Appendix A:
Biological Resources Report Addendum

Biological Report for
Vesting Tentative Parcel Map/Use Permit 10-001
Town of Mammoth Lakes, California

Addendum
January 11, 2011

Prepared For:
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Prepared By:
Resource Concepts, Inc.
340 N Minnesota Street
Carson City, NV 89703

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340 N Minnesota Street
Carson City, NV 89703
www.rci-nv.com

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INTRODUCTION

This Addendum provides supplemental information on Great Grey Owl *(Strix nebulosa*) and Northern Goshawk (*Accipiter gentilis*) for the Resource Concepts, Inc. (RCI) report dated October 6, 2010 entitled *Biological Report for Vesting Tentative Parcel Map/Use Permit 10-001, (VTPM/UPA) in the Town of Mammoth Lakes, California,* and incorporates information provided by the California Department of Fish and Game (CDFG) in a letter to the Town of Mammoth Lakes (ToML) dated December 10, 2010.

SUMMARY OF PREVIOUS FINDINGS

A detailed review of habitat requirements for each of the special status species currently known to occur within the vicinity of the VTPM/UPA Project Area, consultation with the US Fish and Wildlife Service and CDFG, and a site reconnaissance by two qualified RCI biologists were used to determined that the proposed action is not likely to affect the following sensitive wildlife species.

Northern goshawk	*Accipiter gentilis*	CA Species of Special Concern
Habitat: *Accipiter gentilis* habitat consists of older-age mixed coniferous and deciduous forests. Large trees are required for nesting. Closed canopy of greater than 40 percent is necessary for protection and thermal cover, and forest openings are required for maneuverability below the canopy. Nests are usually on north slopes, near water, in red fir, lodgepole pine, Jeffery pine, or aspen. There is no potential nesting habitat for goshawks with the project area. There is no mixed coniferous forest or deciduous forest within the proposed project area that offers suitable nesting or foraging habitat. There is potential habitat for northern goshawk in nearby forest habitat and the proposed project area could occasionally be flown over while foraging. Northern goshawk may occasionally fly over the proposed project area from nearby forested areas.		
Great gray owl	*Strix nebulosa*	CA Endangered
Habitat: *Strix nebulos*a occur in dense mixed conifer and red fir stands bordering meadows. Foraging habitat generally includes open grassy areas such as bogs or selective clear-cuts. Primary prey species are small mammals such as voles, gophers, shrews, mice, chipmunks, and frogs. In the Sierra Nevada Range, great gray owls are found in the subalpine and montane forest zones. Great gray owls have been reported to be both nonmigratory and nomadic. Movements are influenced by prey availability. In high snow environments, owls may disperse to lower elevations. Nest sites include old hawk and raven stick-built nests, depressions on broken-topped snags and stumps, or dwarf-mistletoe platforms. There is no potential nesting or foraging habitat for great gray owl within the proposed project area. There are no mixed conifer or red fir stands bordering meadows that would provide suitable nesting or foraging habitat. There is potential habitat for great gray owl in nearby forest habitat and great gray owl could occasionally fly over the proposed project area while foraging. However, the dense manzanita/ chaparral is not conducive for aerial hunting and catching prey.		

ADDITIONAL INFORMATION FROM CDFG LETTER TO ToML DECEMBER 10, 2010

Northern Goshawk

Northern goshawk is known to occur in the vicinity of the project site (California Natural Diversity Database) and has been observed nesting on nearby by Valentine Reserve. Goshawks are known to reuse nest sites or make new nests nearby old ones, so it is likely that goshawks continue to utilize the area.

Goshawks have a home range extending no less than seven (7) miles from nest sites and are considered 'habitat generalists' in regard to foraging. Goshawks hunt and take prey on the ground, on vegetation, and in the air and their prey include species such as ground squirrel, rabbit, songbird, and grouse that can be found in non-forested habitats.[1] Project site photographs depict forest edge/non-forested foraging habitat for goshawk. Generally, the Mammoth Lakes area provides foraging habitat for goshawks. (Photographs are included in Attachment 'A'.)

Great Gray Owl

Great gray owl is known to occur in the vicinity of the project site (California Natural Diversity Database – 1975 sighting in Valentine Camp). Great gray owl is also a forest dependent nester, but utilizes forest edge and open habitats for foraging and often perches on lone trees, fence posts and poles. In the southern part of its range, great gray owl primarily hunts vole and gopher[2], but they also hunt squirrel, rabbit, mice, rats, shrew, and sometimes birds (crow, ducks, grouse). These prey species are found in open areas (forest clearings) with scattered trees and shrubs used for perching[3].

HABITAT AVAILABILITY

Available foraging habitat for both the northern goshawk and the great gray owl is abundantly available throughout large tracts of adjacent and nearby forested lands managed by the US Forest Service and the National Park Service including:

US Forest Service	John Muir Wilderness	650,734 acres
National Park Service	Yosemite Wilderness	704,624 acres
US Forest Service	Owens River Headwater Wilderness	14,721 acres
US Forest Service and National Park Service	Ansel Adams Wilderness	231,533 acres

[1] McGrath, M.T., etal. 2003. Spatially explicit influences on Northern Goshawk nesting habitat in the interior Pacific Northwest. Wildlife Monographs 154:1-63.

[2] McGrath, Bull, E.L., M.G. Henjum and R.S. Roshweder. 1989. Diet and optimal foraging of Great Gray Owls. J. Wildlife Management Vol.53, No.1.

[3] Bull, E.L. and M.G. Henjum. 1990. Ecology of the Great Gray Owl. Gen. Unites States Dept of Agriculture Forest Service Pacific Northwest Research Station, Portland, Oregon, Technical Report PNW-GTR-265:1-63.

More than 1.6 Million acres characterized with forested ridges and wet meadow habitat in the Sierra Nevada around the Town of Mammoth Lakes support viable populations of small mammals and birds that contribute to the survival of northern goshawk and great gray owl. The Wilderness designation of these lands assures that these vast areas remain undeveloped and largely inaccessible to human disturbance.

MITIGATION MEASURES FOR BIOLOGICAL RESOURCES

The ToML identified the following measures in the Initial Study/Mitigated Negative Declaration (November 2010) that will mitigate impacts to great gray owl and northern goshawk. (Note that the dates in BIO-8 have been adjusted to be more suitable for great gray owl nesting and fledglings.)

BIO-2: All newly disturbed areas shall be immediately revegetated, preferably with native plant materials, to minimize loss of wildlife habitat and to reduce weed species invasion.

BIO-4: In accordance with Municipal Code Section 12.08.090, during construction, dust controls shall be instituted to reduce wildlife impacts. Such controls are to include watering and mulching of disturbed areas; initiation of revegetation efforts shall commence as soon as practical after construction.

BIO-5: Night lighting shall be limited in both amount and intensity of fixtures to a level adequate for safety purposes, so as to reduce impacts to nocturnal wildlife species, particularly mule deer.

BIO-6: Dogs shall not be permitted to roam freely; dogs, including during the construction phase, must be on a leash or within an enclosure.

BIO-7: To reduce the spread of insect pests, trees and other large plants in close proximity to construction sites shall be protected by erecting barriers (e.g. plastic flagging) to avoid root, stem, or trunk damage.

BIO-8: To reduce impacts on mule deer, great gray owl, and northern goshawk construction activities shall be scheduled to minimize disturbance to migratory deer and nesting/fledgling raptors during the spring and fall migration/holding periods. Major construction activities (e.g. earthmoving, paving, extensive exterior building work, etc.) shall be scheduled between November 1 – April 1 and August 1 – October 1.

BIO-11: Disturbance of habitat in the areas adjacent to the development shall be limited to that which is necessary to accomplish necessary work. Limits of disturbance shall be established in accordance with Town engineering standards.

CONCLUSIONS

Northern goshawk and great gray owl would not be directly impacted by the proposed project. The project area does not provide nesting habitat for either raptor. The project area does provide foraging habitat for both species, and indirect impacts from loss of foraging habitat may occur.

The proposed Project Area comprises only 6.3 acres, portions of which will be developed into residential lots surrounded by existing urban development including roads, houses, and a public golf course. Given the regionally abundant suitable habitat for nesting and foraging within the 1.6 million acres of publicly protected wilderness, the proposed VTPM/UPA project may affect but is not likely to adversely affect northern goshawk and great gray owl. Implementation of the mitigation measures will reduce potential local impacts to goshawk and great gray owl to less than significant.

ATTACHMENT 'A'

Photographs of the VTPM/UPA Project Area

VTPM/UPA 10-001 View Looking East from LeVerne St. 8-4-2010

VTPM/UPA 10-001 View Looking South from Tamarack St. 8-4-2010

VTPM/UPA 10-001 View Looking Southwest from Tamarack St. 8-4-2010

Appendix B:
MCWD Board Meeting Agenda Item D-3,
Memo from General Manager Greg Norby

Agenda Item D-3
September 16, 2010

AGENDA ITEM

Subject: Update on Long-Term Access to Various District Facilities in the Mammoth Meadows Area

Information Provided By: Greg Norby

Background:

This staff report provides an update on two related items: the recent efforts to reach an easement agreement through the private parcels which separate the end of Tamarack Street (public right of way) from the nearby USFS-administered federal lands; and, the longer term strategic need for reliable, permitted access to District facilities located on or adjacent to the USFS land. See **Figure 1** for an overview of this area.

District Facilities
The District currently has Well 11, 11M and 12 on USFS lands in this area. Well 10 and 6 are within long term easements located on private Snowcreek Golf Course land. Most of these facilities are 15-20 years old. The District typically accesses these facilities from a mix of easements through Snowcreek V housing, the Snowcreek Golf Course, easements off of Woodcrest, and occasionally using the long established dirt road which routes through the private parcels between the end of Tamarack and the adjoining USFS parcel at the south edge of the private parcels. Standard weekly or monthly access for inspections, water quality sampling, and minor repairs is done with a typical service truck, and walking to the facilities. Major repairs or maintenance, such as pulling a pump or cleaning/inspecting, require a larger private rig, similar to a typical SCE service boom truck. This access has been done, as needed, through the Golf Course for Well 6 and through the dirt road off Tamarack for Well 10, 11/11M, and 12M. Snow depth does influence the choice of access during winter conditions, in addition to the type of work and related equipment.

Plum Parcels Access
The District's use of the dirt road, running through the private parcels owned by the Plum Family and other private parties, came to my attention in the winter of 2008-09. I am not aware of earlier issues related to occasional use of this road for access to the USFS parcel, which likely has occurred since the adjacent District facilities were constructed 15-20 years ago. See **Figure 2** for the area within and adjacent to the private parcels, including existing District easements.

Well 10 failed in the winter of 2008-09, requiring emergency access with a well rig to pull the pump/motor, inspect the casing and bore, clean the casing, and install a new pump and motor. In typical winter conditions, Well 10 can be providing up to 25% of the water supply, through GWTP 1. The dirt road was rutted and some adjacent shrubs disturbed due to plowing of the dirt road and the wet, muddy conditions. Plum notified

the District, upon observing this activity, and requested steps be taken to formalize the use of the dirt road through an easement agreement. The District agreed, and in the Spring 2009 re-graded the dirt road removed the disturbed vegetation from the previous winter's work, and placed a steel post barrier and sign to prevent unauthorized vehicle access.

In the fall of 2009, a letter agreement was reached with Plum to allow use of the dirt road for access to Well 11, to conduct a pump test, cleaning, and inspection of the monitoring well. This was done to determine the feasibility of future development of Well 11 into a production well. Permits from USFS and Lahontan RWQCB were obtained, allowing minor grading on USFS land to avoid deep erosion gullies, and to restore the areas disturbed by the pump test activities. All of this work was completed in the fall of 2009, to the satisfaction and terms of the temporary agreement and the two permits.

During 2010, Plum submitted a Vested Tentative Tract Map application to the Town for the development of five single-family homes, along a new private road extending south from Tamarack Street. **See Figure 3** for the general layout of the development. The District submitted written comments to the Town, in response to their circulation of the draft VTTM. See the attached **Figure 4** copy of the letter, requesting in standard language the separate future recording of necessary easements for the District to provide utility service to the development. The District and Plum continued discussions intermittently during the spring and early summer of 2010, to reach both a short License agreement and long term easement agreement that would formalize use of the dirt road, and establish an easement within the new subdivision's private road when constructed. These discussions concluded recently, and did not result in completing either the short term License or the longer term easement agreement.

Current Status- As of early September, the Planning Commission consideration of the VTTM has been postponed. The District's June 15th requests to the Town for future, separately recorded easements stands, and the expected next step regarding the development is the Town Planning Commission's further consideration of the VTTM application. District staff will not be accessing District facilities through the Plum parcels, unless and until such time as properly permitted access is provided. We will continue to utilize existing easements and access off of Woodman St, the Snowcreek golf course, and Snowcreek V as described above.

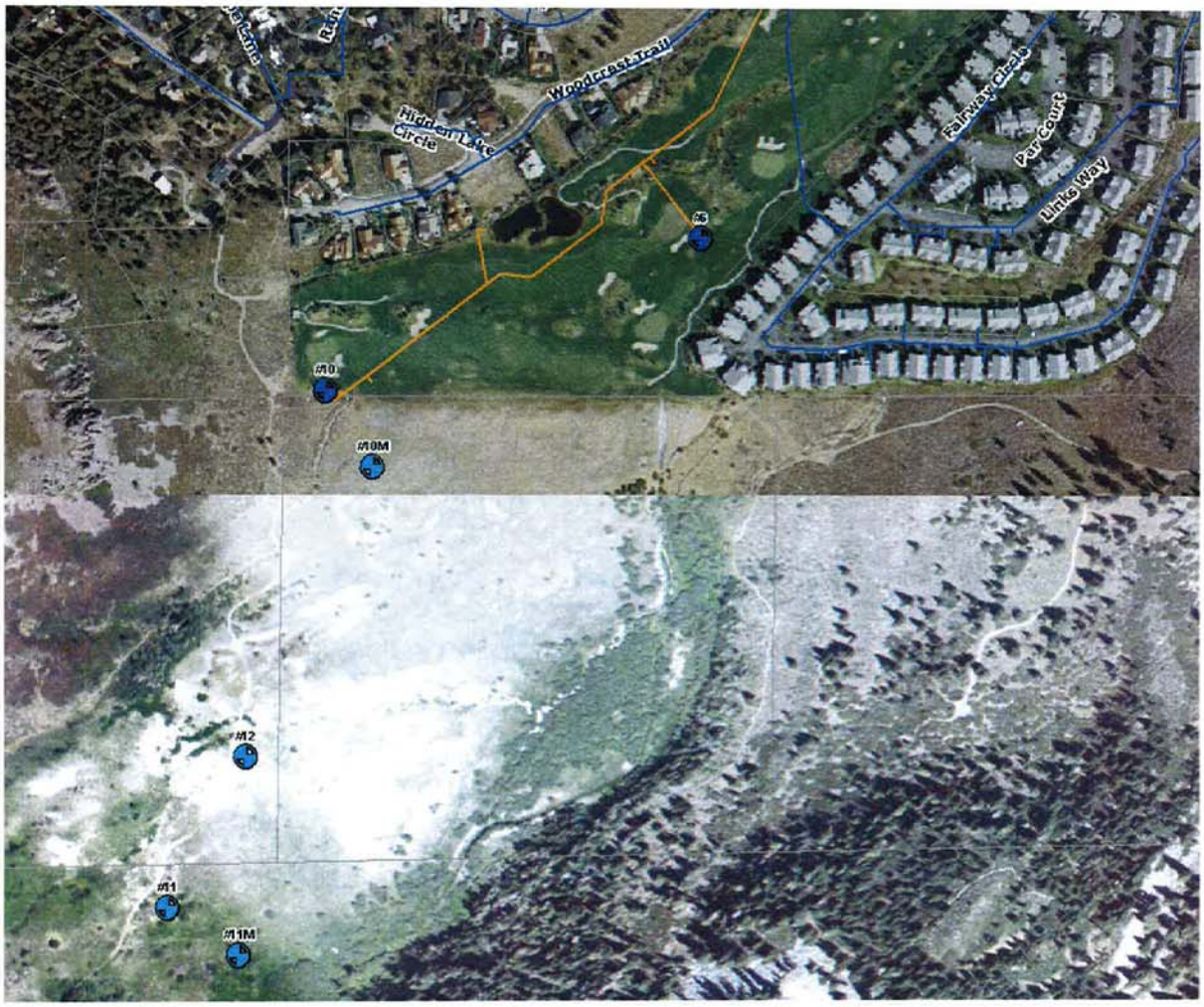
Discussion and Recommendation

The events that have transpired over the last 18 months highlight the need to retain, identify, and secure long term, reliable access to the critical District facilities in this area. The access must be properly permitted, reasonably accessible, and support the range of regular and periodic major maintenance/repair activity. It should also account for long term needs such as potential Well 11 development into a production well. The District's UWMP projections on reliable supply under the various planning scenarios assume these as necessary conditions for relying on the affected groundwater well supplies. Well 6, Well 10, and a future Well 11 represent nearly 50% of the District's existing and projected groundwater supply.

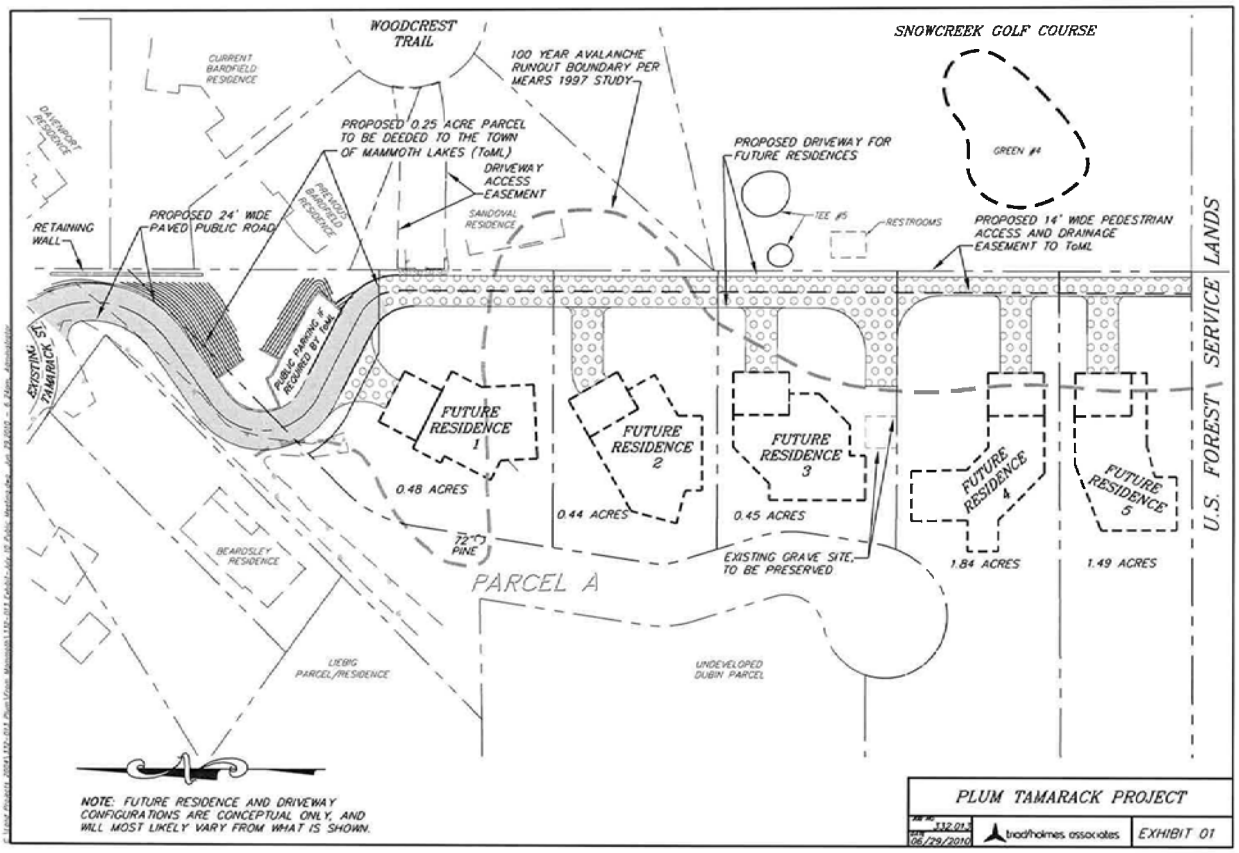
Options for access and easements that can be used in combination to meet the above objectives include the following; existing easements on Woodman, Snowcreek Golf Course, and Snowcreek V parcels; potential future easements under the pending USFS master permit process, with the modified Snowcreek 18 hole golf course, and/or in coordination with the eventual development of the subject private parcels. Related projects that may influence future options include the USFS's Mammoth Meadows restoration project, and the Town/USFS/MLTPA Sherwin Area recreational trail planning process. Cooperative development of a dual use surface, for recreational and service access to the area near Well 11 for example, and designed to enhance the goals of the Mammoth Meadows project, has been discussed informally with these parties. **Figure 5** shows the proposed alignment of a paved, multi-use recreational trail, from the future year-round trailhead at the "gravel pit" site, to the Mammoth Meadows. A similar trail is envisioned to replace the old, eroding dirt road to Well 11 area, first established for timber salvage after the Sherwin avalanche in the 1980s.

Recommendation

Staff recommends that the District continue to explore a range of feasible options for long term access to these facilities. To ensure future flexibility, we should secure proper easements with the USFS under the current master permit process, and in coordination with implementation of the new recreational facilities at the old gravel pit area. The USFS Travel Management Plan's influence of the future status the adjacent dirt roads should also be discussed with USFS. The feasibility of hard surface access for Well 6 and 10 should be explored with Chadmar representatives, as they begin design of any changes to the existing 9-hole golf course area for the long term 18-hole course integration. Finally, when and if the proposed development of the Plum parcels at the end of Tamarack St proceeds, the District should seek standard easements and/or rights-of-way as necessary to provide water and wastewater utility service to the development.


Woodcrest Trail
Hidden Lake Circle
Fairway Circle
Par Court
Links Way
#5
#10
#10M
#12
#1
#1M


12' Water Line and
Well Access Easement
10' Sewer Line Easement
6' Well Access Easement
#10
10' Well Access Easement


WOODCREST TRAIL
SNOWCREEK GOLF COURSE
100 YEAR AVALANCHE RUNOUT BOUNDARY PER MEARS 1997 STUDY
CURRENT BARDFIELD RESIDENCE
DAVENPORT RESIDENCE
PROPOSED 0.25 ACRE PARCEL TO BE DEEDED TO THE TOWN OF MAMMOTH LAKES (ToML)
DRIVEWAY ACCESS EASEMENT
PROPOSED DRIVEWAY FOR FUTURE RESIDENCES
GREEN #4
TEE #5
RESTROOMS
PROPOSED 14' WIDE PEDESTRIAN ACCESS AND DRAINAGE EASEMENT TO ToML
PROPOSED 24' WIDE PAVED PUBLIC ROAD
RETAINING WALL
PROPOSED BARDFIELD RESIDENCE
SANDOVAL RESIDENCE
PUBLIC PARKING IF REQUIRED BY ToML
EXISTING TAMARACK
U.S. FOREST \ SERVICE LANDS
FUTURE RESIDENCE 1
FUTURE RESIDENCE 2
FUTURE RESIDENCE 3
FUTURE RESIDENCE 4
FUTURE RESIDENCE 5
0.48 ACRES
0.44 ACRES
0.45 ACRES
1.84 ACRES
1.49 ACRES
72" PINE
EXISTING GRAVE SITE, TO BE PRESERVED
BEARDSLEY RESIDENCE
PARCEL A
LIEBIG PARCEL/RESIDENCE
UNDEVELOPED DUBIN PARCEL
NOTE: FUTURE RESIDENCE AND DRIVEWAY CONFIGURATIONS ARE CONCEPTUAL ONLY, AND WILL MOST LIKELY VARY FROM WHAT IS SHOWN.
PLUM TAMARACK PROJECT
JOB NO. 332.01.1
DATE 06/29/2010
bradshaimes associates
EXHIBIT 01

Mammoth Community Water District
Post Office Box 597
1315 Meridian Blvd.
Mammoth Lakes, CA 93546
(760) 934-2596

June 15, 2010

VIA E-MAIL
Town of Mammoth Lakes
Community Development Department
Jessica Morriss, Transportation Planner
P.O. Box 1609
Mammoth Lakes, CA 93546

Subject: Comments on the Vesting Tentative Parcel Map 10-001

Dear Ms Morris,

Thank you for the opportunity to comment on the Vesting Tentative Parcel Map 10-001. We appreciate the opportunity to work with the Town to create a sustainable community and submit the following comments. Please call John Pedersen at extension 240 if you have questions regarding the substance of the comments.

Conceptual Site Plan (Sheet 2 of 4)

The Conceptual Site Plan proposes many improvements for the proposed subdivision as well as proposed off-site improvements. The Conceptual Site Plan also shows a number of easements to various entities that will support the creation and operation and maintenance of these improvements. Several of these easements are proposed in favor of Mammoth Community Water District (MCWD) and are "to be created by separate document." MCWD requests that a condition of the Final Map require the easements "in favor of the MCWD to be created by separate document" be recorded concurrently with the Final Vested Parcel Map. MCWD also requests that the alignment of the "proposed 15'- wide waterline easement in favor of MCWD to be created by separate document" be changed to the same alignment of the proposed emergency access easement to the Town of Mammoth Lakes to improve access to the waterline for operation and maintenance.

Conceptual Site Drainage and Utilities (Sheet 3 of 4)

MCWD requests that the proposed waterline alignment be changed to the same alignment of the proposed emergency access easement to the Town of Mammoth Lakes to improve access to the waterline for operation and maintenance. MCWD Construction and Connection Permits shall be applied for with complete engineering drawings to identify the actual improvements to be constructed. MCWD

permits shall be issued prior to the construction of improvements and connection to the MCWD water and wastewater facilities.

Off-Site Improvements- Tamarack Turnouts (Sheet 4 of 4)

A MCWD Construction Permit shall be applied for with complete engineering drawings to identify the actual improvement to be constructed for the proposed new hydrants. A MCWD permit shall be issued prior to the construction of the hydrants and connection to the MCWD water facilities.

Sincerely,

John Pedersen, PE
District Engineer

SHARP
Sherwins Area Recreation Plan
Trails Technical Committee

SHARP TTC: Map ID #S07
S7 Updated Wetland Data
Map Draft Date 08/30/10

Legend

- SHARP Winter Map ID
- SHARP Summer Map ID
- Bridges
- SHARP Proposed Trails
- Existing Use Trails
- INF System Trails
- Ten ft Contours
- Wetlands (USFS 08/24/10)

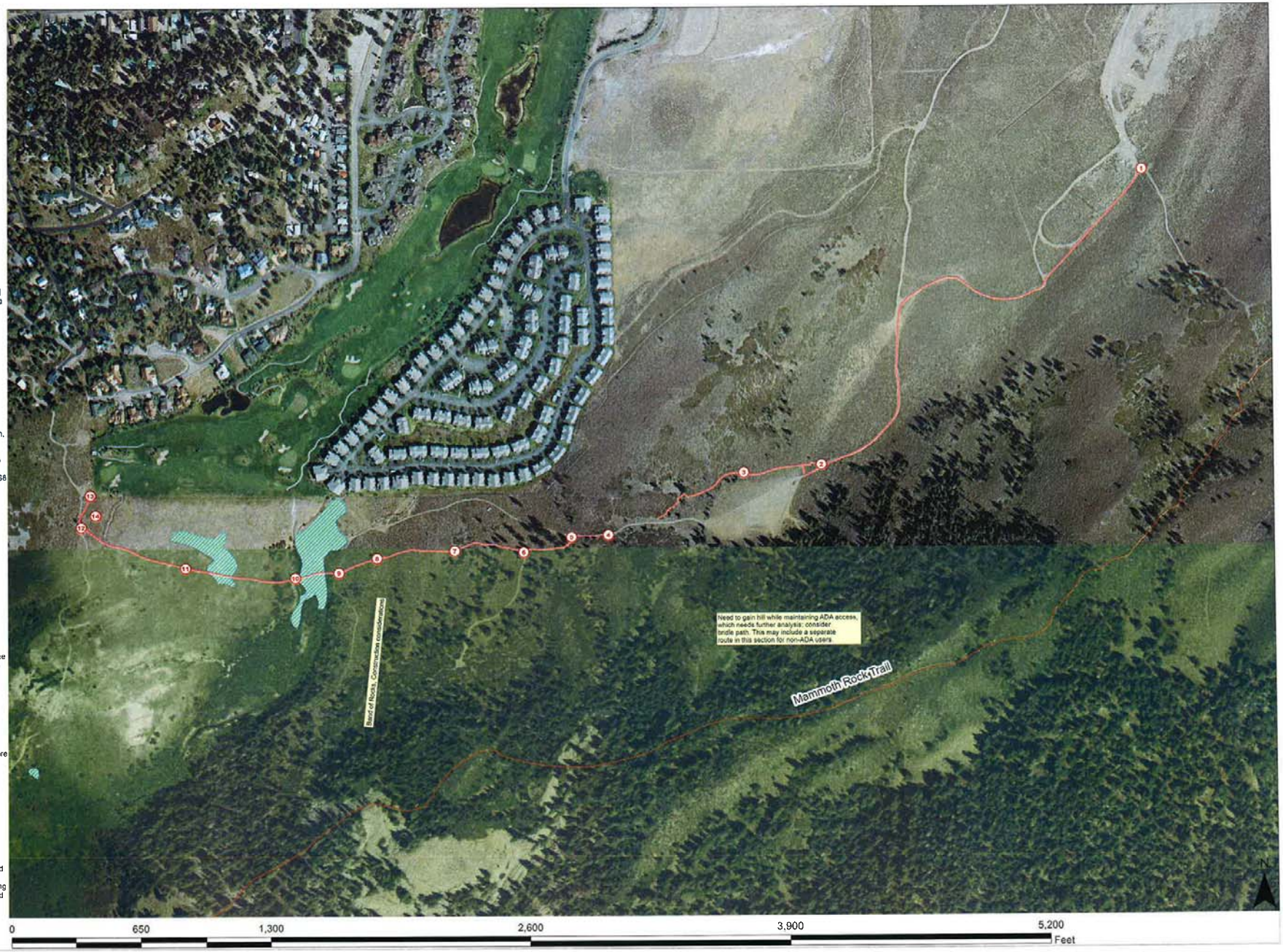
Map ID #87: Non-motorized "backbone" trail connections from the borrow pit staging area to the Tamarack Street trailhead

- Two separate non-motorized routes:
  - Hard-surface or paved trail
    - ADA-accessible
    - Aligned over existing USFS road 4S100 (will require closure to motorized use)
    - Accommodate service- and maintenance-vehicle access to Kerry Meadow
  - Soft-surface trail
    - Aligned over existing trail to the south, near the base of the Sherwins
    - Accommodation of equestrian use (possible equestrian-only bridle path)
    - Also connect into summertime stacked-loop trail system - Map ID #S6
    - Position alignment to avoid possible conflict with golf balls hit from Snowcreek fairway

SHARP TTC

- The primary goal of the Sherwins Area Recreation Plan Trails Technical Committee (SHARP TTC) is to further develop certain recommendations from SHARP (as identified by the Inyo National Forest) into detailed projects that can be submitted to the INF for environmetal review as a step toward possible implementation.
- The SHARP TTC is committed to staying true to the original wording and intent of the SHARP proposals, as crafted by the Sherwins Working Group, and will therefore not revisit or revise any part of any recommendation unless warranted by agency sideboards or other opportunities or constraints as identified by land management agencies such as the INF.
- The SHARP TTC understands that the INF and the Town of Mammoth Lakes (TOML) have made no promises or guarantees of implementation of the group's work.
- This map is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Map Scale= 1:2,400



Appendix C:
Public Works Substandard Streets Policy
and Approving Resolution

POLICY FOR DEVELOPMENT ON SUB-STANDARD STREETS

THIS POLICY IS INTENDED TO ADDRESS THE DEVELOPMENT ON SUB-STANDARD STREETS WITHIN THE TOWN OF MAMMOTH LAKES. THIS POLICY IS APPLICABLE TO ALL SUB-STANDARD STREETS. A STREET MAY BE DEEMED SUB-STANDARD BY THE PUBLIC WORKS DIRECTOR. A STREET MAY BE CONSIDERED SUB-STANDARD AS A RESULT OF CHANGES MADE TO THE MUNICIPAL CODE, THE SUBDIVISION ORDINANCE OF THE TOWN, AND BY CHANGES IN THE INTERNATIONAL FIRE CODE AS AMENDED BY THE STATE OF CALIFORNIA AND THE MLFPD CODE.

IN SOME CASES, IT MAY NOT BE REASONABLE TO IMPOSE THE APPLICATION OF CURRENT STREET STANDARDS TO A PROPOSED DEVELOPMENT THAT MAY ONLY BE ACCESSIBLE VIA A SUBSTANDARD STREET. OFF-SITE RIGHT-OF-WAY DEDICATIONS AND/OR STREET IMPROVEMENTS THAT WOULD BE REQUIRED TO BRING THE STREET INTO COMPLIANCE MAY BE IMPRACTICAL OR EXTRANEOUS TO THE PROPOSED DEVELOPMENT. IN SUCH CASES THE FOLLOWING REQUIREMENTS SHALL BE APPLIED TO PROPERTIES ON STREETS AS SUCH:

- RIGHT OF WAY DEDICATIONS SHALL BE REQUIRED ALONG ALL FRONTAGES OF THE SUBJECT PROPERTY. THE DEDICATION SHALL BE HALF WIDTH FROM CENTERLINE, AND SHALL INCLUDE SNOW STORAGE EASEMENTS WHERE REQUIRED.
- ADDITIONAL RIGHT OF WAY OR SNOW STORAGE EASEMENTS MAY BE REQUIRED WHENEVER THE DEVELOPMENT OF THE PROPERTY REQUIRES THE ADDITIONAL DEDICATIONS. STREETS THAT HAVE NOT BEEN ACCEPTED BY THE TOWN AND PRIVATE STREETS SHALL MAKE AN IRREVOCABLE OFFER OF DEDICATION (IOD) FROM THE CENTERLINE OF THE EXISTING EASEMENT OUT TO THE ULTIMATE RIGHT OF WAY. THE IOD MAY NOT BE ACCEPTED UNTIL SUCH TIME AS THE ENTIRE STREET IS TO BE ACCEPTED AS A PUBLIC STREET. SETBACKS SHALL BE MEASURED FROM THE ULTIMATE RIGHT OF WAY.
- ALL PORTIONS OF STREETS FRONTING THE PROPERTY TO BE DEVELOPED SHALL BE IMPROVED TO THE FULL HALF-WIDTH STREET SECTION FROM CENTERLINE, PLUS EIGHT FEET OF PAVEMENT ON THE OPPOSITE SIDE OF THE CENTERLINE.
- IMPROVEMENTS SHALL INCLUDE PAVING, SNOW POLES, SIGNAGE, AND CURB, GUTTER AND SIDEWALK WHERE REQUIRED BY A TOWN ADOPTED PLAN OR POLICY. ADDITIONAL IMPROVEMENTS MAY BE REQUIRED WHEREVER IT IS DEEMED NECESSARY BY THE PUBLIC WORKS DIRECTOR TO PROVIDE FOR SAFE AND REASONABLE TRANSITIONS.
- FIRE DEPARTMENT ACCESS SHALL BE IMPROVED TO THE PROPERTY BY PROVIDING TURNOUTS, FIRE HYDRANTS AND TURNAROUNDS CONSISTENT WITH MLFPD REQUIREMENTS.
- EXISTING DEAD END STREETS BEING DEVELOPED SHALL PROVIDE A CUL-DE-SAC OR TURNAROUND APPROVED BY THE PUBLIC WORKS DIRECTOR
- IN AREAS WHERE INADEQUATE FIRE ACCESS EXISTS THE DEVELOPER MAY BE REQUIRED TO PROVIDE ADDITIONAL PAVEMENT ALONG THE STREET FRONTAGE IN ORDER TO ACCOMMODATE A FIRE ACCESS TURNOUT, THE LENGTH AND WIDTH TO BE DETERMINED BY THE MLFPD. A FIRE HYDRANT MAY ALSO BE REQUIRED. PARKING WOULD NOT BE PERMITTED AND THE ROAD SHALL BE SIGNED AS SUCH ALONG THE TURNOUT, REGARDLESS OF THE FIRE HYDRANT.
- WHEN PROPERTIES ARE TO BE DEVELOPED ON PRIVATE STREETS, UNIMPROVED STREETS OR A STREET THAT IS NOT MAINTAINED BY THE TOWN THE PROPERTY OWNER SHALL ENTER INTO TWO AGREEMENTS WITH THE TOWN PRIOR TO ISSUANCE OF A BUILDING PERMIT OR RECORDATION OF A MAP: WAIVER OF RIGHTS FOR THE FORMATION OF AND ANNEXATION INTO AN ASSESSMENT DISTRICT FOR THE CONSTRUCTION OF STREET AND RELATED IMPROVEMENTS, INCLUDING UTILITIES; AND A WAIVER OF RIGHTS FOR THE FORMATION OF A BENEFIT ASSESSMENT DISTRICT FOR THE MAINTENANCE OF THE STREET AND RELATED PUBLIC IMPROVEMENTS.
- EASEMENTS SHALL BE GRANTED WHENEVER REQUIRED BY MUNICIPAL CODE OR AN ADOPTED TOWN PLAN OR POLICY.
- DEVELOPMENT PROJECTS THAT PROPOSE DENSITY IN ADDITION TO THAT WHICH IS ALLOWED BY CURRENT ZONING, OR BY THE REZONING OF THE PROPERTY TO A HIGHER DENSITY, SHALL REQUIRE ADDITIONAL IMPROVEMENTS. ALLOWING ADDITIONAL DENSITY IS A DISCRETIONARY PROCESS AND THEREFORE THE EXTENT OF THE ADDITIONAL IMPROVEMENTS IS DISCRETIONARY AND SHALL ADDRESS ALL ISSUES CONCERNING THE PUBLIC HEALTH, SAFETY AND WELFARE AS APPROVED BY THE PLANNING COMMISSION OR TOWN COUNCIL. THIS MAY INCLUDE IMPROVEMENTS OFF-SITE AND NOT ADJACENT TO THE PROPERTY, AND MAY ALSO REQUIRE DEDICATIONS FOR STREET PURPOSES, SNOW STORAGE OR FOR OTHER MEASURES TO MITIGATE NEGATIVE IMPACTS.
- IN THE EVENT THAT A DEVELOPMENT PROJECT IS PROPOSED ALONG AN EXISTING MISALIGNED STREET, WHERE THE ALIGNMENT IS OUTSIDE OF THE ROW, THE REALIGNMENT OF THE STREET TO THE ROW WILL BE AT THE DISCRETION OF THE PUBLIC WORKS DIRECTOR. ANY CONDITION THAT REQUIRES THE RE-ALIGNMENT OF THE STREET WILL BE IN ADDITION TO ALL OTHER CONDITIONS AND REQUIREMENTS WITHIN THIS POLICY, TOWN STANDARDS, AND MUNICIPAL CODE.

THE PUBLIC WORKS DIRECTOR WILL PLACE A MEMO IN THE STREET FILES DESCRIBING ANY INTERPRETATIONS OF THIS POLICY. A MEMO WILL BE CREATED FOR EACH AND EVER PROJECT THAT THIS POLICY HAS BEEN APPLIED TO.

TOWN OF MAMMOTH LAKES - DEPARTMENT OF PUBLIC WORKS

	POLICY FOR DEVELOPMENT ON SUB-STANDARD STREETS	STANDARD PLAN 008 - 0
	PUBLIC WORKS DIRECTOR APPROVAL: Raymond Gomez DATE: 12/30/09	SHEET 1 OF 1

RESOLUTION NO. 09-64

A RESOLUTION OF THE TOWN COUNCIL OF THE TOWN OF MAMMOTH LAKES, STATE OF CALIFORNIA, ADOPTING REVISED AND UPDATED VERSION OF "THE TOWN OF MAMMOTH LAKES STANDARD PLANS FOR PUBLIC WORKS"

WHEREAS, the Planning Commission evaluated the "Town of Mammoth Lakes Standard Plans For Public Works", in accordance with Section 12.04 and 12.08 of the Town of Mammoth Lakes Municipal Code

WHEREAS, the Planning Commission conducted a Public Hearing on the proposed Standards on August 26, 2009, at which time all those desiring to be heard were heard; and

WHEREAS, the Planning Commission considered, without limitation:

1. The review by the Planning Commission,
2. The General Plan, Municipal Code, and current Mono County Roads Standards;
3. Oral evidence submitted at the hearing;
4. Written evidence submitted at the hearing;
5. Proposed "Town of Mammoth Lakes Standard Plans for Public Works", dated August 2009.

WHEREAS, the Town Council makes the following findings pursuant to Section 12.04 and 12.08 of the Mammoth Lakes Municipal Code:

1. The Town of Mammoth Lakes Standard Plans For Public Works establishes goals and policies that implement the goals, policies and objectives of the General Plan.

2. The Mammoth Lakes Standard Plans For Public Works will properly regulate the public works improvements including, design, materials, illumination, and landscaping of new construction, within the Town in order to maintain public safety, and enhance the image, attractiveness and environmental qualities of the Town of Mammoth Lakes.

3. The Mammoth Lakes Standard Plans For Public Works will ensure that public improvements designs provide detail and requirements to promote designs with the public's safety in mind and national adopted standards where such standards are suitable in the Town's environment.

4. The Mammoth Lakes Standard Plans For Public Works provide for flexibility in their use or deviations when they are not applicable when approved by the Public Work Director.

5. The Mammoth Lakes Standard Plans For Public Works will ensure that public infrastructure improvements are constructed of high quality materials and design that will reduce and enhance the life cycle costs of such improvements.

NOW, THEREFORE, BE IT RESOLVED that the Town Council of the Town of Mammoth Lakes hereby adopts the "Town of Mammoth Lakes Standard Plans for Public Works",

BE IT FURTHER RESOLVED that the Planning Commission, in its independent judgment, finds that this action is not a project pursuant to Section 15378 of the California Environmental Quality Act (CEQA) Guidelines.

PASSED AND ADOPTED this 16th day of September, 2009.

NEIL MCCARROLL, Mayor

ATTEST:

ANITA HATTER, Town Clerk

STATE OF CALIFORNIA)
COUNTY OF MONO) ss.
TOWN OF MAMMOTH LAKES)

I, ANITA HATTER, Town Clerk of the Town of Mammoth Lakes, DO HEREBY CERTIFY under penalty of perjury that the foregoing is a true and correct copy of Resolution No. 09-64 adopted by the Town Council of the Town of Mammoth Lakes, California, at a meeting thereof held on the 16th day of September, 2009, by the following vote:

AYES:	Councilmembers Bacon, Harvey, Mayor Pro Tem Eastman, and Mayor McCarroll
NOES:	None
ABSENT:	Councilmember Sugimura
ABSTAIN:	None
DISQUALIFICATION:	None

ANITA HATTER, Town Clerk

Appendix D:

Supplemental Avalanche Hazard Information
From Arthur I. Mears,
dated February 19, 2011

Arthur I. Mears, P.E., Inc.
Natural Hazards Consultants
555 County Road 16
Gunnison, CO 81230
Tel/Fax: (970) 641-3236

February 19, 2011

Ms. Jessica Morriss
Transportation planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

RE: MAMMOTH LAKES AVALANCHE ISSUES – PLUM SUBDIVISION

1. Objectives – This report is provided to summarize my analysis and conclusions regarding avalanche-hazard change from the proposed Plum Vesting Tentative Parcel Map/Use Permit 10-001 subdivision project. It also provides an analysis of and my response to comments submitted in response to the Project Initial Study/Mitigated Negative Declaration with respect to avalanche concerns. My conclusions in #4 have been based on documents listed in #2 (below), my previous site work in Mammoth Lakes and experience in avalanche terrain and with unstable snowpack conditions worldwide. Site-specific limitations to this study are in Section 5. This report has been completed at the request of the Town of Mammoth Lakes.
2. Documents reviewed through February 19, 2011 – In accordance with the objectives of my consulting agreement "...consulting services for the Plum **Vesting Tentative Parcel Map/Use Permit 10-001,"** I have reviewed the following documents.
    a. My report to Mr. Craig Tackabery and Mr. William Taylor *"Avalanche Hazard Change Resulting from "The Bluffs," Mammoth Lakes, California – With Mitigation Recommendations,"* dated May 3, 1997;
    b. My report to Mr. Michael J. Miller of Stoney-Miller Consultants, *"Avalanche mitigation analysis, Tamarack Road Lots, Mammoth Lakes, CA,"* dated November 4, 2003;
    c. An independent review by EIP Associates, *"Independent Review of Subsequent Avalanche Hazard Analysis Prepared For The Plum Tentative Parcel Map (36-203) in the Town of Mammoth Lakes,"* dated March 3, 2006;

d. A review of previous work and analysis prepared by Larry Heywood for Terry Plum, *"Plum Property Avalanche Hazard Analysis and Comments,"* dated January 20, 2006;
e. A report by Larry Heywood to Terry Plum "*Plum Family Bluffs/Tamarack Street Properties Avalanche Hazard Assessment and Comments,"* dated April 23, 2010;
f. An "Exhibit 01" by *triad/holmes associates* dated "04/05/10" showing a 4' wide public pedestrian easement and tentative locations of 5 future residences "01" through "05;"
g. An "Exhibit 02" by *triad/homes associates* also dated "04/05/10" showing a future upper building site "06" and a 30% slope line;
h. A conceptual site plan "VESTED TENTATIVE PARCEL MAP NO. 10-001" showing plans to subdivide the "Plum LLA Parcel 3" into 4 lots (terrain also shown on "f" and "g" above;
i. The Bluff EIR Section N (avalanche hazard potential);
j. Town of Mammoth Lakes Ordinance 97-13 and zoning code amendment 97-3 (Snow Deposition Design zone);
k. An Initial Study/Mitigated Negative Declaration dated November 29, 2010 prepared by the Town of Mammoth Lakes for the Plum Vesting Tentative Parcel Map/Use Permit 10-001 Project

3. Analysis. The documents in "2" have been reviewed because they all are related to avalanche hazards present in the Bluffs. Therefore, they consequently also pertain to analysis of potential avalanche hazard related to the proposed subdivision of the Plum "LLA Parcel 3" into four lots which have been made available by the Town of Mammoth Lakes for my review. Conclusions of my review and analysis follow in #4 and are supported by the following: (a) the proposed Plum development is located approximately 300 – 1000 feet southeast of avalanche starting zones; (b) this distance minimizes the effect of shock propagation through the snowpack (e.g. from roof slides) to the avalanche starting zones; c) the avalanche paths support a timber cover that (i) inhibits slab fracture propagation and (ii) causes an uneven snow distribution under the tree canopy; (d) the uneven snow under the forest inhibits the formation of widespread and continuous weak layers (e.g. surface hoar, near-surface facets; continuous ice lenses) that would be needed for long slab fracture propagations; (e) any thermal effects near the buildings (e.g.. from heating, solar reflections) occur immediately adjacent to the buildings.
4. Conclusions
   a. ***Subdivision of the Plum parcel into the 3 lower lots will not increase the avalanche hazard to adjacent lots or houses below The Bluffs. Hazard resulting from construction of the lower Plum lots should not increase as a result of building heating, wind-drift effects, snow sliding from roofs or any vibrations that may be associated with the use of these buildings during the snow and avalanche season. However, any buildings planned within the indicated avalanche paths***

must be reinforced or otherwise protected as directed in previous reports. If building positions or orientations are changed but remain within the designated avalanche areas the loading criteria may change.

b. ***The upper Plum site (accessed from the Bluffs and adjacent and within a small portion of the >30% slope), should also comply with Town of Mammoth Lakes ordinances and restrictions. If these restrictions are followed, a house on this site will not increase the avalanche hazard to adjacent lots or houses below The Bluffs. Hazard to buildings on the lower lots should not increase as a result of building heating, wind-drift effects, snow sliding from the roof or any vibrations that may be associated with the use of the upper site during the snow and avalanche season. The Project also does not propose to remove trees in the avalanche starting zones and the extent of tree removal proposed below the bluff that would occur with construction of the proposed home sites or access improvements would not pose an increased avalanche hazard.***

5. Site-specific Limitations. I understand that the current project proposal does not propose to develop/construct any buildings on the individual parcels at this time, however the approximate locations of future home sites and related improvements has been provided for my analysis and my findings are based upon this information. I also understand that the further analysis of the design and orientation of future structures will be required prior to development of the parcels to ensure that they adhere to the requirements and mitigation measures of all applicable avalanche hazard analyses. If substantial changes to building positions and/or orientations or if the accesses to these buildings are substantially changed, this could change the conclusions stated in 4a and 4b.

Report prepared by,

Arthur A. Mears

Arthur I. Mears, P.E. (CO)
Avalanche-control engineer

Appendix E:
Preliminary Drainage Study

Preliminary Drainage Study

FOR

TPM 10-001
Plum Family

Mailing Address:

Terry and Paula Plum
P.O. Box 8208
Mammoth Lakes, CA 93546
Phone (760) 924-5603

Date of Report: January 2011

Job No. 332.013

Engineer:
triad/holmes associates

Post Office Box 1570
Mammoth Lakes, Ca 93546
Phone: (760) 934-7588
Fax: (760) 934-5619
triad@THAinc.com
David Laverty, LS, Principal
Tom Platz, RCE, Principal

Paul E. Roten, P.E. C56891, Vice President

Preliminary Drainage Study
TPM 10-001 - Plum Family

Table of Contents

APPENDIX

1. [1]Excerpts from the Town of Mammoth Lakes 2005 Storm Drain Master Update, May 2005, Boyle Engineering Corporation, including Exhibit 8.7, area 2.5 plan
2. Design Manual, Mammoth Lakes Storm Drainage and Erosion Control, Prepared for Mono County Public Works Department, July 1984, Brown and Caldwell and Triad Engineering, excerpts as referenced
3. Water Quality Control Plan for the Lahontan Region, North and South Basins, prepared by the State of California, Regional Water Quality Control Board, Lahontan Region, Chapter 4.8

PRELIMINARY DRAINAGE STUDY
TPM 10-001

1. Project Description

a. General Project Scope and Location

The project site is LLA Parcel 3 of Lot Line Adjustment 08-001, located in the Old Mammoth area in the town of Mammoth Lakes, Mono County, California. The site is on and accessed from a proposed driveway extended from Tamarack Street.. The site is approximately 6 miles southwesterly from the intersection of State Route Highway 203 (SR 203) and US 395.

Project is located as follows:

Figure 1.1

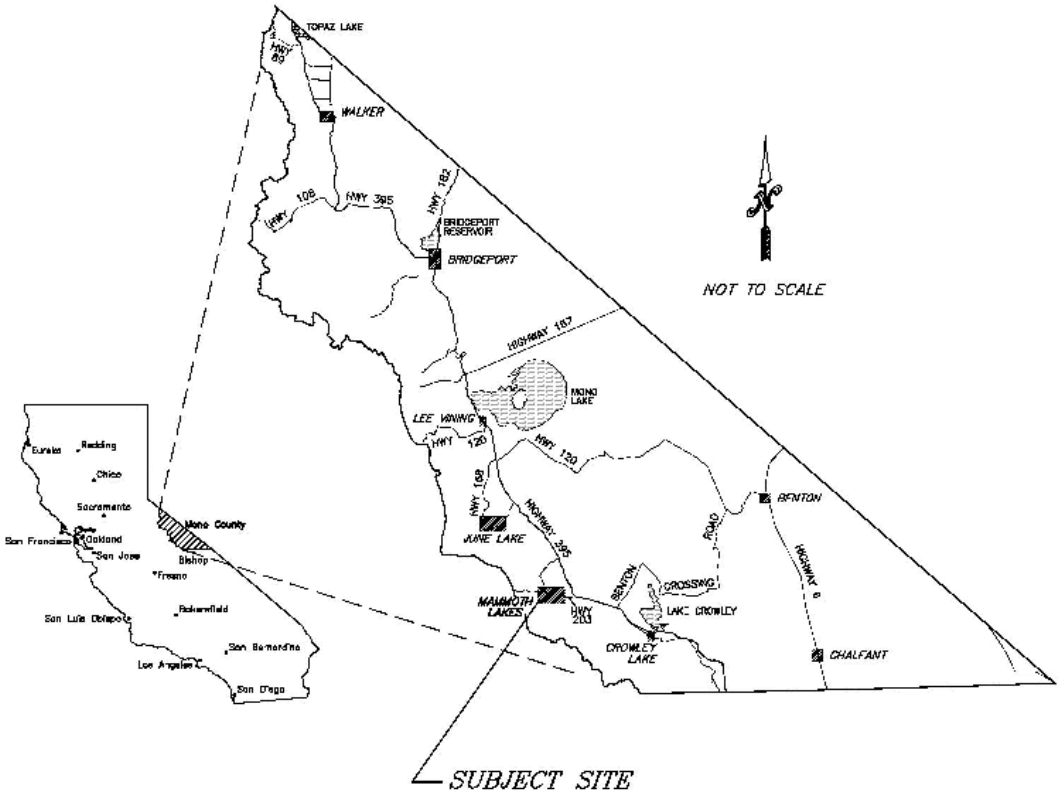
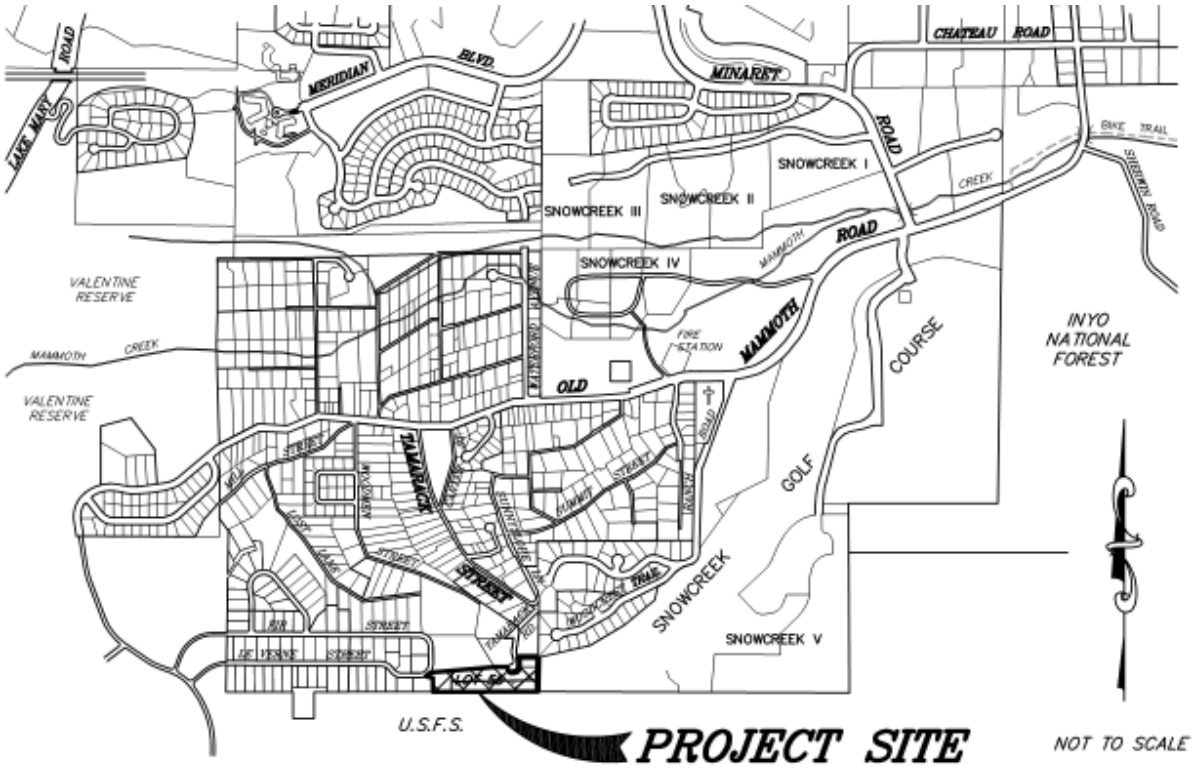


Figure 1.2



The project site is zone RR, Rural Residential. To the west and north of the site are lots and residential dwellings in the Old Mammoth area, also zoned RR; to the north there are some portions that are Rural Residential (Equestrian), Residential Multi-Family 1 and 2 (RMF-1 and RMF-2) and Residential Single Family (RSF) as well. To the east of the site is Snowcreek Golf Course which is zoned Resort (R). To the south of the site is United States Forest Service (USFS) land.

The site encompasses approximately 4.39 acres (191,203 square feet (sf)). The proposed project consists of dividing the existing LLA Parcel 3 of LLA 08-001 into four separate parcels for future single-family residential development. A driveway is proposed to access each of the proposed easterly parcels. The proposed driveway will also include construction of proposed utilities. Appendix A, Exhibit 3 shows the plan view of the proposed improvements.

Construction activities for the project include the construction of the proposed road and utilities. Associated grading and drainage facilities will be constructed during the road improvements.

b. General Topography, Vegetation and Soils

The site generally slopes from the west to the east. The elevations range from approximately 8,310 feet at the northwest corner down to approximately 7,942 feet at the southeast corner. The slope of the lot varies, from approximately 6% to 70%. The site consists of sagebrush scrub, rabbit brush, and assorted pines and firs - natural vegetation for the Town of Mammoth Lakes and the eastern Sierra Nevada area. The existing topography of the site is shown in Appendix A, Exhibit 1.

This project is not located on a receiving water. The existing conditions of the site allow storm runoff to sheet flow, generally from the west towards the easterly property line. There is offsite tributary runoff to the site from the west; there are two tributary areas to the west of the proposed road improvements. The northerly area is approximately 3.7 acres. The southerly tributary area is approximately 6.4 acres. The project will not disturb any wetlands or blue-line streams. Soils are granular, typical of SCS Type "B." based on the "Design Manual, Mammoth Lakes Storm Drainage and Erosion Control[2"].

c. Project Hydrology/Hydraulics

The site is located Drainage area 2.5.1 as shown on Exhibit 8.7 of the 2005 Storm Drain Master Plan Update. The runoff rate for this site is based on Table 3-1A of the above report, and would be a combination of Natural and Single Family Residence. The anticipated flow rate for 20 and 100 year intensity storms is shown below:

Land Use Type	20-Year	% of land use type	20-year this site	100-Year	% of land use type	100-year this site
Natural	0.23	50%	0.12	0.43	50%	0.215
Single Family Residence	0.65	50%	0.33	1.30	50%	0.65
High Density Residence	1.14			1.90		
Commercial	1.22			1.93		
runoff rate this site	20 year		0.44	100 year		0.865

This project is not located in a flood zone based on the Flood Insurance Study, prepared in 1992, for the Federal Emergency Management Agency, for Town of Mammoth lakes, California Mono County area.

2. Report Scope and Objective

The objective of this drainage report is to identify sources of storm water runoff, and estimate quantities of storm water runoff for both pre- and post-development conditions for 20 and 100-year intensity storm events. The report presents preliminary design requirements for storm drainage facilities to collect, convey and retain storm water runoff, generated from both off-site and on-site, at required levels.

3. Design Methods and Assumptions

Runoff rate calculations are based on the Town of Mammoth Lakes 2005 Master Plan Update (Master Plan[1]). On-site drainage facilities including inlets, storm drain pipes, earth swales, and storm drain manholes are be designed for 100-year storm intensity. Refer to Appendix B for hydraulic calculations.

Retention facilities have been designed based on the Water Quality Plan for the Lahontan Region[3] to contain 1 hour of a 20 year intensity storm, which is assumed to be 1 inch (0.83 feet) * Area (square feet) * C (infiltration coefficient). Because the retention facilities will be designed to contain the first flush or contaminated runoff, the conveyance systems have been designed to contain the maximum peak flows without reduction for retention. There will be some reduction in peak flow due to these retention systems, so the conveyance systems are conservatively sized.

Consistent with requirements of the Town of Mammoth Lakes, retention / infiltration systems are designed to retain storm water runoff from the site for 1 hour of a 20-year intensity storm as defined by the Water Quality Control Plan for the Lahontan Region[3] ^{i} (1 inch/hour).

4. Existing Hydrologic/Hydraulic Conditions

The Town of Mammoth Lakes Storm Drainage System (TMLSDS) is made up of underground and surface storm drainage facilities. Tributary sub-areas within the Town, and existing and proposed drainage facilities within each sub-area, are identified in the Master Plan[1].

Drainage from this Sub-area is located on the south side (Mammoth Creek side) of an easterly trending ridge that separates the Murphy Gulch and the Mammoth Creek drainage systems. Mammoth Creek is listed for metals in the State Water Resources Control Board 303 (d) list.

Currently, the runoff from the site and its tributary area sheet flows from the west to the east. The runoff continues east of the site and eventually enters the TMLSDS. There are no existing or proposed drainage facilities for this portion of Sub-area 2.5.1. Since the Master Plan[1] flows shown are noted to be for future build out conditions, this site is considered in the Master Plan[1] and the runoff rates identified therefore include buildout. Downstream facilities are adequate for this project in its built out condition.

The drainage that affects the site has been divided into two drainage areas, Area 1, north and Area 2, south. These areas include both on and off site runoff. These areas are shown on the attached Exhibit 1 in Appendix A. The runoff rates are shown in the table below, based on the rates determined in section 1. c.

	Existing		
Tributary Area	**Acres**	**Q20**	**Q100**
1 (north)	4.05	1.78	3.50
2 (south)	8.93	3.93	7.72
Total	12.97	5.71	11.22

5. Proposed Drainage Facilities

Since the runoff rates selected are based on the developed condition identified in the 2005 Master Plan, there is no alternative runoff rate for the Post Development condition. The use of a "cellular grassed paver" driveway, an infiltration system and a level spreader outflow are measures that are being used to limit impervious surfaces, maintain infiltration, and allow sheet outflow.

The proposed site is shown on Exhibit 3 in Appendix A. The following outlines the general runoff design guideline (hydraulic calculations are included in Appendix B):

- Runoff will be allowed to flow across the site, to a swale located along the east side of the "cellular grassed paver" driveway.
- The swale will vary in size to a maximum depth of less than 1 foot to accommodate the maximum runoff rate of 11.22 cfs during a storm of 100 year intensity.
- This swale will have intermittent inlets into the retention system located directly beneath it.
- Inlets shall be sized to accommodate the 20 year intensity storm rates at a minimum. The maximum runoff rate that must be intercepted by any inlet is 3.93 cfs. It is anticipated that inlets will be 2 foot by 2 foot max placed at a frequency to collect required runoff flow (capacity 3.94 cfs). Final inlet design shall be set during preparation of improvement plans.
- Inlets will be directly connected to the retention system.
- The retention system will be a longitudinal 18 inch Hancor pipe that will also act under low flow conditions to convey runoff to the south portion of the site. It is anticipated based on present calculations that the north area will required 320 feet of 18 inch Hancor retention system, and the south will require 200 feet of 18 inch Hancor retention system, as indicated in section 6 below. Final retention design shall be set during preparation of improvement plans.
- Retention systems will be connected with an 18 inch pipe to direct overflow to the downstream outlet.

- Runoff will be allowed to exit in a level spreader located adjacent to the golf course. Exit spreader shall be designed to flow the entire 11.22 cfs 100 year runoff rate.

6. Retention / Infiltration Systems

As required by the Lahontan Basin Plan, retention / infiltration systems collect and infiltrate the 20-year, one-hour storm flow generated from the project paving, landscaping and natural areas. Retention areas are shown on Exhibit 2 of Appendix A. Total runoff storage volume required for the Area 1 portion of the new road improvement site is 533 cubic feet; for Area 2 it is 610 cf. Retention storage is not being provided for existing streets. Storage volume will provided by the Hancor piping in area 2 (south) for both area 1 and area 2 at 949 cubic feet.

Both the onsite runoff and the offsite tributary runoff are proposed to be directed to the retention basin in Area 2. Once the basins reach their capacity, the overflow will flow out via the inlet of the drywell the overflow will be allowed to sheet flow to the east.

7. Erosion Protection Plan

In general, site disturbance and grading shall be limited as much as possible. Graded areas shall be protected against erosion once they are brought to final grade.

An Engineered Grading Plan shall be submitted for grading activities. The Project shall comply with the National Pollution Discharge Elimination System (NPDES) requirements for construction projects, the MOU between the Town of Mammoth Lakes and Lahontan Regional Water Quality Control Board (LRWQCB), and the Town Municipal Code. Construction activities subject to these requirements shall include clearing, grading, and disturbances to the ground such as stockpiling or excavation, but not including regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Grading Plan shall be designed and incorporate Best Management Practices (BMPs) into plans and Storm Water Pollution Prevention Plan SWPPP as required. All

temporary off-site Best Management Practices (BMPs) are required to be removed in the Town right-of-way after October 15th or before April 30th each year. The applicant shall maintain the BMP's on-site at all times and shall conform to the permits during construction.

8. Summary and Conclusion

Final drainage facilities designed and selected will determined during preparation of improvement plans. Drainage facilities shall be designed to handle the required flows. The criteria followed during the design process shall address issues such as safety, erosion protection and water quality.

Infiltration facilities will be added per Town of Mammoth Lakes and Lahontan Regional Water Quality requirements. The project proponent is proposing erosion resistant surfaces over improved areas. Runoff entering the site from offsite will directed to exit in the vicinity of the adjacent golf course which has been generally the historic drainage path.

The area of disturbance for this project is greater than 1 acre, so this project is subject to the requirements of the National Pollution Discharge Elimination System (NPDES) for construction projects enforced by the State Water Quality Control Board – Lahontan Region.

Though the requirements of permits are not anticipated, work shall conform to conditions of the Army Corp of Engineers, Lahontan Regional Quality Control Board, and State of California Fish and Game. Any work done in this area shall conform to Federal, State, and local requirements.

This site is not located in a 100 year floodzone. Foundations shall be installed in conformance with the most recent building codes to limit any potential for drainage runoff entering the structures and limit potential damage to foundations.

Both the on-site and off-site storm drainage facilities must be maintained to continue to work as designed. Particular items requiring maintenance include, but are not limited to, cleaning of the grates, removal of foreign materials from storm drainage pipes, maintenance as necessary to outlet facilities, and repairs as necessary to damaged facilities. Special attention should be paid to a storm drain at the northern part of the site, which has a slope of 0.7%. This storm drain will required more frequent maintenance due to its low incline. Additionally, snow removal must be performed in a way so as not to restrict drainage collection in gutters, inlets, and flow paths.

[1]The Town of Mammoth Lakes 2005 Storm Drain Master Update, May 2005, Boyle Engineering Corporation.

[2]Design Manual, Mammoth Lakes Storm Drainage and Erosion Control, Prepared for Mono County Public Works Department, July 1984, Brown and Caldwell and Triad Engineering

[3]Water Quality Control Plan for the Lahontan Region, North and South Basins, prepared by the State of California, Regional Water Quality Control Board, Lahontan Region.

Preliminary Drainage Study

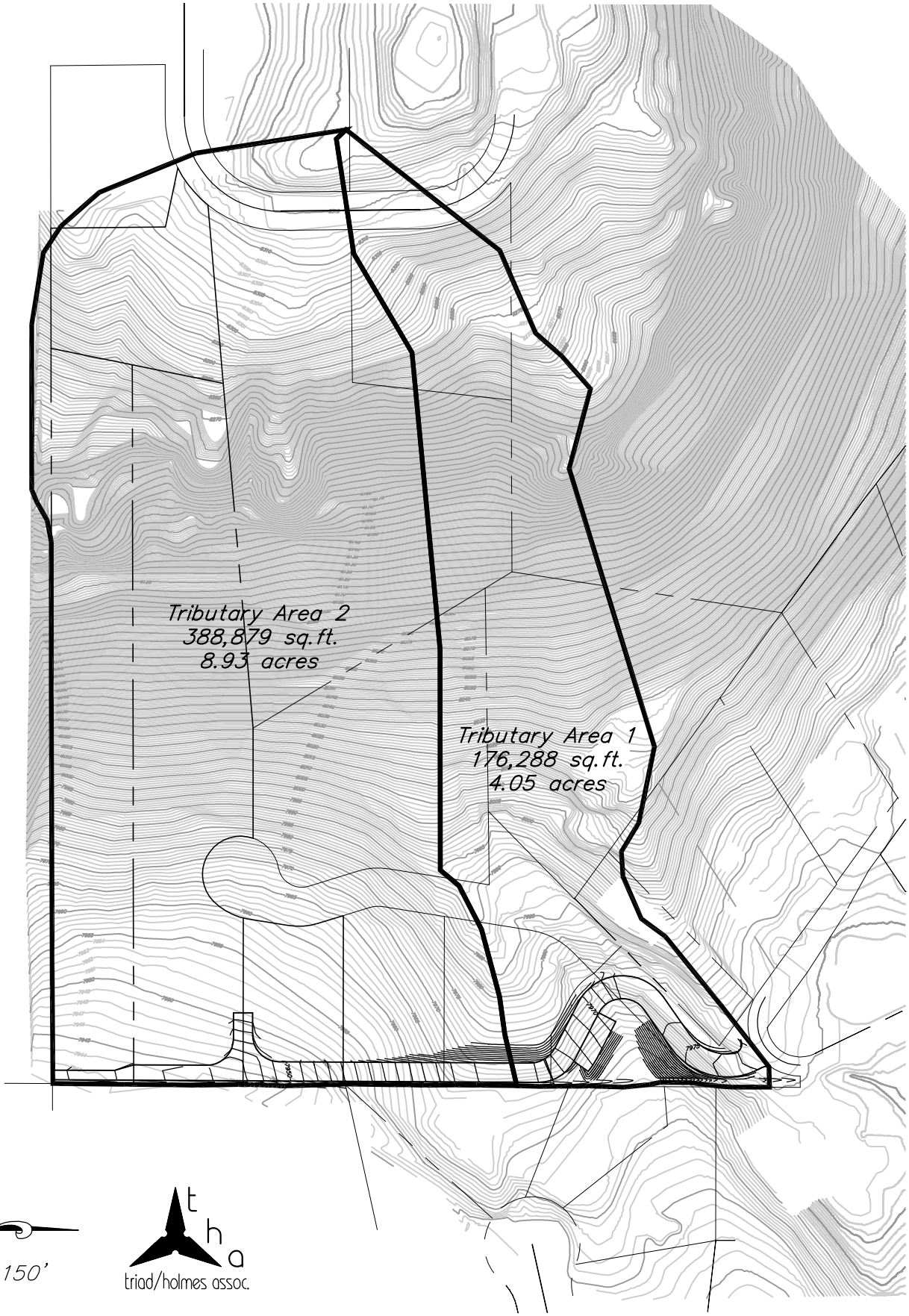
FOR

TPM 10-001 - Plum Family

APPENDIX A

FIGURES

EXHIBIT **1** – VESTING TENTATIVE PARCEL MAP 10–001
TRIBUTARY AREAS



SCALE: 1"=150'

t h a
triad/holmes assoc.

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EXHIBIT 2 – VESTING TENTATIVE PARCEL MAP 10-001
RETENTION AREAS

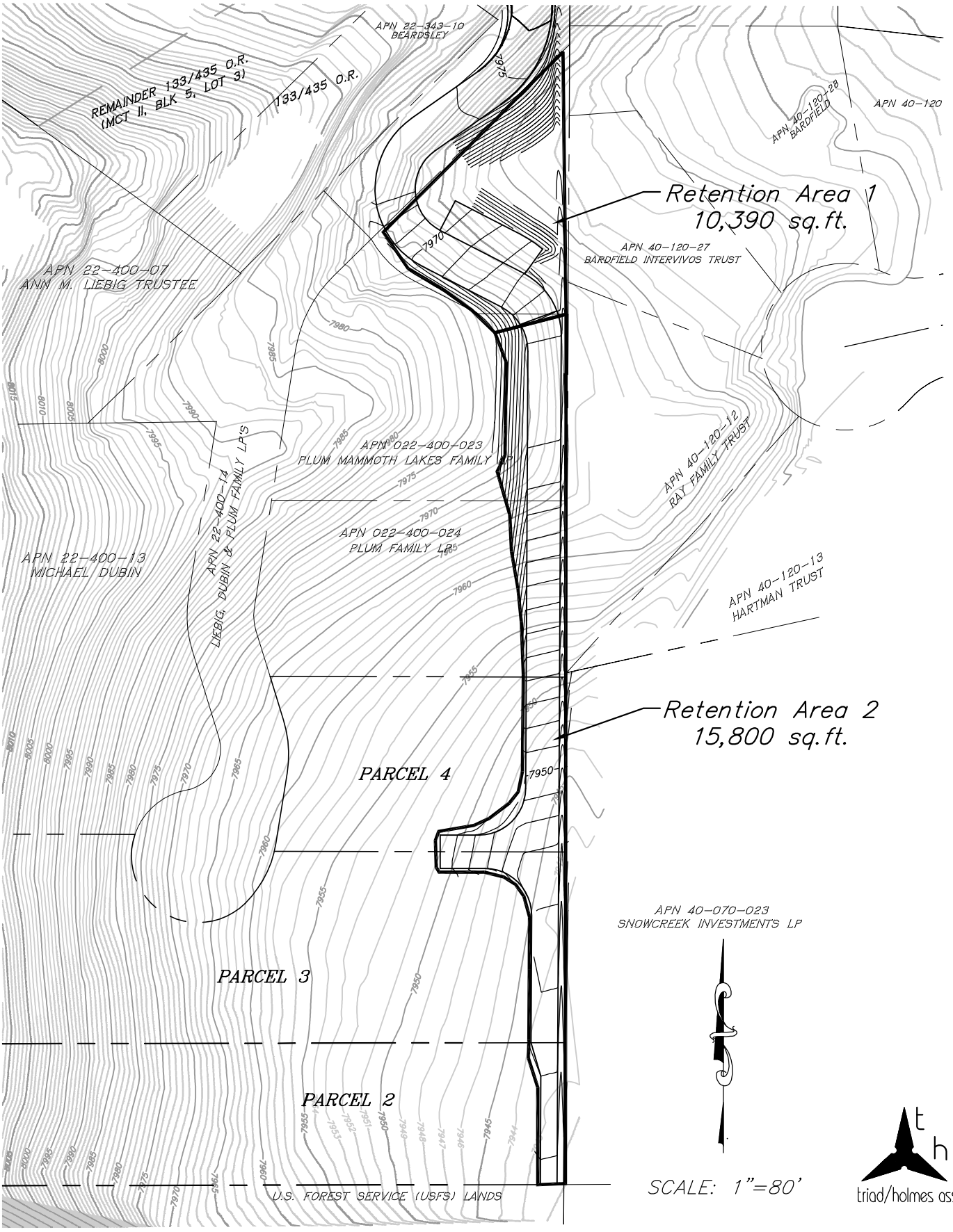

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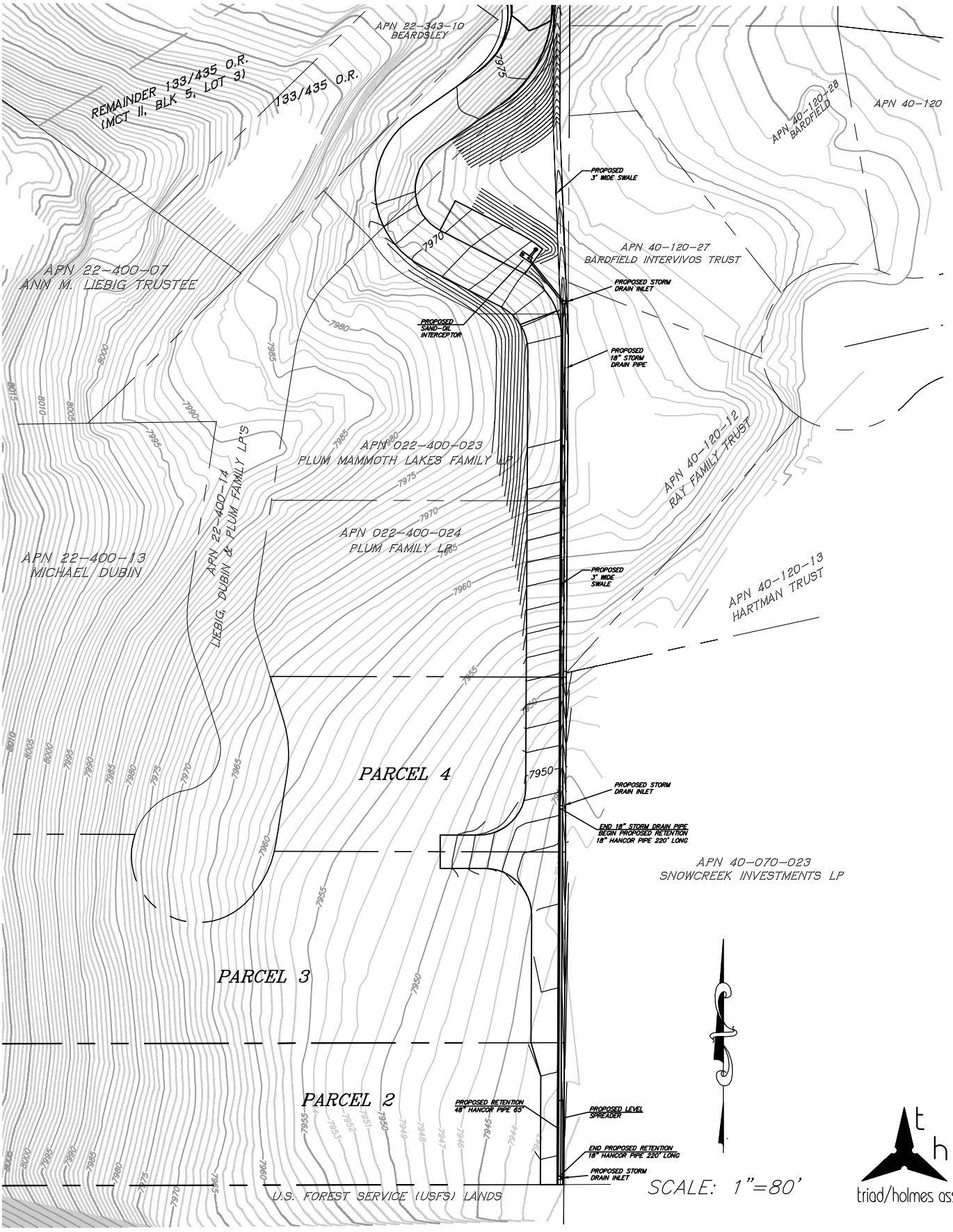
EXHIBIT 3 – VESTING TENTATIVE PARCEL MAP 10–001
PROPOSED STORM IMPROVEMENTS



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Preliminary Drainage Study

FOR

TPM 10-001 - Plum Family

APPENDIX B

HYDRAULICS

Swale Capacity

Swale Capacity					
Q= 12.03 cfs	**V= 10.7 fs**				
$Q=AR^{2/3}(1.486/n)s^{1/2}$					**12.03**
A=area of full swale					1.125
A1=area of below water surface					1.125
R=Hydraulic Radius					0.34
n=Manning's roughness coefficient					0.015
s=slope(ft/ft)					0.05
top width of swale					3
top width at water surface					3
bottom width					0
side slope					0.5
d=depth of swale					0.75
d1=depth of water in swale					0.75
Wetted Perimeter					3.354102

Catch Basin Inlet Capacity

Grate Inlet		**Sump Grate**		
Q= 3.94 cfs		**H= 0.30 feet**	**H = 4 inches**	
Wier	Inlet Capacity (y<0.4 feet), $Q=3Py^{3/2}$			3.9
Orifice	Inlet Capacity (y>1.4 feet), $Q=0.6A(2gy)^{1/2}$			5.1
Q=quantity of runoff, cfs				**3.9**
P=perimeter, ft				8.0
y=depth of flow at inlet, ft				**0.30**
A=total area of clear opening, sf				1.92
Opening Ratio				0.48
g=acceleration due to gravity, 32 ft/s^2				32.2
Total area				4
L=length, in				24
W=width, in				24

These calculations are based on the Hydraulic Engineering Circular No. 12, Chapter 8.1. Generally, under 0.4 feet of depth it is assumed that a catch basin operates under weir conditions. At depths over 1.4 feet catch basins operate under orifice conditions. In between, the typical assumption is to calculate both considerations and use the more conservative. Under sump conditions, the perimeter is the entire perimeter of the catch basin. Under non sump conditions, the perimeter is the leading edge, usually two sides.

Typical pipe - all areas

Total site flow during 100 year storm can be conveyed in pipe at 1% slope

.

	enter	calced
Pipe Diameter (inches)	18	18
Pipe Diameter (feet)		1.50
Slope (s)	0.01	
Friction Factor(n)	0.012	
Depth (inches)		18
Depth (feet)		1.50
Depth (percentage)	100%	100%
Area		1.77
Wetted Perimeter		4.71
Hydraulic radius		0.38
Quantity (cfs)		**11.38**
Quantity (gpm)		5109.5
Velocity (fps)		**6.44**

Preliminary Drainage Study

FOR

TPM 10-001 - Plum Family

APPENDIX C

RETENTION / INFILTRATION BASIN

triad/holmes associates
civil engineering
land surveying
mammoth lakes • bishop • redwood city • napa
san luis obispo • lompoc • pleasanton

Calc'd By:	**per**
Job No.:	**332.013**
Date:	**2011 jan 3**

Runoff Volume and Drywell Sizing Calulation

based on Lahontan RWQCB Design Parameters

TPM 10-001

Area 1 Site Retention

Input:

Rainfall Intensity

1 in/hr = 0.083 ft/hr

Percolation Rate

0 in/hr = 0.00 ft/hr

Tributary Area:

				Runoff Coefficient	
Roof Area	0	SF	0%	0.95	Roof Area
Pavement Area	3832	SF	37%	0.90	Pavement Area
Gravel/Aggregate Area	0	SF	0%	0.80	Gravel/Aggregate Area
Concrete	0	SF	0%	0.90	Unpaved Industrial Area
Landscaping Area	6558	SF	63%	0.45	Landscaping Area
Total Area	**10390**	**SF**		**0.62**	**Average Runoff Coefficient**

Average Runoff Volume = Total Area * Average Runoff Coefficient * Rainfall Intensity * 1 Hour

Average Runoff Volume = 533 CF

triad/holmes associates
civil engineering
land surveying
mammoth lakes • bishop • redwood city • napa
san luis obispo • lompoc • pleasanton

Calc'd By:	**per**
Job No.:	**332.013**
Date:	**2011 jan 3**

Runoff Volume and Drywell Sizing Calulation

based on Lahontan RWQCB Design Parameters

TPM 10-001

Area 2 - Site Retention

Input:

Rainfall Intensity

1 in/hr = 0.083 ft/hr

Percolation Rate

0 in/hr = 0.00 ft/hr

Tributary Area:

				Runoff Coefficient	
Roof Area	0	SF	0%	0.95	Roof Area
Pavement Area		SF	0%	0.90	Pavement Area
Cellular Grassed	13500	SF	85%	0.50	Gravel/Aggregate Area
Concrete	0	SF	0%	0.95	Unpaved Industrial Area
Landscaping Area	2300	SF	15%	0.25	Landscaping Area
Total Area	**15800**	**SF**		**0.46**	**Average Runoff Coefficient**

Average Runoff Volume = Total Area * Average Runoff Coefficient * Rainfall Intensity * 1 Hour

Average Runoff Volume = 610 CF

Stormwater Retention / Detention System Sizing Worksheet For Multiple Diameter and Length Laterals

Project	Lot 56, RS 36-123
Location	Mammoth Lakes, CA
Job Number	01.322.013
Engineer	Triad/Holmes Associates
Email Address	triad@THAinc.com
Information	North Storage Section
Date	6/29/2006

System Type Retention

Header Type Sure-Lok

System Spacing Standard

Design Storage Volume (DSV) 943 cf

(enter a value and the table to the right will give an approximate number of sticks needed per pipe diameter)

Perforated Headers? ☐ Yes ☒ No

Include Headers in Storage Volume Calc? ☐ Yes ☒ No

Header Diameter 18

Number of Headers 1

Stone Porosity (%) 33

Additional stone layer allowing storage **ASV** (in) 14

	Lateral Diameter (in)	Lateral Length (ft)	Sticks of pipe per lateral	Number of Laterals
Group 1	18	220	11.0	1
Group 2	36	0	0.0	0
Group 3	36	0	0.0	0

Notes

* Estimated volumes are based on a flat detention system.

* This worksheet is for estimations purposes only and should not take the place of a comprehensive engineering design

1 **Stone** cf = 6" below the pipe to the top of the pipe and the stone between the rows.

2 **ASV** = Additional Stone volume from the additional layer of stone.

3 **Height** = pipe OD + 18" (6" below the pipe + 12" above the pipe) Does not account for additional base or final fill on project.

4 **Footprint** = The area of the system, additional area is required for proper installation.

5 **Excavation** = length x width x height; additional excavation is required for deeper systems

6 **Stone Backfill =** 6" below the pipe to the top of the pipe and the stone between the rows.

7 **Rolls =** Hancor Terrifiber Nonwoven 15' wide by 300' long with 1' overlap

Hancor® Technology · Innovation · Solutions™

LandMax System Sizing

Version 5.5

	Storage Volume				Approximate System Size		
	Component			Total System			
	Product Volume	Stone[1]	ASV[2]	Retention	Width	Length	Footprint[4]
	cf	cf	cf	cf	ft	ft	sf
Header	0	0		0			
Group 1	389	303	256	949	3	222	666
Group 2	0	0	0	0	0	0	0
Group 3	0	0	0	0	0	0	0
TOTALS	**389**	**303**	**256**	**949**			**666**

Excavation information								
	Pipe Diameter	Width	Length	Height[3]	Excava-tion[5]	Stone Backfill[6]	ASV[2]	Rolls of Filter fabric[7]
	in	ft	ft	ft	cyd	cyd	cyd	
Group 1	18	5	224	3.3	140	40	50	1
Group 2	0	0	0	0.0	0	0	0	0
Group 3	0	0	0	0.0	0	0	0	0
				Total	140	40	50	1

Approx quanity of pipe based on DSV	
Dia	Feet
12	503
15	369
18	274
24	173
30	110
36	81
42	61
48	46
54	36
60	30

Pipe Information			Stone Porosity		
ID	OD/ Width	Volume	40%	35%	33%
in	in	cf/lf	cf/lf	cf/lf	cf/lf
12	14.2	0.79	1.08	0.95	0.89
15	17.7	1.23	1.33	1.16	1.09
18	21.5	1.77	1.67	1.46	1.38
24	28.4	3.14	2.32	2.03	1.92
30	36.0	4.91	3.69	3.23	3.04
36	41.4	7.07	4.50	3.94	3.71
42	48.0	9.62	5.93	5.19	4.89
48	55.0	12.57	8.11	7.09	6.69
54	61.0	15.90	9.98	8.73	8.23
60	67.3	19.63	11.52	10.08	9.51

Preliminary Drainage Study

FOR

TPM 10-001 - Plum Family

APPENDIX D

REFERENCE MATERIAL

B. Procedure A Development

Two types of rare event precipitation-runoff conditions pertain to the meteorological characteristics of the Town and need to be considered jointly. They are subject to two physically distinct events: a rainfall-only condition and the rainfall-on-snow condition, referred to as the summer and winter conditions, respectively. The idea that one should consider each condition separately and then choose the most extreme result is a sound one and will be adopted in this study as well.

The methodology used to determine peak flows is based on the Rational Formula

$$Q = CiA$$

Where:

Q	=	the discharge measured in cfs
C	=	the runoff coefficient, having no physical dimensions
i	=	the rainfall intensity measured in inches per hour
A	=	the area of the watershed basin measured in acres

The above formula is simply a version of the "continuity equation" in the study of hydraulics. Any consistent set of units may be chosen, however the customary units for Q, i, and A are cubic feet per second (cfs), inches per hour (in/hr), and acres (ac) respectively. For this particular choice of units, the product CiA is to be multiplied by a small correction factor of 1.008, which is often neglected in view of the probabilistic nature of hydrologic calculations mentioned above.

It was observed from the 1984 study that flows within the local storm drains experience little attenuation. In other words, individual hydrographs from individual storm drains have nearly coincidental (in time) peaks when a flow confluence occurs. This finding from the 1984 study helps to provide a simple way to determine peak discharge values. Additionally, the assumption of no attenuation is a conservative one.

While it is true that any point on a stream has a watershed area associated with it, one should not compare watersheds having widely ranging area values. Former procedures specified in the 1984 study allow for areas within the town to have an area anywhere between 0 and 1,600 acres, which is too much of a variation. Problems with

comparing a 10 acre subarea with a 1000 acre subarea are obvious in that calculated times of concentrations (t_c) would be vastly different. Hence for this updated study a standard of 40-80 acres is taken as the range of watershed size used to apply cfs/acre peak values[3]. In practice, developers within subareas (if more than one subarea is involved a weighted average should be taken) of this order of magnitude can design systems for their projects using the cfs/acre values that are called out in this study (see **Table 3-1A**).

Another fact that applies to storm drains in the Town is that peak flows within the local storm drain system occur at a time much earlier than offsite flows in major streams. Hence, storm drain design in the Town is mainly independent of offsite drainage and drainage methodology (with the exception of conveyance structures that route large offsite watersheds). For those properties that are affected by large offste watersheds, a reduction factor may be applied, as shown in **Table 3-1B**.

In order to develop a "cfs/acre" approach in lieu of a detailed hydrograph for storm drain flows, a lower bound for cfs/acre value within the Mammoth Basin was first established for comparative purposes. By the term "lower bound", we mean that the estimates made by the following analysis are expected to be less than cfs/acre values that actually apply within the Town for the purpose of pipe design. Such an estimate has some value, since it acts as a safeguard against the use of values that would result in the design of conveyance systems that are inadequate for a given return period.

From the Federal Emergency Management Agency (FEMA) Flood Insurance study [6], it was estimated that the 100-year[4] discharge rate for Mammoth Creek was 640 cubic feet per second (cfs) for a tributary watershed area of 13.12 square miles (8,397 acres) at a stream location taken 650 feet downstream of Old Mammoth Road. Hence for this

---

[3] This standard is used in several communities within the State of California, including Los Angeles [5] and Ventura Counties.

[4] A 10-year storm is defined as a storm event that is equaled or exceeded every 10 years on average. Another way to define a 10-year storm is to say that the probability of an event of having a 10-year magnitude or more has a 1/10 chance in a given year. Likewise, a 100-year storm is defined as a storm that is equaled or exceeded every 100 years on average. The 100-year storm can alternatively be defined by saying that the probability of an event of having a 100-year magnitude or more has a 1/100 chance in a given year [7].

watershed, a cfs/acre ratio is equal to 640/8397 ≈ 0.076 cfs/acre for 100-year conditions. This value is clearly low since it includes an extremely large and predominantly natural watershed (consisting of subareas including portions of the Town) subject to the attenuation process. From the same study, it was estimated that the 100-year discharge rate for Mammoth Creek increased from 350 cfs to 610 cfs between Waterford Street upstream and a point 650 feet upstream of Minaret Road downstream. The increase in the watershed area between these two stations is given as 0.49 square miles (314 acres) and lies within the Town. For this watershed from Waterford Street to 650 feet upstream of Minaret Road, the cfs/acre ratio is equal to (610 – 350)/314 ≈ 0.828 cfs/acre for 100-year conditions.

Next, a statistical analysis was made of the cfs/acre data contained in the 1984 study. Not surprisingly, a strong dependence (on cfs/acre rates) was found on the degree of natural land cover. This data was applied to the individual subareas delineated in this study for the purpose of obtaining a reasonable estimate of cfs/acre value for particular land use types, and were adjusted for consistency. These values were conservatively estimated to be those as given in **Table 3-1** below:

Table 3-1A. Applicable cfs/acre Values by Land Use Type

Land Use Type	20-Year	100-Year
Natural	0.23	0.43
Single Family Residence	0.65	1.30
High Density Residence	1.14	1.90
Commercial	1.22	1.93

Table 3-1B. Reduction Factors for Large Basins

Drainage Area (acres)	Reduction Factor
80	1.00
100	0.97
200	0.88
500	0.77
1,000	0.69
2,000	0.63
5,000	0.55
7,744	0.52

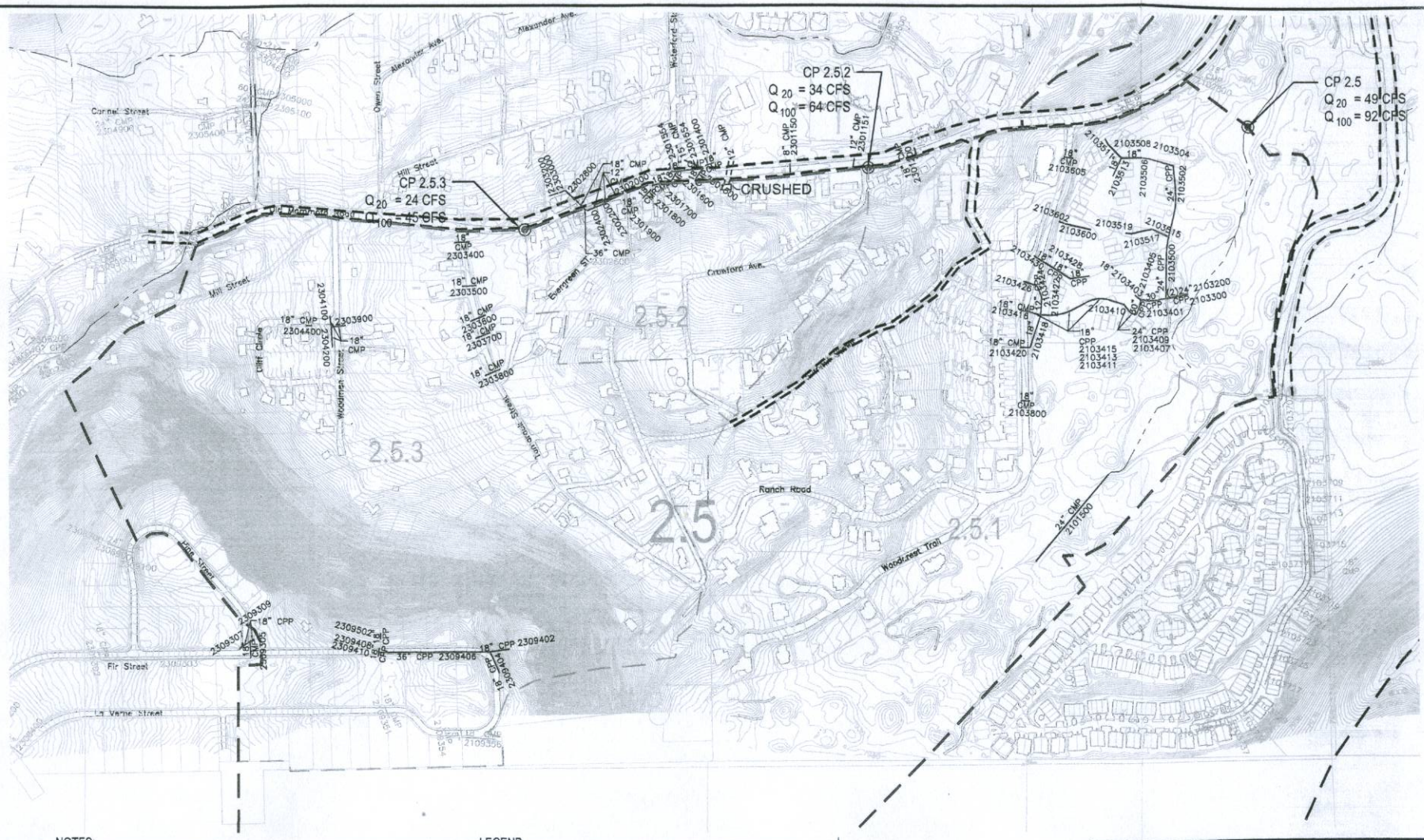
The values for the tables above were determined primarily for the purpose of determining the discharge values within the elements of the storm drain system as outlined in Section 5.

C. Procedure B Development

Procedure B is intended for use in larger, natural areas. A flow-frequency analysis approach was adopted, based on the flow data available and the ease with which it could be applied. Sufficient concurrent precipitation and runoff data were not available to develop a hydrograph method with reasonable accuracy.

The flow out of a large, natural basin in the Mammoth Lakes area has two principal components--snowmelt and rain flood flows. In general, flow records indicate that the peak flows in Mammoth Creek at Highway 395 are produced by snowmelt. Extreme rainfall events may produce short-term peaks on an annual hydrograph, which is dominated by flows produced by snowmelt. This situation is typical of major basins on the eastern side of the Sierra Nevada.

The mean daily flow records for Hot Creek at Highway 395 were used to develop the flow-frequency relationships. Snowmelt flows were segregated from rain flood flows by plotting flow-frequency relationships separately for rainy and non-rainy periods.



NOTES:

1. FLOWS SHOWN ARE TOTALS FOR FUTURE BUILD OUT CONDITIONS.

LEGEND

- MAJOR WATERSHED BOUNDARY
- DETAILED DRAINAGE WATERSHED BOUNDARIES
- FLOWLINE
- STORM DRAIN, EXISTING
- STORM DRAIN, RECOMMENDED
- CURB AND GUTTER, EXISTING
- CURB AND GUTTER, RECOMMENDED
- WATERSHED COLLECTION POINT, CP
- 30" RECOMMENDED PIPE REPLACEMENT OR NEW PIPE. (RED SHADING = PRIORITY 1, YELLOW SHADING = PRIORITY 2)
- 10 NEW PIPE ID

200' 100' 0 200' 400'
SCALE IN FEET

REV	DATE	DESCRIPTION	APP'D

BOYLE

TOWN OF MAMMOTH LAKES

AREA 2.5 PLAN

VT-M01-100-01 | MAY 2005 | EXHIBIT 8.7

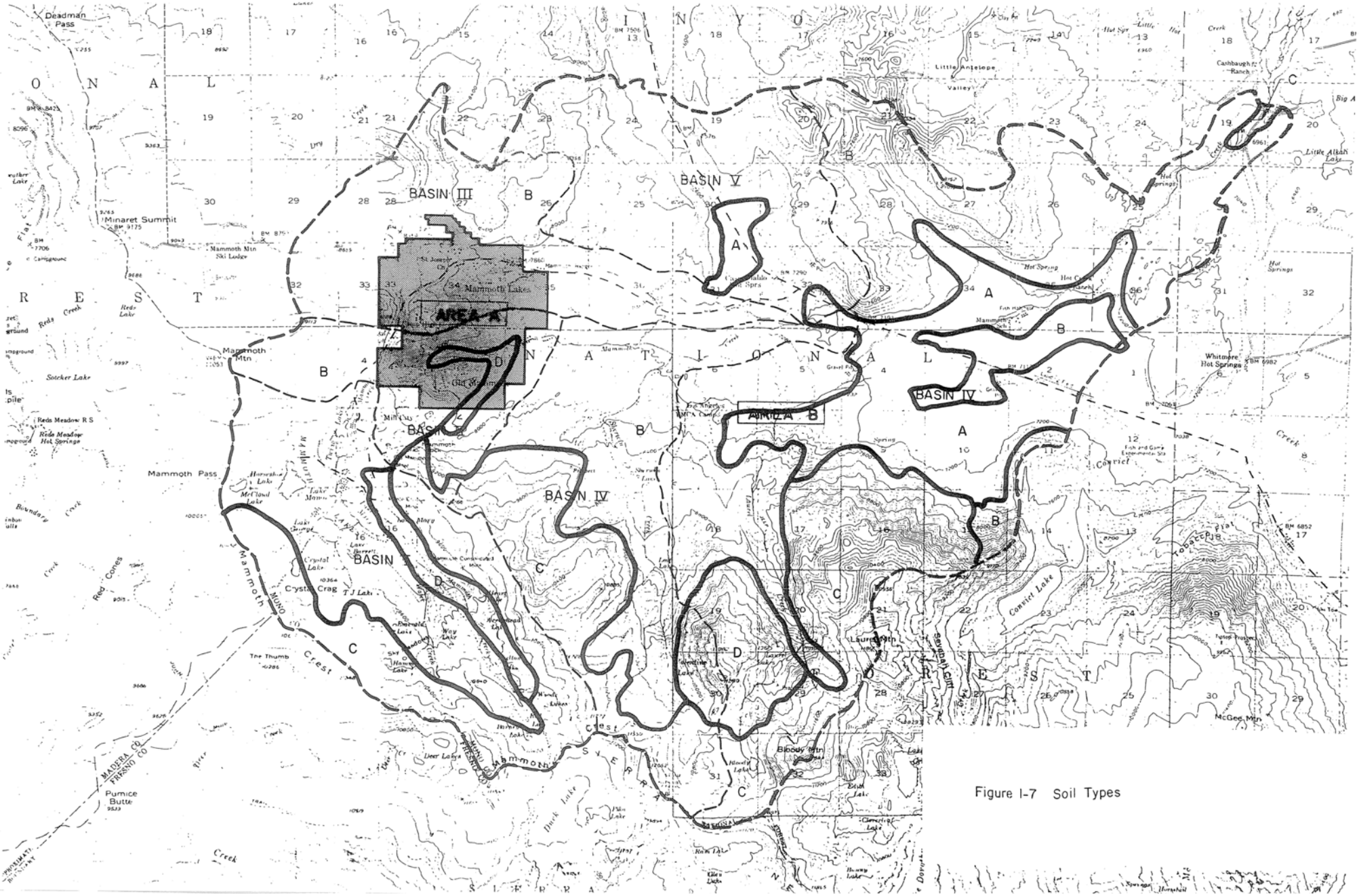


Figure I-7 Soil Types

4.8 LAND DEVELOPMENT

The construction and maintenance of urban and commercial developments can impact water quality in many ways. Construction activities inherently disturb soil and vegetation, often resulting in accelerated erosion and sedimentation. Stormwater runoff from developed areas can also contain petroleum products, nutrients, and other contaminants.

This section contains a discussion of the potential water quality impacts expected to result from land development activities, followed by control measures to reduce or offset water quality impacts from such activities.

Construction Activities and Guidelines

Construction activities often produce erosion by disturbing the natural ground surface through scarifying, grading, and filling. Floodplain and wetland disturbances often reduce the ability of the natural environment to retain sediment and assimilate nutrients. Construction materials such as concrete, paints, petroleum products, and other chemicals can contaminate nearby water bodies. Construction impacts such as these are typically associated with subdivisions, commercial developments, and industrial developments.

Control Measures for Construction Activities

The Regional Board regulates the construction of subdivisions, commercial developments, industrial developments, and roadways based upon the level of threat to water quality. The Regional Board will request a Report of Waste Discharge and consider the issuance of an appropriate permit for any proposed project where water quality concerns are identified in the California Environmental Quality Act (CEQA) review process. Any construction activity whose land disturbance activities exceed five acres must also comply with the statewide general NPDES permit for stormwater discharges (see "Stormwater" section of this Chapter).

The following are guidelines for construction projects regulated by the Regional Board, particularly for projects located in portions of the Region where erosion and stormwater threaten sensitive watersheds. The Regional Board recommends that each county within the Region adopt a grading/erosion control ordinance to require implementation of these same guidelines for all soil disturbing activities:

1. Surplus or waste material should not be placed in drainageways or within the 100-year floodplain of any surface water.

2. All loose piles of soil, silt, clay, sand, debris, or other earthen materials should be protected in a reasonable manner to prevent any discharge to waters of the State.

3. Dewatering should be performed in a manner so as to prevent the discharge of earthen material from the site.

4. All disturbed areas should be stabilized by appropriate soil stabilization measures by October 15th of each year.

5. All work performed during the wet season of each year should be conducted in such a manner that the project can be winterized (all soils stabilized to prevent runoff) within 48 hours if necessary. The wet season typically extends from October 15th through May 1st in the higher elevations of the Lahontan Region. The season may be truncated in the desert areas of the Region.

6. Where possible, existing drainage patterns should not be significantly modified.

7. After completion of a construction project, all surplus or waste earthen material should be removed from the site and deposited in an approved disposal location.

8. Drainage swales disturbed by construction activities should be stabilized by appropriate soil stabilization measures to prevent erosion.

9. All non-construction areas should be protected by fencing or other means to prevent unnecessary disturbance.

10. During construction, temporary protected gravel dikes, protected earthen dikes, or sand bag dikes should be used as necessary to prevent discharge of earthen materials from the site during periods of precipitation or runoff.

11. Impervious areas should be constructed with infiltration trenches along the downgradient sides to dispose of all runoff greater than background levels of the undisturbed site. Infiltration trenches are not recommended in areas where infiltration poses a risk of ground water contamination.

12. Infiltration trenches or similar protection facilities should be constructed on the downgradient side of all structural drip lines.

13. Revegetated areas should be continually maintained in order to assure adequate growth and root development. Physical erosion control facilities should be placed on a routine maintenance and inspection program to provide continued erosion control integrity.

14. Waste drainage waters in excess of that which can be adequately retained on the property should be collected before such waters have a chance to degrade. Collected water shall be treated, if necessary, before discharge from the property.

15. Where construction activities involve the crossing and/or alteration of a stream channel, such activities should be timed to occur during the period in which stream flow is expected to be lowest for the year.

16. Use of materials other than potable water for dust control (i.e., reclaimed wastewater, chemicals such as magnesium chloride, etc.) is strongly encouraged but must have prior Regional Board approval before its use.

Specific Policy and Guidelines for Mammoth Lakes Area

To control erosion and drainage in the Mammoth Lakes watershed at an elevation above 7,000 feet (Figure 4.8-1), the following policy and guidelines apply:

Policy:

A Report of Waste Discharge is required not less than 90 days before the intended start of construction activities of a **new development** of either (a) six or more dwelling units, or (b) commercial developments involving soil disturbance on one-quarter acre or more.

The Report of Waste Discharge shall contain a description of, and time schedule for implementation, for both the **interim erosion control measures** to be applied during project construction, and **short- and long-term erosion control measures** to be employed after the construction phase of the project. The descriptions shall include appropriate engineering drawings, criteria, and design calculations.

Guidelines:

1. Drainage collection, retention, and infiltration facilities shall be constructed and maintained to prevent transport of the runoff from a 20-year, 1-hour design storm from the project site. A 20-year, 1-hour design storm for the Mammoth Lakes area is equal to 1.0 inch (2.5 cm) of rainfall.

2. Surplus or waste materials shall not be placed in drainageways or within the 100-year flood plain of surface waters.

3. All loose piles of soil, silt, clay, sand, debris, or earthen materials shall be protected in a reasonable manner to prevent any discharge to waters of the State.

4. Dewatering shall be done in a manner so as to prevent the discharge of earthen materials from the site.

5. All disturbed areas shall be stabilized by appropriate soil stabilization measures by October 15 of each year.

6. All work performed between October 15th and May 1st of each year shall be conducted in such a manner that the project can be winterized within 48 hours.

7. Where possible, existing drainage patterns shall not be significantly modified.

8. After completion of a construction project, all surplus or waste earthen material shall be removed from the site and deposited at a legal point of disposal.

9. Drainage swales disturbed by construction activities shall be stabilized by the addition of crushed rock or riprap, as necessary, or other appropriate stabilization methods.

10. All nonconstruction areas shall be protected by fencing or other means to prevent unnecessary disturbance.

11. During construction, temporary erosion control facilities (e.g., impermeable dikes, filter fences, hay bales, etc.) shall be used as necessary to prevent discharge of earthen materials from the site during periods of precipitation or runoff.

12. Revegetated areas shall be regularly and continually maintained in order to assure adequate growth and root development. Physical erosion control facilities shall be placed on a routine maintenance and inspection program to provide continued erosion control integrity.

13. Where construction activities involve the crossing and/or alteration of a stream channel, such activities shall be timed to occur during the period in which streamflow is expected to be lowest for the year.

Land Development/Urban Runoff Control Actions for Susan River Watershed

1. To protect riparian vegetation and wetlands from land disturbance activities, the Regional Board shall recommend that Lassen County and the City of Susanville require new development or any land disturbing activities to include buffer strips of undisturbed land, especially along the Susan River and its tributaries.

2. The Regional Board, with assistance from the City of Susanville and the California Department of Transportation (Caltrans), should conduct monitoring of the Susan River and Piute Creek within the City of Susanville to assess impacts from urban runoff. Control measures should be planned and implemented based on the results of the monitoring. The monitoring plan should be developed to identify nonpoint sources needing control. Monitoring proposals will be submitted by the Regional Board, and work will be conducted as resources allow and as the Susan River gains priority.

3. The Regional Board shall encourage and assist other agencies in watershed restoration efforts along the Susan River.

4. The Regional Board shall encourage the City of Susanville and Lassen County to adopt a comprehensive grading ordinance. These ordinances should require, for all proposed land disturbing activities, the use of Best Management Practices to reduce erosion and stormwater runoff, including but not limited to temporary and permanent erosion control measures.

5. The Regional Board shall encourage the City of Susanville, Lassen County and Caltrans to implement Best Management Practices to reduce erosion and stormwater runoff when constructing and maintaining roads, both paved and unpaved, under their jurisdiction.

Road Construction and Maintenance

Road construction activities often involve extensive earth moving, including clearing, scarifying, excavating for bridge abutments, disturbing or modifying floodplains, cutting, and filling. Additionally, the potential for land disturbance exists from construction materials, equipment maintenance, fuel storage facilities, and general equipment use.

Once constructed, impervious road surfaces create another source of water pollution. Oils, greases, and other petroleum products, along with such toxic materials as battery acid, antifreeze, etc., may be deposited along the road surfaces. These contaminants become suspended or dissolved in any stormwater runoff that is generated on the road surfaces. Unless otherwise treated, these contaminants will flow toward local surface or ground waters. (See "Stormwater" section of this Chapter.)

Road maintenance can be potentially threatening to water quality in a number of ways. Below-grade culverts slowly fill with sediment and are cleaned out periodically, sometimes by flushing accumulated sediment into downstream drainageways. Grading of shoulders and drainageways can detach sediments and increase the risk of erosion into nearby surface waters. Road surfaces may be repainted or resealed

with materials that harden quickly, but which can be washed off while still fresh by stormwater runoff.

In the winter, roads are often snowy, icy, or wet. To reduce winter road hazards, maintenance crews may remove the snow or ice, apply sand to provide added traction, and/or apply deicing chemicals to melt the snow and ice. Sand is rapidly dissipated or crushed by the traffic, and must be replaced frequently. Great quantities of sediment enter drainageways and/or surface waters due to this practice. Snow may be removed mechanically via snowplow or snowblower. This practice is not particularly detrimental to water quality in itself, but the snow often carries substances from the roadway when removed. Sediments, chemical deicers, and vehicle fluids may travel much farther than they would otherwise, possibly reaching area surface waters. Ice and small accumulations of snow may be removed with chemical deicers. The deicer in widest use is rock salt (sodium chloride), due to its low cost, high availability, and predictable results.

Winter road maintenance was brought to the forefront in 1989 when significant numbers of roadside trees in the Lake Tahoe Basin suddenly started dying. The public outcry caused many environmental groups and regulatory agencies, including the Regional Board, to look more closely at what had been a more or less unscrutinized, unregulated process in the past. Data began to show that Caltrans was using very high amounts of salt each winter, and the figure seemed to increase from one year to the next. The consensus of the various regulatory agencies was that Caltrans should reduce salt use, explore various alternate deicers, and monitor the impacts of salt applications on soil, water, and vegetation. Salt use decreased significantly from 1989-1992, due to more careful application procedures and to drought conditions.

At least three alternate deicers have been explored: calcium magnesium acetate, potassium acetate, and magnesium chloride with corrosion inhibitors. These products have shown some promise, but further study is required. The cost to switch to an alternate deicer will be significant. The road departments are unwilling to make the switch unless an alternate deicer is demonstrably better environmentally, will not require too much adjustment on the part of the maintenance crews and equipment, and will actually do an effective and predictable job when applied.

However, Caltrans' monitoring of vegetation showed minimal and temporary salt accumulation within the vegetation. During the spring, any salt that had accumulated in the vegetation was flushed out from the plant material. The impacts of chemical deicers on fish and wildlife within the Lahontan Region have not been studied.

Control Measures for Road Construction and Maintenance

(Additional control measures for roads are included in the "Stormwater" section of this Chapter.)

The Regional Board regulates road construction and maintenance projects within the Lahontan Region, concentrating efforts on major construction and construction in sensitive areas. Major construction projects and those projects in sensitive areas are most often regulated under individual WDRs, and are routinely inspected. Less significant projects may be issued conditional waivers of WDRs. The Regional Board has also adopted road maintenance waste discharge requirements for some county governments in the Region. Road construction and maintenance in the Lake Tahoe Basin is also regulated under municipal NPDES Stormwater Permits (see Chapter 5).

For all road projects, the Board requires that construction be conducted in a manner which is protective to water quality, and that, at the end of a given project, the site be restabilized and revegetated. These requirements are detailed in a Management Agency Agreement with Caltrans regarding the implementation of BMPs. Additionally, all road projects are to be in compliance with the Caltrans Statewide 208 Plan (CA Dept. of Transportation 1980), which was approved by the State Board in 1979. This Plan contains a commitment to implement BMPs, but does not include great detail on the BMPs themselves. The State Board should encourage Caltrans to update its 208 plan to provide such detail, with particular attention to:

- stormwater/erosion control along existing highways
- erosion control during highway construction and maintenance

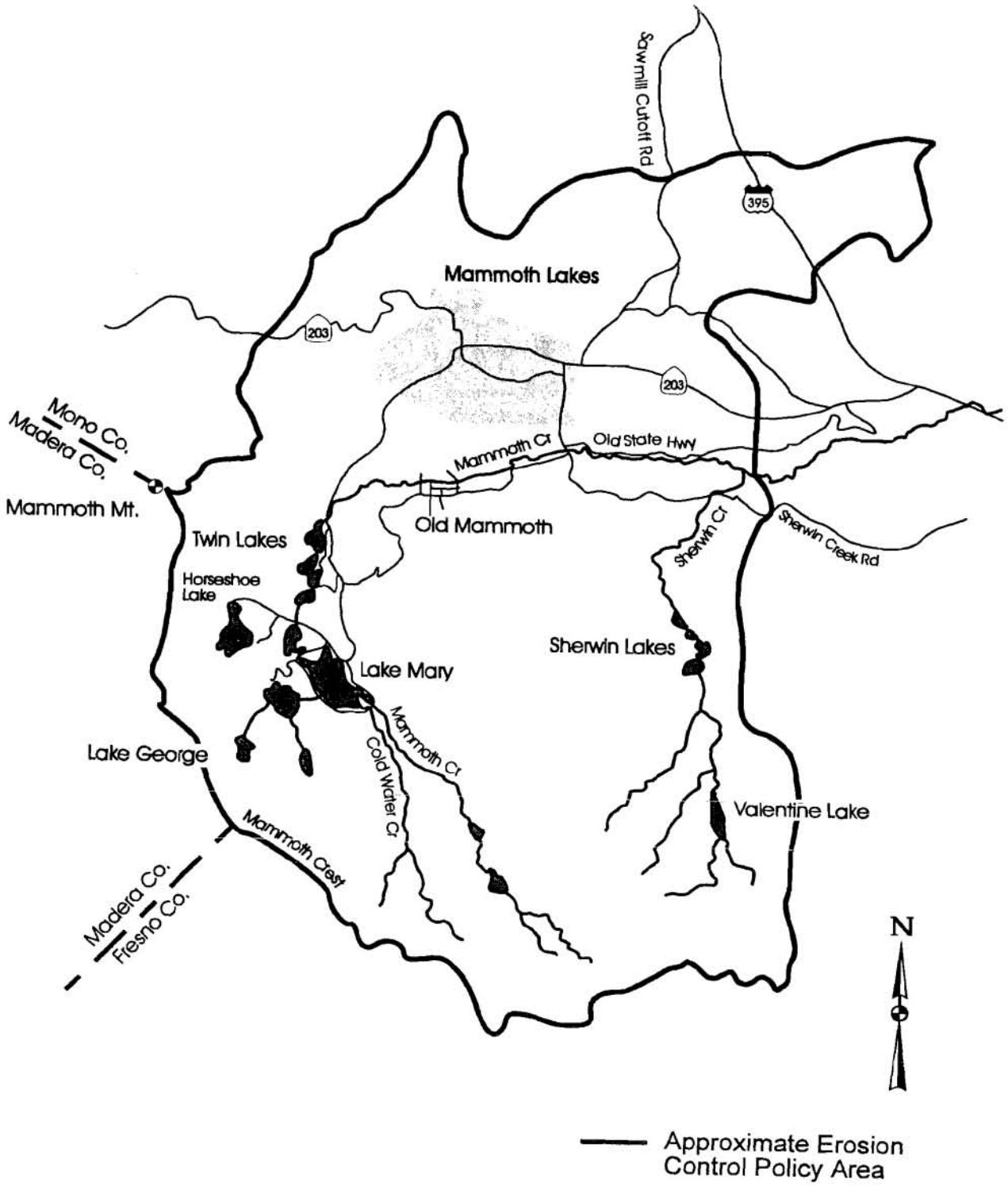
- reduction of direct discharges (e.g., through culverts)
- reduction of runoff velocity
- infiltration, detention and retention practices
- management of deicing compounds, fertilizer, and herbicide use
- spill cleanup measures
- treatment of toxic stormwater pollutants

Since much of the implementation of BMPs on highways is done by Caltrans' contractors, the selection of qualified contractors and ongoing education of construction and maintenance personnel on BMP techniques are particularly important.

In the Lake Tahoe Basin, all governmental agencies assigned to maintain roads are required to bring all roads in the Lake Tahoe Basin into compliance with current "208" standards within a specified time schedule. That is, all existing facilities must be retrofitted to handle the stormwater runoff from the 20-year, 1-hour storm, and to restabilize all eroding slopes. The twenty-year time frame for this compliance process ends in 2008.

The Regional Board should allow salt use to continue as one component of a comprehensive winter maintenance program. However, the Regional Board should continue to require that it be applied in a careful, well-planned manner, by competent, trained crews. Should even the "proper" application of salt be shown to cause adverse water quality impacts, the Regional Board should then require that it no longer be used in environmentally sensitive areas, such as the Lake Tahoe Basin. Similarly, should an alternate deicer be shown to be effective, environmentally safe, and economically feasible, its use should be encouraged in lieu of salt.

Figure 4.8-1
OWENS HYDROLOGIC UNIT



Appendix F:
Tentative Parcel Map Sheet 2
and Exhibit 1: Tamarack Extension
and Private Driveway Access and Profile

22-343-07

ABBREVIATIONS

AC	ASPHALT CONCRETE
AGG	AGGREGATE
APPROX	APPROXIMATE
BC	BEGIN CURVE
CL	CENTERLINE
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
CONC.	CONCRETE
CU.YD., CY	CUBIC YARDS
CSP	CORRUGATED STEEL PIPE
DI	DROP INLET
DIA	DIAMETER
EC	END CURVE
EG	EXISTING GROUND
EL, ELEV	ELEVATION
EP	EXISTING PAVEMENT
EQ, EQUIV.	EQUIVALENT
EX, EXIST.	EXISTING
FES	FLARED END SECTION
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FL	FLOWLINE
FS	FINISHED SURFACE
GB	GRADE BREAK
H	HEIGHT
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
MATL.	MATERIALS
MLFPD	MAMMOTH LAKES FIRE PROTECTION DISTRICT
MCWD	MAMMOTH COMMUNITY WATER DISTRICT
NTS	NOT TO SCALE
OC	ON CENTER
PL	PROPERTY LINE
PP	POWER POLE
P.U.E.	PUBLIC UTILITY EASEMENT
PVMT	PAVEMENT
ROW	RIGHT OF WAY
S.C.E.	SOUTHERN CALIFORNIA EDISON
SD	STORM DRAIN
SL	SEWER LATERAL
SS	SEWER SERVICE
SDMH	STORM DRAIN MANHOLE
SQ.FT., SF	SQUARE FEET
SSMH	SANITARY SEWER MANHOLE
STA	STATION
STD	STANDARD
SD	STORM DRAIN
TCW	TOP OF CURB WALL
TF	TOP OF FOOTING
TG	TOP OF GRATE
TOML	TOWN OF MAMMOTH LAKES
TW	TOP OF WALL
TYP.	TYPICAL
WL	WATER LATERAL
WS	WATER SERVICE

LEGEND

- PROPERTY LINE
- 7995 — EXISTING CONTOUR
- (7963.64) — EXISTING GROUND ELEVATION
- EXISTING EDGE OF PAVEMENT
- CENTER LINE
- H=6' — PROPOSED WALL HEIGHT
- 5.6% — PROPOSED GRADE RATE
- PROPOSED SWALE
- —S— EXISTING SEWER LINE
- —W— EXISTING WATER LINE
- 16"pine — EXISTING TREE TYPE & SIZE
- 16"pine — *TREE TO BE REMOVED
- EXISTING ROCK OUTCROP
- PROPOSED AC PAVEMENT
- PROPOSED CELLULAR GRASSED PAVING
- SD — PROPOSED STORMDRAIN
- S — PROPOSED SEWER LINE
- SFL — PROPOSED SEWER FORCE LATERAL
- W — PROPOSED WATER LINE
- U — PROPOSED DRY UTILITY TRENCH
- PROPOSED FIRE HYDRANT
- PROPOSED WALL
- AVALANCHE RUN-OUT ZONE

REGULATORY AND WARNING SIGNS SHALL BE PROVIDED AS REQUIRED BY THE TOWN OF MAMMOTH LAKES

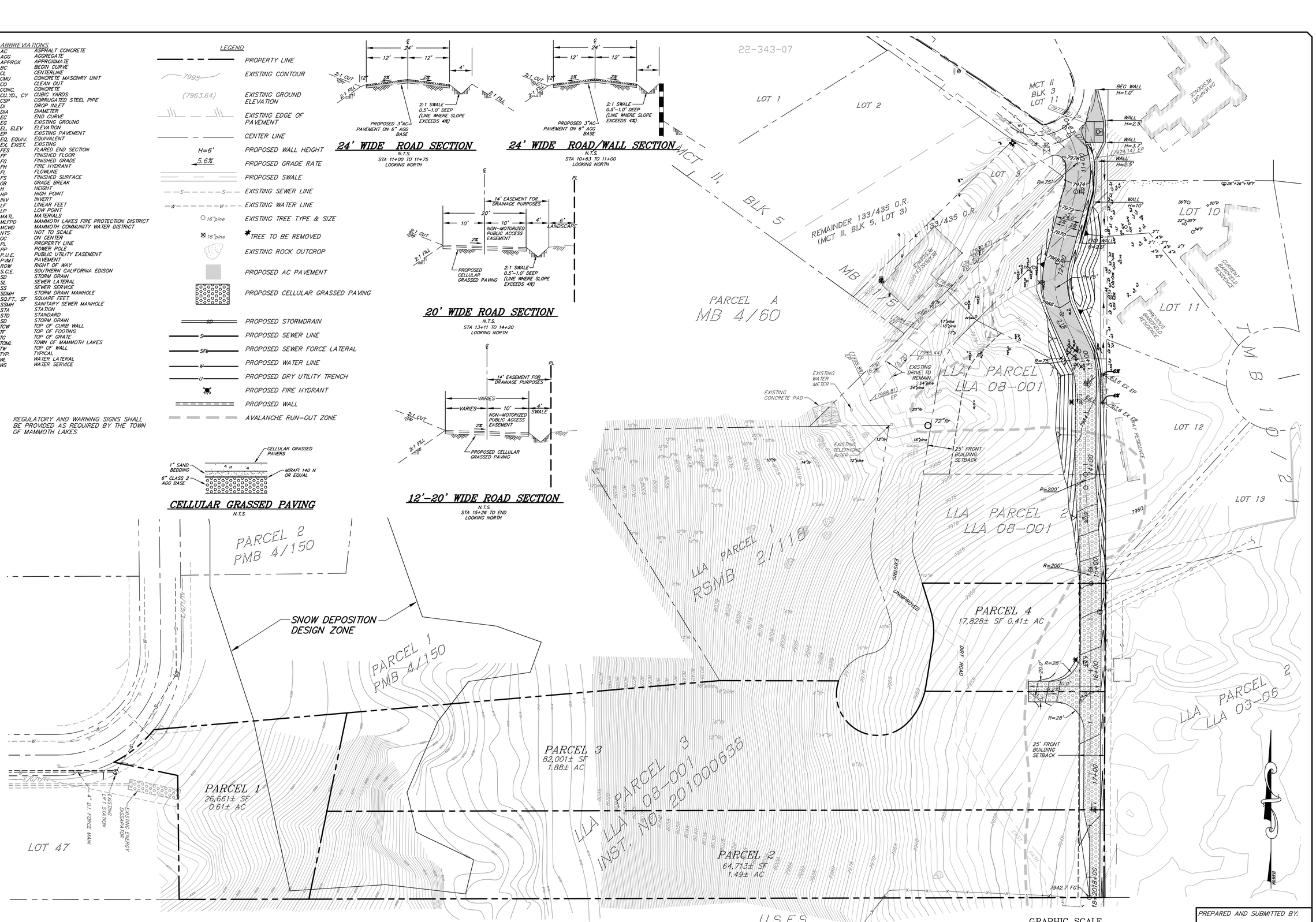
24' WIDE ROAD SECTION
N.T.S.
STA 11+00 TO 11+75
LOOKING NORTH

24' WIDE ROAD/WALL SECTION
N.T.S.
STA 10+83 TO 11+00
LOOKING NORTH

20' WIDE ROAD SECTION
N.T.S.
STA 13+11 TO 14+20
LOOKING NORTH

12'-20' WIDE ROAD SECTION
N.T.S.
STA 15+26 TO END
LOOKING NORTH

CELLULAR GRASSED PAVING
N.T.S.



GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

CONCEPTUAL SITE PLAN

VESTING TENTATIVE PARCEL MAP AND USE PERMIT 10-001

BEING A SUBDIVISION OF LLA PARCEL 3 OF LOT LINE ADJUSTMENT 08-001
IN THE TOWN OF MAMMOTH LAKES, COUNTY OF MONO, STATE OF CALIFORNIA

triad/holmes assoc.
civil engineering
land surveying

post office box 1570
549 old mammoth rd., ste. 202
MAMMOTH LAKES, ca 93546
phone (760) 934-7588
fax (760) 934-5619
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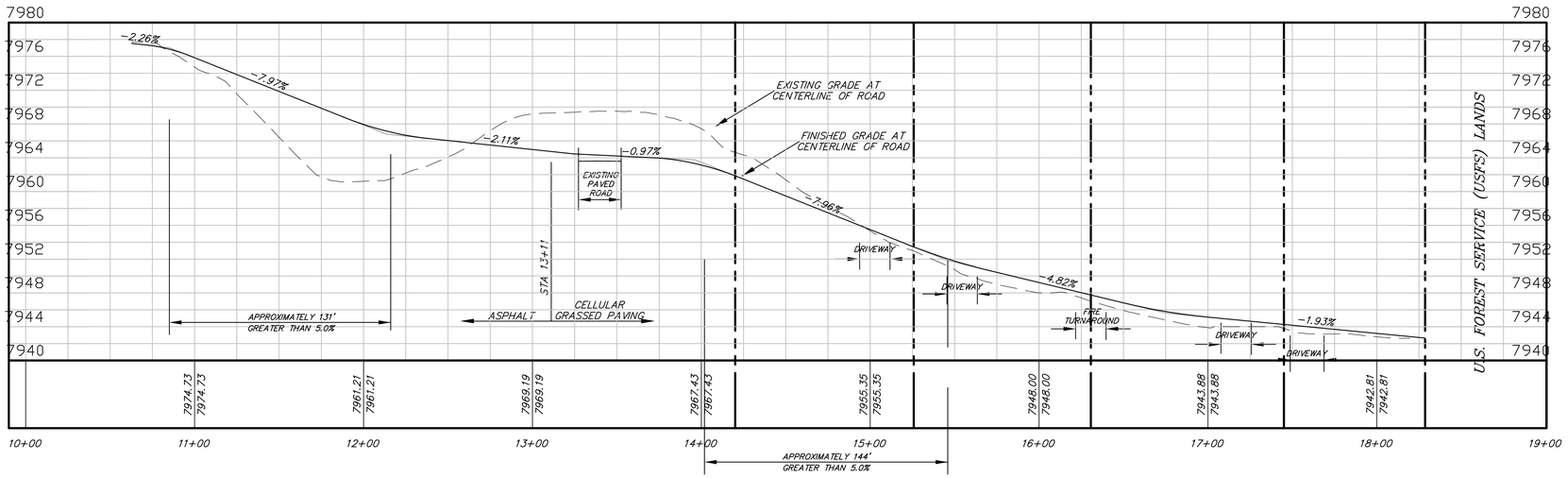
555 chorro st. suite a
SAN LUIS OBISPO, ca 93405
phone (805) 544-8908
fax (805) 544-8932
e-mail slo@thainc.com

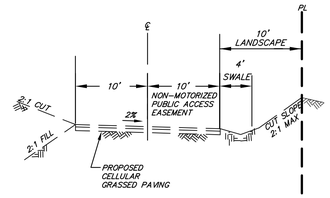
REVISIONS	BY

DATE 04/11/2011
SCALE 1"=40'
DRAWN SR/GP/JEP
JOB NO. 332.013
DWG TPM 10-001.dwg
SHEET 2 OF 4 SHEETS

PREPARED AND SUBMITTED BY:

PAUL EDWARD ROTEN DATE
P.E. C 56891 EXP. 6-30-11

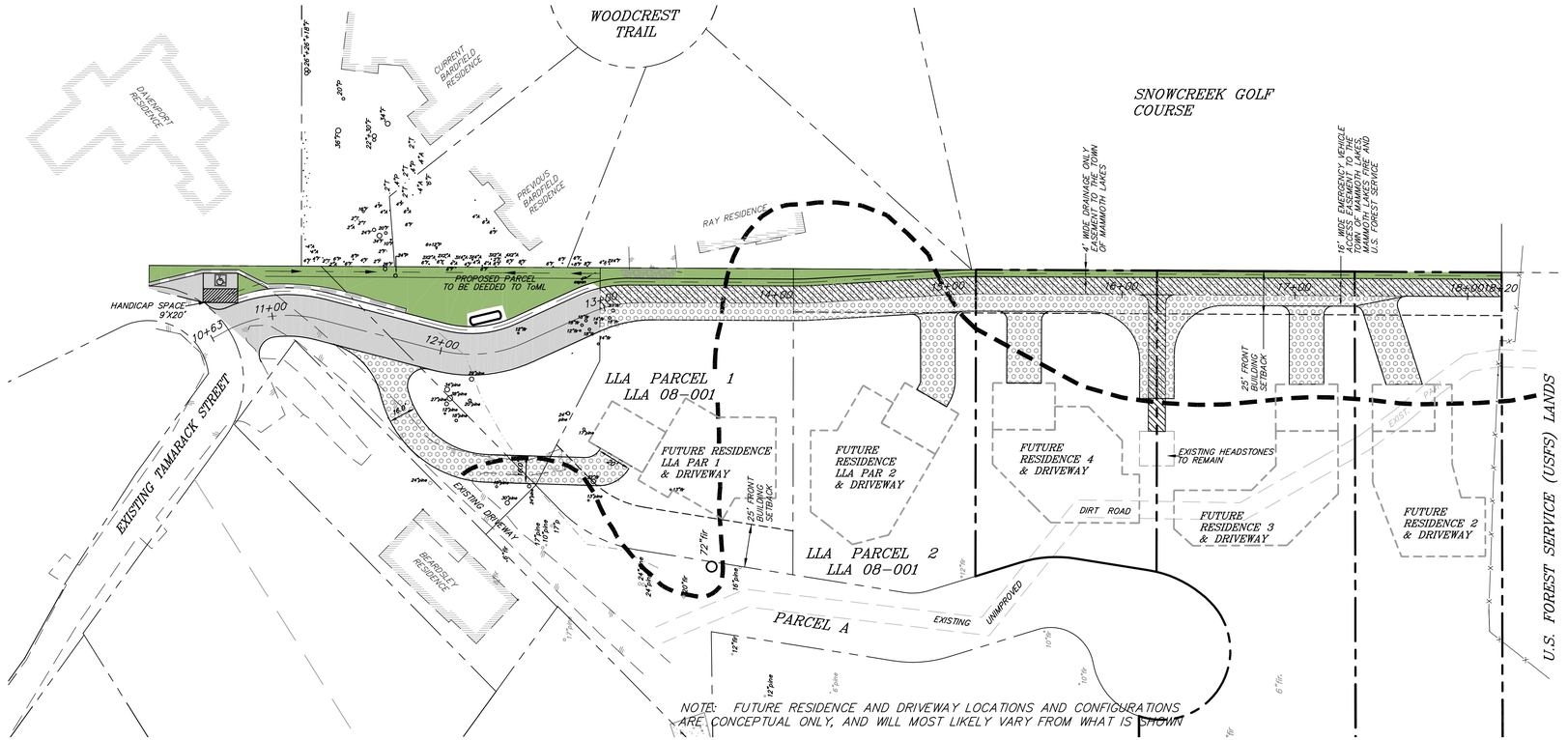




PRIVATE DRIVE SECTION

LOOKING NORTH
STA 13+11 TO 14+20

PROFILE SCALES:
1"=40' HORIZONTAL
1"=8' VERTICAL



NOTE: FUTURE RESIDENCE AND DRIVEWAY LOCATIONS AND CONFIGURATIONS ARE CONCEPTUAL ONLY, AND WILL MOST LIKELY VARY FROM WHAT IS SHOWN

LEGEND

- 100 YEAR AVALANCHE RUNOUT BOUNDARY PER MEARS 1997 STUDY
- 10' WIDE NON-MOTORIZED PUBLIC ACCESS EASEMENT TO ToML
- ASPHALT PAVEMENT
- CELLULAR GRASSED PAVING
- PROPERTY LINE
- WALL-11' MAX HEIGHT
- 12"fir — EXISTING TREE
- PROPANE TANK
- COBBLE LINED AREA
- PROPOSED LANDSCAPE

NORTH

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

PUBLIC TRAILS ACCESS TO U.S. FOREST SERVICE LANDS IN OLD MAMMOTH EXHIBIT
VESTING TENTATIVE PARCEL MAP AND USE PERMIT 10-001

BEING A SUBDIVISION OF LLA PARCEL 3 OF LOT LINE ADJUSMENT 08-001
IN THE TOWN OF MAMMOTH LAKES, COUNTY OF MONO, STATE OF CALIFORNIA

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REVISIONS	BY

DATE 04/11/2011
SCALE 1"=40'
DRAWN SR
JOB NO. 332.013
DWG TPM 10-001.dwg
SHEET **EXHIBIT 1**