclass VIIw.

Rock outcrop-Toem complex, 30 to slopes (RtF). -- This complex is on g uplands, mainly in the southern and ea of the survey area. It is about 25 t granitic rock outcrop and 50 to 75 pe About 85 percent of the acreage of soi soil, and 15 percent is Cagwin loamy

The Toem soil is excessively drai is rapid, and the erosion hazard is hi available water capacity is 0.5 to 1 Cagwin soil is described in the Cagwi outcrop complexes above.

This complex is suitable for wat wildlife and recreation uses. Capabil VIIs.

Toem-Rock outcrop complex, 30 to slopes (TrF). -- This complex is on gr uplands, mainly in the southern and e of the survey area. It is about 75 t soil material and 10 to 25 percent gra outcrop. The soil material is about Toem soil and about 20 percent Cagwin sand.

The Toem soil is excessively dra surface layer does not absorb water re runoff is medium to rapid, depending o of cover. The erosion hazard is high areas.

Rock outcrop consists of slightly to hard granitic rock. The outcrops scattered rock from 1 to 5 feet in dia large expanses covering about 100 to 5 feet. Runoff is very rapid, but the e hazard is slight.

This complex is suitable principa watershed, wildlife, and recreation us limited extent for timber. Capability VIIs.

Characteristics of the site's soil type summarized in Table 4.1.1. Their locat shown on Figure 4.1.2.

TABLE 4.1.1
SOIL CHARACTERISTICS AT SKI INCLINE

	Cagwin-Rock Outcrop 30-50%	Cagwin-Rock Outcrop 15-30%	Marsh	Toem-Rock Outcrop	Rock Outcrop Toem
Soil Capability Class	VIIs	VIs	VIIw	VIIs	VIIs
Shrink Swell Potential	Low	Low	---	Low	---
Erosion Hazard	High	High	Slight	High	High
Frost Heave Potential	Moderate	Moderate	Variable	Slight	Slight
Limitation for:					
Road Location	Severe	Severe	Severe	Severe	Severe
Excavation	Severe	Severe	Severe	Severe	Severe
Dwellings	Severe	Severe	Severe	Severe	Severe

Source: U.S. Department of Agriculture Soil Conservation Service Soil Survey: Tahoe Basin Area, California and Nevada, March 1974.

TRPA thresholds for land use prescribe standards for the coverage of various types of soil within the Ski Incline permit area. Table 4.1.2 indicates the TRPA limitations regarding impervious surface coverage, and the amount of impervious surface coverage which would result from implementation of the proposed expansion.

TABLE 4.1.2
SKI INCLINE COVERAGE ANALYSIS
(in acres)

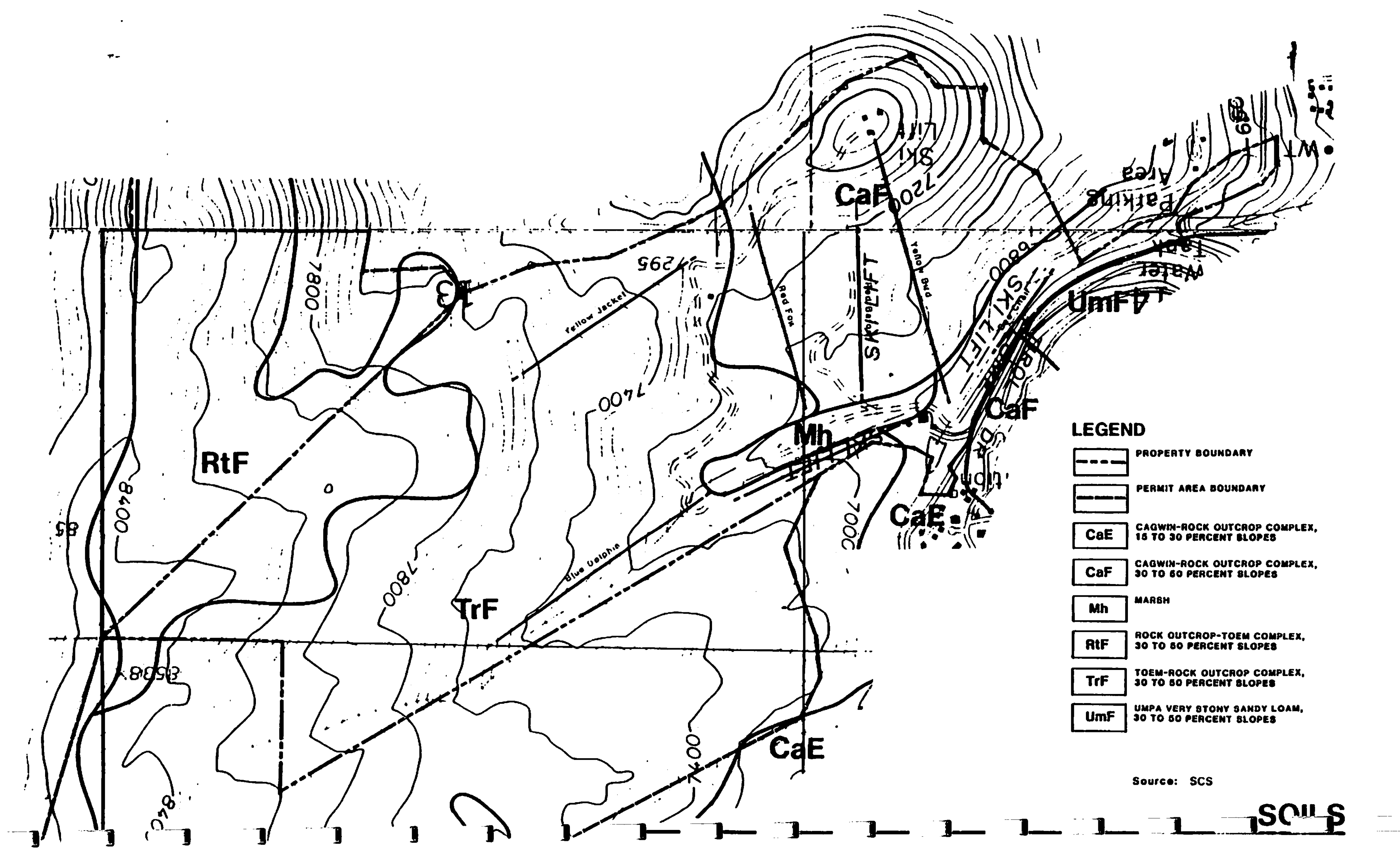
	Soil Type/Land Capability				
	Caf/1a	CaE/2	Mh/1b	Trf/1a	Rtf/1a
TRPA Threshold	1%	1%	1%	1%	1%

Project Area - 652 acres
Allowable Coverage @ 1% = 6.5 acres or 284,011 sq. ft.

POTENTIAL SITE COVERAGE
(with existing and proposed development)

	Existing Square Ft.	New Square Ft.	Additional % of Project Area	Additional % of Project Area
Proposed Project	158,153	183,403*	.65%	1.20%
Alternative 1 (No Action)	158,153	--	--	.55%
Alternative 2 (Minimal Upgrade)	158,153	4,900	.02%	.57%
Alternative 3 (Major Expansion)	158,153	185,403*	.65%	1.21%

* Includes 152,000 sf for access road; study of alternatives to this figure is underway.



RtF
TrF
CaE
CaF
Mh
UmF
Ski Lift
Parking Area
Water Tank
Yellow Jacket
Blue Dolphin
Red Fox
Yellow Bird
7800
7400
7200
7000
6800
8400
7295
LEGEND
PROPERTY BOUNDARY
PERMIT AREA BOUNDARY
CaE CAGWIN-ROCK OUTCROP COMPLEX, 15 TO 30 PERCENT SLOPES
CaF CAGWIN-ROCK OUTCROP COMPLEX, 30 TO 50 PERCENT SLOPES
Mh MARSH
RtF ROCK OUTCROP-TOEM COMPLEX, 30 TO 50 PERCENT SLOPES
TrF TOEM-ROCK OUTCROP COMPLEX, 30 TO 50 PERCENT SLOPES
UmF UMPA VERY STONY SANDY LOAM, 30 TO 50 PERCENT SLOPES
Source: SCS
SOILS

Impacts:

Impacts on soils fall into temporary disturbance or permanent disturbance categories. Proposed temporary impacts which will retain pervious land surface include the removal of vegetative canopy for trails, and ski lift lines, grading of rock outcroppings related to trails and structures, future grading of trails noted for snwomaking systems (includes large boulder removal and finish grading of surface; this will entail removal of existing ground covers), grading for sideslopes associated with the access roads, and trenching associated with underground utility lines (note: air and water lines for snowmaking installed within the trails to be covered will be installed as part of the grading operations of these trails at a future date). Proposed permanent impacts which will increase impervious cover beyond the existing conditions include new structural footprints, lift tower bases, and the width of the access road extensions.

Clearing of vegetation can result in increased erosion. Grading alters normal patterns of percolation and surface runoff and causes nutrients to be lost when the humus layer is disturbed. Impervious surfaces cut off nutrient supplies to the soil and eliminates water infiltration, increase the quantity and velocity of runoff. (1)

A and USDA Forest Service. Vegetation of the Lake Tahoe ion: A Guide for Planning, June 1971.

Mitigation:

Although no irreversible impacts have been identified, the soils on the site do have an erosion potential. To minimize the impacts on these soils the following mitigation measures will be implemented.

1. Over the snow logging or helicopter logging will be utilized to remove the trees which cannot be reached by conventional techniques.

2. A helicopter will be utilized to install the lift footings and lift towers where access cannot be gained from the acces road, or in areas of steep slopes.

3. Restrict grading of new ski trails to only those slopes to be equipped with snowmaking.

4. A majority of the acreage (no earthwork) will retain the natural ground covers and root systems of the logged trees.

5. Revegetation of slopes will be accomplished by seeding, mulching and stabilization. If it is necessary, a temporary irrigation system other than snowmaking lines will be installed to insure rapid germination. Temporary and permanent erosion control measures will be used to increase slope of stabilization.

6. Install temporary erosion controls and vegetation protection measures in accordance with TRPA 208 BMP standards.

4.2 WATER

4.2.1 FLOODWAYS

Setting:

No flood peak data exists at the present time for the Ski Incline tributary. Flood flows of specific magnitudes can, however, be estimated using one of several existing techniques applicable to ungauged stream flow sites.

The State of Nevada, Department of Conservation and Natural Resources, Division of Water Resources, and the U.S. Geological Survey prepared and published a report titled "Nevada Stream Flow Characteristics" in 1978. The report summarized stream flow statistics which included annual peak discharges, annual flood statistics, and results of Log-Pearson Type III Frequency Analysis. One of the sites of data collection published in the report was Incline Creek near Crystal Bay, Nevada. Table 4.2.1 provides a reproduction of annual peak discharge data for Incline Creek. Table 4.2.2 lists the results of Log-Pearson Type III frequency analyses.

TABLE 4.2.1
ANNUAL PEAK DISCHARGES OF INCLINE CREEK

(Station 1036700)

Year	Peak (cfs)
1970	87
1971	38
1972	18
1973	40
1974	64

Location - Latitude 39 14'25", Longitude 119 56'38", Washoe County, 500 feet upstream from Lakeshore Blvd and 3 miles east of Crystal Bay.

Source: Schroer and Moosburner, 1978, page 347.

TABLE 4.2.2
LOG-PEARSON TYPE III FREQUENCY CURVES-INCLINE CREEK

Percent Change of Occurrence	Exceedance Probability	Record	Water Resources Council-Adjusted Value
10	0.10	90	94
25	0.04	110	130
50	0.02	120	150
100	0.01	140	180

Source: Schroer and Moosburner, 1978, page 347.

These data and statistics are presented and are important since they relate to the larger watershed basin in which the study area is located, but were not used in the floodway analysis due to the short time of record. Floodway analysis was based upon statewide flood-frequency equations developed by U.S. Geological Survey (Christensen and Spahr, 1980). Table 4.2.3 provides flood frequency values derived fr.. the aforementioned equations.

TABLE 4.2.3
FLOOD FREQUENCY ESTIMATES AT SELECTED INCLINE CREEK LOCATIONS

Drainage	Basin Area	Q(25)	Q(50)	Q(100)
Incline Creek	7.0	200	300	500
East Fork Incline Cr.	5.0	170	270	400
Ski Incline Tributary	0.50	40	70	110

Source: Frequency estimates calculated from equations from Christensen and Spahr, 1980.

The east fork of Incline Creek in the vicinity of Ski Incline flows through a 2,000 foot long underground 6-foot diameter culvert capable of passing the 100 year flood peak. Ski Incline tributary is also conveyed in underground pipe networks to its convergence with the east fork of Incline Creek. A series of culverts and drop inlets start as high as 7,330 foot elevation and continue down the mountain to elevation 6,790.

This pipe network should be capable of passing the 100 year peak from this tributary.

Impacts:

Future modernization and expansion of Ski Incline will need to conform to the Tahoe Regional Planning Agency's "Regional Goals and Policies Plan." The specific goal relative to risks from natural hazards (floods) is stated below:

"Land uses within the Tahoe Basin should be cognizant of natural hazards so as to help prevent damage to property and to protect public health. Natural hazard areas or situations can be identified and precautionary measures taken to minimize impacts."

The Tahoe Basin is often subject to rain or storm events which cause extreme fluctuations in stream flows or wave runup which can result in flooding, erosion, and damage to property. Grading, filling and structural development within the floodplain causes alteration of the stream flow and may accentuate downstream flooding. Development within the floodplain is subject to damage and inundation as a result of flooding and is generally prohibited by federal regulation (Executive Order No. 11988, 1977 and No. 11296, 1966).

The specific TRPA policy states that construction, grading and filling are prohibited on lands within the 100 year floodplain. The policy also requires all public utilities, located in the 100 year floodplain and area of wave runup to be constructed or maintained to prevent damage from flooding and to not cause flooding.

Specific impacts of each of the alternative Ski Incline mountain improvements are listed below:

Alternative 1 - No impact on existing flood characteristics.

Alternative 2 - No impact on existing flood characteristics.

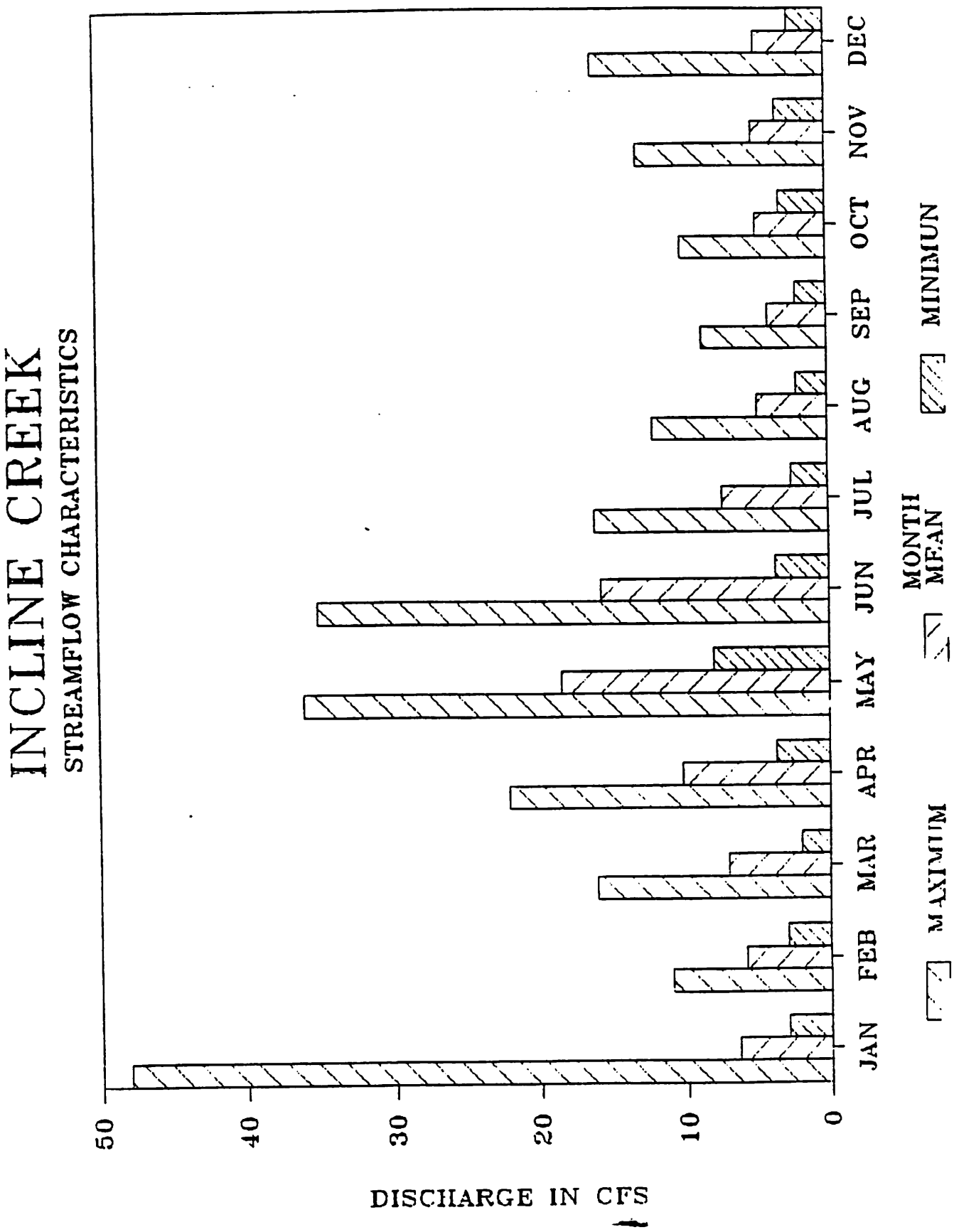


Fig. 4.2.3 Streamflow Characteristics of Incline Creek.

B. Detention structures and basins reduce peak flows by increasing the runoff hydrograph characteristics of time to peak (rising limb) and the recession period. Lengthening of the runoff hydrograph allows a larger infiltration time period. Most detention measures result in an increase area of infiltration also. Revegetate areas stripped of vegetation of all project lands.

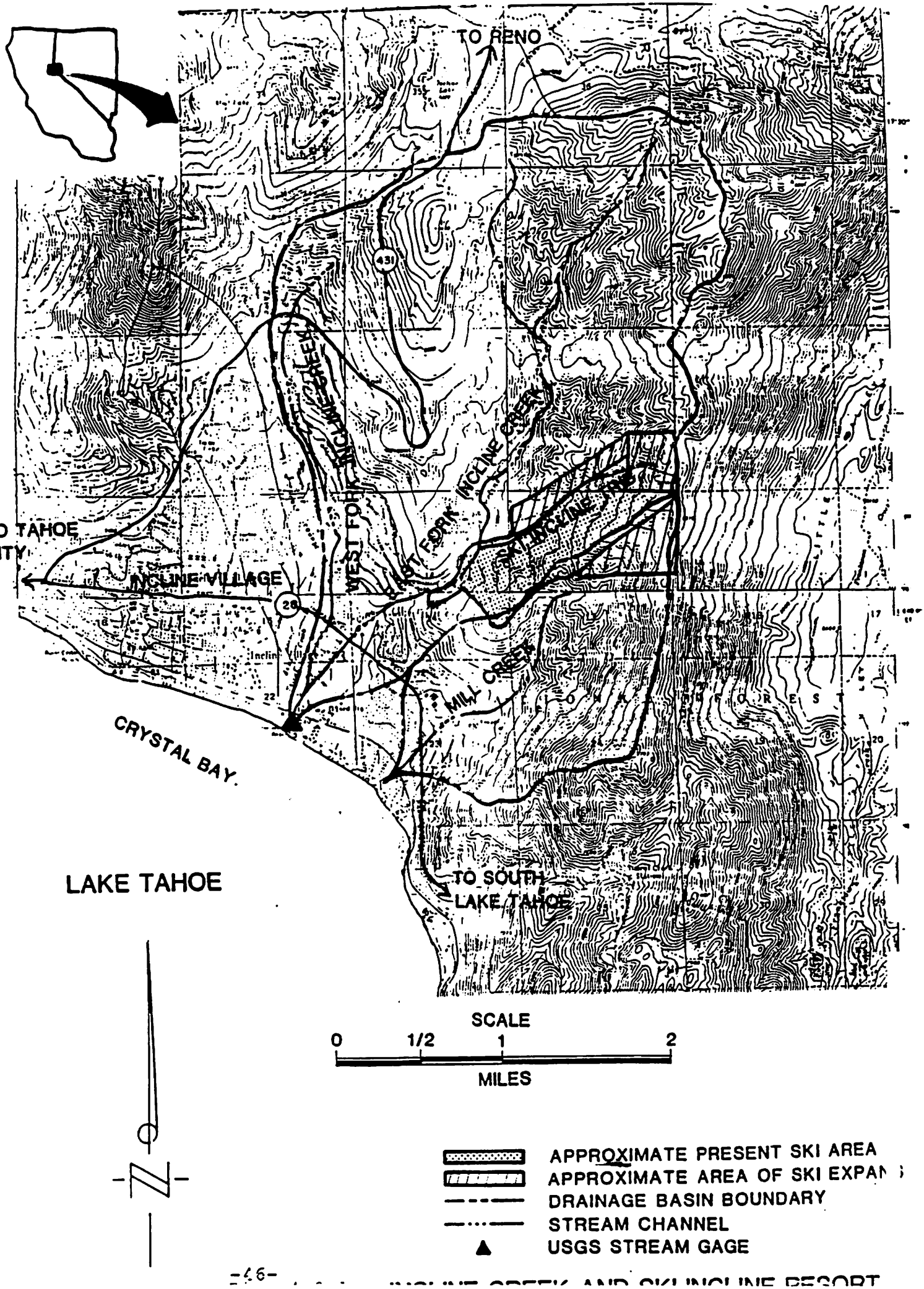
4.2.2 DRAINAGE

Setting:

Surface runoff data is scarce for Incline Creek and nonexistent for East Fork Incline Creek and Ski Incline tributary.

Ski Incline lies within the Incline Creek drainage tributary to Crystal Bay in the northeast part of Lake Tahoe (Figure 4.2.1). Incline Creek lies completely within the Sierra Nevada mass and is dominated by south-facing slopes. The approximate maximum altitude of Incline Creek is 9,225 and the maximum altitude of Ski Incline tributary is 8,538 feet. The legally decreed maximum altitude of Lake Tahoe is 6,229 feet. The longitudinal profile of Incline Creek and Ski Incline tributary are shown on Figure 4.2.2. Runoff occurs in one of a combination of three basic modes: 1) base flow fed by groundwater, 2) rainfall surface runoff, and 3) snowmelt surface runoff. Storm runoff generally recurs frequently during the autumn months when rainstorms are common in the Tahoe Basin. Pulses of low-altitude snowmelt runoff occur frequently during autumn, winter, and spring as the snowpack below 7,000 feet fluctuates with alternating periods of rainfall, snowfall and melting.

Snowmelt runoff is normally the major contributor of annual runoff from Incline Creek. It usually occurs over a several month period, and is frequently interrupted by storms and their accompanying cold temperatures. The snowmelt runoff magnitude also pulsates on a daily basis because of daily temperature fluctuations. Flows of Incline Creek were monitored by the U.S. Geological Survey from October 1, 1969, to September 30, 1975. Figure 4.2.3 shows a bar graph of the monthly maximum, mean, and minimum flows as recorded by the USGS. The mean flow for all recorded days is 7.7 cubic feet per second. Flow of Ski Incline tributary may be estimated by applying the drainage area fraction to the monthly or yearly flow values. Table 4.2.4 provides the average monthly and yearly figures as estimated by the aforementioned method.


TO RENO
431
WEST FORK INCLINE CREEK
EAST FORK INCLINE CREEK
SKI INCLINE
TO TAHOE CITY
INCLINE VILLAGE
28
MILL CREEK
CRYSTAL BAY
LAKE TAHOE
TO SOUTH LAKE TAHOE
SCALE
0
1/2
1
2
MILES
N
APPROXIMATE PRESENT SKI AREA
APPROXIMATE AREA OF SKI EXPAN
DRAINAGE BASIN BOUNDARY
STREAM CHANNEL
USGS STREAM GAGE

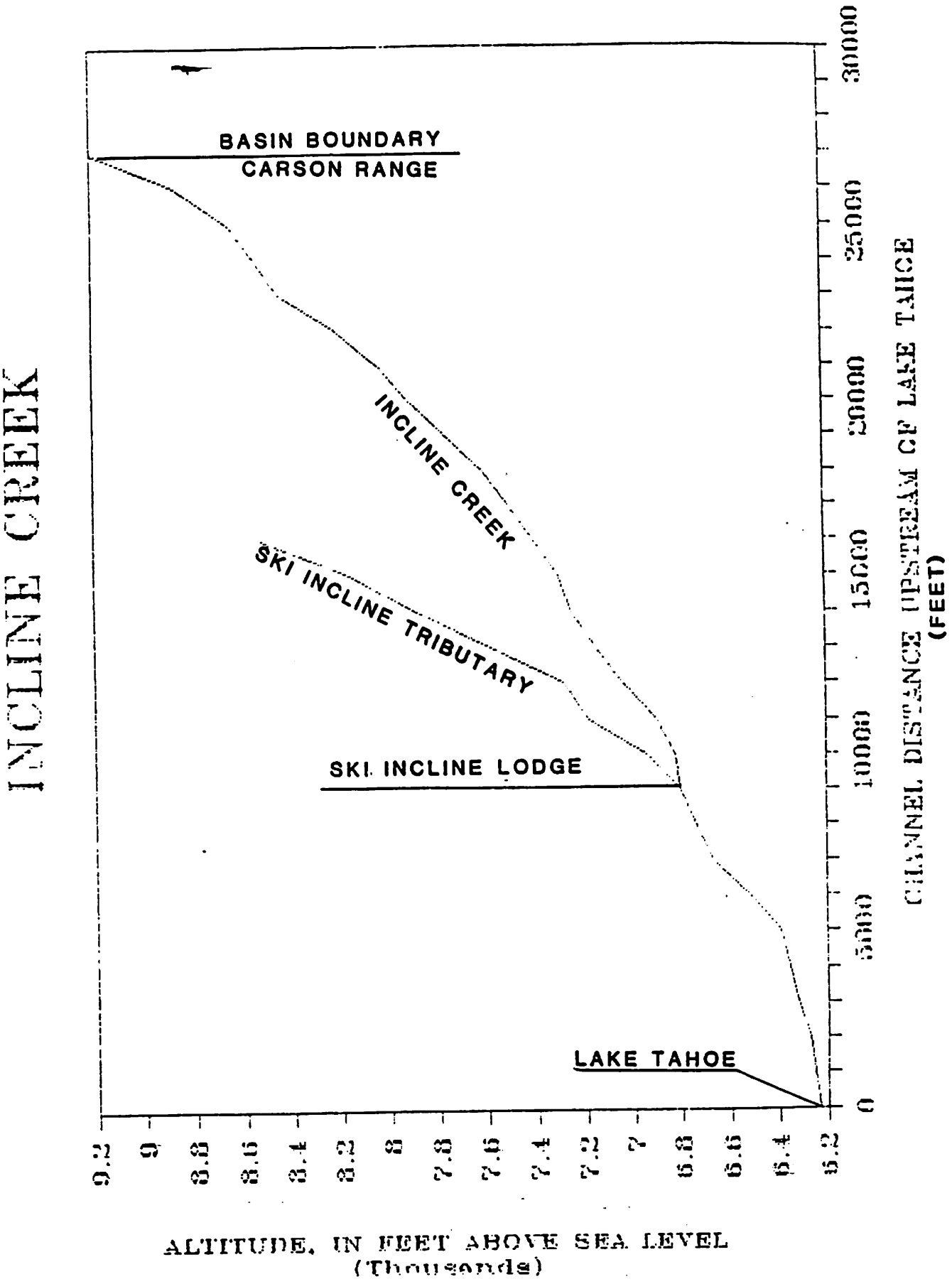


Fig. 4.2.2 Longitudinal Profile of Incline Creek and Ski Incline Tributary.

Alternative 3 - The clearing of 128.8 acres of forest for the new ski trails as proposed in this alternative will have some future effect on flood peaks. There exists no hydrologic data at the present time to accurately quantify this impact. A best estimate to the degree of 100 year flood peak increase of Ski Incline tributary would be the term "slight", approximately 10 percent.

This estimate was based upon an increase of a run-off coefficient for the area that forest removal is proposed. An increase of 20 percent to the run-off coefficient for this area within the Ski Incline tributary basin results in the slight flood peak increase.

Proposed Plan - The clearing of 70 acres of forest in this plan will have an effect on future flood peaks. Qualitatively, the effect will be "slight" also, or an estimated 5 percent 100 year flood peak increase on Ski Incline tributary. Again, this estimate was based upon the planned clearing of trees and thus canopy cover, with the resulting run-off coefficient increasing 20 percent.

The proposed Ski Incline expansion project will have a slight impact on future flood values, but that impact may be difficult to detect and quantify at most downstream reaches. The drainage area of Incline Creek is 7.0 square miles. Ski Incline tributary has a drainage area of 0.5 square miles. Alternates 1 and 2 will have little to no effect to the existing watershed. Alternative 3 alters 0.2 square miles or 3 percent of the total watershed. The proposed plan alters 0.1 square mile or 1.5 percent of the total Incline Creek watershed.

Mitigation:

Man can do little to prevent major rainfall and/or melting snow floods, but the impact of future floods may be lessened with the following development mitigation measures:

A. Revegetate the areas stripped of vegetation. This mitigation effort will lessen future runoff by breaking up bare ground surfaces allowing increased infitration and by slowing overland flow velocities and retarding natural canalization efforts.

TABLE 4.2.4
SKI INCLINE TRIBUTARY CHARACTERISTICS

Time Period	Estimated Mean Discharged In CFS
January	0.5
February	0.4
March	0.5
April	0.7
May	1.3
June	1.1
July	0.5
August	0.4
September	0.3*
October	0.2*
November	0.3*
December	0.4
Year	0.5

* Estimates of extremely low values could be indications of dry or zero flow conditions.

Impacts:

Specific impacts of each of the alternative Ski Incline mountain improvements are listed below:

Alternative 1 - No impact on existing runoff characteristics.

Alternative 2 - No impact on existing runoff characteristics.

Alternative 3 - A slight impact to the existing runoff characteristics may occur with this alternative development plan. The additional 129 acres, of snowmaking coverage may increase the runoff discharge value during the spring/summer melt period but that increase may be so slight that detection will be impossible during normal and above normal annual precipitation years.

Proposed Plan - An impact to existing runoff characteristics may occur with this development plan, but the impact may be impossible to detect. Additional area of snowmaking, 47 acres, may increase the spring/summer runoff discharge value very slightly.

4.2.3 WATER QUALITY

Setting:

Ski Incline is a tributary of the East Fork Incline Creek and represents the most significant surface water body of the project site. The creek is identified as a minor stream formed near the upper reach of the Blue Dolphin Ski Lift by two (2) first order streams. These two Ski Incline Creek tributaries represent regions classified as Stream Environment Zones (SEZ) in consideration of the presence of water and riparian vegetation.

Surface Water Quality

With the exception of water quality data developed by Professor Skau in 1983, no site specific data is available on Ski Incline Creek. In summary, Professor Skau's data suggest that during the period May through July 1983, five million pounds of sediment and 69.0 pounds of Total Nitrate-Nitrogen, was discharged from Ski Incline Creek into the East Fork Incline Creek. It should be noted this period represents a time of high streamflows following the record snow fall of 1983. IVGID has indicated the sediment levels were caused by the failure of several drop inlets constructed in the Ski Incline drainage system which have subsequently been corrected. These failures resulted in surface flows that are normally drained through culverts constructed in the ski runs. The summary data indicates the total Nitrate range form less than 0.01 mg/1 to 0.02 mg/1.

With respect to the project Nitrate-Nitrogen loading from Ski Incline of 69.0 lbs., the data indicates the Nitrate-Nitrogen concentration identified during this period was less than 25 ug/1. Although it is not possible to corrolate the total Nitrate-Nitrogen and soluable inorganic Nitrogen concentrations, the data suggest the Nitrogen concentrations are in compliance with the water quality standards. This data provides insight into the Nitrate-Nitrogen level from the existing ski facilities under a worst case situation.

IVGID has elected to institute a water quality monitoring program of Ski Incline Creek. This program was initiated on July 16, 1986, and will provide baseline water quality data on selected chemical constituents. A copy of the plan titled Water Quality Monitoring, Ski Incline, Incline Village, Nevada is provided as Appendix I. The sampling sites are consistent with those used in the May-July 1983 monitoring program. Each site has been established with a reference gauge which allows for the determination of the stream discharge rate. The water quality data and discharge rate will allow for the development of mass loading rates from the site in addition to determining compliance with water quality standards and the future impact of the proposed plan on the ambient water quality conditions.

The water quality and quantity data available from the Ski Incline Monitoring Plan is listed below in Table 4.2.5.

TABLE 4.2.5

Ski Incline Water Quality Data

Date	Site 1	Site 2	Site 3	Site 4	Site 5
Soluable Nitrate-Nitrogen mg/1					
7-16-86	<0.002	0.011	0.024	0.007	0.009
7-22-86	0.003	0.036	0.071	0.020	0.022
7-22-86	<0.002	0.024	0.055	0.011	0.014
7-25-86	<0.002	0.026	0.047	0.017	0.020
7-30-86	0.002	0.015	0.050	0.012	0.016
8-28-86	0.027	0.057	0.063	0.010	0.016
9-10-86	0.005	0.020	0.075	0.012	0.013
Soluable Phosphorous mg/1					
7-16-86	0.016	0.013	0.033	0.015	0.015
7-22-86	0.014	0.015	0.012	0.017	0.017
7-22-86	0.012	0.015	0.011	0.016	0.015
7-25-86	0.017	0.017	0.005	0.015	0.015
7-30-86	0.017	0.017	0.009	0.015	0.016
8-28-86	0.020	0.019	0.007	0.013	0.011
9-10-86	0.014	0.020	0.009	0.017	0.016
Dissolved Iron mg/1					
7-16-86	0.04	0.09	0.27	0.16	0.23
7-22-86	0.03	0.02	0.23	0.07	0.19
7-22-86	0.03	0.03	0.23	0.07	0.19
7-25-86	0.01	<0.01	0.01	<0.01	<0.01
7-30-86	0.01	0.01	0.22	0.04	0.20
8-26-86	0.03	0.03	0.23	0.05	0.20
9-10-86	0.01	0.01	<0.22	0.06	0.21
Total Suspended Solids mg/1					
7-16-86	0	0	5	6	8
7-22-86	0	0	7	11	10
7-22-86	0	0	7	6	11
7-25-86	12	12	15	7	12
7-30-86	5	3	2	2	0
8-26-86	-not available-				
9-10-86	-not available-				
Discharge (cfs)					
7-16-86*	0.15	0.17	--	9.25	9.07
7-22-86	0.13	0.66	--	10.11	10.73
7-22-86	0.15	0.91	--	9.83	11.73
7-25-86	0.15	0.91	--	9.83	9.62
7-30-86	0.09	0.32	--	8.33	8.29
8-14-86*	0.04	0.15	--	5.91	6.17
8-28-86	0.03	0.06	--	5.89	5.03
9-10-86*	0.03	0.05	--	4.38	4.22

Note: Discharge Site 1,2,5 +/- 5%
Discharge Site 4 +/- 10%
Notes measured discharge

It should be noted that site 3 provides the opportunity to develop group and surface water data. Data developed to date at site 3 is representative of groundwater conditions and demonstrates compliance with TRPA standards. All samples taken on July 22, 1986 were during a summer precipitation event which generated runoff from Ski Incline. The stream flows are indicative of low flow conditions, particularly in August and September.

Although the data base is limited, one major observation noted is that all sampling sites, which includes the background condition of the SEZ's at sites 1 and 2, are in violation of the State Water Quality Standard for soluable phosphorus. In any event, the general water quality conditions in Ski Incline and above and below its confluence with the East Fork Incline Creek is excellent, with the exception of soluble phosphorus which is in violation of the standard.

TRPA Thresholds:

The following is a description of the TRPA standards and policies applicable to Ski Incline's Master Plan.

Lake Tahoe Tributaries Numerical Standard:

> Attain applicable state standards for concentrations of dissolved inorganic nitrogen, dissolved phosphorus, and dissolved iron. Attain a 90 percentile value for suspended sediment concentration of 60 mg/1.

Nevada Division of Environmental Protection has adopted the following numerical standard for Lake Tahoe and its tributaries:

NAC 445.13473
Water Quality Standards
Lake Tahoe

ph Units
Single Value ..... within range 7.0 - 8.4

Dissolved Oxygen - Percent of Saturation
Single Value ..... not less than 90.0

Chlorides - mg/1
Annual Average ..... not less than 3.0
Single Value ..... not more than 5.0

Soluable Phosphorus - ug/1
Annual Average ..... not more than 7.0

Total Soluable Inorganic Nitrogen - ug/1
Annual Average ..... not more than 25.0

Coliform Organisms - MPN/100 ml
A density not greater than the values shown in the following table:

	Median	Maximum
Undeveloped Lake Front Areas		
10 yards offshore	5.0	32.0
100 yards offshore	3.0	15.0
Developed Lake Front Areas		
10 yards offshore	240.0	700.0
100 yards offshore	15.0	64.0
Directly Influenced by Streams		
10 yards offshore	240.0	700.0
100 yards offshore	32.0	240.0

Temperature ° C
Permissible temperature increase above natural receiving water temperature ..... none

Algal Growth Potential - the mean annual algal growth potential at any point in the lake must be greater than twice the mean annual algal growth potential at a limnetic reference station and using analytical methods determind jointly with the Environmental Protection Agency, Region IX.

Plankton Court - number per ml
Average (June through September) ..... not to exceed 100.00
Single Value ..... not to exceed 500.00

Specific Electrical Conductance 0 micro ohms per cm at 20
Annual Average ..... not to exceed 95.0
Single Value ..... not to exceed 105.0

Clarity - The vertical extinction coefficient of less than 0.08 per meter when measured at any depth below the first meter and a turbidity less than 3 Jackson Units at any point of the lake too shallow to determine a reliable extinction coefficient.

Surface Run-Off

Achieve a 90 percent concentration value for dissolved inorganic nitrogen of 0.5 mg/1, for dissolved phosphorous of 0.1 mg/1, and for dissolved iron of 0.5 mg/1 in surface water body in the basin.

Achieve a 90 percent concentration value for suspended sediment of 250 mg/1.

Groundwater

Surface run-off infiltration into the groundwater shall comply with the Uniform Regional Run-off Quality Guidelines as set forth in Table 4-12 of the Draft Environmental Threshold Carrying Capacity Study Report, May, 1982.

Impacts

Past efforts of the TRPA and State of Nevada Division of Environmental Protection have determined that continued unmitigated development in the Tahoe Basin will impact water quality conditions in the Lake. These efforts have resulted in the development of water quality standards and have identified land uses assoc with water quality degradation. The potential impact of the proposed project alternatives are discussed below.

Ski Lift/Trails/Roads

A. Alternative 1 would have no additional impact on water quality.

B. Alternatives 2 and 3 relocate the maintenance shop to the "bone yard" which may provide a source for oil, grease and sediment that could potentially impact water quality conditions. The proposed site has already been disturbed with the construction of an earthen pad for equipment storage and should not represent an increase in impervious surfaces. However, the proper control of oil and grease on site and run-off from the site and access road during and following construction will be necessary to prevent

degradation of water quality and impacting the beneficial use of Ski Incline and the East Fork Incline Creek.

C. Alternative 3 requires the development of 128.8 acres of new trails. These trails will be fully developed under this alternative with no glades proposed. This represents a 112 percent increase in the development of the existing trail acreage.

The proposed plan requires the development of 70 acres of new trails and 24.8 acres of glades. This represents an 82 percent increase in the development of the existing trail acreage excluding the glades.

During the construction of the trails under Alternative 3 and the proposed plan, the deposition of sediment and related organic materials may occur unless a prudent construction plan and adequate temporary controls are implemented until permanent controls have been established. This is particularly true for suspended sediment as IVGID proposed helicopter and over the snow logging plan will assist in mitigating erosion from the site demonstrated in the water quality data gathered during the May-July snowmelt period. During this period, surface runoff over the trails occurred as a result of blocked drop inlets which are constructed within the existing trails to minimize surface flows. If surface flows are not controlled during the construction period, the initial erosion of sediment from the trails will result in the conveyance of organic materials usually concentrated in a few inches of the surface topsoil layer.

D. Alternative 3 and the proposed plan require the construction of a new Summit Lodge and Skier Service Building. The facilities represent an increase in impervious surface on the site. This will result in an increase in runoff from the site. During the construction and post-construction phase, runoff from the facilities must be controlled in order to minimize erosion and the

discharge of sediment and organic material into Ski Incline Creek.

E. Alternative 3 and the proposed plan require the construction of a gravel road to Twin Lakes Lodge. The road will intercept upland drainage and channel flows therefore increasing erosion of the road, natural drainage areas and may enhance surface flows over ski trails. This activity, unless properly designed and mitigated, will increase sediment and nutrient transport to Incline Creek and require constant maintenance.

F. The long range proposes the future installation of snowmaking equipment on trails 1, 3, and 5. This activity will require the installation of underground piping, stump removal and grading of portions of the trails. The grading of the trails with heavy equipment will destroy the established vegetation. Destruction of vegetation will increase surface flows over the construction and post construction period resulting in the erosion of sediment and organic materials into the creek. The trenching for installation of the snowmaking equipment (pipe) may provide a conduit for transporting surface or groundwater down slope. This may result in increased flow and erosion of select areas.

Mitigation:

The following are suggested general and specific mitigation measures required to improve the existing and future conditions at Ski Incline. These suggestions shall be developed in detail during facilities design.

A. Ski Incline shall develop a Plan of Construction that meets with TRPA and Nevada DEP approval. This plan shall fully describe the equipment, techniques, and design to be utilized for tree removal, construction of the trails, ski lifts and buildings. A complete set of erosion control plans and specificiations must accompany this plan of construction.

B. All erosion control structures and practices shall be constructed with each phase of the project to ensure they are in place and functioning in concert with facilities construction. Temporary irrigation will be introduced for establishment of revegetated area as required.

C. All construction activities shall be outside of flowing waters, particularly in the SEZ. Measures to intercept surface or groundwater flow will be described in the Plan of Construction.

D. Incline Village shall develop an Operation and Maintenance Manual that describes in detail the operation of the erosion control structures, required maintenance, and maintenance schedule. This manual shall meet with the approval of the TRPA and Nevada DEP and insure these facilities are functioning as designed.

E. IVGID will restore permanently disturbed or developed land within capability classification 1-3 in the amount of 1.5 times the SEZ disturbed as a result of the implementation of this proposed plan. The land to be restored will be identified by IVGID and shall meet the approval of TRPA and Nevada DEP.

F. IVGID will continue the existing water quality monitoring at a frequency that meets with the TRPA and Nevada DEP approval. TRPA representatives have requested the frequency for sampling Spring snowmelt be increased to properly document water quality.

G. Some rilling of roadway areas due to roadside runoff collection and inadequate conveyance channels is evident on the existing dirt roads providing access to the existing lift area. While this problem is relatively small on an individual road basis, the combined rilling effects should be corrected. The solution is directed at site specific mitigation measures which include sizing and constructing conveyance channels to intercept runoff from hillsides adjacent to the

roadways, lining of roadside channels with an erosion control fabric and/or riprap, seeding, straw mulching, and netting interior portions of the constructed drainageways.

The proposed road must be properly designed in order to minimize erosion of the road, collection ditch, fill slopes, proposed and existing drainage, and ski trails. In addition to those specific methods noted above, other identified methods are the sizing and constructing of a collection ditch at the toe of cuts to handle super critical flows, slope road surface to collection ditch, cross slope swales to interrupt surface flow in critical areas, properly size drop inlets, sediment basins, or energy dissipator at critical drop inlet discharges, riprap of the collection ditch and all slopes 2:1 or greater, and revegetate with adoptive plants or selected seed mix on slopes less than 2:1. Temporary erosion control devices which meet with TRPA approval shall be installed upon commencement of construction.

H. Additional sites with identified erosion control problems include vertical embankments which are actively sloughing and providing some hazard as a result of undercutting tall evergreen trees. Stabilization of these embankments and revegetation would include construction of a retaining wall at the slope toe or placement of riprap boulders and backfilling of the wall area to accommodate a replanting of vegetation.

I. Springs on ski slopes present a wet and sometimes eroding condition down slope. While this problem is not of a critical nature, the problem of erosion is not the less apparent and should be addressed. It is suggested that the spring water, particularly on the higher slope areas along the ridge could likely be harnessed and used effectively through a collection, storage and irrigation system to supply irrigation for some of the ski slope areas. This would be very useful both in enchancing vegetative coverage over difficult and unvegetated areas presently demonstrating some erosion, and for

enhancing those areas which are at the present time mostly stabilized through existence of seeded grass species.

In essence, some of the water which is presently creating erosion problems, and also difficult maintenance problems for Ski Incline staff, could potentially be used to the benefit of the project by enhancing the irrigation capabilities at a reduced cost.

J. The practice of hedging or mowing snowbrush, manzanita, and other shrub species is carried out, when they become too dense for the ski areas. As a result of this action, the only soil protection is the remaining mulch litter, thus the potential for erosion becomes enhanced.

It is suggested that the mechanical trimming (pruning) of these shrub species occur to a height of approximately 12 to 18 inches. This treatment potentially would encourage lateral growth of these plants as opposed to vertical growth and yet continue the erosion control characteristics by good ground cover. If it becomes necessary to remove any additional shrub species, it is also recommended that an appropriate erosion control seed mix be established by qualified specialists and be broadcast across the area to be treated prior to any work in the area. The application through broadcast seeding and the ensuing activity with equipment over the soil will assure placement and burying of seed which will result in plant stabilization following removal of the shrub species.

K. The seed mix which the Ski Incline area is using is a mixture which has been provided by the U.S. Forest Service technicians and includes the following species: Luna wheat grass, Potomac orchardgrass, Sherman big bluegrass, Lincoln smooth brome, and Durar hard fescue. The use of these species are recommended as effective for erosion control in the area. However, it is suggested that the seed mix be expanded to include both flowering forbes and nitrogen fixing legumes to add species diversity to the area as well

as aesthetic quality by inclusion of flowering plants.

L. Another area which has presented problems on the face of the slope are the cross slope ditches for intercepting downslope runoff in the ski run areas and conveying this runoff to generally vegetated areas adjacent to the ski runs. Super critical flow problems exist with the conveyance system both cross-slope and downslope from the interceptor ditches primarily due to the degree of slope in which the cross interceptor ditches were constructed. In some cases the 3 percent and less fall on these ditches is not adequate to intercept and convey the runoff, thus the direct surface flows often breach the ditch and create erosion downslope. There is a need to use specific erosion control techniques for conveying runoff from the interceptor ditches to safe outlet areas.

M. The snowmaking equipment pipe should be backfilled with native material (DG) and compacted in order to prevent conveyance of surface on ground water through the trench. Antiseepage cellars may be required at selected sites.

4.2.4 STREAM ENVIRONMENT ZONE (SEZ)

Setting:

As previously noted in the Water Quality section, the upper reach of Ski Incline Creek represents regions classified as SEZ's. These region's are identified with land compatibility 1b on area map H-3 and demonstrate the presence of water and riparian vegetation.

These two (2) tributary streams are being monitored under the IVGID water quality monitoring program previously discussed in Section 4.2.3. The data developed at this time on sites 1 and 2 demonstrate excellent water quality except for the soluble phosphorus concentrations which exceed the standard of 0.07 mg/1. This exceedance appears to be indicative of natural conditions within the tributaries. With the exception of the

wooden flume which tranverses the SEZ, man induced disturbances have not been identified.

TRPA THRESHOLD
STREAM ENVIRONMENT ZONE
POLICY NO. 6

Public outdoor recreation facilities are permissible uses in stream environment zones if:

1. The project is a necessary part of a public agency's long-range plans for public outdoor recreation;
2. The project is consistent with the recreation element of the regional plan;
3. The project, by its very nature must be sited in a stream environment zone;
4. There is no feasible alternative which would reduce the extent of encroachment in stream environment zones;
5. The impacts are fully mitigated; and
6. Stream environment zone lands are restored in the amount of 1.5 times the area of stream environment zone which is disturbed or developed by the project.

To the fullest extent possible, recreation facilities must be sited outside of stream environment zones. Some recreation facilities, such as river access points or stream crossings for hiking trails, by their very nature require some encroachment of stream environment zones. However, the six part test established by this policy allows encroachment of stream zones where such encroachment is essential for public outdoor recreation, and precautions are taken to ensure that stream environment zones are protected to the fullest extent possible.

Impacts:

Identified construction, and post construction impacts in the SEZ are discussed as follows:

A. Alternatives 1 and 2 would have no additional impacts on the SEZ's located in the upper Ballroom ski run.

B. Alternative 3 and the proposed plan require that 1.0 acres of the SEZ in the upper

Ballroom be contained in a 40 inch CMP and backfilled for development of the lower portion of Trails 1 and 2. This action will result in the destruction of portion of the SEZ. Additionally, 1.6 acres of the SEZ as it continues up Trail 1 will be altered. This section will be covered with a 40 inch perforated half CMP and held in position with a boulder backfill. The use of boulders will allow the existing native vegetation such as alder to re-establish itself.

During the construction of Trails 1 and 2 within these 2.2 total acres of SEZ, the deposition of suspended sediment and organic material containing various chemical constituents of nitrogen and phosphorous procedures. It is anticipated that post construction impacts would be indicative of the existing water quality conditions.

C. Alternative 3 also requires the construction of the Ponderosa Lift on 23.9 acres of U.S. Forest Service lands with 10.9 acres in trails. This will result in the disturbance of an undetermined number of acres of SEZ that represent the headwaters of Mill Creek. This construction activity will result in an increase in the deposition of nitrogen and phosphorous containing materials in Mill Creek.

Mitigation:

The following are suggested mitigation measures required to maintain the existing water quality conditions in Ski Incline Creek during the following construction of project.

A. The plan of construction previously suggested in the Mitigation Section 4.2.3 shall contain a sepcific section for construction and revegetation of teh SEZ. The plan shall specify the following: 1) Limits of construction with heavy equipment for Type I and Type II improvements. 2) All flowing water shall be interrupted and piped around Type I and Type II improvements during installation. 3) Specific limits on vegetation removal or trimming shall be

identified to insure regrowth. 4) Temporary erosion control measures will be specified, maintained, and installed during construction.

B. The SEZ and immediate upland area disturbed as a result of Type I and Type II improvement construction shall be revegetated immediately with adaptive species or site specific seed mixes.

C. IVGID will restore a SEZ in the amount of 1.5 times the SEZ disturbed as a result of the implementation of the proposed plan. The restoration shall be conducted during construction of the project. The restoration site and design shall meet with TRPA proposal.

D. IVGID will include in the Operation and Maintenance Manual identified in Section 4.2.3 a specific section on Type I and Type II improvements. Specific items to be addressed are trimming (pruning) of SEZ vegetation in Type II improvements using mechanioc equipment drainage structures maintenance in Type I improvements and fertilizer use and limits in Type I improvements.

4.3 AIR QUALITY

Through the scoping meeting noted in the Introduction of this report, it was determined that the only critical aspect of air quality concerns which required investigation is the impact of vehicle miles traveled. This aspect is addressed in Section 4.5, Transportation and Circulation.

4.4 VEGETATION AND WILDLIFE

4.4.1 FLORA

Setting:

The climax community of the conifer forest that exists on the project site is a direct result of the Sierra Nevada Wood and Lumber Company clear cutting in the 1800s. Most stands are of an even age with the exception of what appears to be virgin timber on the highest elevations of the project site. It is said that the mines of the Comstock Lode are the tombs of the forests of the Sierras. It was estimated (Lord) in 1880 that 600,000,000 board feet measure of lumber had been buried in the Comstock mines, enough to build a town of six room houses for 150,000 people. Not less than 80 million board feet of timber and lumber were annually consumed on the Comstock Lode and more than two million cords of wood were consumed as fuel at the hoisting works and by the mills. The urgent demand for fuel wood and the more pressing need of the mines (who were using square-set timbering systems) and those of the growing settlements created an insatiable demand for lumber. Areas east of the crest of the Carson Range were soon depleted of their timber and harvesting was directed to the Lake Tahoe Basin. Much of the logging was done on a contract basis with local loggers who supplied stipulated amounts of timber for large firms. Documentary sources suggest the presence of large numbers of Chinese immigrants working in the logging industry during the 19th century. The Sierra Nevada Wood and Lumber Company (SNWLC) was one of the chief lumber companies within the basin cutting in the northern and northeastern sections. The SNWLC was most probably the company that logged the project area. The SNWLC mill at Incline which, in 1879, began a 17 year period of cutting in the timberlands bordering Crystal Bay at the rate of 75,000 feet a day. Their initial cut on the north shore during 1880, was 8 million board feet of lumber and 50,000 cords of fuel wood. By 1883, it was a year round operation with a crew of 150 French Canadian lumberjacks and 225 Chinese woodcutters. The peak cut of the Incline Mill was an eight month period in 1887 when 12 million feet of lumber was cut. The total production figures of the SNWLC starting

in 1879, were estimated (Scott) at 200 million feet of lumber and more than a million cords of wood. By the end of 1893 the SNWLC, having logged over 20,000 acres near Incline, concluded operations at Lake Tahoe.

The result of the Comstock logging has left the vegetation in the project area as characteristic of the subalpine and upper mountain zones in Western Nevada. The distribution of vegetation types is a result of topography, soil conditions, physical and biological factors, and climate. The vegetation mosaic is determined largely by elevation and exposure to the elements. The highest ridges and north/northeast facing slopes are almost completely devoid of all plant material due to snow load and scouring (snow scour).

Four primary vegetation communities exist within the project area (See Vegetation Map). At lower elevations and the protected draw area, the vegetation is dominated shrubs and bushes. Up slope, out of the drainage, vegetation is primarily a shrub herbaceous plant community. Finally, from mid to top slope, the mountain is dominated by a conifer forest. Another plant community interspersed among the dominant communities is wet land. Although a very sparse community it occurs in small streamside areas and in some low areas. The remainder of the project area is made up of non-vegetated rock slopes.

Vegetative Zones

Conifer Forest Plant Communities Association

The most dominant communities in the project area are the conifer stands which occur throughout the site with the heaviest concentrations at mid elevation. Of the roughly 100 acres of expansion area owned by IVGID comprising the project, area about 55% is covered with dense stands of mixed conifer. There are extremely dense stands (about 90% covered) at the lower and mid elevations (elevation 7,000 to 8,500) where the trees attain the height characteristic of the species.

Very sparse stands (10% coverage) occur predominantly at the higher elevation where the weather plays an important role in survival and

the trees are very stunted and nearly all have lost their apical meristems. Characteristic overstory is western white pine, fir and pine.

Aspen Forest Plant Community Association

Aspen stands in the proposed project area occur predominantly between the 6,800 and the 7,500 foot level in a few isolated stands. In the higher elevations occurring in small protected areas along the secondary drainage systems that enter Incline Creek.

The stands are generally healthy as indicated by straight trunks and few fungal cankers. The understory is composed of varying percentages of shrubs and grasses. The Aspen trees that occur at lower elevations intermixed with mountain shrub and herbaceous plant community and become dominant along the Incline Creek Drainage.

Mountain Shrub and Herbaceous Plant Community Association

The shrub and herbaceous plant communities tend to occupy several types of sites within the project area. After the clear-cutting of the 1800's there was a dramatic increase of this plant community in the project area and it remained the dominant community. However, over the years of fire suppression practices by the Forest Service and local fire departments, the conifer forest has become dominant and reduced the stands of shrubs. Cumulatively, they cover 30% of the project area. The shrub cover in this community is typically in clusters and interspersed within the community. While the majority of the shrub and herbaceous plant communities are concentrated on the south aspects at all elevations, on all aspects at higher elevations there are occurrences of these communities congregated in the draws where the soils tend to be deeper and contain more moisture from seeps and drainages than on adjacent areas. Tobacco brush and sagebrush are characteristic of this association. Sedge is the dominant grass when found.

Wet Land Vegetation Association

Vegetation within wetland areas is determined by the type of wet area. The first type, a wet meadow area, is characterized by meadow grasses. Spring areas and ground water rising after snow melt cause the moisture in these meadows. There are sparse seasonal areas like this found on site mostly at mid and low elevation areas. Because of the nature of Incline Creek and its tributaries, the riparian vegetation around these creeks is very limited and there is rapid transition to shrub herbaceous or aspen communities. Riparian and meadow associations, comprising approximately 2 percent of the site, include willow, alder (lower elevations), currant and meadow rue.

Sensitive Plant Species.

Uncommon plant communities are those communities that are uncommon to a specific area or have exceptional scientific, ecological or aesthetic value. Sensitive plant species are those species that are considered vulnerable to extinction.

The sensitive plants all fall into the uncommon plant community of "cushion plants." The term "cushion plants" refers to small plants that are specifically adapted to tundra-like conditions. These conditions include high winds, shallow sandy soils, frigid temperatures and very short growing seasons.

According to the USFS, Intermountain Region Data Summary of Proposed Endangered or Threatened Plant Species, (September 1977), the identified species of plants that are listed as sensitive are:

Draba aesterophora var. asterophora. This species is found in sandy areas between stones or in crevices at elevations between 8,000 and 10,000 feet in the Mt. Rose area.

Haplapappus eximus. This species is found in rock crevices on dry rocky sites at the foot of Mt. Rose and in the Galena Creek area at elevations between 7,000 and 10,000 feet.

Lupinus montigenus. This species is found on high ridges and fell fields in loose gravel at

elevations between 8,500 and 10,000 feet in the Mt. Rose area.

In the field survey done, there were no such species found in the project area. The nearest population site of endangered species, Draba Stenoloba, var. ramosa are located approximately 6 miles south at the north and east ends of Marlette Lake and approximately 8 miles north of Mt. Rose is the population site of Lupinus montigenus and Haplapappus eximus.

This common plant community is found at the highest elevation of the proposed project. The ridgetop area is practically devoid of vegetation because of a limitation imposed by a natural, physical or climatic factor.

COMMON NAMES	SCIENTIFIC NAMES
Bedstraw	Galium grayanum
Douglas chaenactis	Chaenactis douglasii
Elephanthead lousewort	Pedicularis groenlandica
Barestem eriogonum	Erigonum nudem
Graphite erigonum	E. lobb.
Fleabane	Erigeron barbellaltus
Gayophytum	Gayophytum nuttallii
Gilis	Cilis leptalea
Stemless goldenweed	Haplopappus acaulis
Goosefoot violet	Viola purpurea
Knotweed	Polygonum davisiae
Mint	Monardella odoratissima
Phacelia	Phacelia mutabilis
Heretic penstemon	Penstemon heteroduxus
Rush	Juncus mertensiana
Rush	J. nevadensis
Saxifrage	Saxifrage bryophora
Sibbaldia	Sibbaldia procumbens
Sierra primrose	Primula suffrutescens
Sticky currant	Ribes viscosissimum
Windflower	Anemone drummondii

Common plants found in the Herbaceous community are made up of many combination of low growing, non-woody herbs and grasses. This community of plants is found in abundance on the project site:

COMMON NAMES	SCIENTIFIC NAMES
Pale agoseris	Agoseris glauca
Balsamroot	Balsamorhiza sagittata
Alpine brodiaea	Brodiaea lutea var. ixiodes

COMMON NAMES	SCIENTIFIC NAMES
Buckwheat	Erigonum latiforlium var. nudem
Bulbrooted melic	Melica bulbosa
Chaenactis	Chaenactis douglassi
Checkerbloom	Sidalcea glaucescens
Cinquefoil, gland	Potentilla glandulosa
Cymopterus	Pterixia terebinthina
Star gilia	Ipomopsis aggregata
Groundsmoke	Gayophystum nuttallii
Helianthella, California	Helianthella californica
Mariposa lily	Chalochortus leichthinii
Mint pennyroyal	Monardella odoratissima
Mule ears	Wyethis mollis
Needlegrass	Stipa californica
Wild ryegrass	Elymus canadensis
Squirreltail grass	Sitanion hystrix
Stickseed	Hackelia longituba

The common shrub community consists typically of tobacco brush, basin sagebrush, bitterbrush and rabbitbrush; with mountain mahogany on the east side of the project boundry. There are bunch grasses scattered sparsely where the soil is poor and very well drained.

COMMON NAMES	SCIENTIFIC NAMES
Basin sagebrush	Artemisia tridentata
Bitterbrush	Pushia tridentata
Buckwheat, marum-leaved	Eriogonum mariflorum
Buckwheat, sulfur-flowered	E. umbellatum
Buckwheat, Wrights	E. wrightii
Curleaf mountain mahogany	Cercocarpus ledifolius
Dwarf sagebrush	Artemisia arbuscula
Sierra monkey flower	Minulus coccineus
Mule ears	Wyethia mollis
Needlegrass	Stipa lemmoni
Rabbitbrush	Chrysothamnus nauseosus
Squirreltail grass	Sitanion hystrix
Tabacco snowbrush	Ceanothus velutinus

The mixed conifer community consists of evergreen conifers, very sparse grasses, herbs and low shrubs. There are very dense stands on the projects mid elevations where there is no understory of grasses, herbs or shrubs.

COMMON NAMES	SCIENTIFIC NAMES
Brewer's golden aster	Chrysopsis breweri
Balsamroot	Balsamorhiza sagittata
Bitterbrush	Purshia tridentatat

COMMON NAMES	SCIENTIFIC NAMES
Bitter cherry	Prunus emarginata
Bush chinquapin	Castinopsis sempervirens
Cedar, incense	Libodedrus decurrens
Douglas' chaenactis	Chaenactis douglasii
Red fir	Abies magnifica
White fir	A. concolor
Hedgenettle	Agastache urticifolia
Huckleberry oak	Quercus vaccinifolia
Green manzanita	Arctostaphylos patula
Brewer's monkey flower	Mimulus breweri
Mule ears	Wyethia mollis
Pennyroyal	Monardella odoratissima
Phacelia	Phacelia mutabilis
Penstemon	Penstemon deustus
Pine, jeffrey	Pinus jeffreyi
Pine, sugar	P. lambertiana
Squirreltail grass	Sitanion hystrix
Stephanomeria, large flowered	Stephanomeria lactucina
Tobacco snowbrush	Ceanothius velutinus
Waxberry	Symphoricarpos acutus
Mountain whitehorn	Ceanothus cordulatus

In small areas on the high elevations of the north and eastern exposure of the proposed project, there are communities where firs are the dominant trees. They exist among scattered white pine and hemlock, with generous spacing to allow for ski trails without the need to log extensively.

COMMON NAMES	SCIENTIFIC NAMES
Currant, sticky	Ribes viscosissimun
Fir, red	Abies magnifica
Brewer's golden aster	Chrysopsis breweri
White hawkweed	Hieracium albiflorum
Mountain hemlock	Tsunga mertensiana
Kellogia	Kelloggia galloides
Lousewort	Pedicularis semibarbata
Pine, western white	Pinus monticola

The surrounding U.S. Forest Service Permit area to the north and south of IVGID Ski Incline property is dominated by a climax community of conifer forest with red fir comprising the largest percentage of the forest. Only the very highest

ridges bear virgin timber. The rest of the permit area was extensively logged during the 1800s. There still exists many high cut stumps on site.

The southern permit parcel has a fairly even distribution of plant communities of mixed conifer forest of a size class 12 to 24 inches DBH, dominated by fir, a slightly larger community of Basin Sagebrush than Tobacco Brush exists, with the remaining approximately 30 percent of the site covered by rock outcrops. In the southwest corner of the permit area there is a dense grouping of mixed conifer forest that lies next to a stream environment zone consisting of alder and willows, with a few small aspen stands. The general health of the forest is very good with few isolated trees infected.

The northern permit area is dominated by a mixed conifer forest with vegetative groups of Tobacco Brush and Basin Sagebrush occuring between groups of Bitterbrush and Rabbitbrush. There are alder and willow groups associated with the stream environment zones of the tributaries of Incline Creek. Much of the mixed conifer forest is very dense and there are some extremely dense stands (approx. 90% covered) located at the mid level characteristic height. No sensitive plant species were found within the permit area boundaries.

Thresholds:

To provide for increased plant and structural diversity in the forest community through management practices is a threshold that all the proposed alternatives should meet.

The thresholds also address the functional role of vegetation as it relates to soil stabilization and water quality.

In Alternatives #1 and #2 in the areas where existing slopes have been cleared of all vegetation, the continuing growth of the existing revegetation program will eventually bring the existing slopes into attainment with the thresholds.

Impacts:

Alternative #1 and Alternative #2 will have no impact on vegetation. In consideration of Alternative #3 and the proposed plan the consequences of previous ski trail development, which consisted of the use of heavy machinery on the steep slopes to clear the trail which usually involved the complete removal of topsoil, is evident in the Tahoe Basin. However, under Alternative #3 the trail development plan proposes to use a flush cutting system whereby all the soil is left intact, all the root stuctures are left in place, and runs are cleared completely by hand, with no use of heavy equipment and no heavy machinery. Removing the overstory will bring light to the forest floor and result in an increase of groundcover plant production. This should also provide for diversity of species of both flora and fauna, significantly improving the deer habitat. Since most of the trail development is taking place on a conifer forest that was clear-cut in the 1800's and that has now diminished the meadow and brushland communities of the project area with its dominance, Alternative #3 will help return an extensive stand of shrubs, which are uncommon to area where shrubs have been "squeezed out" (TRPA EIS, Feb. 1983) by the dense conifer coverage existing on the project site.

Alternative #3 will also provide a fire break between the conifer forest and in the event of wildfire, hopefully prevent it from spreading east into the basin from the Little Valley and from spreading south into the Marlette Watershed.

The proposed access road will not impact any sensitive plant species. An access road would help in the maintenance of the proposed revegetation plan and would provide emergency access for EMS and fire suppression vehicles.

Since in the permit area no development beyond the roadway is proposed there will be no impacts on the vegetation from winter ski use.

Mitigation:

For Alternatives #1 and #2 mitigation consists of maintaining the current revegetation program that

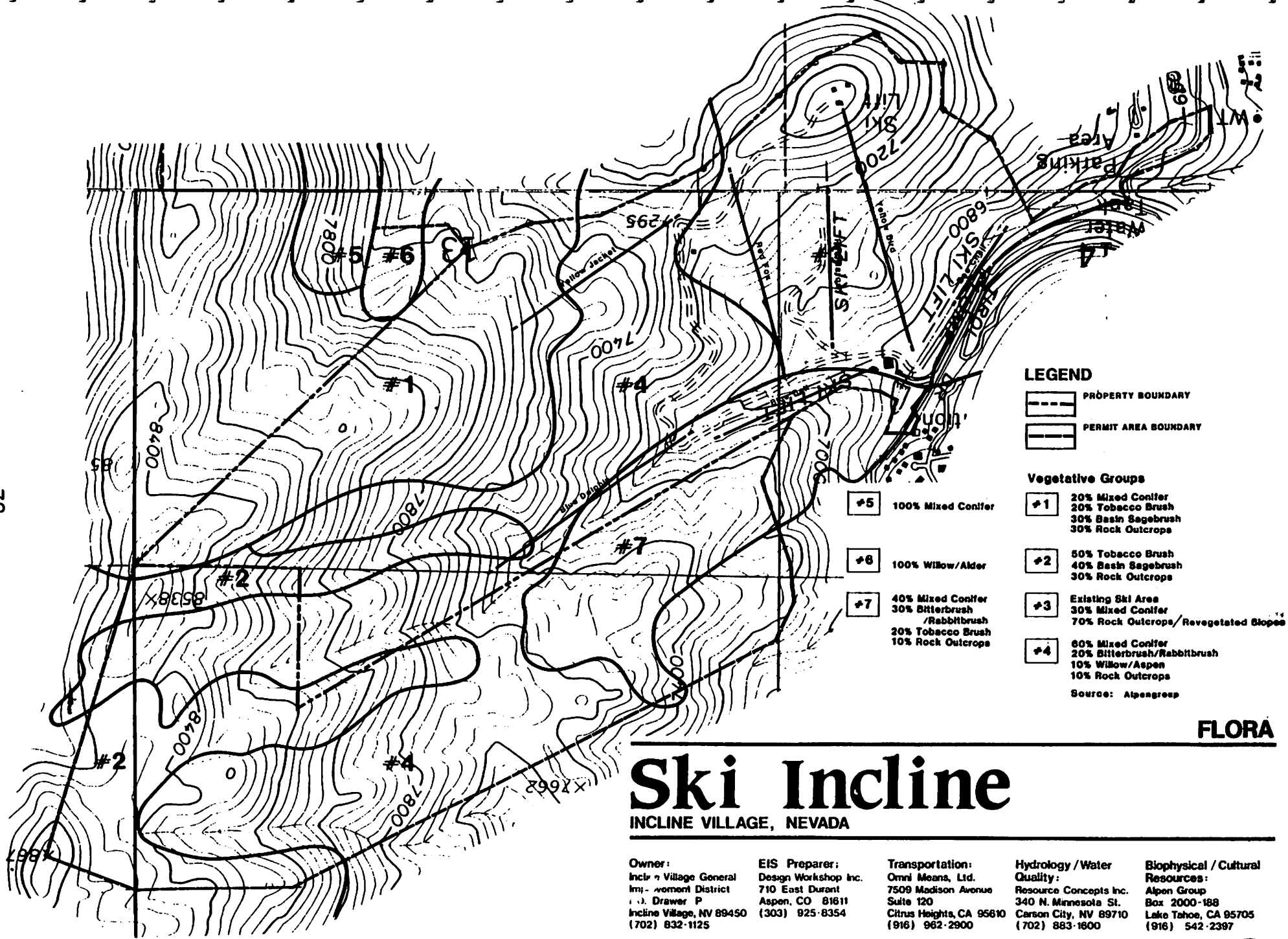
Ski Incline has in use. The plantings that have taken on the current developed slopes have shown a very good response to their maintenance and seem to have stabilized the slope quite well.

Revegetate slope cuts required for the access road with a seed carrying mulch. If necessary, temporary irrrigation should be installed to insure rapid establishment of vegetation. State of the art erosion control measures should be used to assure establishment of vegetation.

For Alternative #3 and the proposed plan it is recommended that in areas inaccessible from the proposed access road, or in areas of steep grades, that ski lifts are placed with a helicopter to avoid having any heavy equipment or machinery on the slope itself. While this is an extremely expensive operation (approx. $5,000 an hour) it is an environmentally acceptable procedure that is used currently all over the United States to install ski lifts and trams. (p.c. Bender, Colorado; p.c. Berry, California; p.c. Yanick, Nevada). Vegetation protection measures should also be installed.

It is recommended that where grades are too steep for conventional logging methods, that logging be performed during the winter months when the snowpack cushions and protects the understroy from degradation. Then, in summer, come back in and flush cut the stumps by hand, leaving the root system of all vegetation and the soil of the slope in.tact and undisturbed. While this is an expensive and dangerous method of trail construction, it is necessary to be in compliance with the Thresholds and the Draft Goals and Policies (June, 1986) of TRPA.

With limited development in the permit area the only opportunity to provide for increased plant and structural diversity in the forest community is through management practices such as a Timber Stand Improvement (TSI) plan for the permit area. This is a threshold for vegetation that the proposed project would meet. There are locations in the permit area on the highest ridges that may



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FLORA

Ski Incline

INCLINE VILLAGE, NEVADA

Owner:
Incline Village General Improvement District
P.O. Drawer P
Incline Village, NV 89450
(702) 832-1125

EIS Preparer:
Design Workshop Inc.
710 East Durant
Aspen, CO 81611
(303) 925-8354

Transportation:
Omni Means, Ltd.
7509 Madison Avenue
Suite 120
Citrus Heights, CA 95610
(916) 962-2900

Hydrology / Water Quality:
Resource Concepts Inc.
340 N. Minnesota St.
Carson City, NV 89710
(702) 883-1600

Biophysical / Cultural Resources:
Alpen Group
Box 2000-188
Lake Tahoe, CA 95705
(916) 542-2397

Environmental Impact Statement Fig. 4.4.1

Scale 200 400 Date 6-1-86

- support the introduction of sensitive plant species (i.e. draba asterophora) as identified by the TRPA. While there is no cooperative agreement currently in place, these sites may be considered in future plannng for recovery of species.

4.4.2 FAUNA

Setting:

Nearly 300 species of animals and birds inhabit the Lake Tahoe Region. Their presence on the project area are grouped as following: Mammals, large, small, and furbearers; Birds, upland game, and other birds.

Mammals

Large Mammals

The only large mammals in the project area are Mule deer, (Odocoileus hemionus hemionus). The Loyalton-Truckee Interstate Deer Herd Management Unit 194 utilizes the area as summer range. The herd migrates off the site during the winter months because of elevation and temperature. A portion of Mt. Rose proper is considered critical range by the Nevada Division of Wildlife. Critical ranges are those areas defined to be necessary to the migration of the species through the area.

The mutually beneficial relationship of deer to the other large mammals of the basin has been interrupted by man, with the great reduction of mountain lion, (Felis concolor) and black bear (Erarclos americanus) in the area. At one time the mountain lion depended on the deer migration as its most important food source. The deer also depends on the mountain lion to manage its herd by removal of the sick and weak from the herd so that a balance between the food supply and herd exists. While deer are not the dependent food source of bears, they will eat fawns, and sick or weak deer. They will also scavenge any carrion found.

Their habitat that exists on the project site to support deer consists of the herbaceous of low-growing, nonwoody grasses, the basin sagebrush and other shrub species such as bitterbrush and whitehorn with small stands of bunchgrass. The mixed conifer forest is also a habitat type for mule deer.

Small Mammals

There are 52 species of small animals in the Lake Tahoe Basin and all but three exceptions are found throughout the north shore of Lake Tahoe. All but 4 of the 52 species can tolerate some disturbance to their habitat. These small mammals are the white-tailed jackrabbit, northern flying squirrel, spotted bat (endangered species), and the pika. Of these small mammals, there exists the habitat to support all of them except the northern flying squirrel.

Common Names	Scientific Names
Bats:	
Hoary	Lasiurus cinereus
Long eared	Corynorhinus rafinesquei
Pallid	Antrozous pallidus
Western big eared	Plecotus townsendi
Little brown motis	Myotis lucifugus
Chipmunks:	
Long eared	Eutamias minimus
Townsend	E. Townsendi
Gophers:	
Mountain pocket	Thomomys monticola
Northern pocket	T. talpoides
Marmots:	
Marmot	Marmota flaviventris
Mice:	
Brush	Peromyscus boylei
Deer	P. maniculatus
Long tailed meadow	Microtus longicaudus
Western harvest	Reithrodontomys magalotis
Porcupine:	
Porcupine	Erethizon dorsatum

Rabbits:

Mountain cottontail	Sylvilagus nuttalli
Snowshoe	Lepus americanus

Rats:

Bushy-tailed wood	Neotoma cinerea

Squirrels:

California ground	Spermophilus beldingi
Golden mantled	S. lateralis

Furbearers

There are 15 species of furbearers in the Lake Tahoe Basin. Of these species, only the racoon, pine marten, and the coyote have stable abundant populations. The wolverine, pine marten, fisher, and the Sierra red fox are considred rare and endangered. Furbearers are medium sized mammals. Their population trends can be correlated closely with the populations of the small mammals. They depend heavily on the well being of animals in the small mammal group for their main food supply.

Common Names	Scientific Names
Coyote	Canis latrans
Raccoon	Procyon lotor
Spotted skunk	Spilogale gracilis
Striped skunk	Mephitis mephitis
Weasel, long tailed	Mustela erminea

Birds

Upland Game Birds

There are four species of game birds in the Lake Tahoe Basin and the dry uplands of the project area are habitat types for all of these species. The Band-tailed pigeon and the Mourning dove are migratory and do not remain in these high elevations during the winter. The Mountain quail and Blue grouse are considered resident birds although they do not spend the entire year in an immediate area. The grouse may move to lower elevations in the spring and summer while the quail spends winter in the lower elevations of the basin.

All four species of upland game birds are seed-eaters and depend on the immediate year's crop for much of their sustenance. They can benefit from habitat manipulation, provided it is done properly. The upland game birds have a moderate tolerance to disturbances. Land disturbances to the habitat necessary for brooding and nesting have adversely effected these species.

Common Names	Scientific Names
Mourning dove	Zenaidura macroura
Blue grouse	Dendrapapus obscurus
Band-tailed pigeon	Coumba fasciata
Mountain quail	Oreotyx pictus

Other Birds

This group consist of 178 species in the Lake Tahoe Basin. The marshland habitat now supports 60 species of birds. Eighty-six of the species require an herbaceous (meadow and grasslands) habitat. This habitat type is used by many of the blackbirds, for feeding areas by hawks, and for cover by the larks. The birds that are most affected by disturbances are the 46 species that are limited exclusively to a single type of habitat. Thirty-seven other species whose diet consist of small mammals, insects, and weed seeds are generally tolerant of human disturbances. Some species like the Steller's Jay seem to flourish in the urban environment. Other species, such as the robin and evening grosbeak, have benefited from lawns, trees, and shrubs planted for landscaping.

Common Names	Scientific Names
Brewer's Blackbird	Euphagus lentiginosus
Red-Winged Blackbird	Agelaius phoeniceus
Mountain Bluebird	Sialia currucoides
Common Bushtit	Psaltriparus minimus
Mountain Chickadee	Parus gambeli
Red Shafted Flicker	Colaptes cafer
Evening Grosbeak	Hesperihpona vespertina
Oregon Junco	Junco caniceps
Kildeer	Charadrius vociferus
Western Meadow Lark	Strunella neglecta
Clarke's Nutcracker	Nucifraga columbiana
Robin	Turdus migratorius
Lark Sparrow	Chondestes grammacus
Tree Swallow	Iridoprocne bicolor
Yellow-Throated Warbler	Ceothlypis trichas
Hairy Woodpecker	Dendrocopos pubescens

Permit Area Setting

The surrounding U.S. Forest Service permit area to the north and south of the IVGID Ski Incline property has evidence of Mule Deer, Odocoileus hemionus, on site. This is the only large mammal found on the project site. There exists on the permit area site habitats that would support mule deer during their summer range activities. These consist of herbaceous stands of low-growing, nonwoody grasses, the basin sagebrush and other shrub species such as bitterbrush and rabbitbrush. The southern permit area has many open meadows of bunchgrass and mule ears that fall into prime deer habitat. There are existing habitats for numerous small mammals on both the southern and northern permit areas. These are primarily chipmunks, gophers, mice, rabbits and squirrels. The furbearers that were found on the permit area consist mainly of striped skunk and raccoon, although signs of coyote travel observed. The main upland game bird observed on the permit area is blue grouse.

Thresholds:

The environmental thresholds for wildlife species are designated in the basin for only seven species that stand out as unique or of special interest among the several hundred species occurring within the basin. Of the seven species only the deer are within the influence zone of the project area. The mule deer that are within the influence zone of the project area are considered by the environmental thresholds for wildlife species as unique or of special interest in the basin.

While the Thresholds address the practical problems of determining how much area is necessary for the well-being of the species, it accepts that habitat degradation has contributed significantly to the decline of regional deer population, it should be noted that in the deer herd that has influence on project area, it may be the degradation of the migration route (p.c. Rhodes, 1986) that has contributed sgnificantly to the decline in deer population. This degradation is from development outside the basin boundary in the Reno/Sparks area.

The Thresholds recommends that mapping and interagency cooperation involving deer management will insure that better informed land use decisions will be made. The Thresholds require the protection of meadows, shrublands, riparian associations and aspen communities that provide critical fawning and feeding habitat.

Impacts:

Alternatives #1 and #2 perpetuates the status quo and would meet the Thresholds. Alternative #3 would provide a greater fawning and feeding habitat for the deer herds. Because of the combination of the opening of the forest canopy for ski-trails, the proposed pruning of trail vegetation that would provide more edible soft shoots of existing vegetation, and the capabilities of irrigation present on much of the proposed area, the opportunity for enhancement of the species habitat is present.

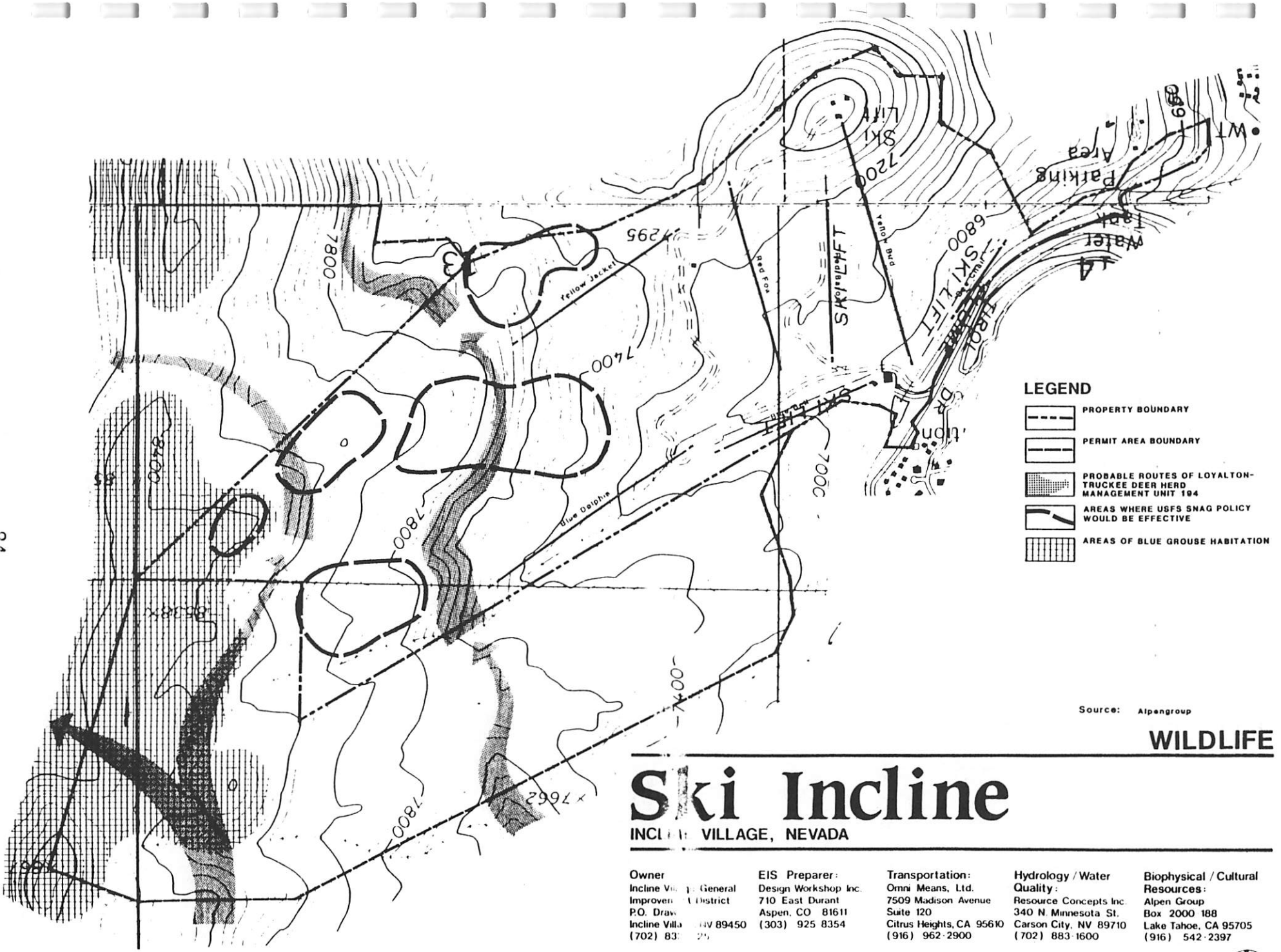
The only proposed impact for the permit area is winter use. Since the mule deer within the project area migrate to lower elevations during the winter there will be no impacts.

The proposed access road should not pose a problem with deer migration. The road as proposed is to stay away from any wet areas and should not disturb the fawning areas. The impacts to other fauna found on the site are minimal.

Mitigation:

The proposed project would be consistent with the goals and policies for the management of wildlife in the Basin as stated in the Draft Original Plan for the Lake Tahoe Basin, Goals and Policies

(June, 1986), which was derived from the wildlife thresholds. As stated in the Goals and Policies there exists considerable potential for improvement of both the wildlife habitat and at the same time the forest health and diversity. Mitigation measures may include marking of trees that conform to USFS Snag Policy. Mapping of the deer areas and cooperation with interagency management plans will insure that better land use



WILDLIFE

Ski Incline

INCL[illegible] VILLAGE, NEVADA

Owner
Incline Vi[illegible] General Improven[illegible] District
P.O. Draw[illegible]
Incline Villa[illegible] NV 89450
(702) 83[illegible]

EIS Preparer:
Design Workshop Inc.
710 East Durant
Aspen, CO 81611
(303) 925 8354

Transportation:
Omni Means, Ltd.
7509 Madison Avenue
Suite 120
Citrus Heights, CA 95610
(916) 962-2900

Hydrology / Water Quality:
Resource Concepts Inc.
340 N. Minnesota St.
Carson City, NV 89710
(702) 883-1600

Biophysical / Cultural Resources:
Alpen Group
Box 2000 188
Lake Tahoe, CA 95705
(916) 542-2397

Envir[illegible]ental Impact
State[illegible]t Fi[illegible]4.2

Scale: 400 2[illegible] 4 800
Date 8-1-86

decisions will be made by the permit issuing agencies. The protection and improvement of meadows, shrublands, and aspen communities that provide critical fawning and feeding habitats is critical. A plan to work with the Nevada Department of Wildlife on improving the blue grouse habitat should be implemented.

4.4.3 FISHERIES

Setting:

Species of fish in the Lake Tahoe Region may be classified conveniently as game and nongame fish. The game fish are so called because they are more elusive than nongame fish and, when hooked, put up more fight to escape. The species of game fish in the Lake Tahoe Region and their distinguishing characteristics are set forth below. The game fish in this area are:

Brown trout	Salmo trutta
Eastern brook trout	Salvelinus fontinalis
Golden trout	Salmo aguabonita
Kamloops rainbow trout	S. gairdneri kamloops
Kokanee salmon	Onchorhynchus nerka kennerlyi
Lahontan cutthroat trout	Salmo clarki henshawi
Lake trout	Salvelinus namaycush
Mountain whitefish	Prosopium williamsoni
Rainbow trout	Salmo gairdneri

The rainbow trout are a self-sustaining population, probably descendants of steelhead rainbow trout (Salmo gaidneri gairdneri) and Shasta rainbow trout (S. gairdneri stonei). Kamloops rainbow trout were planted in recent years. Limited monitoring of the Basin fishering dates back to only 1960 so there is no long term trend information available. Creek census conducted by the Nevada Department of Wildlife generally show a decreasing trend of angler success and increased proportion of smaller fish. The trend information that is available (California and Nevada Department of Fish and Game, 1962-1965, Frantz 1966-1981) indicates that the lake trout catch is generally decreasing in size and that they are getting harder to catch. The spawning runs of kokanee salmon have declined

and it is felt spawning runs of other fishes have likewise declined.

The species of game fish in the Lake Tahoe Region and their distinguising characteristics are set forth below.

Game Fish:

Brown Trout

The brown trout was probably introduced into the Tahoe Region early in the 1900's. They can tolerate warmer water temperatures than other trout and are ideally suited to lower elevation streams. Since they spawn in the fall, the other fish they may compete with for spawning habitat are kokanee salmon and eastern brook trout. In recent years a new strain of brown trout, called the Massachusetts, have been developed. It is somewhat less gamey than the regular brown trout and probably will be stocked generously in the future.

Eastern Brook Trout

The original range of the eastern brook trout was the northeastern portion of the North American continent from the Great Lakes states to the Atlantic Ocean. This species was introduced into the Tahoe Region in 1888. It is ideally suited to high mountain lakes and streams and is chiefly found there today. Brook trout spawn in the fall and, like the lake trout, can spawn in standing waters.

Golden Trout

The golden trout is a native Californian, but not in the Tahoe Region. It spawns from May through July and readily hybridizes with rainbow and cutthroat trout. This species is so popular with anglers that many fishermen hike to remote areas to test their skill against it.

Kamloops Rainbow Trout

The kamloops trout is a subspecies of rainbow trout capable of growing quite large in lakes that have an abundant supply of food. It was

introduced into Lake Tahoe in 1956 as fingerlings. In 1961, 100,000 catchable-sized fish were stocked. The kamloops require the same habitat as the rainbow trout.

Kokanee Salmon

Kokanee salmon, a landlocked form of sockeye salmon, was introduced into Lake Tahoe in 1944. Although difficult to catch, the kokanee has become popular in larger lakes and reservoirs. Kokanee feed primarily on zoo plankton, but larger fish take aquatic insects and sometimes small fishes. The kokanee is a true salmon in that its death occurs soon after spawning. It spawns in the fall in the Lake and its tributaries (chiefly in Taylor Creek) and competes with brown and brook trout where spawning habitat is limited.

Lahontan Cutthroat Trout

Cutthroat is the only trout species native to the Tahoe Region. It spawns in the spring. Its population has been greatly depleted by changes in its natural habitat, by competition, and by hybridization with the rainbow.

Lake Trout

The lake trout, or mackinaw, along with brook trout, belongs to the Char group of the salmon family and was introduced to the Lake Tahoe Region in 1889. It is now the dominant game fish caught from the Lake and its ideal habitat is large, deep, well oxygenated lakes that maintain water temperatures below 55 degrees F. Spawning occurs in the fall.

Mountain Whitefish

The mountair whitefish, which is related to the trout, is native to the Truckee River drainage. It is silver-colored with a light brown to bluish back. It has a much smaller mouth than trout, but larger scales. This fish spawns in the fall in gravel riffles. Whitefish are good to eat, but anglers unfamiliar with the species sometimes discard them.

Rainbow Trout

The rainbow evidently originally occurred on the Western slope of the Sierra Nevada, but the white man has stocked it in lakes and streams throughout the crest and east slope. Rainbow trout normally spawn in spring and are easily raised in captivity. Hatchery-reared rainbows of catchable size are caught very easily; about 50 percent usually are taken within 12 days after a stream or lake is stocked.

Permit Area Setting

The surrounding U.S. Forest Service permit area to the north and south of the IVGID Ski Incline property contain watershed for both Incline Creek and Mill Creek fisheries. Fisheries of Incline Creek were discussed in the previous section. The southern permit area is part of the headwaters for Mill Creek. The distribution of fish in Mill Creek are limited to Eastern Brook Trout which are resident fish and are located only in the lower section of the creek from one-half mile to one mile from the mouth of the creek.

Planting Project

In a bi-state study of Lake Tahoe fishery in the early 1960's, an experimental planting program tested various sizes and strains of trout for stocking. Results of this study led to the present management program of annual planting of 35,000 pounds of large (about 12 inches) trout. Planting of fingerlings and small catchables proved to be unfeasible because of poor rates of survival. The limited supply of food in Lake Tahoe and other high alpine lakes probably is the most important factor controlling production of game fish.

Nongame Fish:

The species of nongame fish in this area are:

Brown bullhead	Leictalurus nebulosus
Golden shiner	Notemigenus crysoleuscias
Lahontan mountain sucker	
Pantosteus lahontan	
Lahontan redside	Richardsonius egregius
Lahontan speckled dace	Rhinichthys osculus robustus
Mosquito fish	Gambusia affinis
Piute sculpin	Cottus beldingii
Tahoe sucker	Catostomus tahoensis
Tui chub	Gila bicolor

Existing Fishery

Species	Occurrence	Distribution	Migration
		Approximate	Pattern
Eastern Brook Trout	Known	From mouth to 3 miles	Resident
Brown Trout	Probable	Lower Section	Migratory
Rainbow Trout	Known	From mouth to 3 miles	Resident and migratory
Kokanee Salmon	Known	Lower Section	Migratory
Lahontan Red-Side	Probable	Lower Section	Migratory
Dace	Probable	Lower Section	Migratory
Tui Chub	Probable	Lower Section	Migratory
Sucker	Probable	Lower Section	Migratory

Thresholds:

The thresholds state the evaluation process for fisheries was focused on habitat. The proposed project is located within the watershed of Incline Creek, which is mapped as a good quality migratory stream on the lower section and is mapped as good resident quality stream on the upper section. The southern permit area which is in the watershed for Mill Creek is mapped as a marginal resident quality stream.

The recommended thresholds for Incline Creek is that the good stream habitat be maintained. While it was found in the thresholds that a fishery potential of a stream was limited by a combination of excessive stream flow diversions, blockages that inhibit fish migration, unstable stream banks, and erosion and siltation problems, none of these are apparent factors in the upper section of Incline Creek that falls within the influence of proposed project area.

Most of the factors that limit the fisher potential of Incline Creek have occurred on the lower sections from the shoreline to Fairview Blvd. Nevada Fish and Game has worked with the Nevada Division of Transportation to improve the migration potential of Incline Creek.

Impacts:

Alternatives #1 and #2 will have no impacts on the existing fisheries. Alternative #3 will not involve excessive stream flow diversions or building of any blockages that inhibit fish migration. The proposed winter use on the Mill Creek watershed area, in which trail development is minimal should have no impacts to the fisheries. The proposed access road impacts on the fisheries of Mill Creek and Incline Creek should be minimal if the proposed mitigation measures are employed.

If the TRPA Best Management Practices are used for any disturbances that may place silt loads that exceed the flushing capacity of the stream, the problems of unstable stream banks and erosion and siltation will not impact the existing fisheries of Incline Creek.

The 6' culvert that extends under the entire length of the existing ski area parking lot channels Incline Creek for approximately 2000 feet then opens into the natural stream environment zone for several hundred feet before entering another culvert that crosses the intersection of Fairview Blvd. The culvert at Faivlew Blvd. then drops Incline Creek into a stream environment zone which begins below the roadway. The culvert protrudes out several feet from the embankment dropping Incline Creek several feet down to rock rip-rap before entering the principal stream channel.

Incline Creek is mapped as a good quality resident stream on the upper section in the TRPA thresholds. In conversation with locals,, there have been fishing on the upper portion of Incline Creek above the ski area in the past but the resident fish population has decreased significantly in recent years. This decrease seems to correspond with the installation of the culvert at Fairview Blvd. after the previous one was consumed by the flows from the winter of 1982. It appears that while large seasonal flows take more and more resident fish downstream, the impassable drop on the downstream end of the Fairview Blvd. culvert has prevented fish from migrating up to the fish ladder

that is installed in the culvert under Ski Incline and then to the upper portions of Incline Creek. This is resulting in the degradation of the resident fisheries of Incline Creek.

The alternative of removing the 2000' culvert and restoring Incline Creek's stream environment zone to its natural state would eventually improve the quality of the stream for fish habitat but would have several problems:

1. The disturbance that the massive removal and restoration would cause may very well off-set any benefit of upgrading the stream from good to excellent status.
2. Even if the culvert was removed and the stream environment zone restored, the problems of migration blockages downstream would prevent any species from using the restoration project.
3. The removal and restoration of the stream would preempt any of the proposed alternatives presented and could cause the operation of the ski area and its maintenance to cease.

Mitigation:

Recommendations for Alternative #1 or Alternative #2 would be to maintain current water quality plan, maintain in functioning condition the fish ladder that is in the 6' CMP, and monitor Incline Creek for degradation.

Recommendations for alternative #3 consist of:

Maintain the existing fish ladders in it's 6 ft. culvert in good condition.

Ensure that bank stability is maintained on Incline Creek within the area of influence.

Bridge perennial stream courses. Use culverts only on intermittent streams and design them to prevent plugging and washouts.

Confine these vehicles to roadways designed and maintained to accept this use without causing erosion.

Prohibit excessive stream flow diversions.

Work with Nevada Fish & Game department and TRPA on programs and monitoring that may lead to enhancement of the fisheries.

The fishery potential of Mill Creek that is contained in the project boundaries is not limited by, excessive stream flow diversion, blockages that inhibit fish migratins or unstable stream banks and erosion of siltation problems. If any development occurs within the Mill Creek watershed, mitigation measures recommended for the Incline Creek fisheries should be employed.

Revegetate slope cuts required for the access road with a seed carrying mulch. If necessary, temporary irrigation should be installed to insure rapid establishment of vegetation. State of the art erosion control measures should be used to assure establishment of vegetation.

IVGID will work with the Nevada Division of Transportaion and Fish and Game to construct a fish ladder at the culvert outlet under Fairview Blvd. This will enable fish migration to the upper portions of Incline Creek.

4.5 TRANSPORTATION AND CIRCULATION

Setting:

Traffic conditions in the Incline Village area are predicated on the availability of regional transportation facilities and on seasonal variation in travel demand. State Route 28 is the major transportation facility serving Incline Village. State Route 28 is a two lane roadway extending from the US 50 junction to the south through Incline Village to the California State line and ultimately to a junction with State Route 89 in Tahoe City. State Route 431 (Mt. Rose Highway) connects Incline Village with the Reno area. State Route 431 is a two lane roadway running from a junction with SR 28 to a junction with US 395 south of Reno.

Traffic volumes on area roadways vary throughout the year. Table 4.5.1 indicates recent daily traffic counts at the three permanent count stations maintained by the Nevada Department of Transportation in this area. As shown, traffic volumes on peak days during both winter and summer months greatly exceed reported annual average daily traffic (AADT), but winter peak volumes are significantly less than summer peak volumes. As the project generates traffic only during the winter ski season, traffic volumes occurring during the peak winter day and peak winter hour are the basis of this analysis. Review of the traffic count data provided by NDOT indicates that winter peak traffic generally occurs during president's birthday weekend and that peak hour traffic can be as much as 14% of peak daily traffic.

To assess existing traffic conditions in the study area, peak hour traffic operations were analyzed at four major intersections and at two roadway segments selected by TRPA staff. The study area includes:

Intersection of SR 28 (Tahoe Boulevard) & Country Club Drive
Intersection of SR 28 (Tahoe Boulevard) & Village Boulevard
Intersection of SR 28 (Tahoe Boulevard) & SR 431 (Mt. Rose Highway)
Intersection of SR 28 & Stateline
State Route 28 segment between Stateline & SR 431 (Mt. Rose Highway)
SR 28 (Tahoe Boulevard) between SR 431 (Mt. Rose Highway) and Country Club Drive.

TABLE 4.5.1
SEASONAL TRAFFIC VARIATION

Location	1985 Average Annual Daily Traffic	August 1985 Peak Day	February 1986 Peak Day	Peak Hr	
US 50 @ So. Lake Tahoe	31,885	47,702	34,524	2,786	(8%)
SR 28 @ No. Lake Tahoe	11,720	21,030	14,202	1,324	(9%)
SR 431 (Mt. Rose Hwy)	4,305	6,691	6,561	893	(14%)

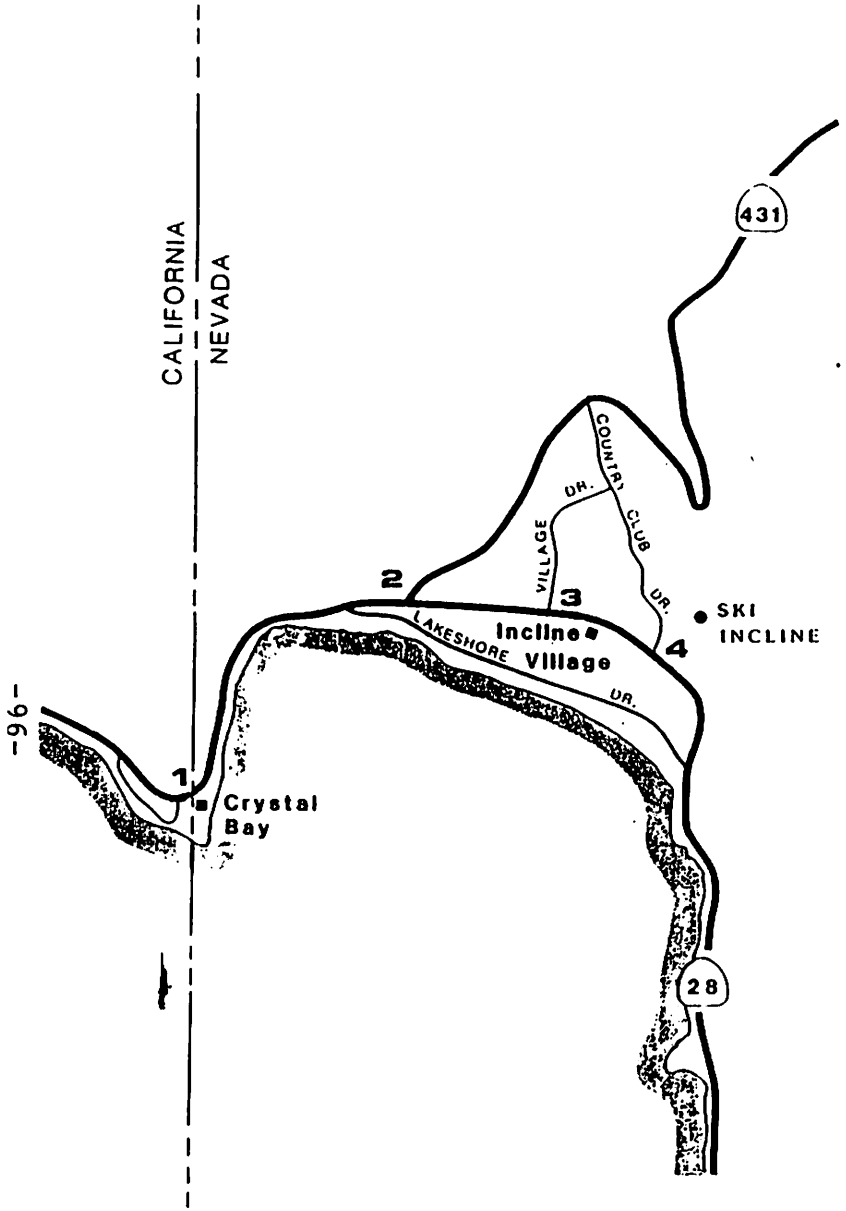
Figure 4.5.1 indicates estimated peak hour turning movements at the study area intersection and along the roadway segments. The volumes presented were developed from peak summer day counts presented in the "Incline Village Traffic Circulation Study" which were factored to account for seasonal variation and for annual traffic growth.

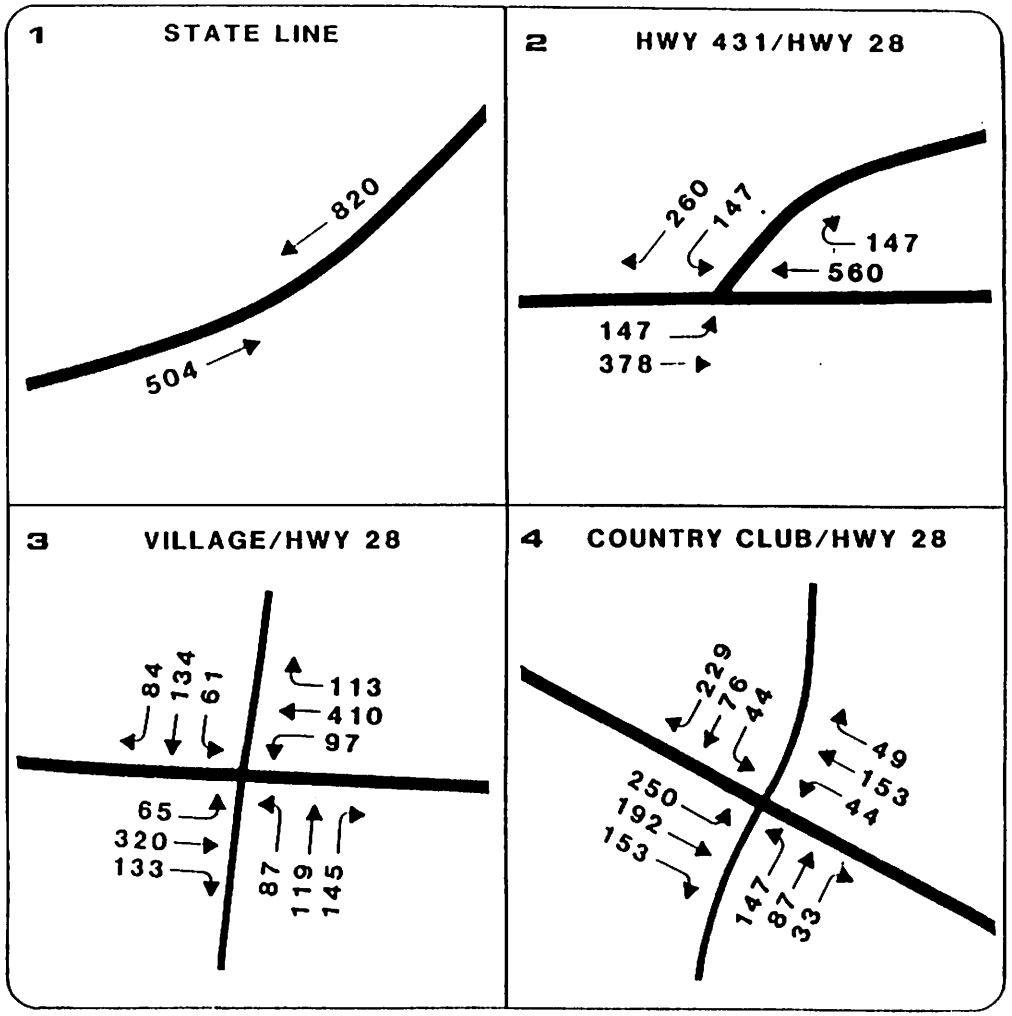
To assess the quality of existing traffic conditions, Levels-of-Service were calculated at study area intersections and for individual roadway segments. "Level-of-Service" is a qualitative measure of traffic operating conditions whereby a letter grade, "A" through "F", corresponding to progressively worsening trafffic operating conditions, is assigned to an intersection or roadway segment. The characteristics associated with the various Levels-of-Service are presented in Table 4.5.2. Procedures used for calculating Levels-of-Service are presented in Transportation Research Board Circular 212, Interim Materials on Highway Capacity.

In general terms, Level-of-Service is calculated for an hour long traffic condition at a signalized intersection, at unsignalized intersections or on discrete roadway segments. By applying a peak hour factor to hourly capacity, an equivalent Level-of-Service based on daily traffic volumes can be estimated. For this analysis, peak hour Levels-of-Service have been calculated at study area intersections, and daily traffic volumes have been compared to LOS capacity thresholds to identify Levels-of-Service for roadway segments. Table 4.5.3 indicates the daily volume thresholds associated with various Levels-of-Service for differing roadway segments in urban areas.

TABLE 4.5.2
LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION
"A"	Uncongested operations, all queues clear in a single-signal cycle.	Little or no delay
"B"	Uncongested operations, all queues clear in a single cycle.	Short traffic delays
"C"	Light congestion, occasional backups on critical approaches.	Average traffic delays
"D"	Significant congestion of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed.	Long traffic delays
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es).	Very long traffic delays, failure, extreme congestion.
"F"	Total breakdown, stop-and go operation.	Intersection blocked by external causes.





Existing Peak Hour Traffic

N

OMNI-MEANS, Ltd. Engineers & Planners

Fig. 4.5.1

TABLE 4.5.3
DAILY VOLUMES ASSOCIATED WITH LEVELS-OF-SERVICE

Facility Type	Level of Service "C" ADT Traffic Volumes V/C=0.71-0.80	Level of Service "D" ADT Traffic Volumes V/C=0.81-0.90	Level of Service "E" ADT Traffic Volumes V/C=0.91-1.00
Two Lanes	10,700-12,000	12,000-13,500	13,500-15,000
Three Lanes	14,200-15,950	15,950-17,950	17,950-19,950
Four Lanes	21,300-24,000	24,000-27,000	27,000-30,000
Five Lanes	28,000-31,900	31,900-35,900	35,900-39,900
Six Lanes	32,000-36,000	36,000-40,500	40,500-45,000

Source: Transportation Research Board, Circular 212 and 1965 Highway Capacity Manual.

Current Levels-of-Service are summarized in Table 4.5.4. Current peak hour volumes at unsignalized locations have been compared with Manual of Uniform Traffic Control Devices (MUTCD) warrants to determine if signals might be needed now. The unsignalized study area intersection at SR 28/SR 431 would not appear to experience sufficient traffic to warrant signalization.

The procedure for calculating the Level-of-Service at an unsignalized intersection with stop signs on one or two approaches is based upon determining the "reserve capacity" for each intersection movement which must yield the right-of-way. Reserve capacity is a function of the volume of conflicting traffic, operating speed and type of control (stop or yield). Therefore, unlike a signalized intersection where overall traffic operation is described by one Level-of-Service grade, a Level-of-Service grade is calculated for each movement, which must yield right-of-way at an unsignalized intersection. The Level-of-Service at Study area intersections presented herein are indicative of the individual "worst case" Level-of-Service at each intersection, and therefore may not be indicative of overall intersection operation.

provides patronage estimates for February
April 6, 1986 provided by Ski Incline
representatives. As shown, internal esti
Ski Incline Transit patronage equate to 1
transit split. Ski Incline management re
on peak days, their three vans (Ski Incli
shuttle system) operate at capacity durin
and evening peak hours.

LOCATIO

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TABLE 4.5.6
SKI SHUTTLE PATRONAGE*

RESORT	NUMBER OF PASSENGERS	SKI
Heavenly Valley	148,000	8
Alpine Meadows	16,400	8
Echo Summit	1,800	8
Kirkwood	4,000	
Squaw Valley	24,800	
North Star	2,700	
Ski Incline	28,000	
Sierra Ski Ranch	11,200	
TOTAL	236,200	

Homewood patronage is combined with TART ridership

* Source: Short Range Transit Plan

TABLE 4.5.7
SKI INCLINE SHUTTLE PATRONAGE*

Annual Ridership - 21,900 skiers

"See Tahoe Tours"
Daily Average/Load - 167
Season Average - 2000 passengers

"Ski Incline Shuttle System"
Daily Average/Load - 137
Season Average - 7,000 passengers

Total skiers, 96,838
% Transit Utilization - 21,900/2/9

* Source: Ski Incline

In 1985, winter peak hourly traffic on SR 28 north of Incline Village reached 1324 VPH at the permanent NDOT Count Station. In 1978 the peak winter hour directional volume reached 820, and review of NDOT traffic volumes for the years 1978-1986 reveals that traffic at this location has been consistent. The projected Level-of-Service on this portion of SR 28 is "E" during winter peak hours.

TABLE 4.5.5
ROADWAY SEGMENT ANALYSIS

LOCATION	PEAK WINTER DAILY VOLUME RANGE	V/C	LOS
SR 28 through Incline Village	12,340 to 10,650	0.82-0.71	"D"-"C"

LOCATION	WINTER DIRECTIONAL PEAK HOUR VOLUME	CAPACITY	LOS
SR 28 north of Incline Village	820	925	"E"

SKI SHUTTLE SERVICE

Almost all ski areas in and around the Lake Tahoe Basin provide ski shuttles. The service is provided by both existing public and private providers in the Basin on a contract basis or with vehicles purchased by the ski areas. The service is provided on a gratuitous or nominal charge basis and has proven to be very beneficial in achieving environmental goals as well as providing a needed service. Ski transportation between the north and south shores is provided by the Tahoe Queen ferry boat connecting with buses at the Tahoe City Boatworks.

Table 4.5.6 provides patronage for existing shuttle services in the Tahoe Basin. Table 4.5.7

TABLE 4.5.9
POTENTIAL PEAK DAY CAPACITY
CREATED BY PROJECT AND ALTERNTIVES

DESCRIPTION	SKIER CAPACITY	CURRENT PEAK DEMAND	ADDITIONAL SKIERS
Proposed Project	3,700/Day	2,500/Day	1,200/Day
Alternative 1	2,800/Day	2,500/Day	----
Alternative 2	2,800/Day	2,500/Day	300/Day
Alternative 3	4,600/Day	2,500/Day	2,100/Day

The extent to which these additional skiers will be translated into increased automobile traffic is dependent on the modal split selected. The choice of transportation modes is dependent on the availability of parking, and transit service, and in turn, the likelihood of transit usage depends on the relative origin/destination of each skier.

As discussed previously, existing parking facilities are reported by staff to be fully utilized during Winter peak days. This conclusion can be verified by comparing peak day utilization, current mode split and the distribution of full/half day skiers, as shown in Table 4.5.10.

TABLE 4.5.10
CURRENT PARKING UTILIZATION

Available Parking: 627 spaces (source: Ski Incline Master Plan)
2500 Skiers x 88.7% Automobile Usage/3.0 Skiers/Automobile*=739 autos

Morning Demand = 739 x 50% Full Day = 370 Automobiles
+ 739 x 50% x 40% AM Half Day = 148

= 518 total = 83% occupancy

Afternoon Demand = 739 x 50% Full Day = 370 Automobiles
+ 739 x 50% x 60% PM Half Day = 222

= 592 total = 94% occupancy

* Source: Ski Incline Master Plan.

PROJECT IMPACTS

The extent to which the proposed Ski Incline expansion will add traffic to the adjacent street system on peak days is dependent on the number of additional skiers attracted and on the transportation mode selected by those skiers. To identify the number of additional skiers utilizing Ski Incline, peak period utilization was compared to the capacity provided by each project alternative. To estimate the modal choice of Ski Incline patrons, probable origin/destination characteristics, anticipated transit service and predicted marketing strategies were discussed with Ski area representatives, and the Ski Incline Master Plan was consulted.

The existing Ski Incline facilities will accommodate 2,800 skiers per day, although current utilization is generally lower. As shown in Table 4.5.8, during the 1985-1986 ski season, utilization ranged from a low of 600 skiers per weekday to an average of 2,500 skiers on a holiday.

TABLE 4.5.8
SKI INCLINE UTILIZATION

DAY	NUMBER OF SKIERS
Average Weekday	600
Average Sunday	1,200
Average Saturday	1,700
Peak 1986 Holiday	2,500

Assuming the reported average holiday utilization represents the current winter peak day condition, then at 100% of capacity the proposed project and its alternatives could accommodate the number of additional skiers shown in Table 4.5.9. These estimates all assume that transporation/parking facilities would exist to handle the increased demand.

TABLE 4.5.12
CURRENT SKI INCLINE PATRONAGE

DESCRIPTION	%	PEAK DAY SKIERS
Incline Village Residents	20%	500
Tahoe Visitor		
- Lodging in Incline Village	58%	1,450
- Lodging in Reno/Sparks	16%	400
- Lodging Other Lake Tahoe	4%	100
- Residing in Reno/Sparks	2%	50
	100%	2,500

To categorize the origin/destination characteristic of the additional Ski Incline patrons who would be attracted on peak days by the proposed project or it's alternatives, the Ski Incline marketing director was consulted. Specific marketing strategies relating to increased patronage were discussed, along with the transportation requirements of each strategy. Table 4.5.13 presents the market segment strategies and utilization estimates for the proposed project and for Alternatives 2 and 3. No additional peak day utilization is predicted for Alternative 1.

TABLE 4.5.13
SKI INCLINE PATRON MARKET SEGEMENTS

DESCRIPTION	CURRENT	INCREASE DUE TO PROJECT	ALT. 2	ALT. 3
Incline Village Res.	500	300	150	300
Tahoe Visitor				
- Lodging in I.V.	1,450	300	500	638
- Lodging in R.S.	400	300	---	638
- Lodging in L.T.	100	---	---	---
- Residing in R.S.	50	---	---	---
Day Tour/Groups	---	300	---	525
TOTAL	2,500	1,200	300	2,100

As shown, current calculated demand exceeds "practical" capacity (90% in parking lots) during the afternoon.

Because no additional parking is proposed on site, additional skiers attracted to Ski Incline must be accommodated by other transporation modes.

ORIGIN/DESTINATION CHARACTERISTICS

The extent to which alternative transportation is available to Ski Incline patrons is dependent on their origin/destination characteristics. Current shuttle bus service connects Ski Incline with the Hyatt Resort Hotel and with various locations in Incline Village itself.. Current service is therefore only practical for patrons originating in Incline Village.

During the 1985-1986 ski season, Ski Incline representatives conducted an on-site survey of its patrons along with a survey of north shore visitors in general. Table 4.5.11 summarizes origin/destination characteristics attributed to Ski Incline patrons.

TABLE 4.5.11
SKI INCLINE ORIGIN/DESTINATION CHARACTERISTICS*

PERMANENT RESIDENCE	LODGING	PLACE OF LODGING
California 60%	Day Skier 28%	Incline Village 75%
Incline Village 20%	Staying Overnight 72%	Reno/Sparks 20%
Reno/Sparks 2%		Northshore/Southshore 5%
Other States 18%		

* Source: Ski Incline Survey

Utilizing these origin/destination characteristics, the overall distribution of current Ski Incline patrons presented in Table 4.5.12 was calculated. As shown, the majority of Ski Incline patrons either reside in Incline Village or stay there on a seasonal/vacation basis.

The proposed system would increase hourly capacity from 138/Hr to 320/Hr for a new increase of 130%.

Future shuttle demand for the proposed project and the 175 alternatives has been calculated on a peak hour basis. As shown in Table 4.5.15, the proposed service will very nearly accommodate peak demands of peak winter days. The excess project demand would be manifested in a three hour, rather than two and one half hour arrival period.

The Ski Incline Marketing Plan suggests that the resort will have to institute a bus program to service tour groups staying in Reno/Sparks and groups arriving from California. As shown in Table 4.5.16, the at capacity project would require the service of fifteen forty-passenger buses running at full capacity.

RESULTING TRAFFIC

The increase in peak hour traffic resulting from the proposed project has been estimated. Because no additional parking is being provided, this increase would be the result of increase shuttle and tour bus activity. However, the shuttle bus plan calls for use of larger buses, rather than an increased number of buses, so no additional trip generation would result from the proposed shuttle system. Four trips per day would be generated per tour bus, for a total of sixty new bus trips, of which 30 could occur in the peak hour.

TABLE 4.5.15
PEAK HOUR LOCAL TRANSIT DEMAND

	Project	Alt 2	Alt 3
Existing Shuttle Patrons	345	345	345
New Shuttle Patrons	600	300	938
Total Shuttle Patrons	945	645	1,283
Hourly Demand Arrival (2.5 Hour)	378	258	513
Shuttle Capacity	320	320	320
Balance	<58>	62	<193>

The four market segments targeted under the proposed project are all adaptable to transit/shuttle service. Ski Incline utilization by area residents is expected to increase, and these patrons can make use of shuttle bus service offered by the resort. Similarly, patrons staying in Incline Village could access the shuttle. Ski Incline representatives indicated that the market share generated in Reno/Sparks would be comprised of out-of-state residents who would drive or fly to Reno/Sparks and would be bused to Ski Incline as part of a package tour. Similarly, day tour/industry incentive programs would create a demand generated in San Francisco/San Jose/ Sacramento areas which would be served by bus.

Alternative 2 would involve increased utilization by Ski Incline permanent or short term residents. Alternative 2 would accommodate additional skiers and would increase the potential for transit.

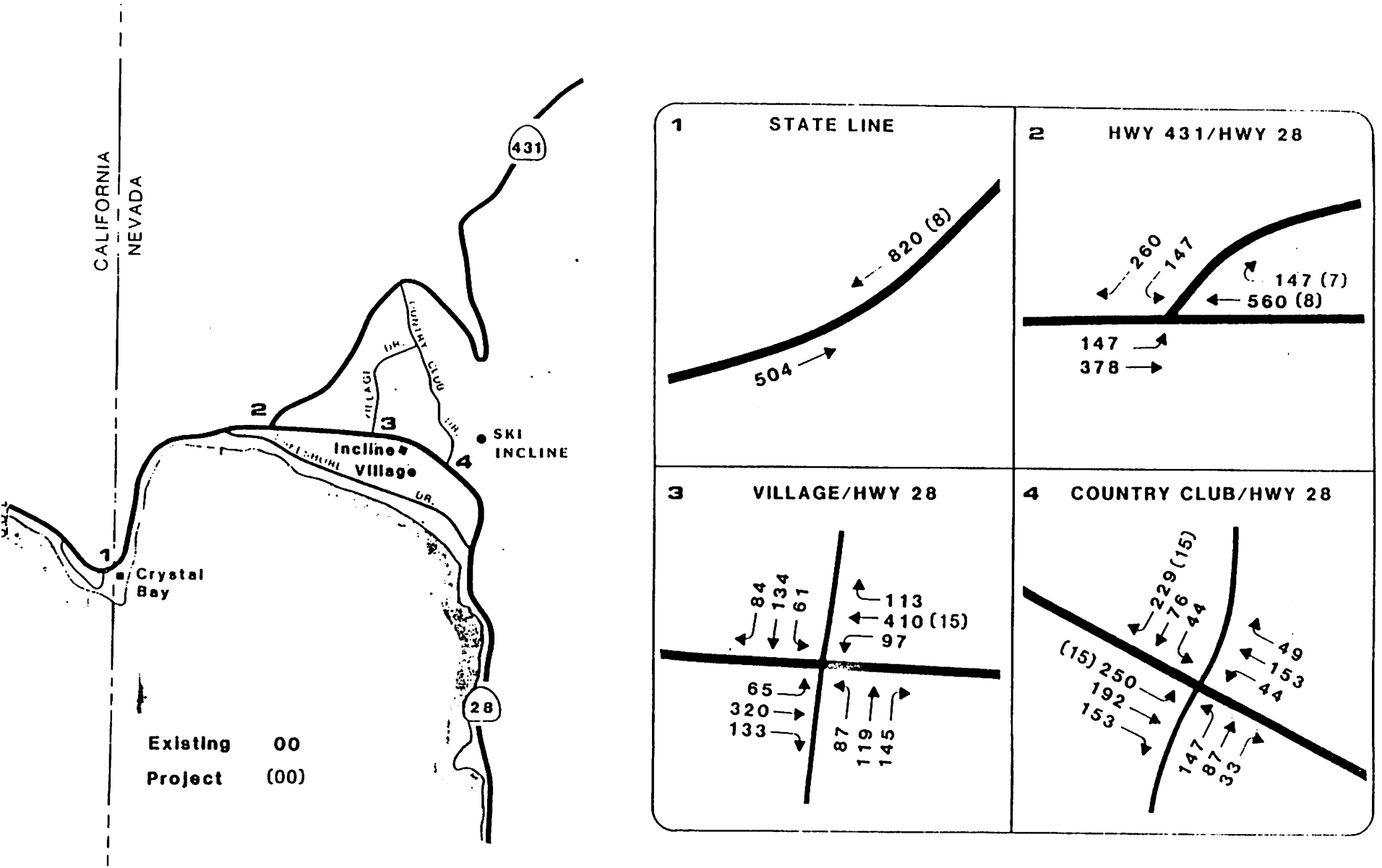
The Ski Incline Master Plan describes an aggressive transit program which will greatly increase transit capacity. According to the Master Plan, additional capacity will be supplied by converting to 40 passenger buses on four routes:

- Town route #1
- Town route #2
- Kings Beach and outlying areas
- Hyatt Tahoe

With the two town routes operating on a 1/2 hour cycle and Kings Beach on a 1 hour cycle, and Hyatt Tahoe on a 20 minute cycle, the total system capacity will be as follows:

TABLE 4.5.14
PROPOSED TRANSIT CAPACITY

ROUTE	SKIERS
See Tahoe/Hyatt	120/Hr
Town Route #1	80/Hr
Town Route #2	80/Hr
Kings Beach	40/Hr
Total System Hourly Capacity	320/Hr



Existing Peak Hour Traffic Plus Project

N

TABLE 4.5.16
TOUR BUS REQUIREMENTS

	Project	Alternative 3
Tour Bus Patron	600	1,163
Buses Required (@40/Bus)	15	30

Figure 4.5.2 illustrates the addition of the tour bus trips onto existing peak hour traffic. During the peak hour, this additional traffic would have an insignificant impact on the operation of adjacent intersections. Tour buses returning to California on SR 28 along North Shore would have an impact on traffic operations on this roadway.

ANALYSIS OF VEHICLE MILES TRAVELED (VMT)

To estimate the net effect of the project on Basin vehicle miles traveled (VMT), peak day VMT was calculated for both existing and proposed project conditions. These calculations account for the origin/destination characteristics described earlier as well as travel distance in the Basin.

Operation of the proposed shuttle system will itself result in only a slight increase in VMT over the current operation. The two town routes and Hyatt route would be similar to the current routes and would create identical VMT. The Kings Beach route (15 mile round trip) would be longer than the local route it would replace (6.5 mile round trip) but would occur on one hour rather than one half hour cycles. The net increase in VMT would be 2 miles per route trip or 20 VMT per day (as shown in Table 4.5.17).

Tour bus activity from Reno to California would account for 488 VMT, based on Basin wide travel distance.

However, trips that would otherwise be made by Ski Incline resident/visitors to competing ski resorts must be accounted for. The average distance to major alternative destinations (Squaw Valley,

AIR QUALITY IMPACT

The federal Clean Air Act Amendments of 1977 requires states violating federal air quality standards to develop plans which demonstrate attainment of these standards by 1982, or by 1987, for carbon monoxide (CO) and ozone (0). The Act also requires the states to make "reasonable further progress" in annual emission reductions to ensure attainment by the statutory deadlines. The Lake Tahoe Air Basin is not attaining the federal standard for carbon monoxide.

The 1978, EPA designated all of the Lake Tahoe Air Basin a non-attainment area for carbon monoxide. Nevada Division of Environmental Protection (NDEP) monitoring indicates that Nevada demonstrated attainment by December 31, 1982. In 1983, Nevada and California requested that EPA redesignate portions of the Basin to attainment. On March 29, 1985, EPA proposed to redesignate all portions of the Basin except the Tahoe City area, El Dorado County, and the urbanized portion of Douglas County (Federal Register, March 29, 1985, p. 12574). Nevada has opposed this proposed rulemaking. On July 29, 1985, EPA staff agreed with California Air Resource Board (CARB) staff that Tahoe City should be redesignated to attainment.

On August 26, 1982, the Tahoe Regional Planning Agency (TRPA) adopted an air quality plan which provided for attainment of the CO standard by 1987. California submitted the plan to the Environmental Protection Administration (EPA) as a revision to the State Implementation Plan (SIP) on December 20, 1983; EPA approved the SIP revision on February 24, 1984. The Nevada State Implementation Plan contains the 1979 TRPA Non-Attainment Plan.

The Clean Air Act also requires each air quality plan to include a contingency plan which describes the measures to be developed and implemented if progress is not made toward attainment of the federal CO standard. If the TRPA cannot demonstrate "reasonable further progress," the Agency must revise the air quality plan to provide for attainment. The adopted Lake Tahoe Basin Air

Alpine Meadows, Northstar) is 20.2 miles, resulting in a reduction of 8080 VMT.

The net result to Basin wide VMT is therefore a decrease of 7572 vehicle miles traveled.

The alternatives to the project would result in similar reductions. Alternative 2 would reduce Basin VMT by 4380, while alternative 3 would reduce VMT by 12,800 VMT.

TABLE 4.5.17
VEHICLE MILES TRAVELED ANALYSIS

DESCRIPTION	NET DISTANCE PER TRIP	TRIPS	NET VMT
Kings Beach Shuttle	2.0 miles	10	20 VMT
Tour Buses - Reno*	14.5 miles	15	218 VMT
Tour Buses - California*	18.0 miles	15	270 VMT
Reduction in Automobile Traffic by Incline Residents/Visitors	20.2 miles	400	<8080 VMT>
Net VMT			<7572 VMT>

* 11.5 miles from Summit to Ski Incline plus 3 miles from Ski Incline to bus potential parking.

** 11.5 miles from Summit to Ski Incline plus 3 miles from Ski Incline to bus potential parking.

TABLE 4.5.18
STAMINA 2.0 NOISE ANALYSIS
COUNTRY CLUB DRIVE BETWEEN SR 28 AND SKI WAY

RECEPTOR	LOCATION	Without Project LEQ(H)	L10	CNEL	With Project LEQ(H)	L10	CNEL
1	30' From Roadway	62.2	65.6		68.1	71.1	
2	50' From Roadway	59.1	62.4		65.0	68.1	
3	70' From Roadway	57.0	60.1		62.9	66.1	
4	100' From Roadway	54.6	57.6	55.6	60.5	63.9	61.5

TABLE 4.5.19
LAKE TAHOE NOISE THRESHOLDS

High Denisty Residential	55 CNEL
Low Density Residential	50 CNEL
Commercial	65 CNEL
Outdoor Recreation	55 CNEL

Mitigation:

The following mitigation measures should be required to mitigate the transportation impacts of the project.

1. An off-site location for tour bus parking (15 buses) has been identified and retained by Ski Incline.
2. The curb returns at the Country Club Drive/Ski Way intersection should be improved to facilitate bus activity.
3. Tour bus activity should be staggered to spread arrivals/departures over a two hour period.

Quality Plan requires the Agency to consider additional transit measures, ridesharing, driver advisories, parking management, indirect source review and idling restriction as contingency measures.

The preceding traffic analysis quantified the traffic volume impacts of the proposed project and its alternatives. The projected decreases in Basin VMT would indicate that the project and is alternatives would have no significant impact on overall Basin emissions.

NOISE

The proposed project will increase traffic slightly on the adjacent street system. Because this increase will be primarily bus activity, it is important to consider the noise impact of project related traffic.

With regard to noise, the most significant aspect of the project would be tour bus activity entering and exiting the site. To assess the impact on these buses, the FHWA Stamina 2.0 Model was utilized. Country Club Drive between SR 28 and Ski Way was modeled with and without the proposed project, and the results are presented in Table 4.5.18.

Noise thresholds established for the Lake Tahoe Basin are presented in Table 4.5.19. Tahoe Regional Planning Agency (TRPA) staff indicate that the thresholds are based on a daily equivalent noise level (CNEL) rather than a peak hour level, and that the threshold is measured 100 feet from the roadway. As shown, the current and with project CNEL levels exceed the threshold. It should be noted that this projection represents a "worst case" condition, as all tour buses are assumed to leave during the same hour.

and maximum expansion alternate would add 21 people to the population if the positions are filled by new residents.

Part-time positions created by the proposals or maximum expansion alternate will likely be filled by area residents as has been the case historically.

Mitigation:

As the increases shown for the proposed plan or Alternative 3 represent at most .2% of the current population, no mitigation is required.

4.7 HOUSING

Setting:

As established in section 4.6, Population & Employment, the number of year-round housing units available in the Incline Village/Crystal Bay area in 1985 is shown as 6,577. This number should be relatively current as a result of the moratorium on single family home construction established in 1984. Of this number, 49% or 3,22[illegible] units, are occupied year-round based on the rate established in the 1980 census for this CDP (Census Designated Place). The balance of homes can be assumed to be second homes or seasonal rentals.

The Incline Village Chamber of Commerce estimates the number of overnight lodging units available at approximately 831.

Impact:

The proposed plan with its possible population increase of 17 people would result in an increase of 7 households (at 2.56 persons per household as established in the 1980 census for this CDP). The no-action and modernization with no expansion alternate would not have an impact on households. The modernization and maximum expansion alternates would add 9 households.

4.6 POPULATION AND EMPLOYMENT

Setting:

Based on 1985 data provided by the Incline Village General Improvement District, there are 6,577 year round homes in the Incline Village/Crystal Bay area. Using a 49% resident occupancy rate established in the 1980 census for this CDP (Census Designated Place), occupied households are estimated at 3,223. Using a person per household rate of 2.56, also established in the 1980 census for this area, the current resident population is estimated at 8,251 in the Incline Village/Crystal Bay CDP. This is consistent with Washoe County Dept. of Comprehensive Planning estimates for unincorporated Washoe County, Tahoe Plan Area (est. pop. 8300 in 1985). For purposes of this document, the assumption is that these numbers are current due to the building moratorium.

Using a factor of 52% of the population as employed, established in the 1980 census of this CDP, the estimated employed population in 1985 was 4,291. The number of employees for Ski Incline in the 1985-86 ski season was 26 full-time year round and 174 part-time.

Impact:

The proposed plan would expand employment at the ski area by 9 full-time and 15 part-time employees. Both the no-action alternate and modernization without expansion alternates would not incur a change in the number of employees, however the modernization and maximum expansion alternate would require an additional 11 full-time employees beyond the current number.

Assuming a factor of 1.92 residents per full-time employee (based on the 52% employment rate for the total population), the proposed plan would add 17 people to the population if the positions are filled by new residents. The no-action and modernization without expansion alternates would effect no population change. The modernization

accessory to the normal operation of the ski area).

Part of the permit area is being United States Forest Service Land and land use in that area is regulated by the Lake Tahoe Basin Management Unit. The current USFS prescribed use for their lands is "Unroaded Recreation." Through meeting and correspondence, Ski Incline has requested designation of 292 acres of USFS land as "Alpine Skiing." Such a designation allows for improvements directly related to skiing such as trail clearing, lifts and related structures. Existing land use at Ski Incline consists of downhill skiing and accessory commercial/ski service uses at the base area. The base area uses specifically include parking, transit drop-off, ticketing and ski school, rental and retail shops, and a cafeteria, as well as operational uses such as area maintenance and administration.

Impacts:

The proposed plan does not provide for any new or different uses than those described above as existing, though it does provide for both operational and aesthetic improvements. Under the proposed plan and all alternates, land uses will be consistent with the TRPA draft planned area statement, Washoe County land use regulations, and revised USFS LTBMU prescriptions.

Mitigation:

None required.

4.9 NOISE

Setting:

The noise evaluation issue centers on two concerns, snowmaking and TRPA thresholds for vehicular traffic. These concerns were raised at a public scoping meeting which was held April 30, 1986 at Incline Village. The traffic component of this issue is discussed in the Transportation/ Circulation Chapter (4.5) of this report as it

Mitigation:

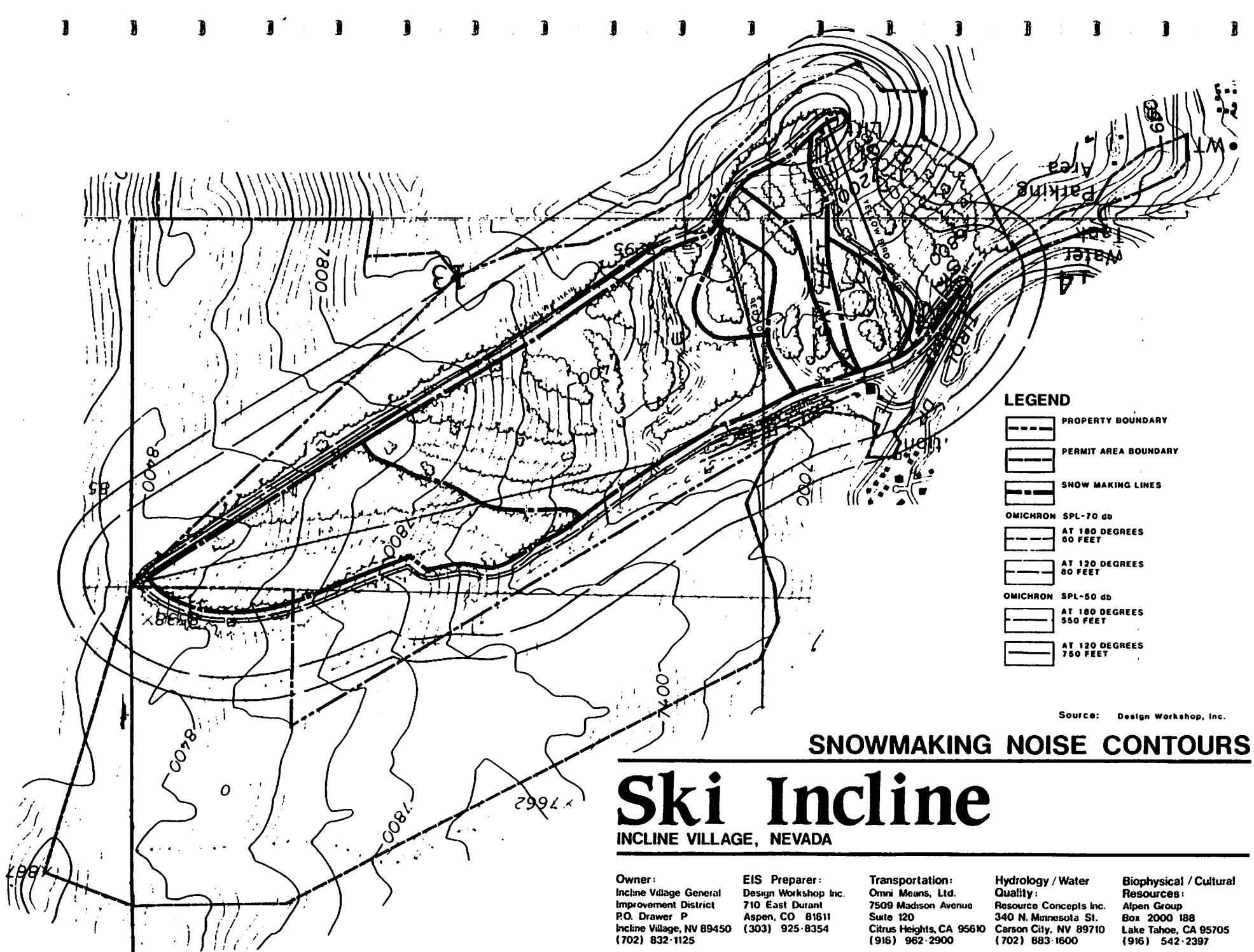
Given the large number of unoccupied year-round housing units, the small number of households the proposed plan or the maximum expansion alternate might add would have virtually no impact on housing conditions and so no mitigation is required.

4.8 LAND USE

Setting:

Because Incline Village lies in unincorporated Washoe County, land use direction for this area is specified by the Washoe County Regional Plan and the Tahoe Area Plan. Control of land use in accordance with these guidelines is exercised through the Washoe County Code, Chapter 110 (Zoning Ordinance). County land use plan maps indicate that the ski area has two county zoning categories. The base area lies in zone C1, Limited Commercial (allowing neighborhood commercial uses with all uses permitted by special use approval; no minimum lot size), and the ski terrain and expansion area lies in zone A4, Farm & Forestry (allowing residential lots with a 5 acre minimum, agricultural uses, church and by special use approval veterinary, mining, hospital, and recreational uses). For long range planning purposes, the Department of Comprehensive Planning considers the project site as a "special development area" based on its location, natural amenity and existing use. While designation does not have any adopted regulatory applications, it serves as a guide to development in areas that have unique limitations and opportunities.

Washoe County uses the TRPA Plan Areas as the principal land use regulations in the basin area as county ordinances and the compact creating TRPA require use of the most restrictive regulation applicable. Ski Incline forms TRPA Plan Area 052, which has a Land Use Classification of Recreation. Allowed uses are downhill skiing, cross country skiing, day use, riding and hiking trails, snowmobile courses, and commercial (only as an



SNOWMAKING NOISE CONTOURS

Ski Incline

INCLINE VILLAGE, NEVADA

Owner:
Incline Village General Improvement District
P.O. Drawer P
Incline Village, NV 89450
(702) 832-1125

EIS Preparer:
Design Workshop Inc.
710 East Durant
Aspen, CO 81611
(303) 925-8354

Transportation:
Omni Means, Ltd.
7509 Madison Avenue
Suite 120
Citrus Heights, CA 95610
(916) 962-2900

Hydrology / Water Quality:
Resource Concepts Inc.
340 N. Minnesota St.
Carson City, NV 89710
(702) 883-1600

Biophysical / Cultural Resources:
Alpen Group
Box 2000 188
Lake Tahoe, CA 95705
(916) 542-2397

Environmental Impact Statement Fig 9.1

Scale: 0 0 20 40 100 Date 8 1 86

relates to the intersections identified for study by TRPA.(1)

The existing snowmaking system at Ski Incline is equipped to cover 66 acres of skiing terrain. The system utilizes snowmaking guns consistent with the general characteristics of the Omichron (brand name) snowmaking head.

The proposed expansion would add 46.6 acres of terrain equipped for snowmaking. With the additional 46.6 acres the total snowmaking terrain would be 113.3 acres. A snowmaking head with characteristics similar to the Omichron head would also be used on the expansion terrain.

The decibel rating for the Omichron head, based on information provided by the manufacturer, are as follows:

Distance from Snowmaking Head	Decibel Level	Degree of Head Rotation
60'	70 db	180
80'	70 db	120
550'	50 db	180
750'	50 db	120

A map illustrating the location of trails equipped with snowmaking equipment and the resulting noise contours for the proposed plan is shown on figure 4.9.1.

Thresholds:

Thresholds for single noise events as defined in the TRPA goals and Polices Draft, June 16, 1986 are included in Appendix C.

(1) Based on a meeting May 29, 1986 between Ken Anderson of Omni-Means and Jim Brennan of TRPA.

The base design of these buildings lacks a cohesiveness and the absence of landscaping around these facilities gives them an unadorned, worn appearance.

The maintenance facility is centrally located at the northern end of the parking lot directly below the front of the main lodge. At this location it is visually distracting. It is seen by visitors moving toward the lodge from parking or by those standing on the deck in front of the lodge."

The following is a listing of the attributes, negative influences and recommendations for Ski Incline which are listed in the study.

Elements That Contribute to the Scenic Quality of Ski Incline

A. The verticality of the hills and the sense of enclosure they provide.

B. The conifer forest which covers the hillsides.

C. The light-colored rock formations which contrast sharply with the dark green forest cover.

D. The glimpse of the lake and distant shore to the south.

Elements That Detract from the Scenic Quality of Ski Incline

A. The absence of landscaping around the various structures makes the buildings appear poorly integrated with the natural environment. The bare earth and pavement around the buildings contrasts sharply with the lushness of the forest vegetation which encompasses the resort.

B. The embankment between the road and the parking area is predominantly bare earth and has very little visual appeal. It also poses erosion problems. The embankment between the parking area and the lodge has been covered with large rocks to help stabilize it, which

Impacts:

Noise levels generated by snowmaking for Alternatives 1 and 2 will remain the same at current levels as acreage and system location remains the same. Decibel levels generated by the snowmaking head for the proposed plan and Alternate 3 occur below threshold levels established for all the sources listed on the TRPA chart for single noise events.

Mitigation:

None.

4.10 VISUAL RESOURCES

Setting:

A scenic resource evaluation of specific areas in the Tahoe Basin was conducted in 1983 for the TRPA by Wagstaff and Brady. Section number 6 of this study is an evaluation of Ski Incline. This section is included as Appendix D. A brief synopsis of the study follows.

"The study focused on two areas of the property, the mountain and the base. The mountain and existing ski runs are viewed as elements contributing to a high scenic quality of Ski Incline. A variety of landforms and features such as rock outcrops can be seen due to the openness of the area. The ski slopes are sensitively integrated into the natural landscape avoiding sharp, straight lines along the edges. And a coniferous forest of uneven density covers the hillside to the east, the proposed expansion area, where trees thin in places to expose a light colored rock base.

The base area is composed of five buildings that have been built in an alpine/Tyrolean style architecture. They consist of an air and water building, main lodge, maintenance facility, racing headquarters building and staff services building.

Natural Features of Ski Incline

Exposed rock formations
Rating: 4

Conifer forest
Rating: 3

Ski slopes and adjacent hills
Rating: 4

Overall rating of natural features: 4

Man-Made Features of Ski Incline

Main parking area
Rating: 2

Main lodge
Rating: 3

Support structures
Rating: 3

Overall rating of man-made features 3

Summary

Overall Rating for Views	3
Overall Rating for Natural Features	4
Combined Rating for Views and Natural Features:	3
Overall Rating for Man-Made Features	3

Impacts:

Visual impacts of the expansion of skiing per the proposed plan as seen from Mt. Rose overlook, and from Stateline Point were analyzed using a computer model. The tree mass configuration of proposed trails was digitized into the computer and represented as a 3 dimensional form 75' in height. This was then combined with a solid surface terrain model (see figure 4.10.1). Photographic slides were taken of the existing site from the viewpoints noted above, and sketches were then drawn from them (see figures 4.10.2 and 4.10.3). From approximately these same photo viewpoints the computer image was developed and registered to the corresponding slide of the

may be effective for reducing erosion and slumping but lacks visual appeal.

C. The location of the maintenance area at the north end of the parking lot directly below the front of the lodge is visually distracting. It places a visually unappealing area in a central location where it will be seen by all visitors moving toward the lodge from the parking lot and by those standing on the deck in front of the lodge.

Recommendations for Preserving the Scenic Quality of Ski Incline

A. Ski slopes and hillsides east of the main lodge

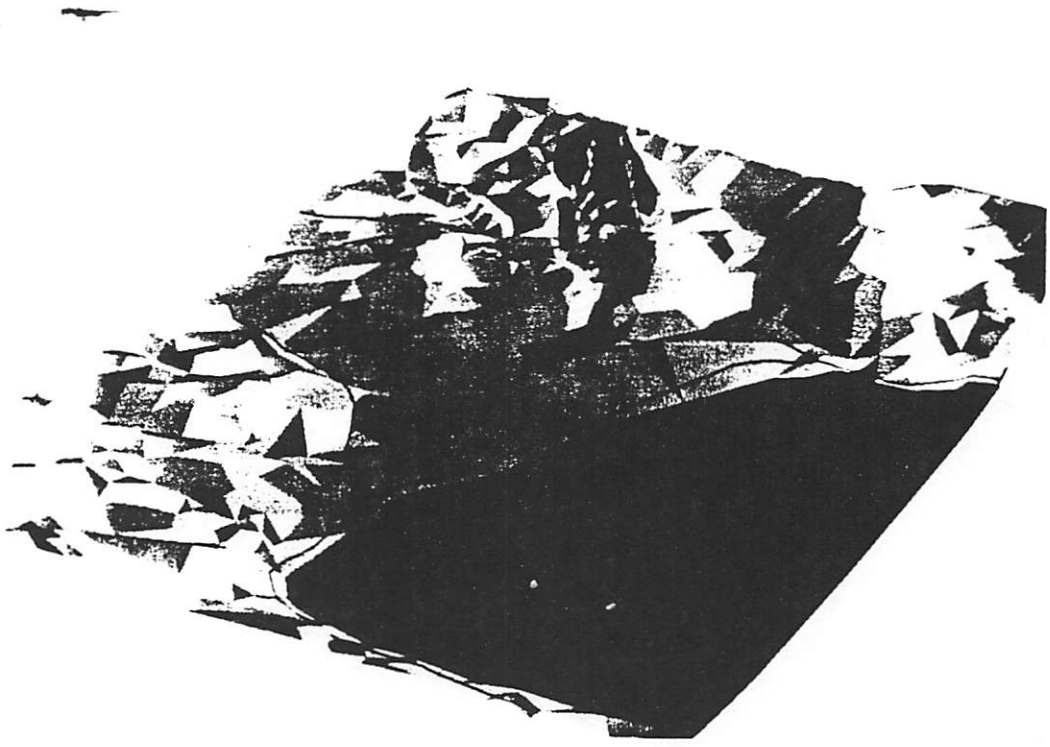
These slopes have been modified for skiing in a manner that is sensitive to the natural forms and vegetation. The resulting ski slopes are much more visually appealing than those of other ski areas in the basin. These slopes with their heavy forest cover create a very scenic recreational setting and should be preserved to ensure a quality recreational experience.

B. Ski Incline

1. Landscaping should be introduced on the embankment along the north and west sides of the main parking area. Low-growing shrubs should also be added to act as a buffer/screen between the road and the parking areas.

2. The location of the maintenance yard makes it very difficult to visually screen it from the other areas of the resort. Relocation of the yard to an area which is less centralized and less scenically sensitive should be considered.

The following are the current ratings given to components of Ski Incline. The criteria for the ratings is defined in the scenic resource evaluation 1983, appendix item D.



Computer Model

75' Vegetation on Terrain Model

Fig. 4.10.1

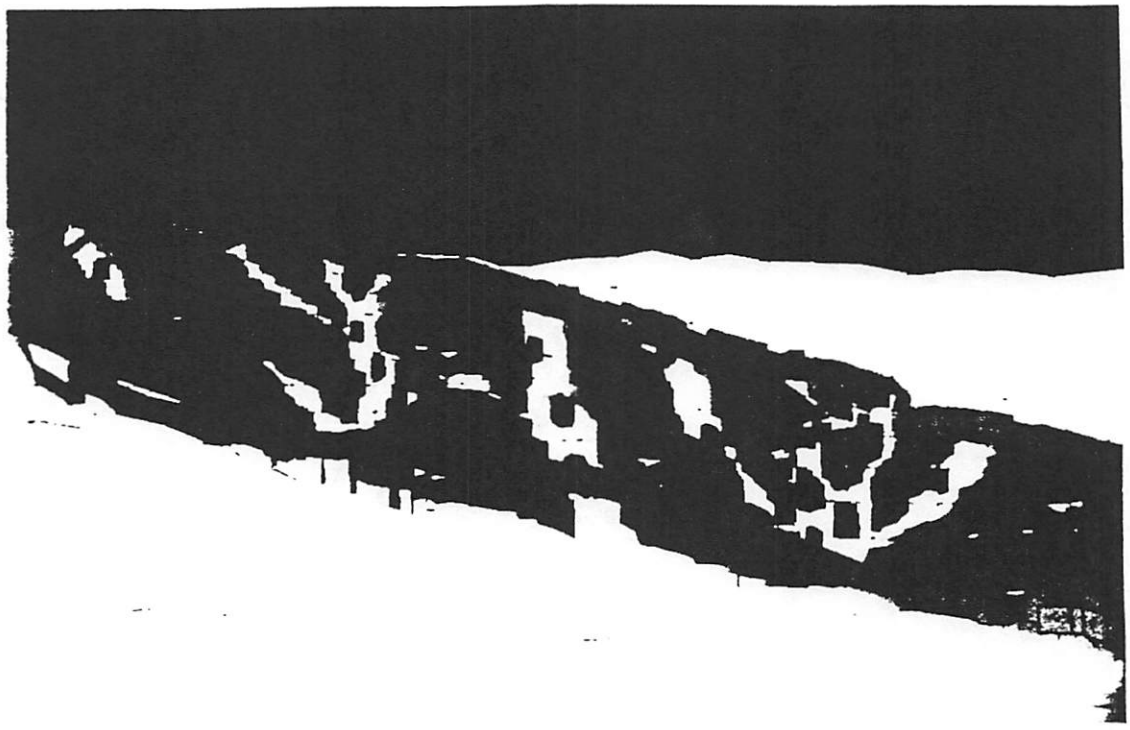
Permit Area

Existing Ski Area

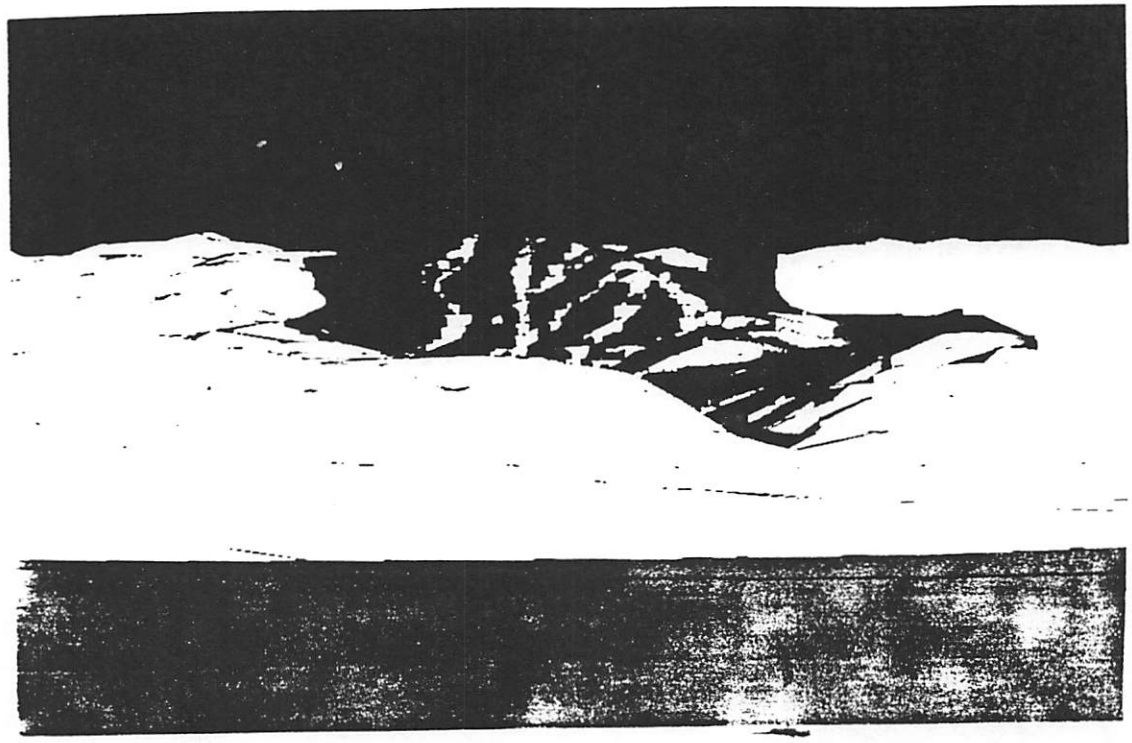
A. EXISTING VIEW FROM MT. ROSE OVERLOOK
Fig. 4.10.2

Permit Area | Existing Ski Area

B. EXISTING VEIW FROM CRYSTAL POINT



Computer Model View from Mt. Rose Overlook



Computer Model View from Crystal Point

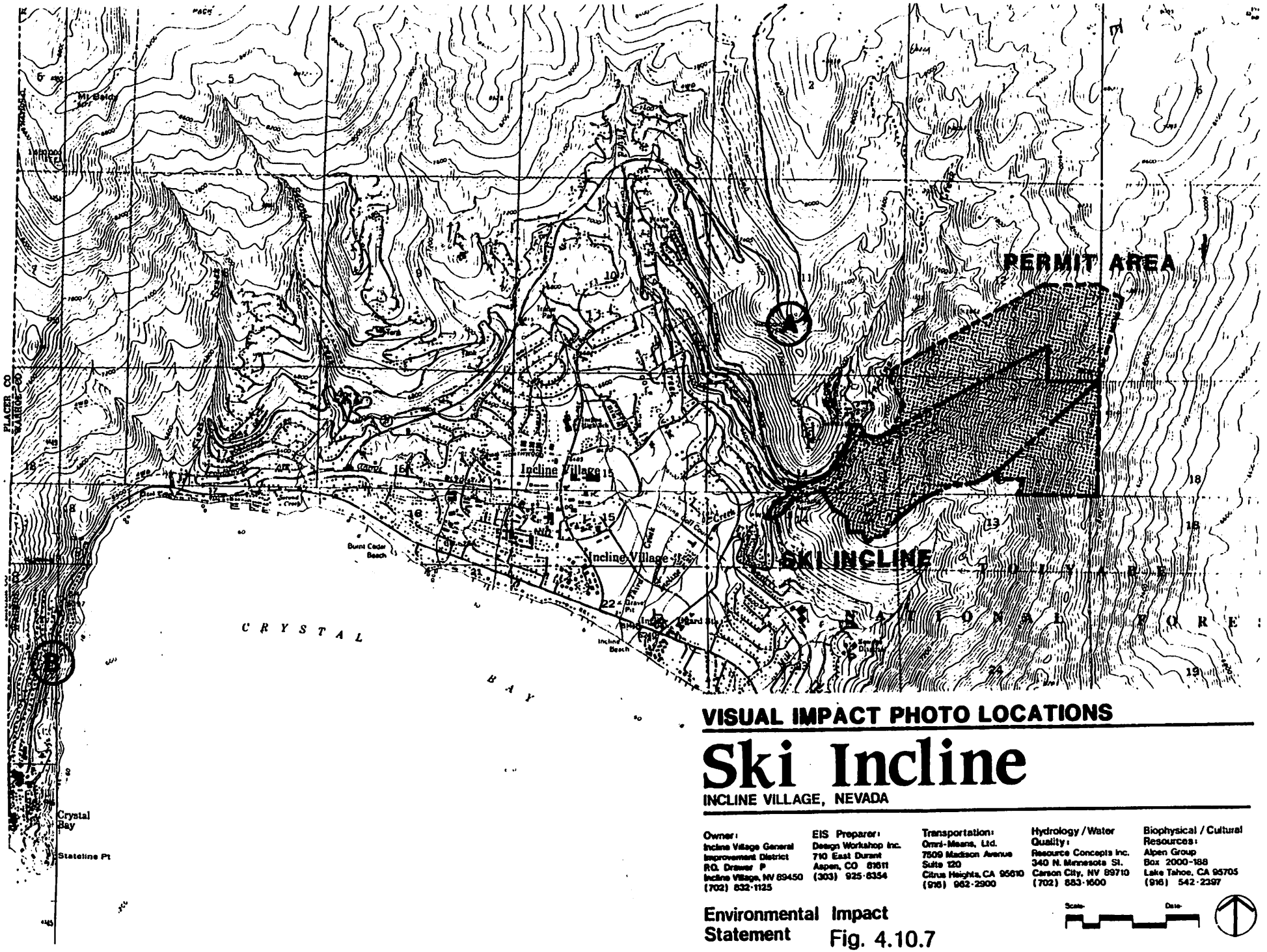
Fig. 4.10.4

Proposed Expansion | Existing Ski Area

A. PROPOSED EXPANSION FROM MT. ROSE OVERLOOK

B. PROPOSED EXPANSION FROM CRYSTAL POINT

Fig. 4.10.6



VISUAL IMPACT PHOTO LOCATIONS

Ski Incline

INCLINE VILLAGE, NEVADA

Owner:
Incline Village General Improvement District
P.O. Drawer P
Incline Village, NV 89450
(702) 832-1125

EIS Preparer:
Design Workshop Inc.
710 East Durant
Aspen, CO 81611
(303) 925-8354

Transportation:
Omni-Means, Ltd.
7509 Madison Avenue
Suite 120
Citrus Heights, CA 95610
(916) 962-2900

Hydrology / Water Quality:
Resource Concepts Inc.
340 N. Minnesota St.
Carson City, NV 89710
(702) 883-1600

Biophysical / Cultural Resources:
Alpen Group
Box 2000-188
Lake Tahoe, CA 95705
(916) 542-2397

Scale: Date:

Environmental Impact Statement Fig. 4.10.7

existing site (see figure 4.10.4). A composite of the two images was then produced and sketched to illustrate the exact influence of the trail configurations (see figures 4.10.5 and 4.10.6).

As confirmed by the computer process, trails or sections of trails, and portions of the access road will be visible to varying degrees from each of the studied locations.

If the trails are designed well, consistent with Forest Service design recommendations and the character of existing trails, the scenic evaluation rating for the coniferous forest slopes could be enhanced with the addition of visually sensitive ski runs.

From the Mt. Rose overlook, the trail impacts are most noticeable on trails #2 and #3. The visual impact of remaining trails is minimal due to their aspect and/or the concealing effect of the tree masses.

From Stateline Point the trail with the most impact is the upper half of trail #3.

Impacts to the base facility are positive. As part of the proposed expansion, the maintenance facility will be relocated to a site which is not visible from the base. In its place at the base a new skier services building will be built which will give the base area and a skier plaza a more cohesive feel.

A substantial amount of landscaping will occur throughout the base to improve the visual experience. This would include landscaping on the embanckment between the road and the lower, main parking lot.

These additions will improve the relatively low rating which was given to the man-made features of the site.

Mitigation:

In accordance with practices recommended by the USFS, several techniques in the design of the ski trails should be utilized. These techniques help minimize the visual contrast of ski trails to the

surrounding landscapes. Techniques to be employed include:

1. Glading of ski runs. Several trails will be gladed. This selective thinning of trees provides a very natural appearing slope due to the quantity and configuration of trees which are left.

2. Leaving large islands on the ski runs. Several of the ski runs will retain large islands of trees.

3. Creating natural appearing edges on the ski runs. The vegetation edge is extremely important. It is a key to maintaining the desired character and meeting visual quality objectives. Run edges should correspond to existing biological edges. The tree edge should undulate with a variety of trees and shrubs. The appearance should be loose and feathery avoiding hard straight lines.

4. Blending of lift lines within ski trails. Lifts and trails should be integrated to avoid the strong line which results from aligning lifts through tree masses.

5. Colors used on the structures should blend easily with the natural environment. Colors utilized on the smooth surfaces of structure should be two or three shades darker than those in the natural environment.

6. The access road should be aligned as illustrated on the proposed plan to avoid sensitive meadow areas and steeply sloped forested areas.

4.11 CULTURAL RESOURCES

Setting:

Staff representing IVGID, TRPA, Washoe County, the U.S. Forest Service, Lake Tahoe Basin Management Unit, and the Nevada State Historic Preservation Office have determined that a specialized analysis of potential cultural resources be done for the

entire study site. As per requirement, a Class II Cultural Resource Inventory was conducted under Forest Service permit. This entailed a program of pre-field research and a 20% ground truth survey.

The surrounding U.S. Forest Service permit area to the north and south of the IVGID Ski Incline property had the best ground visability for a survey along the main north-to-south trending ridgeline and along its intersecting ridge system in the northern section of the project parcel. Bush patches intermittently cover sizable area within the entire project area and prohibit ground inspection . A mature red fir forest covers much of the north-facing slopes in the northern project parcel and duff and deadfall obscured the ground surface. All drainages contain a thick growth of riparian vegetation and ground visibility was very poor here. Project boundaries marked with survey flagging.

Ethnography

The project falls within the nuclear territory of the Washoe. It lies within the seasonal round of the Northern Washoe (We mel ti) who wintered in the Truckee Meadows area and spent the summers in the higher elevations (Downs 1966; Nevers 1976:3, p.c.; Stewart 1966:224). The Washoe language is part of the Hokan linguistic stock. They also embodied a blend of Great Basin and California in their geographical position and cultural attributes. They were relatively informal and had flexible political collectivity.

The ethnographic record suggests that the general areas were inhabitated at various times of the year by small groups who made seasonal movements in order to procure economic resources as they became available. Lake Tahoe and its main tributaries such as Incline Creek, First, Second and Third Creeks were important fisheries (TRPA 1971b). Summers were spent in high mountain valleys, collecting edible and medicinal roots, seeds and marsh plants. Willows, grasses and roots were prized as materials for basket making. Gooseberries and choke-cherries were gathered on the mountainsides. In the higher elevations, men hunted large game (mountain sheep, deer) and trapped smaller mammals.

Evidence of these ancient subsistence activities are found along the mountain flanks as temporary small hunting camps containing chips of stone and broken tools. In the high valleys, more permanent base camps are represented by stone chips, tools, grinding implements and house depressions.

The Washoe have a tradition of making long treks across the Sierran passes for the purpose of hunting, trading and for the gathering of acorns. Small camps along these trekking routes have been inventoried in this portion of the Sierra (Hardesty & Elston 1979; Lindstrom 1978, 1984). These aborigional trek routes, patterned after game trails, are often the precursors of our modern trail systems.

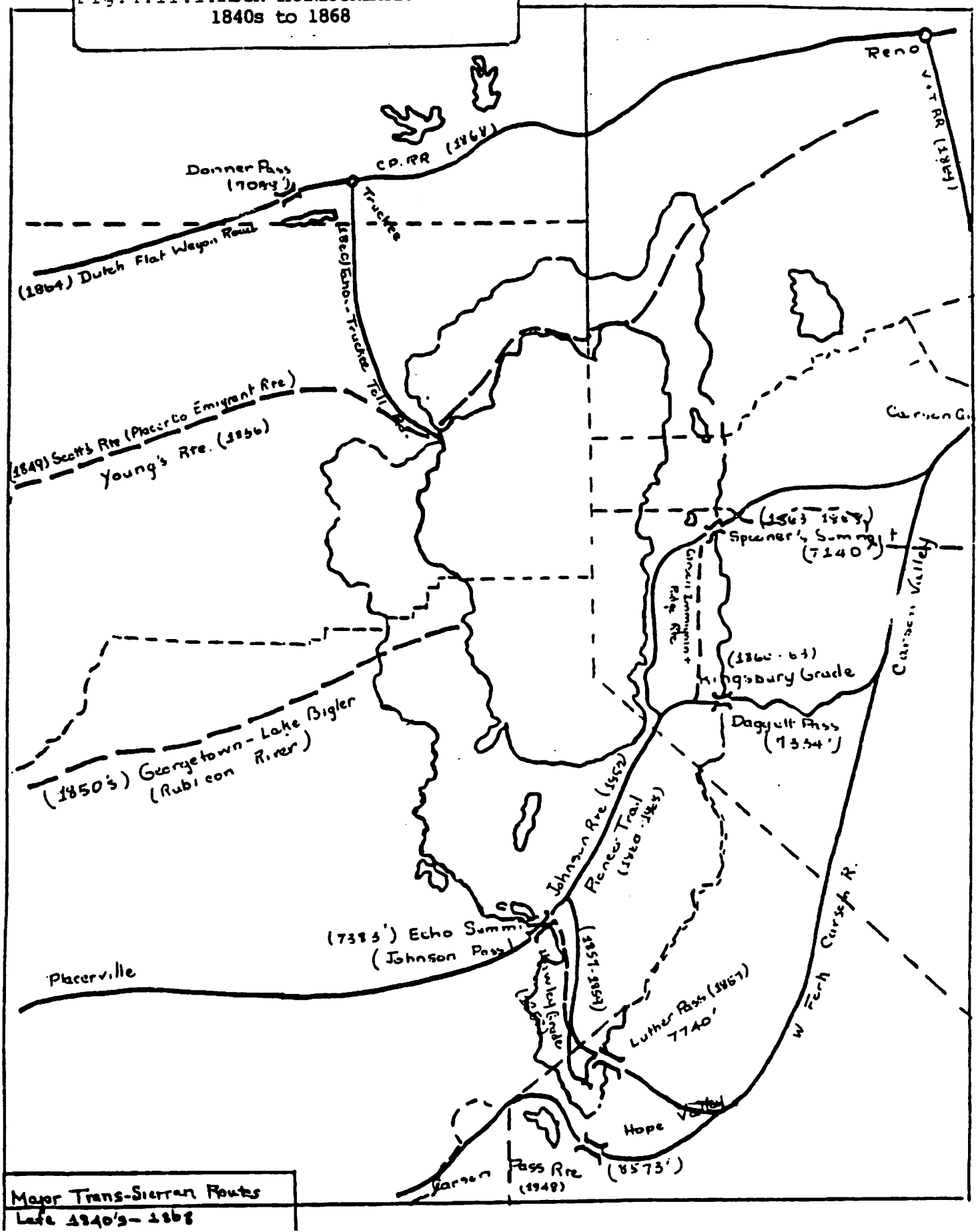
By the 1850's Euroamericans had permanently occupied the Washoe territory and changed traditional lifeways. Mining, lumbering, grazing, commercial fishing, tourism and the growth of settlements disrupted traditional Indian relationships to the land. As hunting and gathering of wild foods were no longer possible, the Washoe were forced into dependency upon the Euroamerican settlers.

History

Pre-Comstock Era: Early Transportation Patterns and Settlement Early on, the Tahoe basin was rejected as unsuitable in terms of the transportation needs of westward movement in the late 1840's and early 1850's. Despite its obvious proximity within the geographical center of trans-Sierran emigration efforts, it was avoided and bypassed (Mackey 1968; TRPA 1971a).

By the early routes such as the Scott's Route (Placer County Emigrant Road) through the northern basin offered shorter distances than other ones actually being utilized (Figure 4.11.1). Even though passes along this route were actually at lower elevations, it suffered from the handicaps of requiring, in effect, a double crossing of the mountains. Also, in the beginning approaches, very steep ascents from the floor of Carson Valley had to be climbed. Wagon traffic, therefore, moved to the north and south of the Tahoe Basin itself in search for more gradual avenues that

Fig. 4.11.1 MAJOR TRANSPORTATION ROUTES
1840s to 1868



Major Trans-Sierran Routes
Late 1840's - 1868

could accommodate wagons. The Scott's Route road had its western terminus near Auburn. It crossed the main sierran crest above Squaw Valley and entered the Lake Tahoe Basin at Tahoe City. It wound its way along the lake's north shore to Mill Creek, near Incline Village. Here the road turned eastward, looped its way to the Carson Range's steep west face between Mill Creek and Tunnel Creek and over the west summit at Twin Lakes. From this pass, the road fell into Little Valley and angled northeast to Washoe Valley, where it tied into the Truckee branch of the California Emigrant Trail at Truckee Meadows (Figure 4.11.3). From 1852 to 1855 the improved and renamed road, now called the Placer County Emigrant Road, was traveled intermittently by westbound emigrants and eastbound prospectors and miners head for the Comstock.

Aside from a few trappers and probably some adventuresome miners moving east from the foothills, the Tahoe Basin was essentially uninhabited following its discovery by Fremont in 1844 until the late 1850's. It is doubtful if there was any permanent settlement of any significance up to the time of the Comstock, other than a few trading post-inns in Lake Valley which catered to early emigrants.

The Comstock Era: Water Supply Engineering and Lumbering

A general history of the Comstock is given by Galloway (1974), Lord (1883) and Shamberger (1969) with some additional information offered by Knowles (1942), Myrick (1962) and Scott (1957, 1973). This summary follows their findings. Two kinds of interrelated activities are documented: those associated with water supply engineering and those associated with logging. The Comstock could not have reached the level of development it attained without adequate souces of water and wood which were supplied by the Tahoe Basin. To utilize these natural resources, an elaborate water supply system of flumes, reservoirs, and pipelines was integrated with innovative logging techniques in order to remove the timber from the slopes of the Tahoe Basin down to the mines and residents of Virginia City.

Water Supply Engineering: The Virginia and Gold Hill Water Company:

As early as 1873, the Virginia and Gold Hill Water Company contracted for a water system to be built that would tap the water resources of the Carson Range and transport it to Virginia City. A diversion dam was constructed on Hobart Creek to collect water which flowed through a wooden box flume to a holding tank. It was then piped down to and across the floor the valley in the vicinity of Lakeview and up the Virginia Range on the other side to another wooden flume which connected to the Virginia City water system. This was a remarkable inverted siphon. This first pipeline, built in 1873, was the world's longest and highest and a had pressure of 865 pounds per square inch at its lowest point at the Lakeview Station. It was so well built that citizens of Virginia City still utilize snow water flumed and piped directly to the Tahoe Region.

In 1875 a second pipeline was added. Marlette Lake, a water reservoir in the Carson Range first developed by the Carson & Tahoe Lumber & Fluming Company (CTLFC), was enlarged by raising the existing dam. From Marlette Lake a flume 14x30 inches in section and 23,175 feet (4.38 miles) in length led to the west portal of [illegible]rginia and Gold Hill Water Company's tunnel [illegible]ger 1969:23). Scott (1957:301) notes this is being a covered box flume with a 30 x 20 inch trough. This tunnel penetrated the divide between the Lake Tahoe drainage on the west and that of Hobart Creek on the eastern slope. It was excavated in granite with help of Chinese labor (Hardesty and Elston 1979:4) and was 3,994 feet long, according to Galloway. Over one-half of the tunnel was timbered, its size being 7 feet high, 4.5 feet wide at the top and 6.5 feet wide at the floor. The August 17, 1875 issue of the Territorial Enterprise described the location of the tunnel and the method of construction and went on to say: "...The work of running the tunnel is being pushed ahead energetically, all the modern appliances for assaulting mother earth being called into requisition...". Lord states that the connection between a flume 14,610 feet (2.77 miles) long conveyed the water to a small diversion pond on Hobart Creek.

Subsequently, the production of silver and gold ore dropped off sharply following 1878 and held steady until 1887, when production sharply increased. This increased activity on the Comstock and the demands for additional water caused the water company to construct a third pipeline across Washoe Valley in 1887 (along the same route as the first and second lines) and also to develop new sources of water. The water company constructed another storage reservoir on Hobart Creek and build new and larger flumes to its inlet and from its outlet.

A new flume was put into Marlette Lake from the west portal of the tunnel. In order, however, to increase the water supply substantially, it was determined that a new flume running northward from the west portal of the tunnel along the mountains rimming the east shore of Lake Tahoe was needed. The Territorial Enterprise of July 27, 1887 stated that Captain Overton was employed in the construction of a new flume running northwesterly from the west portal of the tunnel, a distance 9 miles to the North (Third) Creek, which would tap several streams tributary to Lake Tahoe. A segment of this flume runs throughout the project area. Galloway stated that this flume, called the North Flume, was 43,523 feet (8.25) miles long. In addition to the water of Third Creek, the flume picked up water from the First and Second Creeks, Mill Creek, Tunnel Creek, Incline Creek and other small streams along the way. This flume emptied into the Marlette Lake flume at the tunnel's west portal. (Figure 4.11.2).

Captain J.B. Overton was in charge of the construction of all these works. He designed the second and third pipelines and was responsible for the development of the water supplies, well as being Superintendent of the Virginia and Gold Hill Water Company from 1873 to 1906. Galloway notes that this water supply system as a notable addition to the art of water supply engineering.

Water Supply Engineering-Flumes

There are basically two kinds of flumes. The conventional box flume is constructed of boards and used to transport water by gentle gravity flow from one location to another. The V-flume was

used almost exclusively for moving lumber and cordwood from mountain slopes to assembly yards at lower elevations. V-flumes that carried a relatively small amount of water were constructed at steeper angles than box flumes. The falling water generated great speed and power, carrying wood and lumber right along with it.

H.W. Haines is generally regarded as the inventor of the V-flume. He was engaged in cutting timber on his tract, south of Glenbrook, and built a box flume a mile long to float this lumber. He revamped the flume to the V-type and extended it some 12 miles into the mountains of Kingsbury Canyon. In 1870 he obtained a patent as its inventor.

Flumes were built in the later years of lumbering of a size to transport a piece of lumber 16 inches square and 40 feet long. To supply water to the main flume, feeder flumes were built to bring in water from adjacent creeks. Such flumes sometimes served to transport cordwood. The flume grade increased, ranging up to 20 feet to the hundred (or 4 feet to the rod) and this slope produced a rapid descent of the water and lumber.

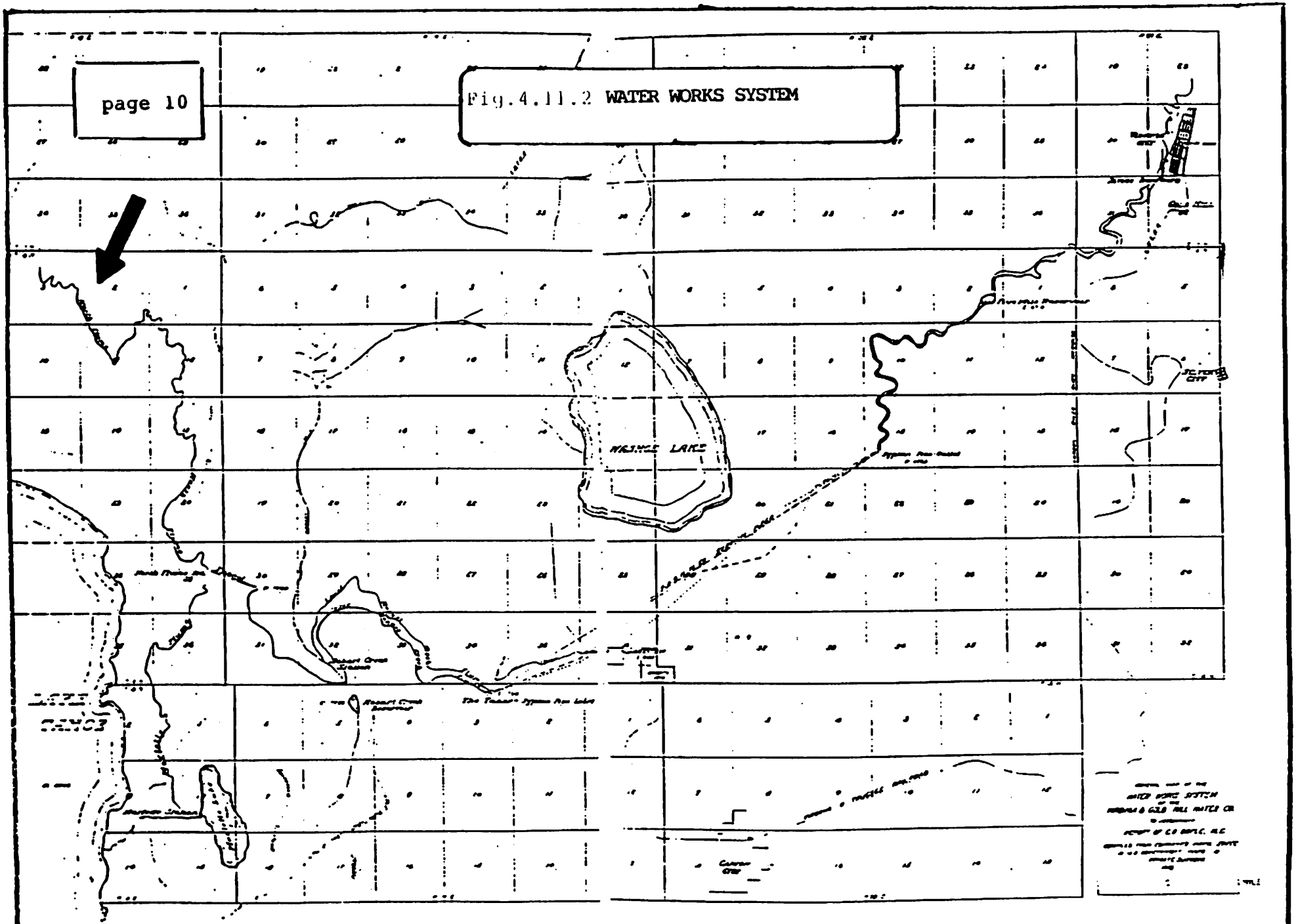
The tremendous vertical scars on Incline Mountain have been caused by the washing out and overflow of Marlett Kae's box where it winds along the mountainside. Today, these slides may be clearly seen from the western side of the lake.

For inspection purposes, a special type of float was constructed to convey a person in the V-flume throughout the tunnel and thence down to Lakeview. The daring sport of lime-riding soon caught on. Depending on the amount of water used in the flume, a ride in this float down the east side of the Tahoe Basin was no doubt a thrilling adventure.

The V-flume was a mode of lumber transportation which revolutionized the lumber business throughout the Tahoe Basin. It made remote forests accessible while doing away with slow and expensive freighting of wood over costly mountain roads and railroads. By 1879, there were at least ten V-lumber flumes in operation on the eastern slope of the Sierra Nevada, totalling more than 80

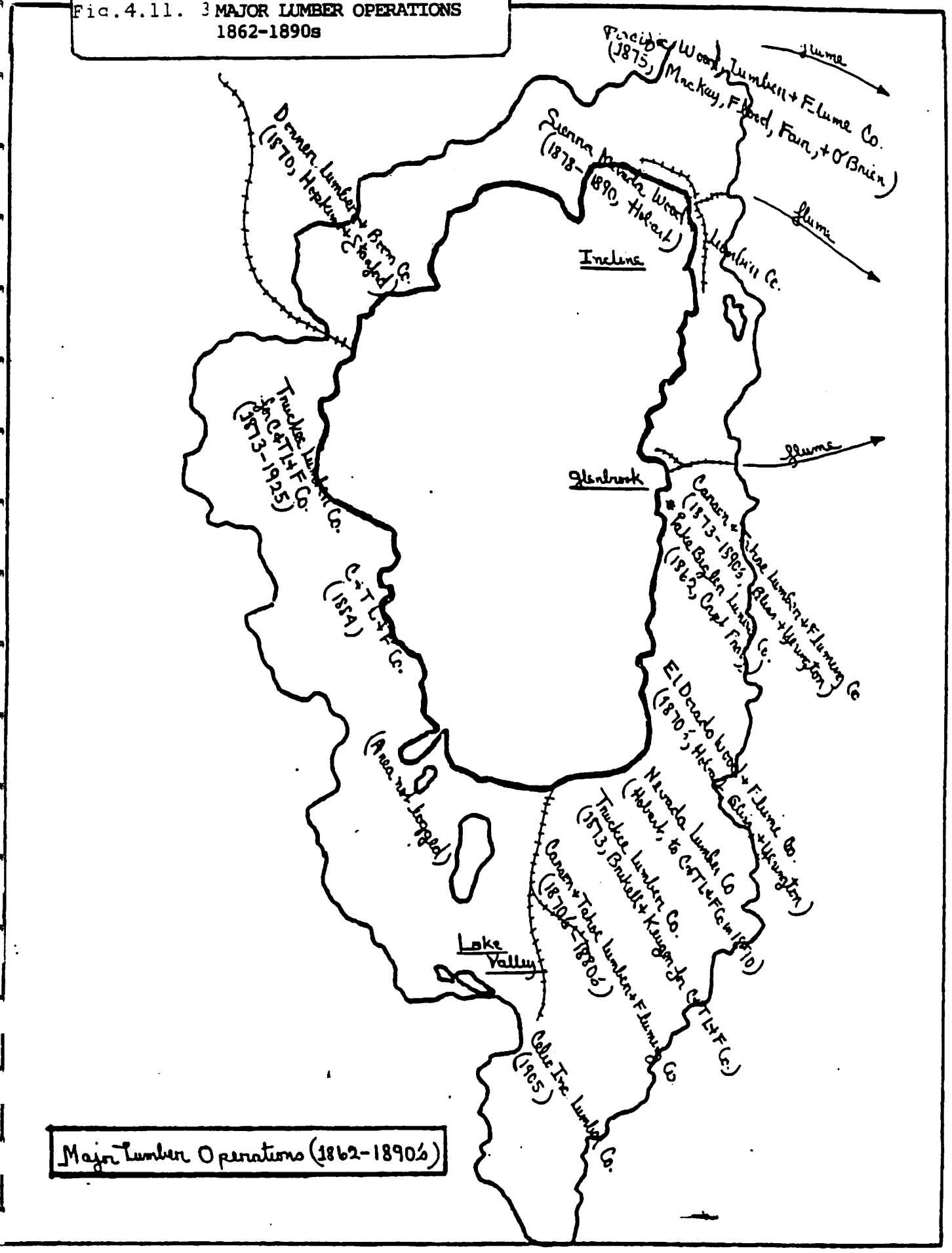
page 10

Fig.4.11.2 WATER WORKS SYSTEM



General map of the water works system of the Virginia and Gold Hill Water Co. 1913.

Fig.4.11. 3 MAJOR LUMBER OPERATIONS
1862-1890s



miles in length. They annually transported 171,000 cords of wood and 33 million board feet of lumber during the period of 1879-1880. The coming of the Virginia & Truckee Railroad stimulated great activity in V-fluming operations, for the lumber operators could flume their lumber and wood down the mountains to Huffaker's Station, Washoe, Ophir, Franktown, Mill Station, Lakeview and Carson City and have it freighted quickly and cheaply to the Comstock Lode. The V-flume transformed several valleys in the Nevada region, such as Little Valley, into busy lumbering centers.

Within a short time, the V-flume had become indispensable to the exploitation of the Comstock Lode and larger number of fluming companies with ample capital were brought into operation. Hobart and Marlette opened their Excelsior Mill and fluming operations in Little Valley in 1873. Mackay, Fair, Flood and O'Brien, who owned some of the largest Comstock Claims, incorporated as the Pacific Wood, Lumber & Flume Company in 1874. They had their first mills on Hunter Creek and built the largest V-flume in Nevada. The Summit Flume Company, with its V-flume along the northern bank of Clear Creek, became the property of Bliss and Yearington's Carson & Tahoe Lumber & Flume Company prior to 1875. These large lumber and fluming companies expanded their operations throughout the Tahoe Basin. This elaborate network of water collecting box and V-flumes and V-lumber flumes furnished the basis for the lumbering operations in the Tahoe Basin

Survey Results:

Site #1 North Flume

A segment of the North Flume traverses the project area at a gentle gradient along the 7670-foot contour. This covered flume once carried water from Third Creek to Tunnel Station, a total distance of 9 miles. It was constructed in 1887 by the Virginia and Gold Hill Water Company and was vital to the logging operations of the SNWLC, which centered out of the Incline area. It is not clear if it was a box-type or V-type flume. The narrow trench exposed along much of its route suggests it may have been a V-flume; however,

certain sources refer to it as a box-type flume. If carried only water and not lumber. Feeder flume was also inventoried at the drainage just beyond the northern boundary.

Boards which were nailed across the top of the flume vary in dimension: 8'x28"x1 1/4", 9 1/2"x28'x1 1/4", 6"x24"x1 1/4" and 8"x30"x1 1/4". Long planks which formed the sides are approximately 16'x12"x1". These were supported by short posts which were 3"x4" in cross-section. The boards and long planks were held together mostly by wire nails, with a few cut (square) nails being observed. The wire nails suggest this feature was repaired subsequent to its construction in 1887 (perhaps several times). It was probably used well into the 20th century, even as slate as 1910 (Hardesty p.c.).

A narrow bench or platform from 3 to 9 feet wide was cut into the side slope to support the structure. The flume has collapsed upon itself. However, a few segments are still in an upright position, supported by the short posts which serve as a trestle. The wood has weathered but is generally well-preserved.

Site #1 Features A and B: Feeder Flume

Two wooden box culvert-type flume segments, or feeder flumes, are located at two of the three drainages which intersect the main flume. These feeder flumes are located on the uphill side of the main flume and appear to have served as a mechanism for collecting and channeling water from these intermittent drainages into the main flume.

Site #1 Features C and D: Flume Washouts

Two barren gullies or "washouts" were observed along the route of the main flume. Erosion commenses directly below the flume and may represent areas where the flumes were washed out (or spilled water) from time to time. Scott (1973:100) notes large vertical scars where water was washed out or overflowed from the flume running from Marlette Lake. These may be similar, smaller-scaled features. Another flume washout noted in the northern USFS parcel.

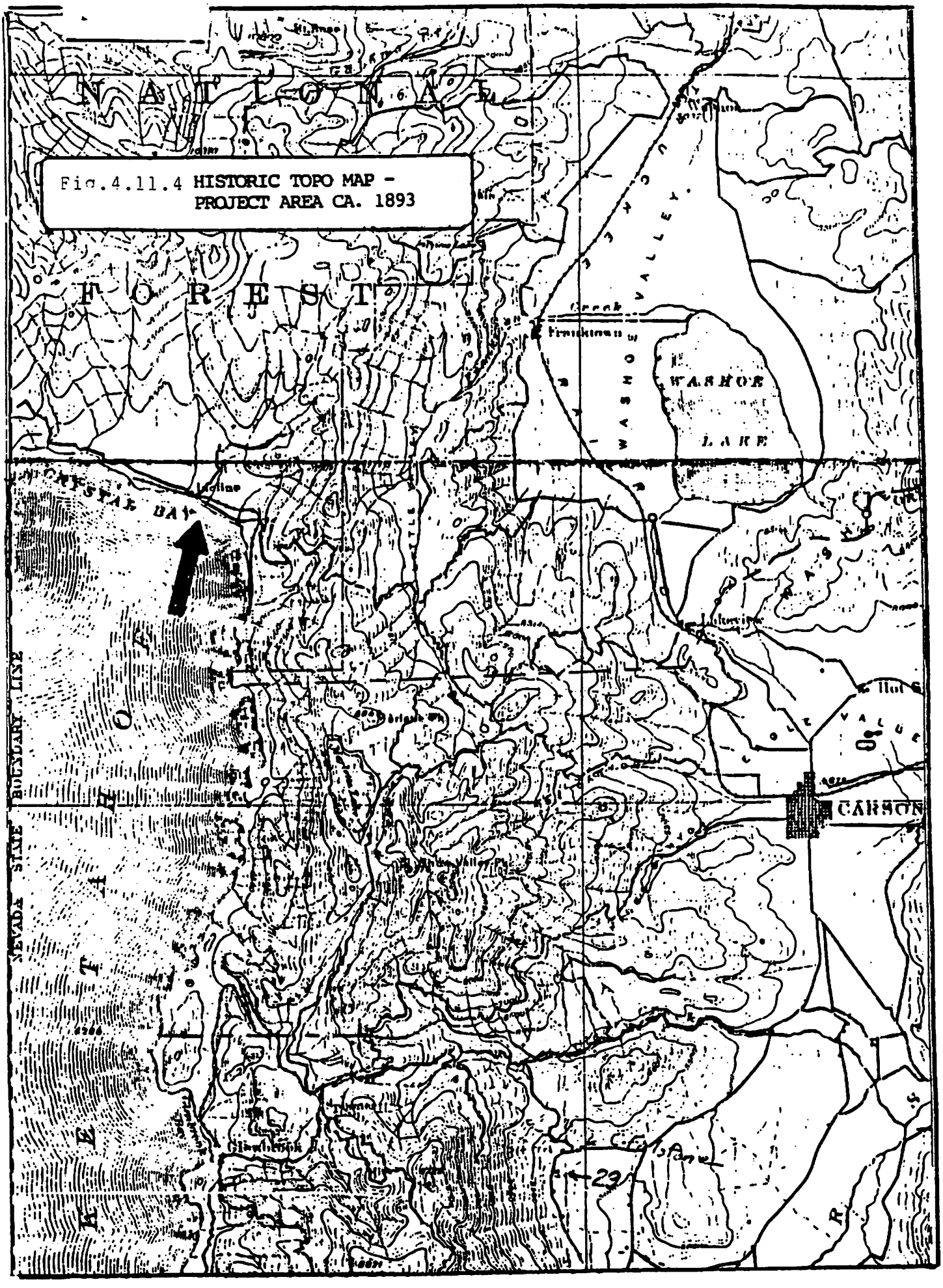


Fig.4.11.4 HISTORIC TOPO MAP - PROJECT AREA CA. 1893

Fig.4.11.5 **INCLINE**

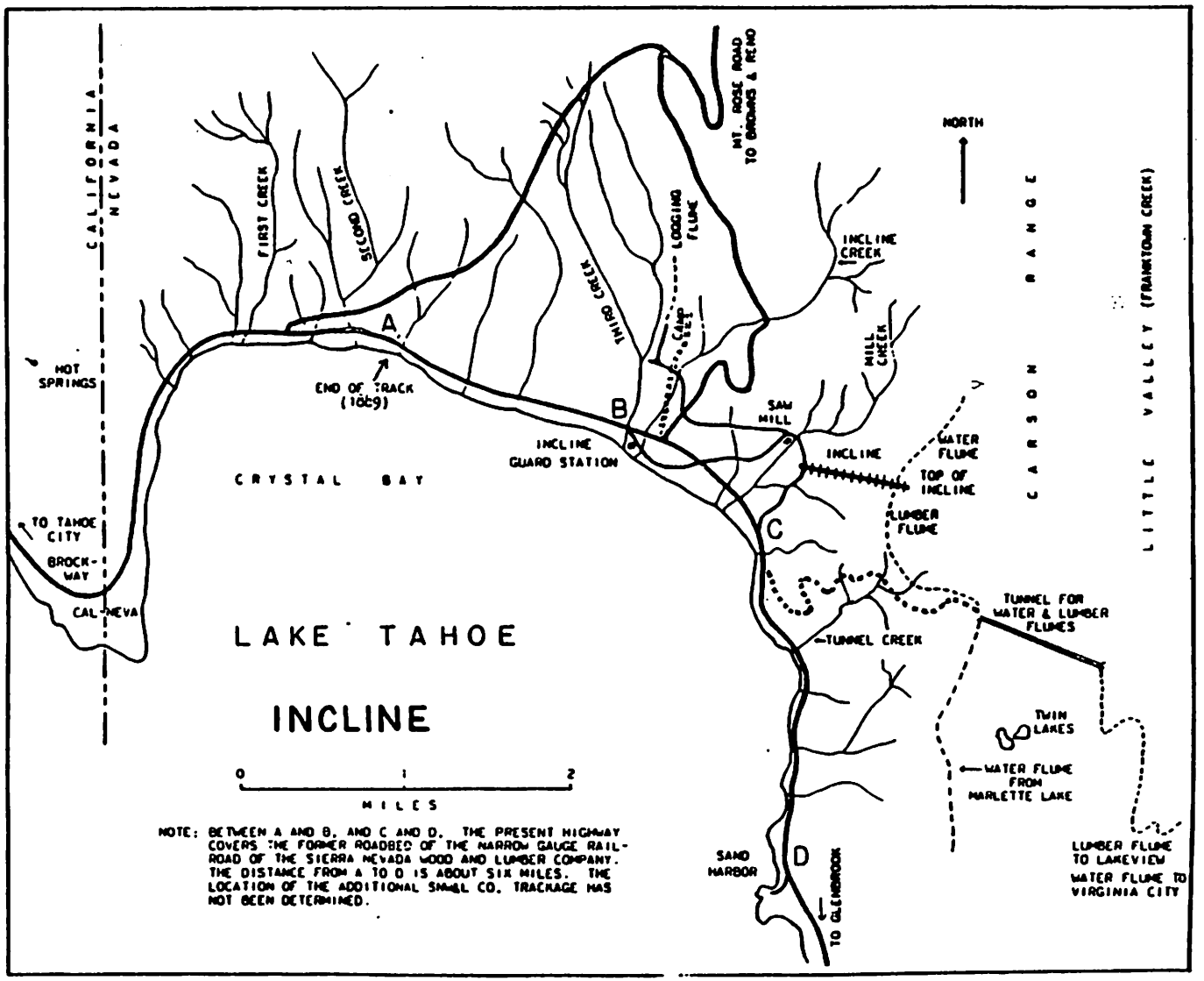
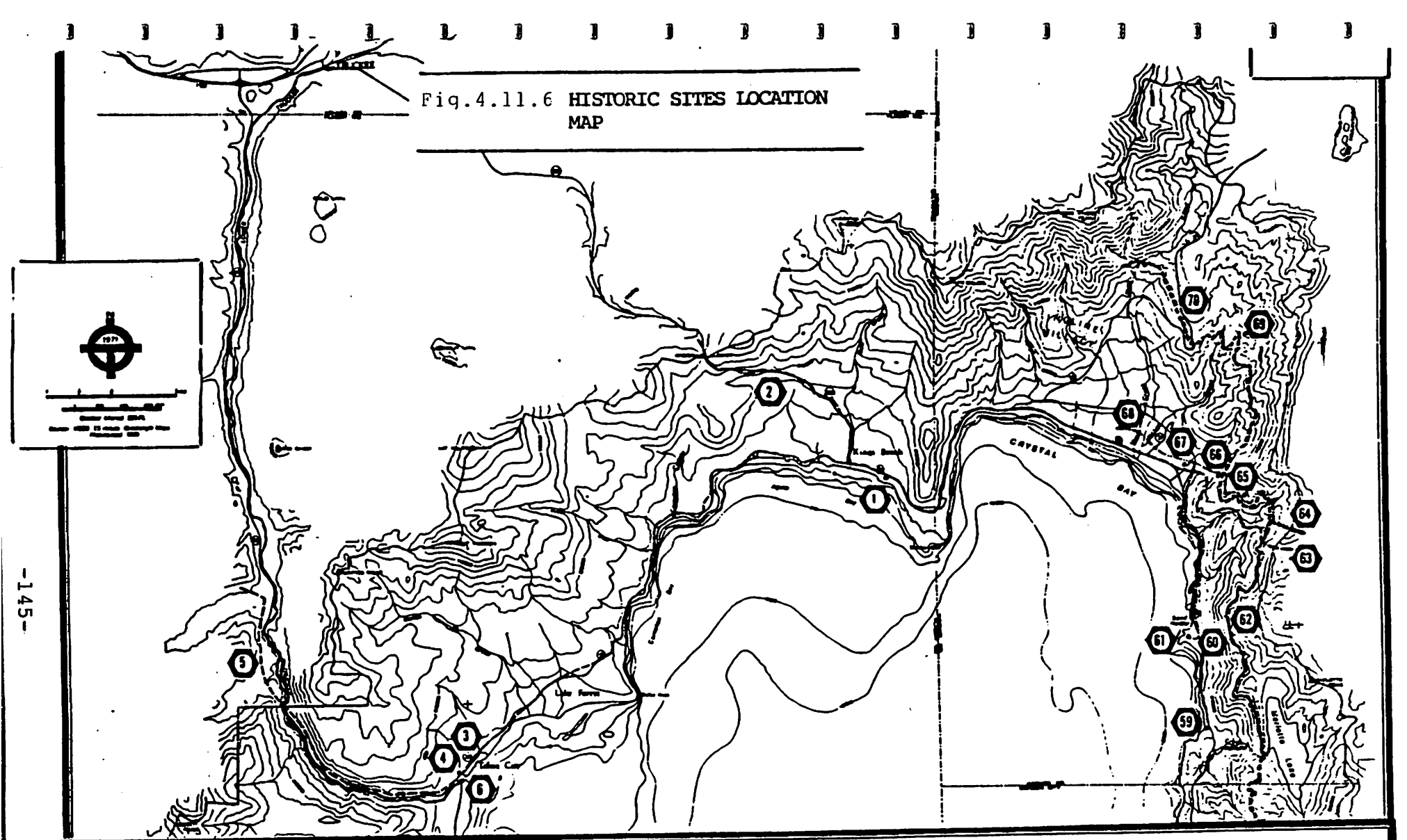
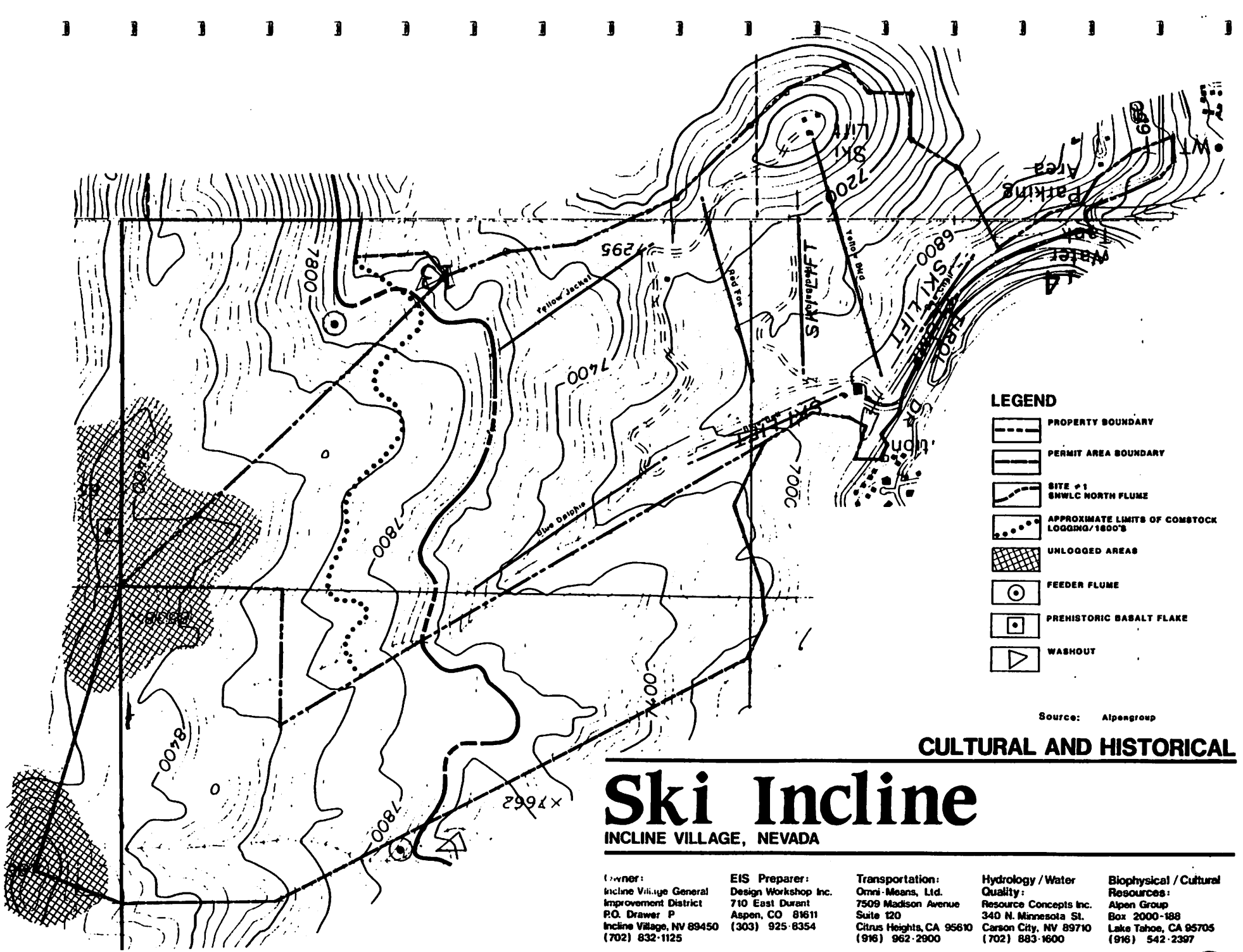


Fig.4.11.6 HISTORIC SITES LOCATION MAP




LEGEND
PROPERTY BOUNDARY
PERMIT AREA BOUNDARY
SITE #1
SNWLC NORTH FLUME
APPROXIMATE LIMITS OF COMSTOCK LOGGING/1600'S
UNLOGGED AREAS
FEEDER FLUME
PREHISTORIC BASALT FLAKE
WASHOUT
Source: Alpengroup
CULTURAL AND HISTORICAL
Ski Incline
INCLINE VILLAGE, NEVADA
Owner:
Incline Village General Improvement District
P.O. Drawer P
Incline Village, NV 89450
(702) 832-1125
EIS Preparer:
Design Workshop Inc.
710 East Durant
Aspen, CO 81611
(303) 925-8354
Transportation:
Omni-Means, Ltd.
7509 Madison Avenue
Suite 120
Citrus Heights, CA 95610
(916) 962-2900
Hydrology / Water Quality:
Resource Concepts Inc.
340 N. Minnesota St.
Carson City, NV 89710
(702) 883-1600
Biophysical / Cultural Resources:
Alpen Group
Box 2000-188
Lake Tahoe, CA 95705
(916) 542-2397
Environmental Impact
Scale
Date 8-1-86
200
400
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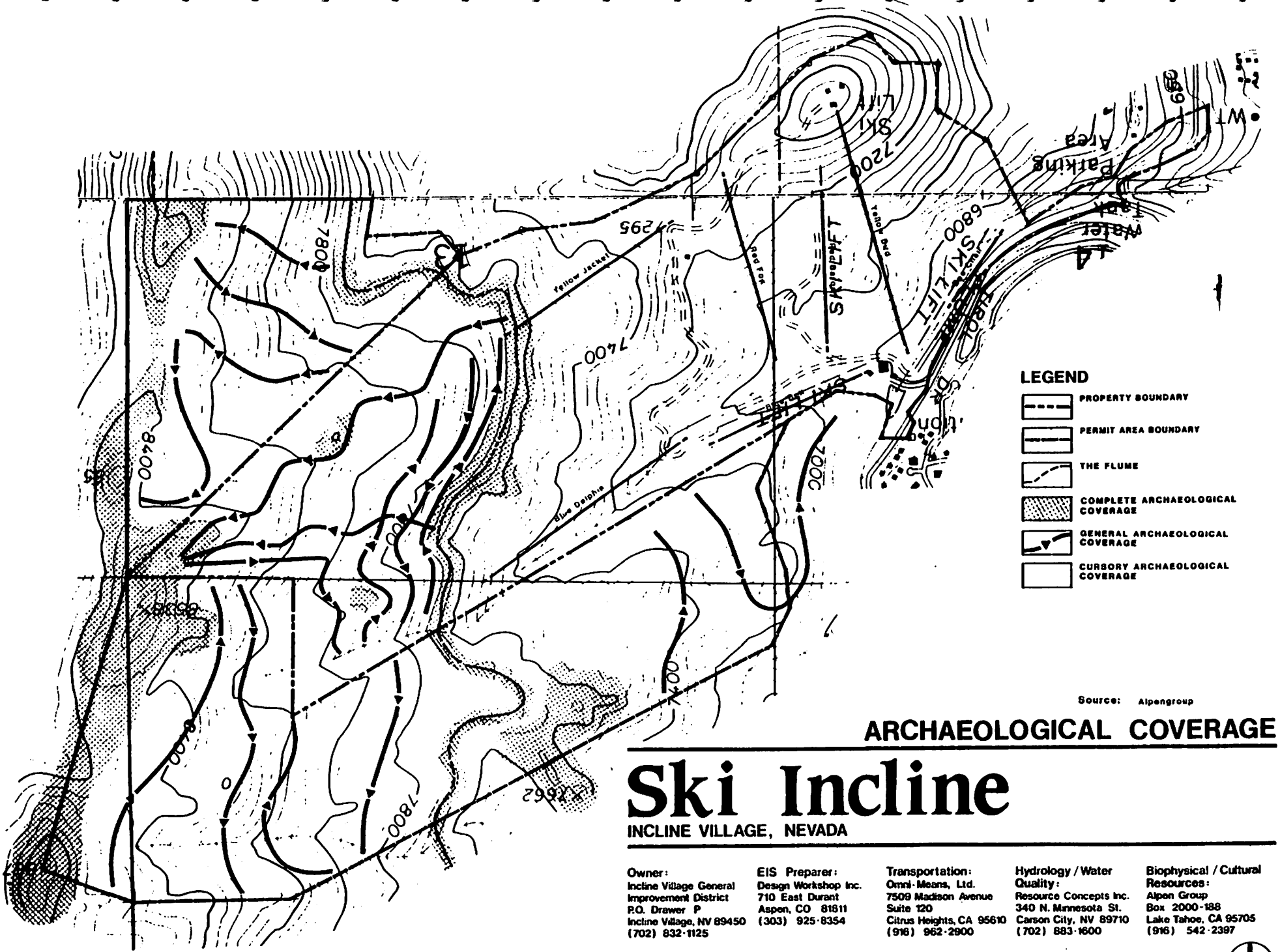
LEGEND
PROPERTY BOUNDARY
PERMIT AREA BOUNDARY
THE FLUME
COMPLETE ARCHAEOLOGICAL COVERAGE
GENERAL ARCHAEOLOGICAL COVERAGE
CURSORY ARCHAEOLOGICAL COVERAGE
Source: Alpengroup
ARCHAEOLOGICAL COVERAGE
Ski Incline
INCLINE VILLAGE, NEVADA
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(916) 542-2397
Environmental Impact Statement
Fig. 4.11.8
Scale
Date 8-1-86
400 200 0 400 800

Isolated Find #1: High-Cut Stumps

Several high-cut stumps were noted, especially along the drier ridges in the southern portion of the project area, which currently support sparce stands of Jeffrey pine. No high cut stamps were observed on north-facing slopes which currently support dense (virgin?) stands of red fir. These areas may never have been logged. Strong (1984:3.1) notes: "Only on the inaccessible upper slopes did the original forest, mainly firs, remain untouched by lumbermen."

Very few high-cut stumps were observed in the southern project parcel. The incidence of stumps greatly increased along the ridge between Peak 8538' to Peak 8676'. As this ridge dropped to the west into the mature red fir forest, fewer stumps were noted. Stumps were again encounterd further down the ridge, closer to the ski area. The ridge was historically logged with timber being hauled directly eastward and down to Little Valley. Stands further down the west slope and closer to the mills at Incline were also more easily accessible mid-slope areas within the red fir forest were not logged historically.

Isolated Find #2: Prehistoric Basalt Waste Flake (fine grained with white inclusions).

Thresholds:

In the Environmental Impact Statement for the Environmental Threshold Carring Capacities there is no mention of Cultural Thresholds in the Affected Environment, Section II, or the Alternatives including the Proposed Action, Section III.

However, in the Draft Regional Plan for the Lake Tahoe Basin, Goals and Policy; (June 1986) the following Goals and Policies are listed (p.IV-30).

Goal #1

Identify and preserve sites of historical, cultural and architectural significance within the region.

Policies

Historical or culturally significant landmarks in the Basin shall be identified and protected from indiscriminate damage or alteration.

Sites and structures designated as historically, culturally, or archaeologically significant shall be given special incentives and exemptions to promote the preservation and restoration of such structures and sites.

There is discussion in the mitigation section to promote the preservation of the flume and the recommendations that are consistant with the goals and policies listed.

Impacts:

An evaluation of significance for the flume was based upon the four criteria of eligibility for inclusion on the National Register of Historic Places which are discussed below.

1. This criterion concerns the association of a cultural property with events that have made a significant contribution to the broad patterns of our history. The North Flume was vital to the success of the Comstock mining activities.

2. This criterion of significance is based upon an association between a cultural property and significant historic personalities. The North Flume is associated with significant Comstock era personalities. It was designed by Captain J.B. Overton, Superintendent of the Virginia and Gold Hill Water Company and Manager of the SNWLC. It was a vital link in the logging operations of W.S. Hobart and S.H. Marlette of the SNWLC.

3. The structural features of a cultural property are evaluated in terms of their architectural significance. The North Flume is a potentially significant water supply engineering feature.

4. Each cultural resource is assessed in terms of its historic, social and scientific

values. Historic values are evaluated in terms of National Register criteria 1,2, and 3. Social values are assessed according to the public benefits which may be realized from the study and interpretation of a cultural resource. Scientific significance is commonly perceived in terms of a site's potential to answer regional research questions. Two important elements of this criterion involve: (a) a consideration of the redundancy of the data contained within the site so that its type and content may be evaluated against the type and content of other sites within the region in order to determine its degree of relative uniqueness; and (b) an evaluation of the integrity of the site which is based upon the degree of disturbance to the surface and buried archaeological deposits. With regards to site redundancy, the North Flume is one of several flumes that once formed an elaborate network to move water and lumber out of the Tahoe Basin and into the Comstock region. The status, location, integrity, and cultural associations of other flumes in the area have not yet been fully evaluated. Therefore, the absence of an adequate data base representing this type of historic feature argues for its potential significance. Further study may provide information about this particular type of site within the region. The physical integrity of the North Flume is moderately intact. It has collapsed but all of its basic components are present.

The North Flume appears to meet criteria 1,2,3 and 4 and may be potentially eligible for inclusion in the National Register of Historic Places. Site #2 meets criterion #4 and may also be potentially eligible to the National Register. Further study is necessary to make this determination.

None of the isolated features possess a level of significance which would qualify them for inclusion in the National Register. The nature and significance of isolated Find #2 is uncertain at this time. Its location outside project boundaries removes it from consideration in this report.

- The proposed access road will have to cross a section of the existing remains of the North Flume at some point. Since such an extensive section of the flume exists on the project site this crossing will not have a major impact on the flume as a whole.

Mitigation:

Pending those recommendations stated below, the project as it is currently proposed will not adversely effect any significant cultural resources.

1. Lift tower locations should be located at a distance away from the flume that will ensure the integrity of the flume during lift construction.

2. Cut timbers should be removed from the ski trails either by aerial logging or during the winter months with an ample protective mantle of snow.

3. If timber must be skidded downslope during summer logging activities and the flume must be crossed, it should be narrowly breached only at a few designated locations. All skid trails should be channeled into a minimum number of flume crossings (no more than 3). Personnel supervising the timber sale should closely monitor any logging activities in the vicinity of the flume to insure that logs are skidded across this linear feature only at designated locations.

4. Any previously unidentified archaelogical remains discovered or exopsed during project operations should be afforded full protection until qualified personnel are able to assess the situation.

5. Winter skiing activities over a protective mantle of snow should not endanger the flume.

6. The incorporation of an interpretive program which reflects the rich historic heritage of the Incline area is highly recommended. Historic exhibits can be attractively and meaningfully displayed in the lodge and other

facilities. Historic places and events can even be reflected in the names of new lifts and ski trails. Ski Incline can set itself apart from other ski areas by capitalizing upon its unique historic circumstances. This will increase the historical awareness of visitors to the ski area and will serve to enhance the economic base of the resort.

It is suggested that where the access road crossing takes place that only as much of the flume that is necessary for crossing be removed and the surrounding portions be protected from degradation with appropriate measures. A suggested method to offset the impacts of the access road crossing is to have the removed section of the flume be added to the interpretive exhibit in the lodge as recommende in mitigation. This would enhance the exhibit and provide for some historical awareness for visitors to the ski area.

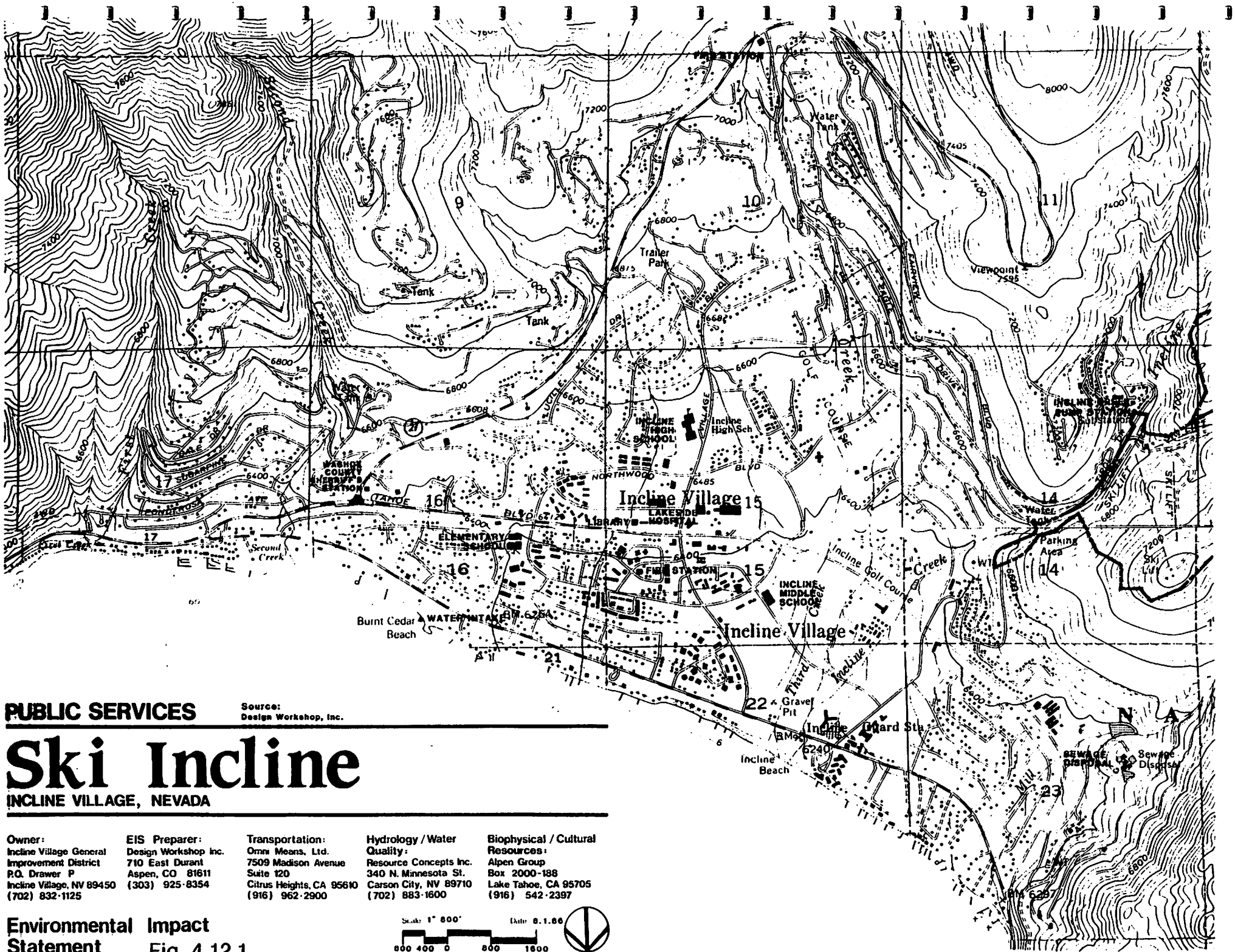
4.12 PUBLIC SERVICES AND UTILITIES

4.12.1 WATER

Setting:

Water service is provided to the project site by the Incline Village General Improvement District. The district's water source is Lake Tahoe and Incline Creek (summer and fall only). The lake water is chlorinated at the pump station, and Incline Creek water chlorinated at the air and water building at Ski Incline. The district is presently using 75% of its available water rights, which are adequate to support a full-time population of approximately 12,000. The water system has been designed to serve as many as 30,000 residents.

The site is served by two 250,000 gallon tanks on the ridge above the existing ski area. These tanks provide water to Tyrolean Village and Ski Incline, including snowmaking activities via 8" and 10" water mains.



PUBLIC SERVICES

Source: Design Workshop, Inc.

Ski Incline

INCLINE VILLAGE, NEVADA

Owner:	EIS Preparer:	Transportation:	Hydrology / Water Quality:	Biophysical / Cultural Resources:
Incline Village General Improvement District P.O. Drawer P Incline Village, NV 89450 (702) 832-1125	Design Workshop Inc. 710 East Durant Aspen, CO 81611 (303) 925-8354	Omni Means, Ltd. 7509 Madison Avenue Suite 120 Citrus Heights, CA 95610 (916) 962-2900	Resource Concepts Inc. 340 N. Minnesota St. Carson City, NV 89710 (702) 883-1600	Alpen Group Box 2000-188 Lake Tahoe, CA 95705 (916) 542-2397

Scale: 1" 800'

800 400 0 800 1600

Date: 8.1.86

Environmental Impact Statement Fig. 4.12.1

Proposed construction includes relocation of existing water lines in the base area to accommodate the new structure and installation of a water main to the new summit lodge which will serve the lodge and future snowmaking system. This line will be installed in an alignment along the Lakeview Trail and would be installed concurrent with construction of the Twin Lakes Lodge.

Impacts:

Under the proposed plan, on peak days the ski area would require a total of 92,500 gallons per day, or roughly 20% of the storage capacity of the two ridge tanks. The ski area will also require approximately 15 million gallons annually for the new snowmaking area, in addition to the current demand of 21 million gallons annually for the existing snowmaking area. Snowmaking generally occurs in the nighttime (low demand) hours. IVGID has indicated that the water demand is within the capacity of the system's lines and tanks serving this area. Installation of the water main to the new summit will require trenching and excavation.

The no action and modernization with no expansion alternates would effect no change on water demand as maximum skier visits and facilities remain the same. The modernization with full expansion alternate would put peak daily demand at 115,000 gallons with approximately 23 million gallons required annually for new snowmaking area, in addition to the current demand of 21 million gallons for the existing snowmaking area. Water demand under this alternate would still be within the capacity of the existing system.

Mitigation:

None required for off-site infrastructure. Revegetation of trenching disturbance will occur as presecribed for revegetation in the soils and water quality sections of this report.

4.12.2 WASTEWATER DISPOSAL

Setting:

Sanitary sewer service is provided by the Incline Village General Improvement District. The

district performs primary and secondary treatment at a facility on Sweetwater Road. After treatment there, solids are hauled away every 4 hours (60-70 cubic yards per day) and the effluent is piped via Spooner Pass to a 900 acre wetlands enhancement project in the Carson Valley. The Incline Village facility presently treats about 1.0 to 1.2 million gallons per day out of an effective capacity of 2.5 million gallons per day, and it is designed to serve Incline Village at 100% buildout. Present service does include the Crystal Bay Improvement District.

From Ski Incline sewage runs by gravity through a 10" line which runs down Ski Way to the treatment facility. A new main will be installed from the new summit on an alignment along the Ridge Chair.

Impact:

Under the proposed plan, on peak days the ski area would be producing approximately 92,500 gallons of sewage. IVGID has indicated that this amount is within the capacity of the existing collection lines, assuming full buildout of the Tyrolean Village subdivision as well.

The total gallonage represents only 3 1/2% of the toal system capacity. The district has advised that they are presently planning to upgrade the treatment system to provide a better degree of treatment.

The no action and modernization without expansion alternates would effect no change on sewage production or treatment as maximum skier visits and facilities remain the same. The modernization with full expansion alternate would result in a total of 115,000 gallons of sewage per day.

The sewer main from the new summit will be built concurrent with Summit Lodge construction and will require trenching and excavation.

Mitigation:

In light of the anticipated treatment facility improvements and the capacity of the existing lines serving the Ski Incline area, no mitigation of off-site infrastructure is required.

Revegetation of trenching disturbance will occur as prescribed for revegetation in the soils and water quality sections of this report.

4.12.3 REFUSE DISPOSAL

Setting:

The site is currently served by Independent Sanitation Service of Incline Village who performs the direct collection of refuse from one 4 and one 5 yard dumpster on a call-in basis, generally once per week. The refuse is turned over to Disposal Services of Reno, who in turn delivers the refuse to the Carson City Sanitary landfill, operated by Capital Sanitation on Carson City owned land. The landfill has a projected exhaustion date of 2001 assuming annual growth rate in refuse quantity. Capital Sanitation also owns two landfill sites in the Reno area with much later exhaustion dates.

Impact:

With the increase in skier capacity of 900 under the proposed plan, refuse production can be expected to increase by approximately 30%. The direct impacts of this growth might be seen in added dumpster locations or increased pick-up services. The impact on the landfill will be negligible as it is designed to accommodate increasing quantities of refuse to the planned exhaustion date.

The no action and modernization without expansion alternates will effect no change on current refuse production or disposal. The modernization and full expansion alternate would increase refuse production by approximately 60% based on an expanded capacity of 1800 skiers.

Mitigation:

Increase dumpster locations or increase pick up frequency to accommodate increased refuse production., for both the proposed plan and the full expansion alternate.

4.12.4 LAW ENFORCEMENT

Setting:

Police protection is provided by the Washoe County Sheriff's Office. The Incline substation is located approximately 3 miles from Ski Incline at the foot to Route 431, the Mt. Rose Highway, 1/2 block from State Route 28. The substation is staffed by 22 officers: 2 detectives, 1 lieutenant, 3 sergeants and 16 deputies; and 7 civilians. Emergency 911 service is available.

Impacts:

The primary though infrequent role of law enforcement at Ski Incline has historically been one of traffic control. While the proposed plan anticipates an increased skier population, the improvements to facilities such as parking, circulation and transit systems should reduce the need for police management of traffic situations. The no action and modernization without expansion will not change law enforcement responsibilities as they do not expand the skier capacity or incorporate base area improvements. The modernization and maximum expansion alternate should also reduce this need for services due to base area improvements.

Mitigation:

None required.

4.12.5 FIRE PROTECTION

Setting:

The project site is in the North Lake Tahoe Fire Protection District and serviced by the Crystal Bay Fire Department District 3, which has 54 firemen over 3 stations. There are 3 work shifts and each shift is staffed by 12 firemen.

The stations and their equipment are as follows: the main station is in Incline Village at Tanager and Oriole. Equipment here includes a pumper truck, a brush truck, 2 ambulances, 1 rescue vehicle, and 2 backup pumpers. The second station in Incline Village is at the Mt. Rose Highway and

Country Club Drive and has a pumper truck and a brush truck. The third station is in Crystal Bay and also has a pumper truck and a brush truck.

Response time to Ski Incline is approximately 1 minute and 45 seconds from the Tanager/Oriole Station. The present facilities at the Ski Incline site have an early warning system (operating 24 hour per day), sprinklers and an increasing alarm capability. The water system for fire protection has a pressure head of 250 psi.

Impacts:

Under the proposed plan and alternate 3 site access and fire fighting ability will be improved. As the proposed structures are of heights common to the area, new equipment should not be necessary, and current staffing will be adequate. The alternatives 1 and 2 will have no impact because of the lack of changes to the base area facilities and mountain capacity.

The extension of the access road to the new summit site will considerably improve fire fighting capabilities in the basin ridge ar[illegible] adjacent forested lands.

Mitigation:

None required.

4.12.6 MEDICAL SERVICES

Setting:

Lakeside Community Hospital in Incline Village provides the medical services to the immediate area. The hospital is an acute care facility with 29 beds. It has a total staff of 64-74 persons including 13 active staff doctors (2 orthopedic surgeons), 28 courtesy staff doctors and 35 nurses. Their peak occupancy season is winter and they are typically below full bed use.

Impacts:

As the skiing activity is an expansion of existing activities, no new services are required. Current emergency and surgery services provided by the

fire department and hospital are adequate. The ski area expansion is likely to generate more orthopedic injuries, some of which can be served at Lakeside, while others will choose to return to their homes for treatment.

Mitigation:

None required.

4.12.7 SCHOOLS

Setting:

The site lies within the Washoe County School District. Three schools serve this area. They are listed below with their current enrollments and total student capacities.

	Current	% Capacity	Total Capacity
Incline Elementary	474	80	592
Incline Middle	260	50	518
Incline High	332	63	531

Impacts:

The proposed plan indicates that an increase of 17 residents can be expected. Based on a rate established for this CDP in the 1980 census, 20% of these residents (3) can be expected to be enrolled students. Based on the unused student capacity throughout the shool system, these students should not impact the schools' infrastructure. Assuming diffusion of these students throughout K-12, there should be no noticeable impact on the student/teacher ratio. The no action and modernization alternates will have no impact on schools as they provide no population change. The modernization with full expansion alternate will provide 4 additional students with no impacts as described for the proposed plan.

Mitigation:

None required.

4.12.8 ELECTRICITY

Setting:

Electrical service is provided by Sierra Pacific Power Company. Power comes by two routes. The first, to the existing summit (Snowflake Lodge) and ski terrain area is served by line no. 43 from the Incline sub-station on Sweetwater Road. This sub-station is serviced by the #123 line from the Brunswick substation. The no. 43 line has a power output/capacity of 14.4 kv. The second service is to the base area via an overhead line coming from Fairview Blvd., through the Bitterbrush project to the Ski Incline Day Lodge. At this point, the line has available 14.4 kv and it continues beyond the ski base to serve the Tyrolean Village Subdivision. The two services at Ski Incline are connected between the lodge and ski lifts.

Impacts:

Sierra Pacific Power Company has indicated that all lines and equipment in place are adequate to accommodate the base and ski area improvements under the proposed plan and all alternates.

Mitigations:

None required.

4.12.9 NATURAL GAS

Setting:

Natural gas service in Incline Village is supplied by the Southwest Gas Corporation. Pressurized main service comes from South of the village along on Route 28 in an 8" steel high pressure line at approximately 225 lbs. This line has a pressure capacity of 400 lbs. and the system is capable of serving considerable projects beyond Incline Village. The Ski Incline site is served by a 4" steel high pressure line.

Impacts:

The proposed plan should result in increased gas usage to provide heat and hot water for expanded

base and mountain facilities, and to prepare meals for additional skiers. Southwest Gas has indicated that there is adequate capacity in the lines for the added consumption. In the event of a cumulative increase in consumption with this and other properties, pressures (and quantities) can be increased in the present lines, but might possibly require upgrading of some valves.

The no action and modernization without expansion alternates will have no impact as the base facilities remain the same. The modernization and full expansion alternate would result in increased gas consumption within the capacity of the system.

Mitigation:

None required.

4.12.10 TELEPHONE

Setting:

Ski Incline is served by an aerial cable which runs along and parallel to Ski Way. From this cable, a 100 pair subgrade line goes into the lodge which serves as the center for all other phone lines on site.

Impacts:

Nevada Bell has indicated that unless development exceeds 100 phone lines, there is adequate capacity to serve the proposed project. There will be no impact on telephone services or infrastructure under the proposed plan or alternatives as no scenario should require more than 100 telephone lines. Any improvements or changes to the system within Ski Incline will be owned and maintained by Ski Incline due to telephone deregulation guidelines.

Mitigation:

None required.

4.13 ENERGY

Setting:

New building construction and renovation of existing buildings in Incline Village is regulated by the Washoe County Building Department, Incline Village branch. They apply energy standards prepared by the State of Nevada, Office of Community Services, Energy Conservation Standards for New Building Construction, dated May 23, 1985. It is the purpose of this document "to provide standards for the design of buildings, and requirements for construction which will promote efficient use of energy." The TRPA Regional Plan policies encourage the use of state standards.

Impacts:

Proposed structures and renovations will consume more total energy than is currently used, but will do so in an efficient manner in keeping with contemporary regulations.

Mitigation:

As required by law, all new structures and renovation must be designed to meet the above described standards.

4.14 RECREATION

Setting:

Incline Village, like the Lake Tahoe Basin, offers a great variety of seasonal recreation opportunities. IVGID provides opportunity in the summer for golfing, tennis, beach and lake access, swimming pool, and natural areas. In addition to Ski Incline, winter recreation opportunities include basketball, jazzercize, karate and others. On the ski area and expansion site, winter activity is limited to downhill skiing in the improved area. There may be some immeasurable passive or cross country skiing use.

The TRPA policy on recreation encourages maximization of the basins potential for

recreational use. The Feasibility Study conducted to examine alternatives for Ski Incline improvements shows that better, econimically sound improvements are necessary for viability of the ski area. The proposed plan would not encourage new uses in the expansion terrain except for downhill skiing on managed runs. Summer use would continue to be limited to passive recreation.

Impacts:

The proposed project will improve the skiing experience at the ski area and will have no impact on the passive uses of the site or activities in the village. The no improvment alternate as well as the expansion alternates will also have no impact.

Mitigation:

None required.

5.0 SUMMARY OF SIGNIFICANT IMPACTS OF THE PROJECT

Soils The process of logging the trees and extending the access road and the consequent loss of cover from the ski trail could increase the incidence of erosion.

Visual Resources Based on the evaluation criteria used in the 1983 Scenic Resources Evaluation, the proposed ski trails have the potential to enhance the visual interest of the coniferous forest. However, the proposed ski trails and access road could also be detrimental to views if not properly designed.

Noise Current and worst case project CNEL noise levels for the traffic intersections studied exceed the thresholds for residential areas.

Transportation The project as proposed would have a net reduction of 7572 VMT.

Flora Removal of the overstory plants will increase the production of ground cover plants. This should provide for diversity of species for both flora and fauna. Ski trails will also provide a fire break.

Fauna Greater fawning and feeding habitats will be provided for the deer herds.

Fire Protection The extension of the access road to the new summit will improve fire fighting capabilities to the basin ridge and adjacent forested areas.

Water Quality The construction of trails will increase erosion and sedimentation. Added impervious surfaces will increase runoff. Construction of the access road will intercept existing drainages and will contribute to sediment erosion and deposition. Installation of the snowmaking system will increase surface flows and subsequent erosion.

Stream Environment Zone 1.0 acres of SEZ will be contained in a 40" CMP and backfilled, and 1.6 acres will be altered by a perforated 40" half CMP with boulder backfill. Temporary sediment deposition will occur without mitigation; there are no longterm impacts anticipated.

6.0 SUMMARY OF PROPOSED MITIGATION MEASURES

Soils

1. Utilize oversnow or helicopter logging techniques where access cannot be gained from the access road or in areas of steep slopes.
2. Utilize a helicopter to install lift towers where access cannot be gained from the access road or in areas of steep slopes.
3. Retain natural ground covers and root systems of the logged trees.
4. Restrict ski trail grading (not including spot grading and blasting of rock outcroppings) to slopes where snowmaking systems will be installed.
5. Reseed all disturbed slopes with a seed mulch and install temporary irrigation if it is needed.

Visual Resources

1. Provide gladed ski runs vs. open ski runs.
2. Leave large tree islands in ski runs.
3. Create natural appeaing edges along both ski runs and lift lines.
4. Utilize colors for all structures which will blend with the natural environment.
5. Locate road to avoid steep cross slopes and minimize and stabilize slopes.

Noise

1. Tour bus activity should be staggered to spread arrivals/departures over a two hour period.

Fisheries

1. Construct a fish ladder at the culvert outlet under Fairview Blvd.

Water Quality

1. Develop a Plan of Construction describing methods and techniques of construction activity.
2. Install temporary and permanent erosion control measures, as well as temporary irrigation for revegetation.
3. Install measures to intercept surface or ground water flows.

4. Develop an Operations and Maintainence Manual for erosion control features.
5. Replace permanently disturbed lands in capability classes 1-3 in an amount 1.5 times that disturbed.
6. Continue a water quality monitoring program.
7. Stabilize roadway sideslopes and install drainage facilities to avoid erosion.
8. Revegetate disturbed areas with suggested seed mix.
9. Stabilize existing vertical embankments.

Stream Environment Zone

1. The Plan of Construction noted above will have specific recommendations including limits of heavy equipment use, temporary piping, vegetation removal and temporary erosion control.
2. Revegetate SEZ and immediate upland area disturbed by construction.
3. Restore a SEZ in the amount of 1.5 times the SEZ disturbed.
4. The Operations and Maintenance Manual noted above will have specific recommendations on the SEZ improvements.

7.0 RELATED CONCERNS

7.1 GROWTH INDUCING IMPACTS

The expansion of Ski Incline does not in itself constitute a growth inducing impact. The plan does not contain within it proposals to expand the permanent, residential or lodging base of the community. The marketing plan for the ski area is aimed at taking advantage of unused ski capacity during weekdays and to redistribute skier visitation more evenly throughout the week.

With no expansion of day skier parking, additional growth of the ski resort will be realized, from a transportation standpoint, by use of transit vehicles and expanded public transportation system. This in combination with marketing strategies to ski group charters will maintain current levels of private vehicular activity traveling to and from the ski area.

The project will be developed consistent with the regional land use plan proposed for the Tahoe Basin with specific criteria as enumerated in the plan area statement for Ski Incline. The expansion of daily capacity (PAOT) of 900 is consistent with the draft regional plan and plan area statement and therefore does not represent growth beyond that which is planned for the Basin.

7.2 CUMULATIVE IMPACTS

The development of the proposed project will contribute incrementally to cumulative impacts in the vicinity. Some of these areas include increased transit vehicle traffic, increased surface coverage, and increased noise due to expanded snowmaking operation. In addition, due to expanded skier visits and skier attendance at Ski Incline, business activity in Incline Village will likely experience growth in retail sales. This growth in commercial activity constitutes the only likely foreseeable secondary impact to be created from the project. Direct increases in employment with associated demand for housing and services will be negligible as disclosed in housing and population portions of this document.

It is unlikely that increased commercial activity in Incline Village will create demand for substantially expanded commercial facilities but rather will create a level of demand that can be accommodated within the existing range of commercial and retail services currently available in the community.

7.3 SHORT TERM VS. LONG TERM PRODUCTIVITY

The construction of the proposed project will create short term impacts in the areas of noise and water quality due to construction. However the long term utilization of the site will yield social, economic and environmental benefits. Improvement of Ski Incline facilities will provide a better recreational experience for both local and destination resort skiers through

expanded and balanced terrain as well as improved skier services. The local economy should be aided by expanded use of business by increase skier visits. Expanded facilities will place Ski Incline on a profitable operating basis over the long term, and physical expansion of the resort will create the economic capability to cure existing problems associated with water quality and revegetation. The redevelopment of the Ski Incline base area will create a more attractive environment through the use of native and adaptive landscape materials to aid in visually integrating Ski Incline with the surrounding forested land. Reductions in Basin VMT should have positive impacts on traffic conditions and no negative impact on air quality.

The development of the project will create a more viable opportunity for active recreation. The short term costs of increased noise and traffic will be offset by the long term improvements in the recreational quality of the area.

7.4 POTENTIALLY IRREVERSIBLE ENVIRONMENTAL CHANGES

There will be no irreversible significant environmental changes as a result of implementing the project if the recommended mitigation measures are properly implemented.

8.0 PROJECT COMPATIBILITY WITH FEDERAL, STATE, REGIONAL AND LOCAL PLANS

The following agencies and regulatory plans apply to the Ski Incline site permit area. In each case, the proposed plan complies with adopted regulations or draft regulations under review.

United States Forest Service:

The project site is in the Lake Tahoe Basin Management Unit, Mt. Rose Management Area. The applicable management plan is draft Land and Resource Management Plan. The draft revisions would accommodate the proposed plan by revising the Mt. Rose Management Area to include 292 acres of land prescribed for alpine skiing adjacent to the existing ski area.

Washoe County:

The project site is in the Tahoe Plan area as described in the Master Plan for Washoe County, Nevada. The applicable plan is the Tahoe Area Plan, Policies and Issues, dated May, 1985, prepared by the Department of Comprehensive Planning. While much of the control for land use issues is based upon TRPA regulations, the proposed project does meet presently applicable county policy and action plans. Policies affecting and addressed by this plan are primarily in the

areas of erosion control, land capability, transit system and recreation.

Tahoe Regional Planning Agency:

The project site comprises Planning Area 052 of the Regional Plan for the Lake Tahoe Basin, parts I and II. The planning issues addressed for this site pertain to Land Use, Transportation, Conservation, Recreation and Public Services. The proposed plan meets current and draft goals and policies as described in the Planned Area Statement. This planning statement describes the planned land use management strategy of mitigation. The planning statement allows for continued downhill skiing opportunities with mitigation measures for erosion control and vegetation loss. The draft planned area statement provides for an additional 900 PAOT.

The proposed plan conforms to the goals and policies of the Draft Regional Plan in regard to a disturbance in a Stream Environment Zone. As noted in Section IV, Subelement Stream Environment Zone, Policy 5A of the proposed Draft Regional Plan, the construction of Trail #1 is a permissible use in a stream environment zone because it meets the six conditions in a manner are set forth below:

1. The project is a necessary part of IVGID's long range plan for public recreation. The IVGID Board of Trustees have adopted the proposed plan as the master plan for the Ski Incline General Policy, adopted by the IVGID Board July 26, 1984.
2. The project is consistent with the recreation element of the TRPA Regional Plan as well as the Forest Service Plan.
3. The project by its very nature must be sited according to the natural fall line. This put the ski run in conflict with the stream environment zone.
4. There is no feasible alternative which would reduce the extent of encroachment in the stream environment zone. The natural lines for skiing occur over the SEZ. To move the ski run out of the SEZ would require massive regrading to correct the fall lines. This action would cause extensive environmental degradation. The mitigations as proposed are necessary to insure a snow cover on the ski run as an open stream channel would cause unskiable terrain (water presence) and present hazards to skiers. To leave slope and SEZ conditions as is would result in unskiable sideslope conditions which would dictate elimination of the entire trail, resulting in a lack of balance in provided ski terrain. To eliminate this ski run would make the project unviable.

5. The impacts are being fully mitigated. The proposed mitigations will not cause any degradation to water quality. They will not cause disruption of natural stream flows and, in a majority of the stream environment zone, the root systems of native vegetation will be left intact. The proposed modification and mitigations have been submitted for review to the U.S. Army of Corps of Engineers and approval of an application for permit is pending.

6. As part of the mitigations, Stream Environment Zone lands will be restored in the amount of 1.5 times the area of Stream Environment Zone land to be disturbed. IVGID will work with the State Department of Transportation and the Nevada Department of Fish and Game to construct a fish ladder at the outlet of the culvert under Fairview Blvd. and restore the SEZ at and below this location.

The proposed plan also conforms to the goals and policies of the Draft Regional Plan in regard to disturbance in land capability districts 1-3 as described in Section IV, Subelement Soils, Policy 2B. This proposal is a necessary part of the long range plan for recreation opportunities and is consistent with the recreation element of the plan by providng a high quality recreation opportunity, by improvements to

the local transit system, and by expansion of the ski area in an appropriate context of lodging services and infrastructure. The proposal, as an expansion of an existing ski area, must be located in land capbility districts 1 and 2, and there is no practical or feasible alternative to this expansion site. All land capability associated impacts as disclosed in this EIS will be mitigated.

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