



FINAL PROGRAM
ENVIRONMENTAL IMPACT REPORT

VOLUME III
COMMENT LETTERS

TOWN OF MAMMOTH LAKES
2005 GENERAL PLAN UPDATE

SCH No. 2003042155

MAY 2007

Letter 001



United States
Department of
Agriculture

Forest
Service

Inyo National Forest

Mammoth Ranger Station
P.O. Box 148
Mammoth Lakes, CA 93546
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File Code:

Date: December 24, 2005

Town of Mammoth Lakes
437 Old Mammoth Road, Suite R
POB 1609
ATTN: William Taylor
Mammoth Lakes, CA 93546

Dear Mr. Taylor,

The Inyo National Forest (INF) appreciates the opportunity to provide input regarding the Town of Mammoth Lake's (TML) Draft Environmental Impact Report and accompanying Draft General Plan.

Recreation, as identified in the Inyo National Forest LRMP, is the most important public resource available on the Inyo National Forest. The Forest Service would like to take this opportunity to state again, the Inyo National Forest recognizes the role of public lands as a "backyard" critical to the well-being of Mammoth Lakes residents, and the role of the Town of Mammoth Lakes as a gateway community providing access and amenities that augment recreation on the INF. The Forest Service also recognizes the central role of tourism and related public lands recreation in the economy of Mammoth Lakes.

The majority of land within the town limits of Mammoth Lakes, and surrounding those limits, is public land administered by the Inyo National Forest. Consistency and coordination between the Inyo National Forest Land and Resource Management Plan (LRMP) and Town of Mammoth Lakes General Plan is of critical importance to both agencies.

General Plan Comments

(1) The General Plan should include guidance regarding set-backs for development occurring along the UGB/ Federal Land interface. Set-backs are necessary to discourage development up to the property line, or encroachment in areas where future Forest Service uses have not been determined. Provision of set-backs was previously adopted as an informal practice between the Town of Mammoth Lakes and the Inyo National Forest, however, given the current scale of development and in anticipation of future proposals, it is appropriate to formalize this practice within the General Plan. I recognize from our discussions on the matter, the general plan may not be the appropriate vehicle within which to address setbacks. If this is indeed the case, I request continued attention to the matter by TML when appropriate.

Public Safety and Hazards



(2) The Forest Service requests clarification on Snow Deposition Design Zones as depicted in the General Plan. Specifically, where appropriate, design zones should include consideration of starting zones on Forest Service lands with potential to affect private property or TML permitted developments within the Town Boundary. It is not clear from the included maps, whether Snow Deposition Design Zones include consideration of all lands within the Municipal Boundary. This is of principal importance in reference to structures within the Town Boundary, outside the UGB and located on Forest Service lands. These structures, resorts, cabins and other facilities are, as noted in the general plan, subject to building permits and other municipal requirements. Ostensibly, this would include siting and design standards as they relate to mitigation of avalanche hazards.

Hydrology and Water Quality

(3) The Inyo National Forest (INF) is concerned about any future TML water supply reliant on groundwater pumping in the Dry Creek watershed, located almost entirely on INF land. It is probable, although impossible to predict, that there will be periods before 2020 during which a drought we may endure drought conditions for three dry or more years in a row. In that case, further water conservation or new water supplies would be required to meet water demand. We note the only new water supply discussed is new groundwater pumping in the Dry Creek watershed, on INF land.

As stated in the RDEIR on page 4-268, new groundwater sources are not a certain supply. Installation of groundwater pumps on INF lands would require review and authorization by the INF. Installing new production wells on INF land would necessitate federal environmental analysis and is known to be a controversial issue for Federal and other agencies and downstream private landowners. Forest Service regulations require that groundwater from Forest Service land not be used solely to provide a less expensive water supply when other sources are available. Further, groundwater pumping must minimize effects to groundwater dependent resources on Forest Service land. It is currently unknown whether groundwater pumping within the Dry Creek watershed would meet INF Standards and Guidelines and whether the Forest Service would approve such pumping.

The Revised Draft Program Environmental Impact Report would benefit from a discussion of the availability of any other feasible new water supplies and a better description of water-saving measures that would be implemented during a drought longer than three years. On page 4-268, the Town states that, "While additional water volumes available from more firm supply sources (i.e., water conservation and system loss reduction) would augment supplies by 797 AFY, certainty of these sources occurring does not exist." Consideration should be given to why these sources are not certain in addition to development of specific mitigation measures to ensure these supplies are more certain, such as better education about water saving measures, or greater enforcement of these measures.

(4) The General Plan and Draft EIR should discuss and reference application of the 2004 SNFP Record of Decision direction to IP and OS lands under Forest Service jurisdiction, within the UGB. The Draft EIR mistakenly references the 2001 SNFP Record of Decision and tiers to information contained therein. Although much of the information contained in the 2001 SNFP

FEIS and Record of Decision carried forward into the supplemental EIS, the 2004 Decision differs in several key ways from the previous decision.

Mineral Resources Management

(5) Regarding Mineral Resource Management on General Plan CHS-13, it is not clear how TML jurisdiction for mineral extraction or geothermal leasing within the town limits may be applied to lands administered by the FS and BLM under the relevant mining laws. The General Plan should clarify the limits of TML jurisdiction or at minimum note TML's coordinating role with the Forest Service and Bureau of Land Management in mineral resource management within the town boundary.

(6) The Forest Service looks forward to working collaboratively with the TML in further development of public education regarding CO2 and high hazard areas. As well as working collaboratively to ensure that all high-hazard areas are marked and/or closed to public access during high-risk periods.

Land Use and Planning

(7) The Town of Mammoth Lakes has indicated an interest in extension of the UGB to encompass adjacent Forest Service Lands such as the Visitor Center, Ranger Station, and employee housing complexes. The INF notes UGB policies, specifically V.1.A.b.2 allow for later inclusion of FS lands in the UGB. The Forest Service does not believe inclusion of lands such as the Visitor Center, Ranger Station and employee-housing complex need occur at this time. The General Plan provides adequate guidance to ensure a reasoned and timely process can occur should the issue become ripe. Regardless, the INF believes a thorough and public discussion of the merits and motives in expanding the UGB should occur outside the General Plan Process. Towards this end, we are pleased TML does not appear to be considering inclusion of these lands at this time.

(8) UG-3 does not appear to be consistent with UGB Policies on UG-5. This may be intentional; however, restricting TML Land Designations to IP for FS lands within the UGB should be accomplished carefully and in consultation with the INF. Although the IP Land Designation may make sense for the East Gateway property, it may not for others.

(9) The intent of application of OS to Ski-Back Trail lands, and lands located in T.4.S, R.27.E, sec. 4, in all project alternatives is not clear. Consistent application of Land Designations suggests these lands should be designated NF. It appears from a review of Fig. 3-4, the oversight has been corrected. As stated on LU-10, this "designation is applied to lands administered by the Inyo National Forest that are outside the adopted Urban Growth Boundary.

Recreation Access and Planning

(10) The INF requests clarification of General Plan 1.3.A.1 & IV.3.A.a - Accessibility of public lands for outdoor recreation. Although the Town of Mammoth Lakes acknowledges the Forest Service role in provision of recreation opportunities and management of adjacent lands, the intended outcome of ensuring accessibility should be clarified sufficient to ensure a common understanding between governments. Specifically, I.3.A.1b should be revised and made consistent with I.3.A.1a to reflect coordination between agencies for access to public lands. It may not be the case, in all instances, that pedestrian access to public lands is desired or appropriate from adjacent private land developments.

(11) General Plan RE-8, Paragraph 2, regarding public access to the Lakes Basin, the Inyo National Forest may consider restrictions on modes of access through better coordination of transit, parking and day use. It is not our base intent to limit or restrict access in terms of numbers of people within the limits of the Lakes Basin's available recreation and natural resources. The text should be rephrased to reflect INF policies and to make it more consistent with the right margin box statement on RE-8.

(12) General Plan IV.1.B.a.2 on RE-14, TML should coordinate Winter Recreation Planning with the INF as most motorized and non-motorized modes occur almost exclusively on FS lands.

(13) General Plan T&C-22 Development Impacts. Specifically, "traffic is expected to increase as a result of expansion of the Mammoth Mountain Ski Area (MMSA)." No expansion on FS, other than in delivery of services within existing capacity, is expected, planned or reasonably foreseeable at this time. The INF recognizes both TML and MMSA seek a better balance of weekday and peak period skier visits. It is anticipated, over time, as weekday skier visits increase, overall weekday and annual utilization of MMSA would also increase. However, any increase in skier visits is expected to occur within existing ski area capacity. The Forest Service notes this concern has been addressed in part at 4-286.

(14) Revised Draft EIR ES 2-1, 3-2, 4-280. Estimates of ski area capacity should be used with caution. It is incorrect to assert MMSA has expanded to a capacity of 24,000 SAOT. Calculation of Skiers At One Time (SAOTs) is based in part on assessment of terrain and lift capacities, but is also generally understood to be a factor of social perceptions of crowding. Although lift capacity and terrain capacity has been enhanced at MMSA over the last planning cycle, attainment of maximum SAOTs as depicted in the MMSA Master Development Plan has not been achieved. Substantial planned components including terrain expansion have not been implemented. A more meaningful, and conservative approach would be to model ski area use around the typical Saturday (generally 80% of peak annual one-day use). The RDREIR mistakenly states capacity as set in the Mammoth Mountain Ski Area permits as 24,000 SAOTs. A determination or authorization of capacity is not made within the ski area permit.

(15) Table 4.12.-1 depicts existing and planned park land including acres own by the town and acres developed. Forest Service lands permitted for use to the TML at both Shady Rest and Mammoth Creek Parks are included. With reference to the TMLs stated intent at 4-281 and in

IV.1.D.A.a.1, it appears lands authorized for use by the Forest Service may be utilized by the TML to meet Quimby Act (GC 66477) requirements. The Forest Service notes, while these lands are authorized for TML use, they are also located outside the UGB. It may not be appropriate to include these lands as contributing components towards community park lands. Special uses authorizations could be viewed and may become a future constraint on use of these lands. The Forest Service strongly encourages TML to seek out opportunities to provide park lands and recreation amenities within the UGB consistent with the Quimby Act, rather than looking to acreage on National Forest Lands as a significant component of TML park lands.

(16) Discussion of potential effects of TML population growth on adjacent public lands should be better developed within the regional context. Although the analysis notes Forest Service lands serve as the primary release valve when TML park capacity is exceeded, it may be more appropriate to base the analysis in the context of TML as a gateway community reliant on public lands recreation for the majority of local area recreation opportunities.

The central role of public lands recreation should be recognized in this context as a critical amenity and driver in population change in the Eastern Sierra. As such, the analysis should also reference current information on recreation trends in California, which I believe will show there is a stronger correlation between regional population change and public lands recreation on the Inyo National Forest than between TML population change and local area public lands recreation.

Into the foreseeable future, population growth in Southern California will remain the primary driver for growth in Eastern Sierra public lands recreation. As impacts associated with regional scale growth are anticipated and better understood, the INF will respond accordingly and appropriately to maintain and enhance public lands recreation opportunities in and adjacent to the Town of Mammoth Lakes. The need for action in response to changes in population, desired recreation experiences and opportunities in the local area will arise under all General Plan Alternatives.

We look forward to working more closely with the TML in the future on efforts aimed at addressing future recreation and management of landscapes in the Eastern Sierra.

Sincerely,

MOLLY BROWN /S/

MOLLY BROWN
District Ranger
MAMMOTH/ MONO DISTRICTS



United States Department of the Interior

NATIONAL PARK SERVICE
Devils Postpile National Monument
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760-934-2289

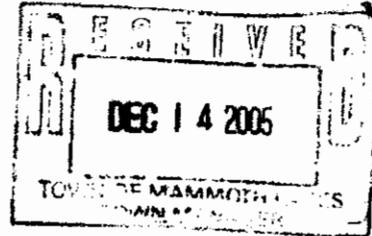


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IN REPLY REFER TO:

L7621

December 12, 2005



Memorandum

To: Robert Clark, Town Manager and Bill Taylor, Town Planner
From: Deanna Dulen, Superintendent, Devils Postpile National Monument
Subject: Comments on the Town of Mammoth Lakes Draft General Plan

Dear Robert and Bill,

Thank you for the opportunity to comment on the Draft General Plan. With our complementary geographic locations, an opportunity exists to coordinate our activities in providing quality visitor services and adequate facilities in a world-class setting of natural beauty. Also, as Devils Postpile National Monument (DEPO) remains a destination for many Mammoth Lakes visitors, it serves as a significant, sustainable recreational opportunity which the Town of Mammoth Lakes (TML) should address in its planning.

With this in mind, important aspects to be considered are:

Impacts of Future Growth on Parking Facilities and Transportation Systems (Section 4.13 Transportation and Circulation, TML Draft General Plan)

"At build out of the General Plan, it is anticipated that the Town will hold approximately 60,700 Persons at One Time (PAOT) on an average winter Saturday... The permanent population at build out is expected to grow from approximately 7,600 residents in 2004 to approximately 11,600 people." (Page LU-4)

It is important that the Town's Mobility Plan consider adequate transit and parking facilities associated with the Reds Meadow/Devils Postpile transportation system. We look forward to working with the TML to explore opportunities for partnership in shared transit services. Please include us in any relevant site-specific planning meetings.

Handwritten notes: 1 gen., 2 TRF/COM

During the recent meeting on the proposed redevelopment of Mammoth Mountain Inn and Ski Area several concerns became apparent. In particular, the staging area for the Reds Meadow/DEPO shuttle bus was not addressed. Whether this omission was an oversight or a reflection of a future goal to transfer the responsibility of all transportation to the TML is not clear. What is important is that the location of the Reds Meadow/Devils Postpile shuttle bus staging area needs to be safe, functional, well signed and easily discernable to the general public. This is not addressed in the TML Draft General Plan and there is no mention of where the future location of the shuttle bus staging area will be.

TRF
3

The TML General Draft and Mobility Plans as well as the Mammoth Mountain Redevelopment Plan should all complement one another in that they each must address adequate parking for shuttle bus users to meet current demand and future use projections. Currently, there are days where bus ridership exceeds 2,031 visitors (July 5, 2003 statistics, and a general estimate is that perhaps there is a current need for parking for 677 vehicles on a peak day). The average estimated number of needed parking based on statistics from 2003 to 2005 is between 275 to 300 vehicles on an average Saturday. During holiday weekends, 400 to 500 parking sites are needed between the peak visitation hours of 10:00am and 1:00pm.

4
TRF

Furthermore, it appears that the proposed removal of 250 parking spots would decrease available parking from 985 spaces today to 735, and would compromise the ability to provide adequate parking. Reference was made to possible underground parking facilities however, it remains unclear if these would be available to the general public and at what cost. Additional parking also needs to be addressed in Mammoth Mountain Ski Area and the Town of Mammoth Lakes planning to accommodate future growth.

5
TRF

With this future growth in mind, it is important to assess the impacts to DEPO/ Reds Meadow that additional visitation will bring. Thankfully, work is underway to look at visitor access and transportation alternatives. We should continue evaluating impacts, needs, and partnership opportunities. One of these multi-agency opportunities will be to discuss integrating transportation operations that include the shuttle bus system.

6
TRF

Hydrology and Water Quality (Section 4.6)

The draft plan fails to identify whether the reach of future water needs will extend to the watershed along the western slope of the San Joaquin Ridge. More specifically, it does not consider the impacts associated with using the Mammoth and Dry Creek watersheds for ground pumping and the potential adverse effects the west slope of the Upper Middle Fork of the San Joaquin may incur. It is critical that the impacts of increased numbers of visitors and resort guests do not compromise the watershed that affects the Upper Middle Fork of the San Joaquin. During DEPO's Vital Signs Meetings in April 2002, the USGS explained how springs and groundwater use on the east side of the San Joaquin ridge could impact the hydrology on the west side where numerous springs occur.

7
WTR

The Mammoth and Dry Creek watersheds connect to springs and drainages along the western slope of the San Joaquin ridge that provide lush wetland environments and aspen groves where many deer and bird species occur. This area also serves as a migration route for deer leaving the Upper Middle Fork of the San Joaquin for their winter habitat. It is possible that tapping into springs and groundwater on the east side of San Joaquin Ridge and Mammoth and Dry Creeks could also affect the river levels of the Upper Middle Fork of the San Joaquin. A thorough analysis and study should be done for both the Mammoth and Dry Creek groundwater reservoirs in order to understand current and future impacts to this vital watershed.

8
WTR

Aviation and Impacts on Natural Soundscapes (Section 4.08)

"In 1998, the Town of Mammoth Lakes adopted an updated plan for the Mammoth Yosemite Airport. This plan provides for major development and expansion of the airport terminal area, including a hotel, major infrastructure improvements; aircraft support facilities, and passenger terminal. The Mono County Airport Land Use Commission adopted an Airport Land Use Plan in 1986. The plan also establishes specific land use policies to protect the public welfare and the safety of aircraft operations" (page T&C-15).

**Regional commercial jets (50 passenger) will probably start flying into the Mammoth Yosemite Airport in December 2006. The Environmental Impact Statement (EIS) on the Mammoth Yosemite Airport expansion will likely be completed in the beginning of next year. However, the airport's expanded facilities cannot be constructed until the FAA approves the EIS. Therefore, it will probably be 3 more years until larger commercial jets arrive.*

Other impacts from the promotion and growth of tourism include the proposed regional jet service. The aircraft currently being considered for commercial traffic fly at lower altitudes and are noisier than most commercial jetliners at higher altitudes. An FAA map provided to the National Park Services shows flight paths over the Ansel Adams and John Muir Wilderness areas within the Inyo and Sierra National Forests, the Ansel Adams Wilderness in Devils Postpile National Monument, Devils Postpile National Monument itself, and probably over Minaret Vista. The importance of protecting natural soundscapes is integral to providing a quality experience to a broad spectrum of campers, anglers, hikers, and day-use visitors to these areas both within the TML and the recreation area of Reds Meadow/DEPO. While the TML provided an analysis of acceptable noise levels within town limits, it remains important to safeguard this same resource in the places our visitors and residents seek to experience a natural soundscape. Planes arriving over Minaret Pass and just west of Mammoth Mountain would impact the TML soundscape standards.

We have an important partnership opportunity to influence the flight paths so that they do not compromise the visitor's experience or the resource. We request that you identify soundscapes as a key value of town and neighboring public lands and therefore commit to ensuring that future flight paths do not impact the very resources your residents and visitors value.

Public Safety and Hazards (Section 4.5)

An important concern is the need for emergency services access and response ability. Currently, the Town of Mammoth Lakes serves as the only access point to the Reds Meadow/DEPO/Middle Fork of the San Joaquin River in which many of its residents and visitors recreate. It would be prudent to identify potential evacuation routes in the event of a forest fire, flood, earthquake, volcanic event, or other emergency. As many remember, the availability of an escape route during the Rainbow Fire was critical to public safety. During the past fire season of 2005, many lightning strikes ignited in the post-Rainbow Fire burn area. So it is probable in a future scenario that there could be a repeat of the Rainbow Fire conditions where it is impossible to determine the magnitude and extent of the fire in the smoke-filled valley. Both the TML Draft General Plan and the Mammoth Mountain Redevelopment Plan need to address these public safety concerns.

Another shared interest is that the TML Fire Department provides structural fire suppression to the Upper Middle Fork of the San Joaquin/Reds Meadow/DEPO that will both protect local recreational facilities and prevent fire from spreading over the Mammoth Crest. It would be beneficial to have the Town and

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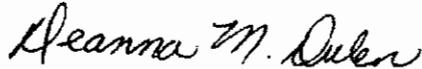
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FIR

DEPO coordinate with one another in all needed inspections and MOUs in order to allow for an adequate response.

Finally, as Mammoth Mountain Ski Area is proposing a redesign of State Highway 203 and CalTrans is considering a relinquishment of jurisdiction over the road, it is important to consider accessibility and maintenance issues in relation to Highway 203's function as an evacuation route.

Thank you again for considering our comments. We look forward to your response and the opportunity to work in partnership to address solutions.

Sincerely,



DEANNA M. DULEN
Superintendent

CC:

Molly Brown, Acting Mammoth District Ranger, Inyo National Forest
Nancy Upham, Public Affairs Officer, Inyo National Forest
Russ Wilson, Acting Superintendent, Sequoia Kings Canyon National Park
John Austin, Supervisory Resource Management Specialist, Sequoia Kings Canyon National Park
Kevin Percival, Alternative Transportation Planning Manager, NPS
Michael Morelli, Transportation Planner, Washington Office, NPS
Dianne Croal, Regional Landscape Architect, NPS
Gay Page, Transportation Planner, Denver Service Center, NPS

↑ 11
(cont.)
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California Regional Water Quality Control Board

Lahontan Region



Alan C. Lloyd Ph.D.
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Arnold Schwarzenegger
Governor

December 14, 2005

CERTIFIED MAIL 7002 2030 0005 9257 8071
File: Environmental Doc Review, Inyo County

Sonja K. Porter
Town of Mammoth Lake
P.O. Box 1609
Mammoth Lakes, CA 93546

COMMENTS ON THE REVISED DRAFT PROGRAM ENVIRONMENTAL IMPACT REPORT - SCH#2003042155, INYO COUNTY

Thank you for the opportunity to review the above-referenced Draft EIR dated October 31, 2005. Comments were requested by December 14, 2005. The proposed project is a comprehensive update of the Town of Mammoth Lake's General Plan. The General Plan is the primary policy document for the Town that will guide decisions, which will impact the physical environment in the future. The revised plan proposes lower residential and commercial densities, which the plan was circulated in February 2005.

We have the following comments on the Revised Draft EIR:

Issue 4.6-1 on P. 4-156. *Impacts to surface water quality*

Your discussion mentioned that an increase in impervious surface area and an increase in development result in a loss of water quality. The concluding statement summarizes the paragraph by saying that there would be no impact because all projects are subject to the permitting process. Under "Mitigation Measures" you stated, "The Updated Plan would not result in a violation of any water quality standards or waste discharge requirements. Therefore, no mitigation measures are required."

Comments:

1. Please note that obtaining a permit and conducting monitoring does not constitute adequate mitigation. Development and implementation of acceptable mitigation is required. Obtaining permits for new projects does not preclude cumulative impacts from multiple projects.
2. An evaluation and explanation of how you will monitor for cumulative impacts of development and expected increase in impervious surfaces that may impact surface water quality is needed. We recommend a clear definition of when monitoring results will trigger adaptive management and what the alternative adaptive management strategies, including mitigation, will be.
3. We request that you evaluate and explain how you will detect when Phase II Storm water Monitoring will be needed and explain when you will begin implementing it as your population grows.

California Environmental Protection Agency

Sonja K. Porter

- 2 -

December 14, 2004

4. We recommend an evaluation and discussion of potential off-road vehicle use, especially unauthorized use, surrounding new developments to be included in this section. We suggest an evaluation and discussion of potential impacts that off road vehicle use may have on water quality.
5. We suggest an explanation of how your monitoring and adaptive management for surface water quality will coordinate with the County Watershed Activities.
6. We request an explanation of how the cumulative effects of multiple projects, that in isolation may not be significant, will be mitigated. We suggest that you include explanation of how the cost of mitigating cumulative impacts will be covered so that mitigation may be implemented if warranted by monitoring results.

I.1.A.b.2. This implementation measure was listed in the general plan, but not mentioned in the EIR. "The Town of Mammoth Lakes shall encourage, through project review, that water courses be integrated into new development in such a way that they enhance the aesthetic and natural character of the site. Mapped intermittent streams shall not be routinely placed in culverts."

I.1.A.b.3. "The Town of Mammoth Lakes shall regulate the modification of natural stream beds and flow to ensure that adequate mitigation measures are utilized."

I.1.B.e.3. You mentioned that new development in the vicinity of Mammoth Creek will be required to maintain minimum setbacks and preserve stream vegetation.

Comments and Questions:

7. We appreciate The Town's policy of placing value on natural watercourses. We recommend that I.1.A.b.2 be included in the "Implementation Measures" section of the EIR. Please add a statement regarding how The Town will also encourage maintaining the natural function of watercourses in addition to aesthetics. We concur that intermittent streams should not be routinely placed in culverts. Please delete the word "mapped" from the statement.
8. We recommend that you quantify "minimum set backs" and evaluate application of "minimum set backs" to wetlands and other surface waters.
9. We suggest an evaluation and explanation of how the set back requirement would be applied to tributaries, creeks other than Mammoth Creek and other wetlands.
10. We recommend that you include a map of creeks, tributaries, water bodies, and wetlands with setback buffer zones. An aerial photo with a minimum of 1M resolution for a background and a minimum of 1 inch to 1000 feet scale is suggested.
11. We suggest that you evaluate and discuss the possibility of trading land with other agencies or private parties in order to set aside property with water bodies, wetlands or property that is in the flood zone; and designate it as open space.

I.7.A.b.1. You mentioned that The "Town shall require where practical and when warranted by the size of the project that parking lot storm drainage shall include facilities to separate oils and salts from storm water."

Sonja K. Porter

- 3 -

December 14, 2004

Comments:

12. We appreciate the practice of treating non-point source pollutants before they reach the storm water drainage system. We encourage you to continue this practice and expand it as the need arises.
13. What criteria will you use to determine when it is not practical to install storm water separators?
14. We recommend a description of any mitigation monitoring that will be used along with this measure to evaluate and minimize urban runoff impacts.

Issue 4.6-2: Impacts that would result in erosion or siltation

You stated, "Development in accordance with the Updated Plan could lead to alterations of the existing drainage patterns, especially where drainage occurs on private property, or development occurs near natural drainage channels." In **I.1.A.b.3.** you stated, "The Town shall regulate the modification of natural stream beds and flow to ensure that adequate mitigations measures are utilized." Under **Mitigation Measures** on p. 4-160 you stated, "The implementation of the Updated Plan would not substantially alter drainage patterns causing substantial erosion or siltation within the Planning Area. Therefore, no mitigation measures are required." Please note that obtaining a permit and conducting monitoring does not constitute adequate mitigation. Development and implementation of acceptable mitigation is required. Obtaining permits for new projects does not preclude cumulative impacts from multiple projects.

Comments:

15. We request that you explain how you will ensure that adequate mitigation measures will be utilized.
16. We request that you explain how you will coordinate mitigation for different projects with each other so that the end result will be a functional system.
17. We request that you explain how comments six to nine above will apply to siltation and erosion.
18. In **II.4.A.a.3** we recommend that "should" be changed to "will." A map of creeks, creek corridors, corridor setbacks, and riparian vegetation is advised.
19. We recommend that you evaluate and discuss the potential of increased off-road vehicle use surrounding new developments, the impact of increased off-road vehicle use, especially unauthorized off-road use, on conditions that may cause erosion and runoff.

Issue 4.6-3: Impacts that would result in flooding In the Discussion section you stated that "Upstream development may include a variety of alterations to existing conditions such as more impervious surface, thus more runoff; altered drainage patterns, shifting the location of surface runoff; increases in runoff velocity; and alterations to water quality." You summarized the section with the statement, "The implementation measures in the Updated Plan and Municipal Code sections serve to maintain the existing drainage pattern of the Planning Area, including streams and river courses. With these implementation measures and compliance with federal, state and local design and construction requirements, surface runoff rates within the Planning Area would not be substantially increased."

Sonja K. Porter

- 4 -

December 14, 2004

20. We request that you explain how the impacts of upstream development will be mitigated to prevent problems downstream that may impact flooding and/or water quality.
21. See Comment 18 above regarding **II.4.A.a.3.**
22. We recommend that you evaluate and discuss the potential of increased off-road vehicle use surrounding new developments, the impact of increased off-road vehicle use, especially unauthorized off-road use, on conditions that may cause increased flooding.

Issue 4.6-4: Impacts that would result in loss of storm water capacityImplementation measure **I.1.A.b.2** from General Plan was not included.**Comments:**

23. We recommend that you reinstate implementation measure **I.1.A.b.2.**
24. See Comment 18 above regarding **II.4.A.a.3.**
25. We recommend that you evaluate and discuss increase of off-road vehicle use surrounding new developments, the impact of increased off-road vehicle use, especially unauthorized off-road use, on storm water capacity

Issue 4.5-5: Substantial degradation of water quality.

26. Same as comments 1 – 25.

Issue: Long-term impacts to ground water quality resulting from pumping and leaching of contaminants were not addressed.

Comments:

27. We request that you explain how you will implement long term monitoring for TDS and drinking water standards in groundwater. Include adaptive management responses should analysis of results show a significant decline in groundwater quality.
28. We request that you explain how your monitoring and adaptive management for surface water quality will coordinate with the County Watershed Activities.

Thank you for your attention to these comments and issues. Your cooperation and interest in water quality is appreciated. If you have any questions or would like to discuss these issues further, please contact me at (760) 241-3523 or Cindi Mitton (Senior Engineer) at (760) 241-7413.

Sincerely,



Mary Dellavalle
Environmental Scientist
mdellavalle@waterboards.ca.gov

cc: State Clearinghouse
PO Box 3044
Sacramento, CA 95812-3044

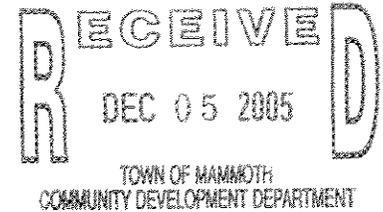
MD/rp/Mammoth Lakes

DEPARTMENT OF TRANSPORTATION Letter 004

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November 28, 2005

Ms. Sonja Porter
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546-1609

Dear Ms. Porter:

Re: Town of Mammoth Lakes General Plan Update (Revised Draft Environmental Impact Report)
SCH# 2003042155

The California Department of Transportation (Caltrans), Division of Aeronautics reviewed the above-referenced environmental document with respect to airport-related noise and safety impacts, airport operations safety, and regional comprehensive planning pursuant to the California Environmental Quality Act (CEQA). The Division has technical expertise in the areas of airport operations safety and airport land use compatibility planning. The following comments are offered for your consideration.

The proposed project is the comprehensive update of the Town of Mammoth Lakes (Town) General Plan. The General Plan is the primary policy document for the Town, and it is the basis for all decisions regarding the physical development within the Town. It expresses the community's vision for its future, and it is the guide for both long-term and day-to-day decisions and action of the Town. Mammoth Yosemite Airport (MMH) is located in the Town of Mammoth Lakes. We encourage that you consider the long-term vision for airport and aviation related issues as a part of this process. Since MMH is included in the Federal Aviation Administration's (FAA) National Plan of Integrated Airport System, future federal-aid airport development will require the FAA to address cumulative and growth-inducing (secondary) environmental impacts associated with airport development. The General Plan and its environmental process can be used strategically to address these issues.

In accordance with CEQA, Public Resources Code 21096, Caltrans Airport Land Use Planning Handbook (Handbook) must be utilized as a resource in the preparation of environmental documents for projects within the boundaries of an airport land use compatibility plan, or if such a plan has not been adopted, within two nautical miles of an airport. The Handbook provides a "General Plan Consistency Checklist" in Table 5A, and "Airport Combining Zone Components" in Table 5B. For your reference, our Handbook is published on-line at <http://www.dot.ca.gov/hq/planning/aeronaut/htmlfile/landuse.php>.

The planned height of buildings, antennas, and other structures should be checked relative to the Federal Aviation Regulation (FAR) Part 77 criteria if development is close to the airport, particularly if situated within the runway approach corridors. General Plans must include policies restricting the height of structures to protect navigable airspace. To ensure compliance with FAR Part 77, "Objects Affecting Navigable Airspace," the filing of a Notice of Proposed Construction or Alteration (Form 7460-1) with the Federal Aviation Administration (FAA) may be required. For further technical information, please refer to the FAA's web site at <http://www1.faa.gov/ats/ata/ATA400/oeaaa.html>.

The Section 11010 of the Business and Professions Code, and Sections 1102.6, 1103.4, and 1353 of the Civil Code (<http://www.leginfo.ca.gov/calaw.html>) address buyer notification requirements for lands around airports. Any person who intends to offer land for sale or lease within an *airport influence area* is required to disclose that fact to the person buying the property.

The Education Code, Section 17215 requires a school site investigation by the Division of Aeronautics prior to the acquisition of land for a proposed school site located within two miles of an airport runway. Our recommendations are submitted to the State Department of Education for use in determining suitability of the site. This should be a consideration prior to designating residential uses in the vicinity of an airport.

The protection of airports from the encroachment of incompatible land uses is vital to California's economic future. MMH is an economic asset that should be protected through effective airport land use compatibility planning and awareness. Although the need for compatible and safe land uses near airports in California is both a local and State issue, airport staff, airport land use commissions, and airport land use compatibility plans are key to protecting an airport, and the people residing and working in the vicinity of an airport. Consideration given to the issue of compatible land uses in the vicinity of an airport should help relieve future conflicts between airports and their neighbors.

Aviation plays a significant role in California's transportation system. This role includes the movement of people and goods within and beyond our state's network of over 250 airports. Aviation contributes nearly 9% of both state employment (1.7 million jobs) and total state output (\$110.7 billion) annually. These benefits were identified in a recent study, "Aviation in California: Benefits to Our Economy and Way of Life," which is available on-line at <http://www.dot.ca.gov/hq/planning/aeronaut/>. Among other things, aviation improves mobility, generates tax revenue, saves lives through emergency response, medical, and fire fighting services, annually transports air cargo valued at over \$170 billion and generates over \$14 billion in tourist dollars, which in turn improves our economy and quality of life.

Ms. Sonja Porter
November 28, 2005
Page 3

These comments reflect the areas of concern to Caltrans, Division of Aeronautics with respect to airport-related noise and safety impacts and regional airport land use planning issues. We advise you to contact our district office concerning surface transportation issues.

Thank you for the opportunity to review and comment on this proposal. If you have any questions, please call me at (916) 654-5253.

Sincerely,



DAVID COHEN
Associate Environmental Planner

c: Mono County ALUC
Mammoth Yosemite Airport
Camille Garibaldi, FAA SFO-613

DEPARTMENT OF TRANSPORTATION Letter 005

District 9
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*Flex your power!
Be energy efficient!*

December 13, 2005

Ms. Sonja Porter, Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, California 93546

File: 09-MNO
RDEIR
SCH #: 2003042155

Dear Ms. Porter:

Mammoth Lakes 2005 General Plan Update (GPU) Revised Draft Program Environmental Report (RDPEIR) (October 2005)

Thank you for giving the California Department of Transportation (Caltrans) the opportunity to review and comment on the General Plan Update RDPEIR. Caltrans is appreciative of the effort put into the document for the transportation areas, and will do our best to work with you on applicable policy implementation measures. We have the following comments to offer:

- Page 2-11, correct "Interstate 395" to "US 395".
- Page 2-41, spacing would not be optimal for a traffic signal at Center Street. One-third mile spacing would place the closest signal at the Post Office.
- Page 2-46, Issue 4-13-6, it appears that illegal parking both during the winter and summer construction season is often not enforced, creating significant impacts. The Town should strive to prevent this from continuing.
- Page 3-1, for further location clarity, other abutting counties such as Inyo, Alpine, and those in Nevada should be included.
- Figure 3-2, the Town may wish to include the Urbanizing Federal Designation Boundary (similar to the Urban Growth Boundary). At some point in time special funding may be available for projects within this area. Electronic files for use by your Geographical Information Systems Department were forwarded to you on December 13, 2005. A hard copy is provided herein as Enclosure A.
- Page 2-35, Issue 4.10-4 for Roadway Maintenance/Snow Removal could be clarified. The imposition of the developer impact fee is stated, then the next column states no mitigation measures are necessary. It is unlikely that Caltrans would be able to increase existing snow removal or highway maintenance without an ongoing funding source.
- Page 2-40 and 4-311, ensure that any widening of Minaret Road, and a focused capacity study, is compatible with North Village planning. There had been discussion of an "8050 Alignment Study" for the area.

Ms. Sonja Porter
December 13, 2005
Page 2

- Page 2-40, Mitigation Measure 4-13-1 may not be appropriate as worded since it proposes undefined measures by using the phrase "equivalent or better alternative".
- Figure 3-1, correct "Navada" to "Nevada".
- Page 4-26, justifying density transfers on the basis of making "the community more efficient and successful" could be difficult to predict/measure. Is a change in transportation usage intended?
- Page 4-38, updating equipment in the snow removal fleet would probably reduce emissions of PM 2.5, not PM 10.
- Page 4-154, Caltrans would appreciate a copy of the May 26, 2005 Storm Drainage Master Plan.
- Page 4-298, Caltrans would appreciate a copy of the Mammoth Lakes 2005 Parking Study.
- Page 4-309, extension of frontage roads could be added to the list in VII.1.D.a.3.
- Page 5-12, it seems that the cumulative effects area should include the Tri Valley area, along with greater Bishop.
- Page 8-2, the "California Department of Transportation, Tom Hallenbeck" should be added to the list of agency contacts.
- Appendix F – Traffic Study, a roundabout may not be practical for Main Street (SR 203)/ Center nor Main Street (SR 203)/ Meridian Boulevard. During peak travel times reduction of multiple lane facilities to a single lane roundabout approach could cause delays and queuing with end of queue collisions.

If you have any questions, I may be contacted at (760) 872-0785. We value a cooperative working relationship in transportation matters with the Town of Mammoth Lakes.

Sincerely,



GAYLE J. ROSANDER
IGR/CEQA Coordinator

Enclosure

c: State Clearinghouse
Terry Gess, Caltrans

Letter 006



Mammoth Community Water District
P.O. Box 597, Mammoth Lakes, CA 93546
(760) 934-2596; fax (760) 934-4080

December 13, 2005

Sonja Porter
Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Re: Revised Draft Environmental Impact Report for the Mammoth Lakes General Plan Update

Dear Ms. Porter,

The District has reviewed the Revised Draft Environmental Impact Report for the Mammoth Lakes General Plan Update. The District has previously provided comments on the Draft EIR for the Town of Mammoth Lakes General Plan update circulated in February 2005. We appreciate the opportunity to comment on this new, revised Draft EIR. The District has the following comments on the Draft EIR:

1. Land use approvals in coordination with water supplies p. 2-36 and 4-270

The District supports mitigation measure 4.11-1, which requires that all new developments have sufficient water supplies before approval. The District regularly updates water supply projections based on results from the District's monitoring program and monitors water supply in comparison to new water and wastewater permits. Regular coordination between the Town and the District would ensure that the latest data is

utilized in the determination of available water supply for new developments and that there is sufficient lead-time for development of new supplies if necessary.

2. Groundwater / surface water connection p. 4-147, 4-253, 4-256

The document states on page 4-147 that, “The aquifers supply water to Mammoth Creek, Hot Creek, and lakes in the Lakes Basin.” This statement is not accurate and is contradictory to the statements made on page 2-253 where the document states that, “Surface water within the Mammoth Basin is generally supplied by snowmelt and not by groundwater” and on page 4-256 in a similar statement. Surface water within the Mammoth Basin is generally supplied by snowmelt and not by groundwater. Although the interactions between surface and groundwater are not well understood, there is no evidence to support the claim that groundwater supplies lakes and streams in the Basin.

3. Arsenic MCL compliance date p. 4-149

The correct date for compliance with the new federal MCL for arsenic is January 23, 2006, not January 1, 2006. This date was incorrectly stated in the District’s comment letter for the previous Draft Program EIR, dated April 26, 2005.

4. Mammoth Creek water quality p. 4-156 to 4-160

On page 4-156 the document states that, “During construction of the individual development sites, runoff from disturbed areas may contain silt and debris, resulting in short-term increases in the existing sediment load in the storm drain system.” While the document notes later in the same section that nutrients, organic compounds, and heavy metals have adversely affected water quality in Mammoth Creek, sediment is also degrading water quality in Mammoth Creek.

The District would like to encourage the Town to strictly hold to the BMPs and mitigation measures described in section 4.6-1 and 4.6-2. If degradation of water quality

occurs, it is possible that the Lahontan RWQCB could establish Total Maximum Daily Load (TMDL) limits, as seen in other communities.

Although the Town and Lahontan are charged with the responsibility of protecting water quality in Mammoth Creek, the District is also held responsible for the condition of the creek. Currently, the District is preparing a new Mammoth Creek EIR, which will establish permanent minimum bypass flow requirements for Mammoth Creek. In this document, the District is accountable for addressing water quality in the creek as well as cumulative impacts from other projects, such as the Town of Mammoth Lakes General Plan, which includes the enforcement of BMPs. Thus, if BMPs are not strictly enforced, potential water quality problems could affect the future availability of surface water.

5. Infrastructure increases based on population increases p.4-230

On page 4-230, the document states that, “The Updated Plan does not result in an increase in the capacity of existing infrastructure so as to provide for an increase in population.” The District believes that the proposed project will result in an increase in water and wastewater infrastructure. The District will need to increase the size of water and wastewater service lines and build additional facilities such as booster stations to meet the needs of the community as development proceeds. In addition, the District will have to extend water and wastewater main lines to serve certain new developments. The District is near completion of the development of water and wastewater computer models that will identify necessary infrastructure improvements needed to meet demands of new development projects as they are proposed.

6. Water supply and demand p.4-253 to 4-257 and p. 4-265 to 4-268

On page 2-254, the document states that “Current water supplies are 6,760 acre-feet, of which 2,760 acre-feet are from surface sources and 4,000 acre-feet are from groundwater sources.” As a point of clarification, these volumes are the maximum available supply available during wet and normal years, not necessarily the standing supply of water each year.

In reference to the second paragraph on page 2-254, the District would like to update the Town that the Board of Directors approved a Groundwater Management Plan on July 21, 2005.

The District would like to clarify Footnote 56 on page 4-254 that describes the District's surface water right. The District is currently entitled to divert 2,760 acre-feet annually from Lake Mary at a maximum diversion rate of 5.039 cfs, however, this quantity is dependant upon minimum bypass streamflows in Mammoth Creek. This value includes the 25,000 gallons per day that may be diverted between May 1 and November 1 of each year. The District has two licenses and one permit that comprise the total surface water right.

The information contained in Tables 4.11-1, 4.11-2, and 4.11-3 comes from the District's 2000 Urban Water Management Plan (UWMP). The District has completed an updated UWMP, which requires District Board approval and submission to the State Department of Water Resources by December 31, 2005. In this update process, the information in Table 4.11-1 has changed based on the potential build-out number of units found in the Town Draft EIR. The potential number of units amounted to a slight increase over what the District had previously used for its analysis. An updated table is included below for your use. Table 4.11-3 has also been updated and is included below for your records. In addition, it should be noted that the projections in these tables are based on meeting expected demands and do not reflect actual quantities of groundwater available.

Table 4.11-2
Groundwater Pumping Projections (acre-feet)
To Meet Demand In Normal Year Conditions

Well No.	2010	2015	2020	2025
1	146	200	74	38
6	200	300	400	500
10	300	300	400	500
15	300	300	400	500
16	0	0	0	0
17	200	300	400	500
18	0	0	0	0
20	200	210	200	100
Future Well(s)	0	0	0	0
Total	1346	1610	1874	2138
Groundwater projections based on utilizing 2760 ac-ft of surface water in normal year to meet projected demand.				

Table 4.11-3
Groundwater Pumping Projections (acre-feet)
To Meet Demand In Multiple Dry Year Conditions

Well No.	2010	2015	2020	2025
1	161	256	325	356
6	311	415	475	506
10	500	726	960	991
15	336	440	500	531
16	135	139	199	230
17	231	335	395	426
18	28	41	92	123
20	150	154	214	245
Future Well(s)	0	0	0	406
Total	1852	2506	3160	3814
Groundwater projections based on utilizing 1084 ac-ft of surface water in multiple dry years to meet projected demand. The volume of 1084 ac-ft is derived from the actual available surface water that could have been available in 1992, the last year of a six-year drought.				

The water supply and demand projections on page 4-266 and page 4-267 have been updated in the District's 2005 Urban Water Management Plan, which is based on the land use classifications and potential build-out unit numbers listed in the October 2005 Draft

EIR. It should also be noted that the current water use by the Sierra Star golf course has been extended into future water demand projections for tracking purposes until an alternative water source is developed such as recycled water. Water supply projections are continually updated through the District's monitoring program and could change based on new, future information. In addition, the District Board of Directors has been considering the establishment of a contingency plan that may be included in future projections. Updated Tables 4.11-4 and 4.11-5 are included below for your records.

Table 4.11-4
Past, Current, and Projected Water Use (acre-feet)

Water Use Sector	2000	2005	2010	2015	2020	2025
Single Family Residential	515	549	586	623	659	696
Condominium	961	948	960	973	985	997
Multi-Family Residential	144	140	211	282	353	424
Commercial/Industrial/Public	217	278	374	469	565	660
Motel / Hotel	112	111	304	496	689	881
Public Sector	170	296	Included in commercial	Included in commercial	Included in commercial	Included in commercial
Golf Course**	297	255	400	400	400	400
Other*	53	103	80	80	80	80
Unaccounted	486	746	760	760	760	760
Total	2955	3426	3674	4082	4490	4898

Note: Existing hotel/motel water-use sector includes only those units that are separately metered and does not include units that share water meters with commercial. Commercial includes mixed uses such as restaurants, condo/hotel, retail, etc. Public sector is included in the commercial water-use sector for future projections for consistency with data from the Town of Mammoth Lakes General Plan EIR (2005).

*Other = treatment plant process water, fire fighting, line cleaning, etc.

** Golf course water use based on existing demand from Sierra Star and Snowcreek Golf Courses. This value would be reduced by recycled water use in the future.

Table 4.11-5

Comparison of Current Supply and Future Demand in Acre-Feet for Normal, Single Dry, and Multiple Dry Years

Supply and Demand	Normal Year	Single Dry Year	Two Dry Years	Three Dry Years
Existing Supply	6760	4908	4508	4492
Projected Demand at Build-out	4898	4898	4898	4898
Surplus or (Deficiency)	1862	10	(390)	(406)

As stated in the October 2005 Draft EIR, the District has developed plans to reduce water demand and to develop additional water supply sources. The implementation of these plans will provide sufficient water supplies to meet the projected demands of the land use development described in the October 2005 Draft EIR.

Table 4.11-6 in the Draft EIR is titled "Potential Additional Water Supply Sources" and lists only demand reduction measures. This table has been modified to include additional sources of supply as well as water demand reduction measures.

Table 4.11-6

Potential Additional Water Supply Sources and Demand Reduction Measures

Source	Potential Volume (afy)
Decrease Water Loss	310 (demand reduction)
Recycled Water Supply	360 (demand reduction)
Water Conservation	550 (demand reduction)
Future Well Development	1000 (increased supply)

In Table 4.11-6, water loss and water conservation figures have increased in volume because they represent a percentage of the increased total demand. Recycled water

supply includes irrigation for Shady Rest Park. Future well development represents Dry Creek wells and/or additional Mammoth Basin wells.

7. Wastewater treatment 4-257 to 4-258

On page 4-257, the document states that, "The total capacity of the affected trunk sewer lines within the Town has been calculated at 310 gallons per minute for the ten-inch sewer at Minaret Road and Main Street, which is the main confluence for the Town." All trunk sewer lines in Town, not just the lines at Minaret Road and Main Street, will be impacted by the population growth associated with the General Plan.

Thank you again for the opportunity to comment on this document. Please feel free to contact the District if you have any questions.

Sincerely,

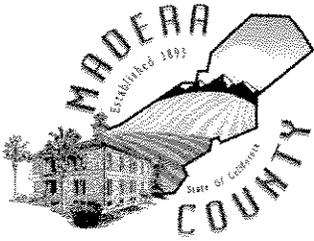


Gary Sisson, General Manager



Ericka Hegeman, Environmental Specialist

Letter 007



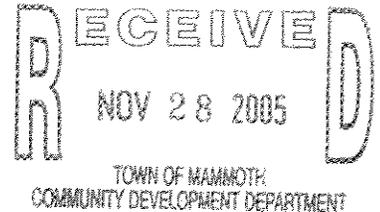
RESOURCE MANAGEMENT AGENCY
Planning Department

Rayburn Beach, Planning Director

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- Madera, CA 93637
- Mail Stop G
- (559) 661-6333
- FAX (559) 675-6573
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- mc_planning@madera-county.com

November 21, 2005

Sonja Porter
Town of Mammoth Lakes
Community Development Department
P.O. Box 1609
Mammoth Lakes, Ca 93546



Dear Ms. Porter:

We are in receipt of your Revised Draft Program Environmental Impact Report for the 2005 General Plan Update for the Town of Mammoth Lakes. Thank you for forwarding us the copy.

I wish to thank you for the opportunity to review this document. I found it to be well formatted and laid out. I felt that the level of detail in regards to the data was excellent. It was obvious that all issues related to the Town of Mammoth Lake was addressed.

Madera County, in general, has concerns in the areas of Air Quality, Housing, and Circulation. My review of these aspects were in regards to how they could potentially impact the County. There were a few issues that we had, but they were addressed in the document.

Sincerely,

Robert Mansfield
Planner I

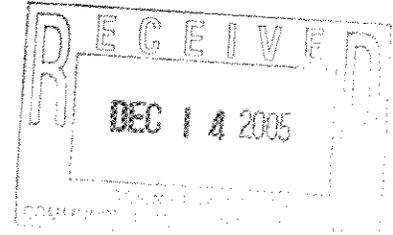
Letter 008
Mono County
Community Development Department

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December 14, 2005

Sonja Brynelsen, Project Planner
Community Development Department
Town of Mammoth Lakes
PO Box 1609
Mammoth Lakes, CA 93546-1609



RE: MAMMOTH LAKES 2005 GENERAL PLAN UPDATE EIR COMMENTS

Dear Sonja:

Thank you for providing the revised Draft Program Environmental Impact Report for review. Attached are the comments the Mono County Community Development Department submitted earlier this year. As we discussed several weeks ago, it appears these comments have not been addressed in the new Revised Draft Program Environmental Impact Report, particularly those related to environmental impacts resulting from Dry Creek well development.

Your consideration of these attached comments is appreciated. Please let us know if you have questions or need additional information regarding this matter.

Sincerely,

Scott Burns
Director

ATTACHMENT

May 17, 2005, Comment Letter

cc Dave Wilbrecht, CAO
Mono County Board of Supervisors

Mono County Community Development Department

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May 17, 2005

Sonia Brynelsen, Project Planner
Community Development Department
Town of Mammoth Lakes
PO Box 1609
Mammoth Lakes, CA 93546-1609

RE: MAMMOTH LAKES GENERAL PLAN UPDATE EIR COMMENTS

Dear Sonia:

The Mono County Community Development Department appreciates the opportunity to review the Draft EIR for the Mammoth Lakes General Plan Update. In general, we find the document to be comprehensive and informative. The following comments focus on further mitigating potential impacts of the Plan to the unincorporated area of Mono County.

Scenic Highway

It is suggested that Mitigation Measure 4.1.bb be clarified to include development within the Town at the Mammoth-Yosemite Airport visible from Highway 395, a State and County designated Scenic Highway. This would better ensure consistency with State and County policies for preservation of the Scenic Highway. Also in the DEIR discussion concerning State Scenic Highway Regulations (4.1.2), it would be helpful to clarify if the Town has adopted or is recognizing the Scenic Corridor Protection Program for Highway 395. In addition, including major viewpoints as viewed within the Town at the airport (Figure 4.1.4) would further highlight the importance of the Highway 395 Scenic Corridor.

Water Supply

The DEIR notes that even with mitigation, the Plan will have potential impacts on groundwater supplies considered significant and unavoidable, and that the nature of these environmental impacts are not yet known. DEIR section 4.6 explains that the focus for new groundwater supply sources is the Dry Creek Watershed, and DEIR Appendix E projects potential groundwater volumes available from Dry Creek at 1,500-acre-feet per year during normal years and 1,245 acre-feet per year during multiple dry year periods. Due to long standing Dry Creek water development concerns by down-gradient residents and ranchers, the Mono County General Plan Land Use Element calls for environmental studies to assess and mitigate adverse water resource impacts to the Upper Owens Area from activities such as the Dry Creek well development (see attached Mono County General Plan excerpts).

It is requested that an additional mitigation measure be added to require preparation of an environmental impact report to fully assess and mitigate the environmental impacts of Dry Creek well development on the down-gradient unincorporated area of the Upper Owens Area.

Housing/Transportation

The aggressive housing policies of the Plan and its focus on housing the Town's workforce that want to live in town are commendable. As noted under Growth Inducing Impact, however, the Plan has the potential to impact growth rates and housing demand in nearby unincorporated communities, noting that the employment base in Mammoth Lakes is expected to continue to increase at a rate higher than the population. Mitigation Measures 4.12 o commits to developing and maintaining a public transit system responsive to the work force. To clarify the applicability of this measure within the regional context, it is suggested that Mitigation Measure 4.12 note that this may include access to employees residing in nearby communities.

Thank you for the opportunity to comment. Please let us know if you have questions or need additional information regarding this matter.

Sincerely,



Scott Burns
Director

ATTACHMENT

Mono County General Plan Excerpt

cc Dave Wilbrecht, CAO
Mono County Board of Supervisors

MONO COUNTY GENERAL PLAN LAND USE ELEMENT EXCERPT (Upper Owens River)

OBJECTIVE B

Protect the water resources of the Upper Owens Area.

Policy 1: Ensure that direct and indirect impacts of development projects on the water resources of the Upper Owens Area are avoided or mitigated to a point where clearly no significant effects would occur.

Action 1.1: Oppose development of a fish hatchery at Big Springs, unless it can be demonstrated that there will clearly be no significant adverse effects on the area's water and fishery resources.

Action 1.2: Oppose water transfer projects that could affect the Upper Owens Watershed - such as the development of the Dry Creek Wellfield - unless it is demonstrated that there will clearly be no significant adverse effects on the area's water resources.

Action 1.3: Require development within the Upper Owens Area to avoid or mitigate impacts to local water resources to a point where clearly no significant adverse effects would occur.

Action 1.4: Require development to set back 50 feet from the top of the bank of natural waterways, and to comply with other stream, riparian and wetland area setback requirements of Federal and State agencies.

Action 1.5: Request that potential impacts to the Upper Owens River be thoroughly considered in applicable environmental studies.

Action 1.6: Require projects with the potential to impact the water resources of the Upper Owens area to conduct long term water monitoring programs in order to ensure the maintenance of the area's water quality and quantity.

Policy 2: Preserve the Upper Owens River water resources and riparian corridor.

Action 2.1: Work with local landowners to develop coordinated strategies for preserving the integrity of the Upper Owens River corridor, including the riparian corridor, downstream to Crowley Lake. Stream preservation options and techniques—such as conservation easements, transfer of development rights, fencing, enhancement of water quality and the sale of sensitive land to conservation organizations—should be considered.

Action 2.2: Work with local landowners to manage access to the river in a manner that preserves the integrity of the riparian corridor and the fishery.

Action 2.3: Promote sound grazing management in accordance with the Conservation/Open Space Element, Agriculture/Grazing/Timber policies, Goal I, Objective C.

Letter 009

December 14 2005

Ms. Sonja Porter
Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546-1609

Dear Ms. Porter:

Subject: Comments on Revised Draft Program Environmental Impact Report for the Town of Mammoth Lakes 2005 General Plan Update (Draft Program EIR)

Thank you for providing the Los Angeles Department of Water and Power (LADWP) the opportunity to comment on the above referenced Draft Program EIR.

The City of Los Angeles (City) derives its main source of water supply from the Eastern Sierra region and possesses water rights on most of the streams flowing from Eastern Sierra Nevada Mountains to the Owens River Basin. Mammoth and Hot Creeks are major contributors to the flows into the upper Owens River. LADWP is responsible for protecting the City's vast water rights in the Eastern Sierra, and is concerned about the effects of the proposed General Plan on its ability to exercise these rights.

Additionally, the City is a major landowner in the Eastern Sierra region, and it is greatly concerned about any project's potential degradation of the environment and its impact on the water quality that are associated with increased pollution, increases in waste disposal, pollutants from storm runoff, and dilapidation of the air quality.

Therefore, our comments to the Draft Program EIR are directed to any potential impacts of the proposed General Plan on the City's water rights, water quality, and land management. Please ensure that the issues listed below are addressed in the Final Program EIR.

Water Supply and Demand

- Section 4.6.1.6 describes groundwater hydrology and the Town of Mammoth Lakes increased reliance on groundwater pumping for meeting its future demands. There are a number of springs throughout the basin that contribute to the flows in the Mammoth and Hot Creeks. Spring flow and the relationship between groundwater pumping and spring

flows are not described in the Draft Program EIR. The Final Program EIR should analyze these impacts and identify mitigation measures to ensure the historical contribution of these springs to the Mammoth and Hot Creeks is not impacted by this project in the future.

Mammoth Creek interacts with the groundwater system. Sections of Mammoth Creek are either gaining or losing flow to the groundwater system depending on the water level in the aquifer adjacent to the creek. Whether a section is gaining or losing flow is a function of the recharge that the groundwater aquifer receives from runoff from the Eastern Sierras. Determining a threshold water level in the aquifer adjacent to Mammoth Creek is critical to an understanding of the surface/groundwater interaction in the area and the switch from a gaining to losing condition in each section of Mammoth Creek. A reliable surface/groundwater flow model should be developed that can be used to determine a safe level of pumping that would not impact the flow in Mammoth Creek.

- Section 2.4, page 2-11, states that “the water supply at this time is uncertain,” and Section 4.11.3, Page 4-268, states “Water conservation activities are initiated as needed.” These statements clearly indicate the uncertainty of water supply and the need for conservation. This demonstrated need requires immediate action that should not be deferred to a later date. It is imperative that the Town of Mammoth Lakes and the Mammoth Community Water District (MCWD) join the preeminent water conservation organization in the state, the California Urban Water Conservation Council (Council), and immediately begin implementation of the Council’s Best Management Practices (BMPs) to reduce long-term urban water demands. If the BMPs cannot be implemented legally or cost effectively, the Public Utilities section should explain why they cannot be implemented and institute other equally effective programs to reduce long-term water demand. Enclosed, for your reference, is a copy of the Council’s BMPs.

Additionally, the Town of Mammoth Lakes and MCWD should investigate and adopt regulations that would lead to increased water conservation associated with both indoor and outdoor water uses. Examples include a retrofit on resale requirement that mandates the replacement of all non-water saving toilets, urinals and showerheads prior to the sale of improved real property; landscape requirements for all new and rehabilitated landscapes (if applicable); and prohibition of wasteful water practices (e.g. unattended leaks, single pass cooling, use of water to clean outdoor hardscapes).

- Section 4.11.1.1, pages 4-255 and 4-256 describe figures depicting groundwater levels in MCWD monitoring wells. These figures are not included in the document and should be added to the document.
- In Table 4.11-1, a 1,500 acre-feet of supply is listed as becoming available from Dry Creek in 2015; however, there are no discussions regarding the measures that will be

taken should this alternative source of water supply not be realized. The Final Program EIR should address the potential environmental impacts of utilizing Dry Creek as a source of water supply for the Town of Mammoth Lakes.

- Table 4.11-5 lists water supply in normal, single dry year, two dry years, and three dry years. From 1987 to 1992 and from 1999 to 2004, the Eastern Sierra experienced six consecutive years of below normal runoff conditions. The Final Program EIR should evaluate the impact of up to six years of dry runoff conditions on the water supply for the area and the impact of such condition on groundwater pumping as well as flows in Mammoth and Hot Creeks.

Water Quality

- The Drainage Master Plan should include in its list of priorities the reduction of high sediment loads and improvement of water quality as to the runoff into Mammoth and Hot Creeks.
- Provide discussion and analysis regarding the adequacy of the existing siltation basin at the downstream end of Murphy Gulch channel as improvements are made to construct adequate trunk capacity for the ultimate development with the attendant increase in siltation.
- Analyze the impacts associated with snow removal, use of salts for deicing of the road surface, and gravel for traction on water quality, and identify mitigation measures to address those impacts.

Land Management

- Section 4.11.4, page 4-273 states, "MCDPW has indicated that based on their projections, there is sufficient capacity for the projected buildout under the Updated Plan. The Town also has an option for five years at the Pumice Valley Landfill." This leads to the conclusion on page 4-274, "The Updated Plan would result in less than significant impacts with regard to disposal of solid waste. Therefore, no mitigation measures are required." Provide in the Final Program EIR calculations from the Mono County Department of Public Works (MCDPW) to demonstrate no significant impact to the solid waste disposal sites located on Benton Crossing Landfill and Pumice Valley Landfill.
- Section 4.11.1.3, page 4-259 states, "The Benton Crossing Landfill is owned and operated by the County of Mono." This is not correct. A lease between LADWP and Mono County covering use of LADWP property as the Benton Crossing Landfill has expired and is in the process of being renewed. In a communication by MCDPW to LADWP, it was stated that it would take 10-15 years to permit a new landfill to replace the

Benton Crossing Landfill. Despite LADWP's desire to close the facility by 2015, negotiations have led LADWP management to pursue extending the capacity of Benton Crossing provided that Mono County would close Benton Crossing Landfill, relocate to an entirely new location and obtain permits for that new facility by 2023. However, the proposed lease has not been drafted or submitted to our Board and City Council for review and approval. The Final Program EIR should include an analysis and proposal for the location of the new facility. The EIR should also provide updated information on the status of the lease renewal and a tentative date as to when it will be approved.

- The other lease on City property, Pumice Valley Landfill, is scheduled to expire in 2006. LADWP management is willing to present to its Board of Water and Power Commissioners a new lease extending the term consistent with Mono County's plans for use of the facility as a transfer station and landfill that accepts construction waste only. In the event that Mono County proposes other uses for Pumice Valley (i.e., as a replacement to Benton Crossing Landfill and/or as a regular landfill) those uses must be evaluated in the Final Program EIR. The EIR should also provide updated information on the status of this lease renewal.
- The cost and planning associated with permitting a new landfill site is significant. Section 4.9.1, page 4-216 states that the resident population of the Town in 2000 comprised 55% of the County population (7,094 out of 12,853), which has increased 6.6 percent to 61.6% of the County population as of 2004. Page 4-217 of the same section states that population intensity of the Town for 2004, defined as the PAOT (people at one time) representing an average winter Saturday as 34,265 people, is forecasted to increase to 60,727 people by 2024 (an increase of 77 percent). The number of housing units is forecasted to increase from 9,871 to 16,710 (69 percent). Section 4.11.1.3, page 4-259 states that the Benton Crossing Landfill "receives an average of 108 tons per day (tpd) of nonhazardous and hazardous solid waste, with peak daily loading rate of 400 tpd. The maximum daily permitted throughput is 500 tons per day." Peak daily loading of 400 tpd is pinpointing to days associated with population intensities as discussed above (i.e. average winter Saturdays). Therefore, as the population intensity in Mammoth, represented as a PAOT, increases from 34,265 to 60,727 over the next 20 years, the average and peak daily loading rate at the landfill should also increase by 77 percent. It is unclear whether this was considered in Mono County's estimate to the Town. The Final Program EIR must demonstrate and provide calculations that support your findings that no significant impact is expected. Since the majority of the county's waste is produced by, and coming from the Town, then the Town should plan and mitigate for the development of a new landfill for the future.

Ms. Sonia Porter
Page 5
December 14, 2005

Thank you again for the opportunity to comment on the Draft Program EIR for your General Plan Update. Should you have any questions about our comments, please contact Mr. Milad Taghavi of my staff at (213) 367-1032.

Sincerely,

Thomas M. Erb
Director of Water Resources
Enclosure

c: Mr. Milad Taghavi

MEMORANDUM OF UNDERSTANDING
REGARDING
URBAN WATER CONSERVATION
IN CALIFORNIA

As Amended March 10, 2004
(Except Section 4.5 & 4.6, Amended on March 9, 2005)

EXHIBIT 1. BMP DEFINITIONS, SCHEDULES AND REQUIREMENTS

This Exhibit contains Best Management Practices (BMPs) that signatory water suppliers commit to implementing. Suppliers' water needs estimates will be adjusted to reflect estimates of reliable savings from this category of BMPs. For some BMPs, no estimate of savings is made.

It is recognized by all parties that a single implementation method for a BMP would not be appropriate for all water suppliers. In fact, it is likely that as the process moves forward, water suppliers will find new implementation methods even more effective than those described. Any implementation method used should be at least as effective as the methods described below.

Best Management Practices will be implemented by signatory water suppliers according to the schedule set forth in Section B of each BMP's definition. These schedules set forth the latest dates by which implementation of BMPs will be underway. It is recognized that some signatories are already implementing some BMPs, and that these schedules do not prohibit signatories from implementing BMPs sooner than required.

"Implementation" means achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in Section A of each BMP's definition, and to satisfy the commitment by the signatories to use good faith efforts to optimize savings from implementing BMPs as described in Section 4.4 of the MOU. BMPs will be implemented at a level of effort projected to achieve at least the coverages specified in Section C of each BMP's definition, and in accordance with each BMP's implementation schedule.

Section D of each BMP definition contains the minimum record keeping and reporting requirements for agencies to document BMP implementation levels and efforts, and will be used to guide Council development of BMP implementation report forms and database.

The evaluation criteria presented in Section E of each BMP definition shall be used to evaluate compliance with the implementation definitions, schedules, and coverage requirements specified in Sections A, B, and C of each BMP definition.

Section F of each BMP definition contains the assumptions of reliable savings to be used in accordance with Sections 5.1 and 5.2 of the MOU

EXHIBIT 1

1. WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL CUSTOMERS

A. Implementation

Implementation shall consist of at least the following actions:

- a) Develop and implement a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers.
- b) Directly contact via letter or telephone not less than 20% of single-family residential customers and 20% of multi-family residential customers each reporting period.
- c) Surveys shall include indoor and outdoor components, and at minimum shall have the following elements:

Indoor

- i) Check for leaks, including toilets, faucets, and meter check
- ii) Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, as necessary
- iii) Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary

Outdoor

- iv) Check irrigation system and timers
- v) Review or develop customer irrigation schedule

Recommended but not required

- vi) Measure currently landscaped area
 - vii) Measure total irrigable area
- d) Provide customer with evaluation results and water saving recommendations; leave information packet with customer.
 - e) Track surveys offered, surveys completed, survey results, and survey costs.

EXHIBIT 1

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the year following the year the agency signed or became subject to the MOU.
- c) Agencies shall develop and implement a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.
- d) The coverage requirement for this BMP, as specified in Section C of this Exhibit, shall be realized within 10 years of the date implementation was to commence.

C. Coverage Requirements

- a) Not less than 15% of single-family residential accounts to receive water use surveys within 10 years of the date implementation was to commence. For the purposes of calculating coverage, 15% of single-family residential accounts means the number of accounts equal to 15% of single-family accounts in 1997 or the year the agency signed the MOU, whichever is later.
- b) Not less than 15% of multi-family residential units to receive water use surveys within 10 years of the date implementation was to commence. For the purposes of calculating coverage, 15% of multi-family residential units means the number of units equal to 15% of multi-family units in 1997 or the year the agency signed the MOU, whichever is later.

D. Requirements for Documenting BMP Implementation

- a) Number of single-family residential accounts in service area.
- b) Number of multi-family residential accounts in service area.
- c) Number of single-family residential surveys offered during reporting period.
- d) Number of single-family residential surveys completed during reporting period.
- e) Number of multi-family residential surveys offered during reporting period.
- f) Number of multi-family residential surveys completed during reporting period.

EXHIBIT 1

E. Criteria to Determine BMP Implementation Status

- a) Agency has developed and implemented a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.
- b) Agency has directly contacted not less than 20% of single-family residential accounts and 20% of multi-family residential units during period being reported.
- c) Agency is on schedule to complete surveys for 15% of single-family residential accounts and 15% of multi-family units within 10 years of the date implementation was to commence. Agencies will receive credit against the coverage requirement for previously completed residential water use surveys according to the following schedule*:

	<u>% Credit</u>
Before 1990	0.0%
1990	12.5%
1991	25.0%
1992	37.5%
1993	50.0%
1994	62.5%
1995	75.0%
1996	87.5%
1997	100.0%

- d) Agencies will be considered on track if the percent of single-family accounts and the percent of multi-family accounts receiving water use surveys equals or exceeds the following: 1.5% by end of first reporting period following date implementation to commence; 3.6% by end of second reporting period; 6.3% by end of third reporting period; 9.6% by end of fourth reporting period; and 13.5% by end of fifth reporting period.

* * In its study "What is the Reliable Yield from Residential Home Water Survey Programs: The Experience of LADWP" (AWWA Conf. Proceedings, 1995), A & N Technical Services, Inc., found that the average level of savings from home water surveys decreased over time, reaching about 50% of initial yield by the fourth year following the survey, on average. The above decay schedule used for crediting past surveys utilizes these findings to recognize and account for the limited persistence of water savings over time from home water use surveys

EXHIBIT 1

F. Water Savings Assumptions

	<u>Pre-1980 Construction</u>	<u>Post-1980 Construction</u>
Low-flow showerhead retrofit	7.2 gcd	2.9 gcd
Toilet retrofit (five year life)	1.3 gcd	0.0 gcd
Leak repair	0.5 gcd	0.5 gcd
Landscape survey (outdoor use reduction)	10%	10%

EXHIBIT 1

2. RESIDENTIAL PLUMBING RETROFIT

A. Implementation

Implementation shall consist of at least the following actions:

- a) Identify single-family and multi-family residences constructed prior to 1992. Develop a targeting and marketing strategy to distribute or directly install high-quality, low-flow showerheads (rated 2.5 gpm or less), toilet displacement devices (as needed), toilet flappers (as needed) and faucet aerators (rated 2.2 gpm or less) as practical to residences requiring them.
- b) Maintain distribution and/or direct installation programs so that devices are distributed to not less than 10% of single-family connections and multi-family units each reporting period, or require through enforceable ordinance the replacement of high-flow showerheads and other water using fixtures with their low-flow counterparts, until it can be demonstrated in accordance with Section E of this Exhibit that 75% of single-family residences and 75% of multi-family units are fitted with high-quality, low-flow showerheads.
- c) Track the type and number of retrofits completed, devices distributed, and program costs.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the year following the year the agency signed or became subject to the MOU.
- c) Agencies shall develop and implement a strategy targeting the distribution and/or installation of high-quality, low-flow plumbing devices to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.
- d) An agency may elect to discontinue its device distribution programs without filing a formal budget or cost-effectiveness exemption when it can demonstrate that 75% of its single-family residences and 75% of its multi-family units constructed prior to 1992 are fitted with high-quality, low-flow showerheads.

EXHIBIT 1

C. Coverage Requirements

- a) Plumbing device distribution and installation programs to be maintained at a level sufficient to distribute high-quality, low-flow showerheads to not less than 10% of single-family residences and 10% of multi-family units constructed prior to 1992 each reporting period; or the enactment of an enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts.
- b) Plumbing device distribution and installation programs to be operated until it can be demonstrated in accordance with Section E of this Exhibit that 75% of single-family residences and 75% of multi-family units are fitted with high-quality, low-flow showerheads.

D. Requirements for Documenting BMP Implementation

- a) The target population of pre-1992 single-family residences and multi-family units to be provided showerheads and other water saving devices.
- b) The number of showerhead retrofit kits distributed during previous reporting period.
- c) The number of device retrofits completed during the previous reporting period.
- d) The estimated percentage of pre-1992 single-family residences and multi-family units in service area fitted with low-flow showerheads.

E. Criteria to Determine BMP Implementation Status

- a) Agency has developed and implemented a strategy targeting and marketing water use surveys to single-family residential and multi-family residential customers by the end of the first reporting period following the date implementation was to commence.
- b) Agency has tracked the type and number of retrofits completed, devices distributed, and program costs.
- c) Agency EITHER
 - i) has distributed or directly installed high-quality, low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family residences and 10% of multi-family units constructed prior to 1992 during the reporting period; and/or has enacted an ordinance requiring the

EXHIBIT 1

replacement of high-flow shower-heads and other water use fixtures with their low-flow counterparts.

OR

- ii) can demonstrate through customer surveys with 95% statistical confidence and a $\pm 10\%$ error that 75% of single-family residences and 75% of multi-family units constructed prior to 1992 are fitted with low-flow showerheads.

F. Water Savings Assumptions

	<u>Pre-1980 Construction</u>	<u>Post-1980 Construction</u>
Low-flow showerhead retrofit	7.2 gcd	2.9 gcd
Toilet retrofit (five year life)	1.3 gcd	0.0 gcd

EXHIBIT 1

3. SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR

A. Implementation

Implementation shall consist of at least the following actions:

- a) Annually complete a prescreening system audit to determine the need for a fullscale system audit. The prescreening system audit shall be calculated as follows:
 - i) Determine metered sales;
 - ii) Determine other system verifiable uses;
 - iii) Determine total supply into the system;
 - iv) Divide metered sales plus other verifiable uses by total supply into the system. If this quantity is less than 0.9, a fullscale system audit is indicated.
- b) When indicated, agencies shall complete water audits of their distribution systems using methodology consistent with that described in AWWA's *Water Audit and Leak Detection Guidebook*.
- c) Agencies shall advise customers whenever it appears possible that leaks exist on the customer's side of the meter; perform distribution system leak detection when warranted and cost-effective; and repair leaks when found.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

- a) Agency shall maintain an active distribution system auditing program.
- b) Agency shall repair identified leaks whenever cost-effective.

EXHIBIT 1

D. Requirements for Documenting BMP Implementation

- a) Prescreening audit results and supporting documentation;
- b) Maintain in-house records of audit results or the completed AWWA Audit Worksheets for each completed audit period.

E. Criteria to Determine BMP Implementation Status

- a) Agency has annually completed a pre-screening distribution system audit.
- b) Agency has conducted a full system audit consistent with methods described by *AWWA's Manual of Water Supply Practices, Water Audits and Leak Detection* whenever indicated by a pre-screening audit.

F. Water Savings Assumptions

Unaccounted water losses assumed to be no more than 10% of total water into the water supplier's system.

EXHIBIT 1

4. METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS

A. Implementation

Implementation shall consist of at least the following actions:

- a) Requiring meters for all new connections and billing by volume of use.
- b) Establishing a program for retrofitting existing unmetered connections and billing by volume of use.
- c) Identifying intra- and inter-agency disincentives or barriers to retrofitting mixed use commercial accounts with dedicated landscape meters, and conducting a feasibility study to assess the merits of a program to provide incentives to switch mixed use accounts to dedicated landscape meters.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.
- c) A plan to retrofit and bill by volume of use existing unmetered connections to be completed by end of the first reporting period following the date implementation was to commence.
- d) A feasibility study examining incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters to be completed by end of the first reporting period following the date implementation was to commence.

C. Coverage Requirements

100% of existing unmetered accounts to be metered and billed by volume of use within 10 years of date implementation was to commence.

EXHIBIT 1

D. Requirements for Documenting BMP Implementation

- a) Confirmation that all new connections are metered and are being billed by volume of use.
- b) Number of unmetered accounts in the service area. For the purposes of evaluation, this shall be defined as the baseline meter retrofit target, and shall be used to calculate the agency's minimum annual retrofit requirement.
- c) Number of unmetered connections retrofitted during the reporting period.
- d) Number of CII accounts with mixed-use meters.
- e) Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.

E. Criteria to Determine BMP Implementation Status

- a) Agency with existing unmetered connections has completed a meter retrofit plan by end of first reporting period following the date implementation was to commence.
- b) Agency has completed a feasibility study examining incentive programs to move landscape water uses on mixed-use meters to dedicated landscape meters by end of first reporting period following the date implementation was to commence.
- c) Agency with existing unmetered connections is on track to meter these connections within 10 years of the date implementation was to commence. An agency will be considered on track if the percent of unmetered accounts retrofitted with meters equals or exceeds the following: 10% by end of first reporting period following date implementation to commence; 24% by end of second reporting period; 42% by end of third reporting period; 64% by end of fourth reporting period; and 90% by end of fifth reporting period.

F. Water Savings Assumptions

Assume meter retrofits will result in a 20% reduction in demand by retrofitted accounts.

EXHIBIT 1

5. LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES

A. Implementation

Implementation shall consist of at least the following actions:

Customer Support, Education and Assistance

- a) Agencies shall provide non-residential customers with support and incentives to improve their landscape water use efficiency. This support shall include, but not be limited to, the following:

Accounts with Dedicated Irrigation Meters

- a) Identify accounts with dedicated irrigation meters and assign ETo-based water use budgets equal to no more than 100% of reference evapotranspiration per square foot of landscape area in accordance with the schedule given in Section B of this Exhibit.
- b) Provide notices each billing cycle to accounts with water use budgets showing the relationship between the budget and actual consumption in accordance with the schedule given in Section B of this Exhibit; agencies may choose not to notify customers whose use is less than their water use budget.

Commercial/Industrial/Institutional Accounts with Mixed-Use Meters or Not Metered

- a) Develop and implement a strategy targeting and marketing large landscape water use surveys to commercial/industrial/institutional (CII) accounts with mixed-use meters. Each reporting period, directly contact via letter or telephone not less than 20% of CII accounts with mixed-use meters and offer water use surveys. (Note: CII surveys that include both indoor and outdoor components can be credited against coverage requirements for both BMP 5 and BMP 9.)
- b) Unmetered service areas will actively market landscape surveys to existing accounts with large landscapes, or accounts with landscapes which have been determined by the purveyor not to be water efficient.
- c) Offer the following measures when cost-effective:
 - i) Landscape water use analysis/surveys

EXHIBIT 1

- ii) Voluntary water use budgets
 - iii) Installation of dedicated landscape meters
 - iv) Training (multi-lingual where appropriate) in landscape maintenance, irrigation system maintenance, and irrigation system design.
 - v) Financial incentives to improve irrigation system efficiency such as loans, rebates, and grants for the purchase and/or installation of water efficient irrigation systems.
 - vi) Follow-up water use analyses/surveys consisting of a letter, phone call, or site visit where appropriate.
- d) Survey elements will include: measurement of landscape area; measurement of total irrigable area; irrigation system check, and distribution uniformity analysis; review or develop irrigation schedules, as appropriate; provision of a customer survey report and information packet.
- e) Track survey offers, acceptance, findings, devices installed, savings potential, and survey cost.

New or Change of Service Accounts

Provide information on climate-appropriate landscape design, efficient irrigation equipment/management to new customers and change-of-service customer accounts.

Recommended

- a) Install climate appropriate water efficient landscaping at water agency facilities, and dual metering where appropriate.
- b) Provide customer notices prior to the start of the irrigation season alerting them to check their irrigation systems and make repairs as necessary. Provide customer notices at the end of the irrigation season advising them to adjust their irrigation system timers and irrigation schedules.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.

EXHIBIT 1

- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.
- c) Develop ETo-based water use budgets for all accounts with dedicated irrigation meters by the end of the second reporting period from the date implementation was to commence.
- d) Develop and implement a plan to target and market landscape water use surveys to CII accounts with mixed-use meters by the end of the first reporting period from the date implementation was to commence.
- e) Develop and implement a customer incentive program by the end of the first reporting period from the date implementation was to commence.

C. Coverage Requirements

- a) ETo-based water use budgets developed for 90% of CII accounts with dedicated irrigation meters by the end of the second reporting period from the date implementation was to commence.
- b) Not less than 20% of CII accounts with mixed-use meters contacted and offered landscape water use surveys each reporting period.
- c) Irrigation water use surveys completed for not less than 15% of CII accounts with mixed-use meters within 10 years of the date implementation was to commence. (Note: CII surveys that include both indoor and outdoor components can be credited against coverage requirements for both BMP 5 and BMP 9.) For the purposes of calculating coverage, 15% of CII accounts means the number of accounts equal to 15% of CII accounts with mixed-use meters in 1997 or the year the agency signed the MOU, whichever is later.

D. Requirements for Documenting BMP Implementation

Dedicated Landscape Irrigation Accounts

Agencies shall preserve water use records and budgets for customers with dedicated landscape irrigation accounts for a period of not less than two reporting periods. This information may be used by the Council to verify the agency's reporting on this BMP.

- a) Number of dedicated irrigation meter accounts.
- b) Number of dedicated irrigation meter accounts with water budgets.

EXHIBIT 1

- c) Aggregate water use for dedicated landscape accounts with budgets.
- d) Aggregate budgeted water use for dedicated landscape accounts with budgets.

Mixed Use Accounts

- a) Number of mixed use accounts.
- b) Number, type, and dollar value of incentives, rebates, and no, or low interest loans offered to, and received by, customers.
- c) Number of surveys offered.
- d) Number of surveys accepted.
- e) Estimated annual water savings by customers receiving surveys and implementing recommendations.

E. Criteria to Determine BMP Implementation Status

- a) Agency has developed water use budgets for 90% of accounts with dedicated irrigation meters by end of second reporting period from date implementation was to commence.
- b) Agency has implemented irrigation water use survey program for CII accounts with mixed-use meters, and directly contacts and offers surveys to not less than 20% of accounts each reporting period. (A program to retrofit mixed-use accounts with dedicated landscape meters and assigning water use budgets, or a program giving mixed-use accounts ETo-based budgets for irrigation uses satisfies this criterion.)
- c) Agency is on track to provide water use surveys to not less than 15% of CII accounts with mixed-use meters within 10 years of the date implementation was to commence. Agency may credit 100% of the number of landscape water use surveys for CII accounts with mixed-use meters completed prior to July 1, 1996, that have received a follow-up inspection against the coverage requirement; and 50% of surveys that have not received follow-up inspections. Agency may credit 100% of the number of landscape water use surveys completed for CII accounts with mixed-use meters after July 1, 1996 against the coverage requirement. (A program to retrofit mixed-use accounts with dedicated landscape accounts, or a program giving mixed-use accounts ETo-based budgets for irrigation uses satisfy this criterion.)

EXHIBIT 1

- d) An agency will be considered on track if the percent of CII accounts with mixed-use meters receiving a landscape water use survey equals or exceeds the following: 1.5% by end of first reporting period following date implementation to commence; 3.6% by end of second reporting period; 6.3% by end of third reporting period; 9.6% by end of fourth reporting period; and 13.5% by end of fifth reporting period. (A program to retrofit mixed-use accounts with dedicated landscape accounts, or a program giving mixed-use accounts ETo-based budgets for irrigation uses satisfy this criterion.)
- e) Agency has implemented and is maintaining customer incentive program(s) for irrigation equipment retrofits.

F. Water Savings Assumptions

Assume landscape surveys will result in a 15% reduction in demand for landscape uses by surveyed accounts.

EXHIBIT 1

6. HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS

(This version expires June 30, 2004)

A. Implementation

Implementation shall consist of at least the following actions:

Council Actions and Responsibilities

- a) Within 6 months from the adoption of this BMP, the Council will develop interim estimates of reliable water savings attributable to the use of high-efficiency washing machines based on the results of the THELMA Study and other available data. Water purveyors may defer implementing this BMP until the Council has adopted these interim estimates. [NOTE: INTERIM ESTIMATE OF RELIABLE WATER SAVINGS ADOPTED BY COUNCIL PLENARY APRIL 8, 1998, SEE SECTION F.]
- b) Within two years from the adoption of this BMP, the Council will complete studies quantifying reliable savings attributable to the use of high-efficiency washing machines.
- c) At the end of two years following the adoption of this BMP, the Council will appoint a committee to evaluate the effectiveness of triggering high-efficiency washing machine financial incentive programs operated by MOU signatories with programs operated by energy service providers. This committee will consist of 2 group 1 representatives, 2 group 2 representatives, and the Council Administrator or Executive Director or his/her designee. This BMP will be modified by the appointed committee to require agencies to implement financial incentive programs for high-efficiency washing machines whenever cost-effective and regardless of the absence of a program operated by an energy service provider if the committee concludes from available evidence the following:
 - i) the Council has verified that significant water savings are available from high-efficiency washing machines;
 - ii) there is widespread product availability; and
 - iii) financial incentive programs offered by energy service providers in California have either not materialized, been largely discontinued or significantly scaled back.

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Water Purveyor Responsibilities

- a) In conjunction with the Council, support local, state, and federal legislation to improve efficiency standards for washing machines.
- b) If an energy service provider or waste water utility within the service territory is offering a financial incentive for the purchase of high-efficiency washing machines, then the water agency shall also offer a cost-effective financial incentive based on the marginal benefits of the water savings. Incentive levels shall be calculated by using methods found in *A Guide to Customer Incentives for Water Conservation* prepared by Barakat and Chamberlain for the CUWA, CUWCC, and US EPA, February 1994. A water purveyor is not required to implement a financial incentive program if the maximum cost-effective rebate is less than \$50.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Cost-effective customer incentive for the purchase of high-efficiency washing machine offered if incentives are being offered by local energy service providers or waste water utility.

D. Requirements for Documenting BMP Implementation

- a) Customer incentives to purchase high-efficiency washing machines being offered by local energy service providers, if any.
- b) Customer incentives to purchase high-efficiency washing machines being offered by agency, if any.

E. Criteria to Determine BMP Implementation Status

- a) Agency has determined if energy service providers or waste water utilities operating within service territory offer financial incentives for the purchase of high-efficiency washing machines.

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- b) If energy service provider or waste water utility operating within agency's service territory is offering financial incentives, agency has calculated cost-effective customer incentive using methods found in *A Guide to Customer Incentives for Water Conservation* prepared by Barakat and Chamberlain for the CUWA, CUWCC, and US EPA, February 1994, and is offering this incentive to customers in service territory.

F. Water Savings Assumptions

The interim estimate of reliable annual water savings per replacement of a low-efficiency washing machine with a high-efficiency washing machine is 5,100 gallons, which is the mean yearly water savings derived from THELMA study data on water savings and washing machine load frequencies. Signatory water suppliers may use an estimate of annual water savings exceeding 5,100 gallons at their discretion, and may also select a lower estimate, so long as it is not below 4,600 gallons per year per retrofit, and there is a data supported reason for adopting an estimate lower than 5,100 gallons.

EXHIBIT 1

6. HIGH-EFFICIENCY CLOTHES WASHING MACHINE FINANCIAL INCENTIVE PROGRAMS

(This version adopted March 10, 2004 and effective July 1, 2004)

A. Implementation

Implementation shall consist of at least the following actions:

1. Until January 1, 2007, the water agency shall offer a financial incentive, if cost effective, for the purchase of high-efficiency clothes washing machines (HEWS) meeting a water factor value of 9.5 or less.
2. Any financial incentive offered shall be not less than the marginal benefits of the water savings, reduced by the necessary expense of administering the incentive program. Incentive levels shall be calculated by using methods found in *A Guide to Customer Incentives for Water Conservation* prepared by Barakat and Chamberlain for the CUWA, CUWCC, and US EPA, February 1994. A water agency is not required to implement a financial incentive program if the maximum cost-effective financial incentive is less than \$50.

The Council shall begin to review this BMP before July 1, 2005. This review shall determine appropriate agency implementation activities after 2007. The purpose of this review is to revise this BMP to account for potential Federal and State standards, the market share of HEWs with various water factors, further advances in washer efficiency, funding partner activities, and consumer participation.

B. Implementation Schedule

1. For Agencies signing the MOU prior to July 1, 2003, implementation shall commence no later than July 1, 2004.
2. For Agencies signing the MOU or becoming subject to the MOU after July 1, 2003, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Overview

The Council's objective is to transform the clothes washer market by increasing sales of HEWs. The Council anticipates this interim program will have a positive and long-lasting effect on the market share of HEWs; thus decreasing the future efforts needed by the Council and its members to achieve water efficiency in this sector.

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The goal for this BMP is to at least triple the market share of HEWs purchased for use inside residential dwelling units, where no incentive program exists. For purposes of determining coverage requirements, the Council's estimates a non-incentive market share of HEWs at 12% of all clothes washing machine sales (derived from year 2000 Energy Star data). The coverage requirements are based upon the goal of increasing the market share of HEWs to thirty-six percent (36%) of all clothes washing machine sales.

Coverage Goal

The Council developed a Coverage Goal (CG) system to more easily determine coverage progress, and allow agencies to obtain additional credit for promoting the purchase of ultra high efficiency machines with water factor values of 8.5 or less. The CG is based on the total quantity of dwelling units (single-family and multi-family) in each agency's service territory. The Council chose to use the quantity of both single-family and multi-family dwelling units because US Census data on in-home clothes washing machines includes both types of dwelling units.

Agency determines its CG by the following calculation:

$$\text{CG} = \text{Total Dwelling Units} \times 80\% \times 6.67\% \times 12\% \times 3 \times 2.5$$

Where: CG = Coverage Goal
Dwelling Units = total SF and MF dwelling units in agency service territory
80% = percentage of all dwelling units with in-home clothes washers
6.67% = percentage of washers requiring replacement each year
12% = Average HEW market share when no incentives exist
3 = tripling non-incentive market share
2.5 = years of program activity from July-2004 to January-2007

Simplified Formula: CG = Total Dwelling Units x 0.048

Agencies may request an adjusted CG where US Census data or other statistically valid surveys prove that less than 80% of all dwelling units (single-family and multi-family) in their service territory include a clothes washing machine. Agencies signing the MOU after July 1, 2003, shall use a prorated CG based on implementation period of less than 2.5 years.

Coverage Points

Agency shall earn points towards its Coverage Goal for the purchase and installation of HEWs in its service territory where agency provides a financial incentive of \$25 or more per HEW. In efforts to transform the market place towards ultra-high efficiency washers, agency may earn additional points for HEWs with water factor values of 8.5 or less.

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1. Agency shall earn 1 point for each HEW incentive issued on or after July 1, 2004, which results in the purchase and installation of a HEW with a water factor value greater than 8.5 but not exceeding 9.5.
2. Agency shall earn 2 points for each HEW incentive issued on or after July 1, 2004 resulting in the purchase and installation of a HEW with a water factor value greater than 6.0 but not exceeding 8.5.
3. Agency shall earn 3 points for each HEW incentive issued on or after July 1, 2004 resulting in the purchase and installation of a HEW with a water factor value of 6.0 or less.

Past Credit Points

Agency shall have the option to receive points towards its Coverage Goal for past efforts (efforts prior to July 1, 2004) by one of the following methods of agency's choosing:

1. Agencies shall earn points according to point scale described above in "Coverage Points; 1, 2 and 3" for each HEW incentive issued before July 1, 2004, resulting from agency incentive program, where agency has documentation of participation. Agency shall not receive any credit for HEWs with water factors greater than 9.5. Agencies shall not receive credit for any HEW sales or installations where the agency did not materially and substantially participate in the incentive program, and agency did not provide a financial incentive of \$25 or more.

OR

2. Agencies shall earn 1 point for each HEW incentive issued before July 1, 2004, resulting from agency incentive program, where agency has documentation of participation. Agencies shall not receive credit for any HEW sales or installations where the agency did not materially and substantially participate in the incentive program, and agency did not provide a financial incentive of \$25 or more.

D. Requirements for Documenting BMP Implementation

1. Agency shall provide documentation for all of the following items:
 - a) The quantity of single-family and multi-family dwelling units in the agency service area and the calculated Coverage Goal.
 - b) The quantity and value of financial incentives issued for HEWs with water factor values greater than 8.5, but not exceeding 9.5.

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- c) The quantity and value of financial incentives issued HEWs with water factor values greater than 6.0 but not exceeding 8.5.
 - d) The quantity and value of financial incentives issued for HEWs with water factors of 6.0 or less.
 - e) Average or estimated administration and overhead costs to operate the program.
 - f) To receive credit for past programs, agency shall provide: quantity and value of financial incentives, water factor values and date of incentives issued for high-efficiency clothes washers installed before July 1, 2004.
2. Agency shall retain records of each participant of the incentive program, including: name, address and telephone number of participant; water account number of building or dwelling unit; make and model of HEW purchased; water factor value; dollar amount of the agency's financial incentive; dollar amount of program partner's financial incentive (if applicable); and name of program partner(s).

E. Criteria to Determine BMP Implementation Status

Agency is offering a financial incentive to customers in its service territory for the purchase of high-efficiency clothes washing machines with water factors of 9.5 or less, and agency is meeting the coverage requirement as stated in this BMP.

Agency shall be considered on-track to meet its coverage requirements according to the following table:

Implementation Status Schedule	
Date	Percent of Points Earned Towards Coverage Goal
January 1, 2005	10%
July 1, 2005	30%
January 1, 2006	50%
July 1, 2006	75%
January 1, 2007	100%

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Agencies signing the MOU after July 1, 2003, shall have a prorated Implementation Status Schedule, based on implementation period of less than 2.5 years.

F. Water Savings Assumptions

Gross water savings (gallons) from financial incentive programs that result in the purchase and installation of High Efficiency Washing Machines with water factors equal to or less than 9.5 shall be calculated using the following formula:

$$GWS = 14 \text{ yr.} \times \sum_i N_i \times (13.3 - i) \times 1,170 \frac{\text{gal.}}{\text{yr.}}$$

Where: N_i is the number of machines replaced with water factor i ($i < 9.5$)

13.3 is the Baseline WF for washers sold in 1994, as supplied to DOE by the Association of Home Appliance Manufacturers (AHAM).

14 yr. is the assumed average useful life of residential washers. (Based on information from the Bern Kansas study)

1,170 gallons/year is the average change in water use for a unit change in water factor. This value was developed by the California Energy Commission.

Net water savings (gallons) from financial incentive programs shall be calculated using the following formula:

$$NWS = GWS \times (1 - FR),$$

Where: FR is the estimated rate of free ridership for the BMP 6 financial incentive program.

EXHIBIT 1

7. PUBLIC INFORMATION PROGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

- a) Implement a public information program to promote water conservation and water conservation related benefits.
- b) Program should include, but is not limited to, providing speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote water conservation practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agencies shall maintain an active public information program to promote and educate customers about water conservation.

D. Requirements for Documenting BMP Implementation

- a) Number of public speaking events relating to conservation during reporting period.
- b) Number of media events relating to conservation during reporting period.
- c) Number of paid or public service announcements relating to conservation produced or sponsored during reporting period.
- d) Types of information relating to conservation provided to customers.
- e) Annual budget for public information programs directly related to conservation.

EXHIBIT 1

E. Criteria to Determine BMP Implementation Status

Agency has implemented and is maintaining a public information program consistent with BMP 7's definition.

F. Water Savings Assumptions

Not quantified.

EXHIBIT 1

8. SCHOOL EDUCATION PROGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

- a) Implement a school education program to promote water conservation and water conservation related benefits.
- b) Programs shall include working with school districts and private schools in the water suppliers' service area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Education materials shall meet the state education framework requirements, and grade appropriate materials shall be distributed to grade levels K-3, 4-6, 7-8, and high school.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agencies shall maintain an active school education program to educate students in the agency's service areas about water conservation and efficient water uses.

D. Requirements for Documenting BMP Implementation

- a) Number of school presentations made during reporting period.
- b) Number and type of curriculum materials developed and/or provided by water supplier, including confirmation that curriculum materials meet state education framework requirements and are grade-level appropriate.
- c) Number of students reached.
- d) Number of in-service presentations or teacher's workshops conducted during reporting period.
- e) Annual budget for school education programs related to conservation.

EXHIBIT 1

E. Criteria to Determine BMP Implementation Status

Agency has implemented and is maintaining a school education program consistent with BMP 8's definition.

F. Water Savings Assumptions

Not quantified.

EXHIBIT 1

9. CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL (CII) ACCOUNTS

A. Implementation

Implementation shall consist of at least the following actions:

BOTH (a) AND (b)

(a) CII Accounts

Identify and rank commercial, industrial, and institutional (CII) accounts (or customers if the agency chooses to aggregate accounts) according to water use. For purposes of this BMP, CII accounts are defined as follows:

Commercial Accounts: any water use that provides or distributes a product or service, such as hotels, restaurants, office buildings, commercial businesses or other places of commerce. These do not include multi-family residences, agricultural users, or customers that fall within the industrial or institutional classifications.

Industrial Accounts: any water users that are primarily manufacturers or processors of materials as defined by the Standard Industrial Classifications (SIC) Code numbers 2000 through 3999.

Institutional Accounts: any water-using establishment dedicated to public service. This includes schools, courts, churches, hospitals, and government facilities. All facilities serving these functions are to be considered institutions regardless of ownership.

(b) 3-Year Interim CII ULFT Program

Implementation shall consist of at least the following actions:

- i) A program to accelerate replacement of existing high-water-using toilets with ultra-low-flush (1.6 gallons or less) toilets in commercial, industrial, and institutional facilities.
- ii) *Programs shall be at least as effective as facilitating toilet replacements over a 3-year implementation period, commencing July 1, 2001, sufficient to produce cumulative water savings over 10 years equal to 3% of Total Water Savings Potential, as defined by Exhibit 8 of this MOU.*

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iii) Annual reporting to the Council of all available information described in Section D, subsection (b) of this BMP. The Council shall develop and provide agencies with a concise reporting form by March 31, 2001.

iv) By July 1, 2004, a committee selected by the Steering Committee shall complete for submittal to the Steering Committee a written evaluation of the interim program, including an assessment of program designs, obstacles to implementation, program costs, estimated water savings, and cost-effectiveness. By August 2004, the Steering Committee will reconvene to review the evaluation and recommend to the Plenary the next course of action on BMP 9 targets for CII toilet replacement programs.

AND EITHER (c) OR (d)

(c) CII Water-Use Survey and Customer Incentives Program

Implement a CII Water-Use Survey and Customer Incentives Program. Develop a customer targeting and marketing strategy to provide water use surveys and customer incentives to CII accounts such that 10% of each CII sector's accounts are surveyed within 10 years of the date implementation is to commence. Directly contact (via letter, telephone, or personal visit) and offer water use surveys and customer incentives to at least 10% of each CII sector on a repeating basis. Water use surveys must include a site visit, an evaluation of all water-using apparatus and processes, and a customer report identifying recommended efficiency measures, their expected payback period and available agency incentives. Within one year of a completed survey, follow-up via phone or site visit with customer regarding facility water use and water saving improvements. Track customer contacts, accounts (or customers) receiving surveys, follow-ups, and measures implemented. The method for crediting water use surveys completed prior to the revision of this BMP is described in Section E.

(d) CII Conservation Performance Targets

Achieve a water use reduction in the CII sectors equaling or exceeding the CII Conservation Performance Target. Implement programs to achieve annual water use savings by CII accounts by an amount equal to 10% of the baseline use of CII accounts in the agency's service area over a ten-year period. The target amount of annual water use reduction in CII accounts is a static value calculated from the baseline amount of annual use. Baseline use is defined as the use by CII accounts in 1997. Water purveyors may justify to the Council the use of an alternative baseline year.

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B. Implementation Schedule

- (a) For agencies signing the MOU prior to December 31, 1997, implementation other than CII ULFTs shall commence no later than July 1, 1999. Implementation of Section A (b) --CII ULFTs -- shall commence July 1, 2001.
- (b) For agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation other than the 3-Year Interim CII ULFT Program shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU. Implementation of Section A (b) -- CII ULFTs -- shall commence July 1, 2001. Agencies signing the MOU or becoming subject to the MOU after July 1, 2001 shall not be subject to the Coverage Requirements set forth in Section C, subsection (a) -- 3-Year Interim CII ULFT Program.
- (c) The coverage requirement for this BMP, as specified in Section C of this Exhibit, with the exception of CII ULFTs, shall be realized within 10 years of the date implementation was to commence.

C. Coverage Requirements

(a) 3-Year CII ULFT Program

CII ULFT program water savings equal to 3% of Total Water Savings Potential, as defined by Exhibit 8 of this MOU, by July 1, 2004.

EITHER

(b) CII Water Use Survey and Customer Incentives Program

10% of each of the CII sector's accounts to accept a water use survey within 10 years of the date implementation is to commence. For the purposes of calculating coverage, 10% of CII accounts means the number of accounts equal to 10% of CII accounts in 1997 or the year the agency signed the MOU, whichever is later.

OR

(c) CII Conservation Performance Targets

Reduce annual water use by CII accounts by an amount equal to 10% of the annual baseline water use within 10 years of the date implementation is to commence, including savings resulting from implementation of section A (b) -- CII ULFTs.

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D. Requirements for Documenting BMP Implementation

(a) CII Accounts

The number of accounts (or customers) and amount of water use within each of the CII sectors.

(b) 3-Year Interim CII ULFT Replacement Program

(1) Customer participant information, including retail water utility account ID's, primary contact information, facility address, facility type, number of toilets being replaced, number of toilets in facility (if available), primary reasons for toilet replacement and program participation (if available).

(2) Number of CII ULFTs replaced or distributed by CII sub sector by year.

(3) Total program cost by year, including administration and overhead, labor (staff salaries and benefits), marketing, outside services, incentives, and implementation (agency installation, rebate, permitting and remedial costs), and any required evaluation and reporting by the Council. Costs for program development and program operation shall be reported separately.

(4) Total program budget by year.

(5) Program funding sources by year, including intra-agency funding mechanisms, inter-agency cost-sharing, and state/federal financial assistance sources.

(6) Description of program design and implementation, such as types of incentives, marketing, advertising methods and levels, customer targeting methods, customer contact methods, use of outside services (e.g., consultants or community-based organizations), and participant tracking and follow up.

(7) Description of program acceptance or resistance by customers, any obstacles to implementation, and other issues affecting program implementation or effectiveness.

(8) General assessment of program effectiveness.

AND EITHER (c) OR (d)

(c) CII Water Use Survey and Customer Incentives Program

1) The number of CII accounts (or customers) offered water use surveys during the reporting period.

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- 2) The number of new water use surveys completed during the reporting period.
- 3) The number of follow-ups completed during the reporting period.
- 4) The type and number of water saving recommendations implemented.
- 5) Agency's program budget and actual program expenditures.

(d) CII Conservation Performance Target

The estimated reduction in annual water use for all CII accounts due to agency programs, interventions, and actions. Agencies must document how savings were realized and the method and calculations for estimating savings, including the savings resulting from agency-assisted CII ULFTs replacements under section A (b).

E. Criteria to Determine BMP Implementation Status

(a) CII Accounts

Agency has identified and ranked by water use its CII accounts.

(b) CII ULFTs

Agency is on schedule to meet the coverage requirement for section A (b) within 3 years of the start of implementation. An agency will be considered on track if by the end of the first year of implementation the 10-year cumulative water savings equals or exceeds 0.5% of Total Savings Potential; by the end of the second year of implementation the 10-year cumulative water savings equals 1.5% of Total Savings Potential; and by the end of the third year of implementation the 10-year cumulative water savings equals or exceeds 3.0% of Total Savings Potential.

During the 3-year interim implementation period, cumulative savings from CII ULFT replacement programs occurring prior to January 1, 2001, may not be applied towards the interim coverage requirement. However, cumulative savings from *all* previous agency CII ULFT replacement programs may be applied toward any long-term CII ULFT coverage requirement.

AND EITHER (c) OR (d) OR (e)

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(c) CII Water Use Survey and Customer Incentives Program

- 1) Agency has developed and implemented a strategy targeting and marketing water use surveys to CII accounts (or customers) by the end of the first reporting period following the date implementation is to commence.
- 2) Agency is on schedule to complete surveys for 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of the date implementation is to commence. Agencies may credit 50% of the number of surveys completed prior to July 1, 1996 that have not received follow-up verification of implementation, and 100% of the number of surveys completed prior to July 1, 1996 that have received a follow-up survey. Agencies may credit 100% of the number of surveys completed after July 1, 1996 against the coverage requirement.
- 3) Agencies will be considered on track if the percent of CII accounts receiving a water use survey, in aggregate, equals or exceeds the following: 0.5% of the total number of surveys required by end of first reporting period following date implementation is to commence; 2.4% by end of second reporting period; 4.2% by end of third reporting period; 6.4% by end of fourth reporting period; and 9.0% by end of fifth reporting period.

(d) CII Conservation Performance Targets

- 1) Agency is on schedule to reduce water use by CII accounts by an amount equal to 10% of baseline use (as defined in Section A) for CII accounts within 10 years of the date implementation is to commence.
- 2) Agencies will be considered on track if estimated savings as a percent of baseline water use equals or exceeds the following: 0.5% by end of first reporting period following date implementation is to commence; 2.4% by end of second reporting period; 4.2% by end of third reporting period; 6.4% by end of fourth reporting period; and 9.0% by end of fifth reporting period.
- 3) Credited water savings must be realized through agency actions performed to increase water use efficiency within the CII sector. Agencies may credit 100% of estimated annual savings of interventions since 1991 that have been site verified, and 25% of estimated annual savings of interventions that have not been site verified.
- 4) Agencies may claim the estimated savings for regulations, ordinances, or laws intended to increase water use efficiency by the CII sector, subject to the review and approval of the savings estimates by the Council. To avoid double counting, agencies justifying savings on the basis of rate structure

EXHIBIT 1

changes may not claim savings from any other actions undertaken by CII customers, third parties, or the agency.

(e) Combined Targets

Agencies may choose different tracks for different CII sectors, and will be considered in compliance with this BMP if they are on track to meet each applicable coverage requirement for each sector. In addition, agencies may implement both tracks for a given CII sector, and will be considered in compliance with this BMP if the percent of surveys completed and the percent of water savings realized, when added together, equals or exceeds the applicable compliance requirement. For example, at the end of the second reporting cycle an agency would be considered on track to meet the coverage requirement if the percent of surveys completed and the percent of water savings achieved, when added together, equaled or exceeded 2.4%. Agencies may combine tracks only if they make a convincing demonstration that savings attributable to counted surveys are not also included in their estimate of water savings for meeting the water savings performance track.

F. Water Savings Assumptions

Commercial water reduction results from Best Management Practices such as Interior and Landscape Water Surveys, Plumbing Codes, and Other Factors (Includes savings accounted for in other BMPs.) Estimated reduction in gallons per employee per day in year 2000 use occurring over the period 1980-2000: 12%.

Industrial water reduction results from Best Management Practices, Waste Discharge Fee, New Technology, Water Surveys, Plumbing Codes and Other Factors (Includes savings accounted for in other BMPs.) Estimated reduction in gallons per employee per day in year 2000 use occurring over the period 1980-2000: 15%.

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10. WHOLESALE AGENCY ASSISTANCE PROGRAMS

(Version adopted March 10, 2004 and effective July 1, 2004)

A. Implementation

Implementation shall consist of at least the following actions:

Financial Support

1. Wholesale water suppliers will provide financial incentives, or equivalent resources, as appropriate, beneficial, and mutually agreeable to their retail water agency customers to advance water conservation efforts and effectiveness.
2. All BMPs implemented by retail water agency customers that can be shown to be cost-effective in terms of avoided cost of water from the wholesaler's perspective, using Council cost-effectiveness analysis procedures, will be supported.

Technical Support

Wholesale water agencies shall provide conservation-related technical support and information to all retail agencies for whom they serve as a wholesale supplier. At a minimum this requires:

3. Conducting, funding or promoting workshops addressing the following topics:
 - a) Council procedures for calculating program savings, costs and cost-effectiveness;
 - b) Retail agencies' BMP implementation reporting requirements; and
 - c) The technical, programmatic, strategic or other pertinent issues and developments associated with water conservation activities in each of the following areas: ULFT replacement; residential retrofits; commercial, industrial and institutional surveys; residential and large turf irrigation; and conservation-related rates and pricing.
4. Having the necessary staff or equivalent resources available to respond to retail agencies' technical and programmatic questions involving the Council's BMPs and their associated reporting requirements.

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Program Management

Wholesale and retail agencies will retain maximum local flexibility in designing and implementing locally cost-effective BMP conservation programs. Cooperatively designed regional programs are encouraged.

5. When mutually agreeable and beneficial, the wholesaler may operate all or any part of the conservation-related activities which a given retail supplier is obligated to implement under the BMP's cost-effectiveness test. The inability or unwillingness of the wholesaler to perform this function, however, in no way relieves or reduces the retailer's obligation to fully satisfy the requirements of all BMPs which are judged cost-effective from the retailer's perspective.

Water Shortage Allocations

6. Wholesale agencies shall work in cooperation with their customers to identify and remove potential disincentives to long-term conservation created by water shortage allocation policies; and to identify opportunities to encourage and reward cost-effective investments in long-term conservation shown to advance regional water supply reliability and sufficiency.

B. Implementation Schedule

1. Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1999.
2. Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the second year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

1. Cost-effectiveness assessments completed for each BMP the wholesale agency is potentially obligated to support. The methodology used will conform to Council standards and procedures, and the information reported will be sufficient to permit independent verification of the cost-effectiveness calculations and of any exemptions claimed on cost-effectiveness grounds. Any subset of the BMPs being directly implemented by a wholesale agency will be reported.

All other BMPs supportable by the retailers located in a wholesaler's service area will be considered for financial and technical support, and will be dependent on agreement between the wholesaler and its retailers.

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2. Agency avoided cost per acre-foot of new water supplies. The methodology used will conform to Council standards and procedures, and the information reported will be sufficient to permit independent verification of the avoided cost calculations.
3. The total monetary amount of financial support, incentives, staff support and equivalent resources provided to retail members to assist, or to otherwise support, the implementation of BMPs.
4. The total amount of verified water savings achieved by each wholesaler-assisted BMP.
5. At each reporting cycle, wholesale agencies shall provide a written offer of support to each of their retailers, and request a response from each retailer. Verification of such offers and responses shall be submitted to the Council at each regular reporting cycle via the "notes" section in the BMP reporting database.

It is recognized that wholesale agencies have limited control over retail agencies that they serve, and must act in cooperation with those retail agencies on implementation of BMPs. Thus, wholesale agencies cannot be held responsible for levels of implementation by individual retailers in their wholesale service areas.

6. Wholesale agencies will receive full credit and acknowledgement for previous BMP implementation.

D. Requirements for Documenting BMP Implementation

1. The total monetary amount of financial incentives and equivalent resources provided to retail members to assist, or to otherwise support, the implementation of BMPs, subtotaled by BMP.
2. The total amount of verified water savings achieved by each wholesaler-assisted BMP.

E. Criteria to Determine BMP Implementation Status

1. Timely and complete reporting of all information as provided for above under "Reporting and Record Keeping Requirements."
2. Offering workshops covering all topics listed above under "Technical Support."

EXHIBIT 1

3. Timely reconciliation of wholesaler and retailer BMP reports as provided for above under "BMP Reporting."

F. Water Savings Assumptions

Not quantified. Wholesalers shall use the Council's Cost and Savings Document to assess the total amount of water savings achieved by each wholesaler-supported BMP.

EXHIBIT 1

11. CONSERVATION PRICING

A. Implementation

Implementation methods shall be at least as effective as eliminating non-conserving pricing and adopting conserving pricing. For signatories supplying both water and sewer service, this BMP applies to pricing of both water and sewer service.

Signatories that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.

- a) Non-conserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components: rates in which the unit price decreases as the quantity used increases (declining block rates); rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used; pricing in which the typical bill is determined by high fixed charges and low commodity charges.
- b) Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the longrun marginal cost or the cost of adding the next unit of capacity to the system.
- c) Adoption of lifeline rates for low income customers will neither qualify nor disqualify a rate structure as meeting the requirements of this BMP.

CUWCC Rate Impact Study

Within one year of the adoption of this BMP revision, the Council shall undertake a study to determine the relative effect of conservation rate structure influence on landscape and indoor water use. The study shall develop sample areas that incorporate varying rate structure environments (e.g., low, uniform commodity rates,; high uniform commodity rates; increasing block rates, etc.). As practical, the study shall utilize direct metering of customer end uses, and shall control for weather, climate, land use patterns, income, and other factors affecting water use patterns. If the study shows significant potential savings, as determined by a balanced committee of voting Council representatives, a revised pricing BMP containing numeric targets or other appropriate standards shall be developed for a Council vote.

EXHIBIT 1

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing.

D. Requirements for Documenting BMP Implementation

- a) Report annual revenue requirement by customer class for the reporting period.
- b) Report annual revenue derived from commodity charges by customer class for the reporting period.
- c) Report rate structure by customer class for water service and sewer service if provided.

E. Criteria to Determine BMP Implementation Status

Agency rate design shall be consistent with the BMP 11's definition of conservation pricing.

F. Water Savings Assumptions

Not quantified.

EXHIBIT 1

12. CONSERVATION COORDINATOR

A. Implementation

Implementation shall consist of at least the following actions:

- a) Designation of a water conservation coordinator and support staff (if necessary), whose duties shall include the following:
 - i) Coordination and oversight of conservation programs and BMP implementation;
 - ii) Preparation and submittal of the Council BMP Implementation Report;
 - iii) Communication and promotion of water conservation issues to agency senior management; coordination of agency conservation programs with operations and planning staff; preparation of annual conservation budget; participation in the Council, including regular attendance at Council meetings; and preparation of the conservation elements of the agency's Urban Water Management Plan.
- b) Agencies jointly operating regional conservation programs are not expected to staff duplicative and redundant conservation coordinator positions.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

D. Requirements for Documenting BMP Implementation

- a) Conservation Coordinator name, staff position, and years on job.
- b) Date Conservation Coordinator position created by agency.

EXHIBIT 1

- c) Number of Conservation Coordinator staff.
- d) Duties of Conservation Coordinator and staff.

E. Criteria to Determine BMP Implementation Status

- a) Creating and staffing a Conservation Coordinator position within the agency organization.
- b) Providing the Conservation Coordinator with the necessary resources to implement cost-effective BMPs and prepare and submit Council BMP Implementation Reports.

F. Water Savings Assumptions

Not quantified.

EXHIBIT 1

13. WATER WASTE PROHIBITION

A. Implementation

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

Signatories shall also support efforts to develop state law regarding exchange-type water softeners that would: (1) allow the sale of only more efficient, demand-initiated regenerating (DIR) models; (2) develop minimum appliance efficiency standards that (a) increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used; and (b) implement an identified maximum number of gallons discharged per gallon of soft water produced; (3) allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.

Signatories shall also include water softener checks in home water audit programs and include information about DIR and exchange-type water softeners in their educational efforts to encourage replacement of less efficient timer models.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.

C. Coverage Requirements

Agency shall adopt water waste prohibitions consistent with the provisions for this BMP specified in Section A of this Exhibit.

D. Requirements for Documenting BMP Implementation

Description of water waste prohibition ordinances enacted in service area.

EXHIBIT 1

E. Criteria to Determine BMP Implementation Status

Agency's water waste prohibition ordinances meet the requirements of the BMP definition.

F. Water Savings Assumptions

Not quantified.

EXHIBIT 1

14. RESIDENTIAL ULFT REPLACEMENT PROGRAMS

A. Implementation

Implementation shall consist of at least the following actions:

- a) Implementation of programs for replacing existing high-water-using toilets with ultra-low- flush (1.6 gallons or less) toilets in single-family and multi-family residences.
- b) Programs shall be at least as effective as requiring toilet replacement at time of resale; program effectiveness shall be determined using the methodology for calculating water savings in Exhibit 6 of this MOU.

After extensive review, on July 30 1992, the Council adopted Exhibit 6, "ASSUMPTIONS AND METHODOLOGY FOR DETERMINING ESTIMATES OF RELIABLE WATER SAVINGS FROM THE INSTALLATION OF ULF TOILETS." Exhibit 6 provides a methodology for calculating the level of effort required to satisfy BMP 14.

B. Implementation Schedule

- a) Agencies signing the MOU prior to December 31, 1997, implementation shall commence no later than July 1, 1998.
- b) Agencies signing the MOU or becoming subject to the MOU after December 31, 1997, implementation shall commence no later than July 1 of the first year following the year the agency signed or became subject to the MOU.
- c) The coverage requirement for this BMP, as specified in Section C of this Exhibit, shall be realized within 10 years of the date implementation was to commence.

C. Coverage Requirements

Water savings from residential ULFT replacement programs to equal or exceed water savings achievable through an ordinance requiring the replacement high-water-using toilets with ultra-low-flow toilets upon resale, and taking effect on the date implementation of this BMP was to commence and lasting ten years.

D. Requirements for Documenting BMP Implementation

- a) The number of single-family residences and multi-family units in service area constructed prior to 1992.

EXHIBIT 1

- b) The average number of toilets per single-family residence; the average number of toilets per multi-family unit.
- c) The average persons per household for single-family residences; the average persons per household for multi-family residences.
- d) The housing resale rate for single-family residences in service area; the housing resale rate for multi-family residences in service area.
- e) The number of ULFT installations credited to the agency's replacement program, by year.
- f) Description of ULFT replacement program
- g) Estimated cost per ULFT replacement.
- h) Estimated water savings per ULFT replacement

E. Criteria to Determine BMP Implementation Status

Calculated ULFT replacement program water savings at the end of each reporting period are within 10% of calculated retrofit-on-resale water savings, using Exhibit 6 methodology and water savings estimates.

F. Water Savings Assumptions

See Exhibit 6.

EXHIBIT 1

POTENTIAL BEST MANAGEMENT PRACTICES

This section contains Potential Best Management Practices (PBMPs) that will be studied. Where appropriate, demonstration projects will be carried out to determine if the practices meet the criteria to be designated as BMPs. Within one year of the initial signing of this MOU, the Council will develop and adopt a schedule for studies of these PBMPs.

1. Rate Structure and other Economic Incentives and Disincentives to Encourage Water Conservation.

This is the top priority PBMP to be studied. Such studies should include seasonal rates; increasing block rates; connection fee discounts; grant or loan programs to help finance conservation projects; financial incentives to change landscapes; variable hookup fees tied to landscaping; and interruptible water service to large industrial, commercial or public customers. Studies on this PBMP will be initiated within 12 months from the initial signing of the MOU. At least one of these studies will include a pilot project on incentives to encourage landscape water conservation.

2. Efficiency Standards for Water Using Appliances and Irrigation Devices

3. Replacement of Existing Water Using Appliances (Except Toilets and Showerheads Whose Replacements are Incorporated as Best Management Practices) and Irrigation Devices.

4. Retrofit of Existing Car Washes.

5. Graywater Use

6. Distribution System Pressure Regulation.

7. Water Supplier Billing Records Broken Down by Customer Class

8. Swimming Pool and Spa Conservation including Covers to Reduce Evaporation

9. Restrictions or Prohibitions on Devices that use Evaporation to Cool Exterior Spaces.

10. Point of Use Water Heaters, Recirculating Hot Water Systems and Hot Water Pipe Insulation.

11. Efficiency Standards for New Industrial and Commercial Processes.

Letter 010

SHUTE, MIHALY & WEINBERGER LLP
ATTORNEYS AT LAW

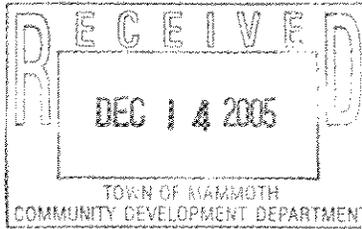
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December 13, 2005

Sonja Porter, Senior Planner
Community Development Department
Town of Mammoth Lakes
P.O. Box 1609
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**Re: Comments of Advocates For Mammoth on Revised Draft Program
Environmental Impact Report (SCH #2003042155)**

Dear Ms. Porter:

We write on behalf of our client, Advocates For Mammoth ("AFM"), to comment on the Revised Draft Program Environmental Impact Report ("EIR") prepared by the Town of Mammoth ("Town") for the proposed 2005 General Plan Update ("GPU"). We have been asked to comment on the Air Quality and Water Supply portions of the EIR. As discussed in detail below, we have found that both sections are flawed in several crucial respects. We therefore request that the Town revise the document and recirculate it for further public consideration and comment pursuant to Public Resources Code section 21092.1.

We have also been asked to comment on the proposed density transfer provision in GPU Policy LU.1.a. As discussed below, that Policy includes several ambiguities that could obstruct its implementation. We provide recommendations to resolve those ambiguities.

I. THE EIR'S ANALYSIS OF GPU IMPACTS IS INADEQUATE.

An EIR must be detailed and complete and reflect a good faith effort at full disclosure. The document should provide a sufficient degree of analysis to inform the

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public about the proposed project's adverse environmental impacts and to allow decision makers to make intelligent judgments. CEQA Guidelines § 15151. In reviewing the legal sufficiency of environmental review documents, the courts have emphasized that an EIR must support with rigorous analysis and substantial evidence the conclusion that environmental impacts will be insignificant and will be adequately mitigated. *Kings County Farm Bureau v. City of Hanford*, 221 Cal. App. 3d 692 (1990). As described below, the EIR fails to comply with this standard.

A. Air Quality

1. Mitigation Measure 4.2-1 Does Not Eliminate the GPU's Conflict With the AQMP.

Issue 4.2-1 states that the GPU would have a significant impact if it would conflict with the Air Quality Management Plan ("AQMP") or obstruct its implementation. EIR at 4-32. The EIR admits that, at build-out, the GPU would produce "vehicle miles traveled" ("VMT") far in excess of the 106,600 VMT standard established by a control measure in the AQMP—159,961 VMT. *Id.* at 4-32 to 4-33. The VMT standard is also set forth in the Mammoth Lakes Municipal Code. Muni. Code § 8.30.110. Mitigation Measure 4.2-1 purports to reduce this impact to a less than significant level. EIR at 4-36.

As discussed below, this measure improperly defers the specification of mitigation requirements until after approval of the GPU, but regardless of that deferral, the measure does not in fact mitigate the identified impact. The mitigation measure would not prevent the Town from approving development that would produce more than the 106,600 VMT ceiling established in the AQMP and Municipal Code. So long as the GPU may produce more than the 106,600 VMT standard, the GPU must be considered to be inconsistent with the plain terms of both the AQMP and the Municipal Code. As the EIR admits, this is a significant impact.

Furthermore, the EIR's proposal to violate the control measure included in the AQMP also raises serious legal questions under the federal Clean Air Act. The AQMP is part of California's EPA-approved State Implementation Plan ("SIP"). EIR at 4-32. Accordingly, EPA has reviewed and approved each of the control measures in the SIP/AQMP, including the control measure limiting growth to less than 106,600 VMT. *See* 42 U.S.C. § 7410(a)(3)(B); 57 Fed. Reg. 13,498 (1992). Refusal to comply with an EPA-approved SIP control measure, as Mitigation Measure 4.2-1 proposes, could subject the Town or State to federal sanctions. *See* 42 U.S.C. §§ 7410(m), 7509(a)(4). It could

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also leave the Town open to a citizen suit or other enforcement action under the Clean Air Act.

2. Mitigation Measure 4.2-1 Improperly Defers Specification of Mitigation.

Because an EIR is intended to apprise the decision maker and the public of a project's environmental effects *before* a decision on the project is made, *Citizens of Goleta Valley v. Bd. of Supervisors*, 52 Cal. 3d 553, 564 (1990), the EIR may not defer identification of mitigation for potentially significant effects until after the decision on the project has been made. CEQA Guidelines § 15126.4(a)(1)(B) ("Formulation of mitigation measures should not be deferred until some future time."); *Sundstrom v. County of Mendocino*, 202 Cal. App. 3d 296, 307 (1988). Courts have allowed deferral of mitigation only in very limited circumstances. "[F]or kinds of impacts for which mitigation is known to be feasible, *but where practical considerations prohibit devising such measures early in the planning process . . .*, the agency can commit itself to eventually devising measures that will satisfy *specific performance criteria* articulated at the time of project approval." *Sacramento Old City Ass'n v. City Council*, 229 Cal. App. 3d 1011, 1028-29 (1991) (emphases added).

Mitigation measure 4.2-1 improperly defers specification of mitigation until after GPU approval without any valid justification for that deferral. The measure defers modeling and establishment of a limit of total VMT to achieve the federal PM₁₀ standard. The measure also fails to specify how the "offset credits" referred to in the measure would be calculated and with the use of the word "should" rather than "shall," makes the use of such credits advisory rather than mandatory. The EIR also fails to identify any "practical considerations [that] prohibit devising [mitigation] measures" before GPU approval or "specific performance criteria" to guide selection of mitigation. *Id.*

In fact, it is clear that the Town could now limit development in the GPU to achieve a VMT limit that would allow the Town to meet the federal PM₁₀ standard. The air quality analysis in Appendix C states that "[t]he model predicts compliance with the federal standard up to a daily VMT of 130,000." EIR, App. C, at 2; *accord id.* at 8, tbl. 6. The EIR states that build-out of the GPU, however, would produce 159,961 VMT. EIR at 4-33. The EIR provides no explanation for its failure to include a mitigation measure that proposes to limit development to a level that would produce 130,000 VMT. Because the traffic model allows prediction of VMT for various levels of growth, the Town could

easily calculate the reductions in new development required to reduce VMT to 130,000 or below.¹

Although the GPU “implementation measures” might further reduce PM₁₀ emissions to some degree, the fact that their benefits cannot be presently determined does not justify a conclusion that the impact is less than significant. The implementation measures are as vague as Mitigation Measure 4.2-1 and provide no performance criteria to guide future specification. For example, measure 1.7.B.c.1 directs the Town to “conduct pilot projects and work with all applicable agencies to determine the feasibility of utilizing alternative traction control methods.” EIR at 4-34. The EIR touts this insubstantial measure in concluding that the GPU’s impact on compliance with the federal PM₁₀ standard is less than significant. EIR at 4-40 n.14. The EIR provides no basis to judge the effectiveness of this measure. Rather it is a “mere expression[] of hope” that the Town will be able to devise a way around the problem of entrained road cinders. *Lincoln Place Tenants Ass’n v. City of Los Angeles*, --- Cal. App. 4th ---, 2005 WL 1635178, at *10 (July 13, 2005). CEQA requires more than that to mitigate significant impacts. *Id.*

The appropriate approach here would be to limit development to a level that would produce no more than 130,000 VMT, as discussed above and then revisit the issue after the implementation measures have in fact been implemented.² Development levels could then be adjusted, if appropriate, to reflect the reductions in emissions, if any, achieved by the implementation measures.

3. Issue 4.2-2 Misstates Emission Reductions From Stationary Sources.

The discussion of Issue 4.2-2 states that emissions from stationary sources “would decrease” relative to current conditions because of three AQMP control measures implemented by the Municipal Code: prohibition of wood burning appliances in multi-

¹ Even if the Town were to adopt such a measure, however, it would not cure the GPU’s inconsistency with the AQMP and the refusal to implement an EPA-approved SIP control measure. A GPU that allows 130,000 VMT is still facially inconsistent with the 106,600 VMT limit set forth in the AQMP and Municipal Code. Moreover, the measure would require modification of the land use portions of the GPU to ensure that the GPU remains internally consistent.

² Furthermore, because Mitigation Measure 4.2-1 provides for ongoing modeling using the AQMP model, the implementation measures will not justify a conclusion that a higher VMT may be sustained while nonetheless achieving the federal ambient standard: the AQMP model does take the implementation measures into account.

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family units, curtailment of solid fuel combustion on designated poor air quality days, and a program for the replacement of existing wood burning stoves for EPA-approved stoves with lower emissions. EIR at 4-39. The first two measures are already in effect and have been in effect since the early 1990s. *See* Muni. Code §§ 8.30.030, 8.30.090. Thus they cannot be said to *reduce* stationary source emissions from current levels. Only the third measure can effect an improvement to existing emissions levels by requiring replacement of existing sources with cleaner sources. However, that requirement applies only upon a change in ownership of the property on which an affected source is located. Muni. Code § 8.30.050(A). Moreover, the air impact study (EIR, App. C) notes that the “great majority” of solid fuel appliances are already EPA-compliant. EIR, App. C, at 2.

The EIR and air impact study also note that the Air Pollution Control District is *proposing* a series of measures to further reduce PM₁₀ emissions. *Id.*; EIR at 4-30. The air quality model assumes that these measures will be adopted and implemented as proposed but provides no support for this assumption beyond the conclusory statement that “[t]hose measures are expected to be adopted.” EIR, App. C, at 2. Likewise, the EIR concedes that no implementation schedule for the measures has been adopted. EIR at 4-30. As a result, it is speculative to rely on these measures to reduce Town air emissions. *Cf.* EIR at 4-267 (concluding that reliance on unapproved recycled water program as a water source for GPU development would be “speculative”). Accordingly, the EIR’s air quality model must be revised to eliminate reliance on these measures.

4. The EIR Errs In Concluding That the Town Will Attain the Federal PM₁₀ Standard With Build-out of the GPU.

Although the EIR concedes that state PM₁₀ and federal ozone standards will continue to be violated under the GPU, EIR at 4-40, it concludes that the GPU will not cause violations of the federal PM₁₀ standard. In fact, because the identified mitigation is inadequate, the Town is likely to violate the federal standard. Under the thresholds of significance in the EIR, this violation of an air quality standard is a significant impact. Nevertheless, contrary to the EIR’s conclusion, the impact is not unavoidable.

Table 4.2-2 demonstrates that on “road-dust dominated days,” ambient PM₁₀ concentrations are expected to reach 174.5 ug/m³, well over the 150 ug/m³ federal standard. EIR at 4-38. The EIR suggests that the GPU “implementation measures” will produce some reduction in PM₁₀ levels, but concedes that these reductions are impossible to predict. EIR at 4-40 n.14. The Town thus has no basis for concluding that they will be effective at avoiding violations of the federal standard. Indeed, given *existing* ambient conditions on road-dust dominated days (142.4 ug/m³) are only a hair’s breadth away

from a violation of the federal standard, the implementation measures would need to have an enormous impact to offset the impacts of the growth planned in the GPU.

Mitigation Measure 4.2-2 does not eliminate the impact either. This measure is identical to Mitigation Measure 4.2-1. *Compare* EIR at 4-40 *with id.* at 4-36. That measure is little more than a hope that the Town, in the future, will somehow reduce VMT to a level that would achieve compliance with the federal standard. As described previously, that measure is invalid under well-established CEQA principles. Also previously noted, the air quality impact study concludes that the Town can achieve the Federal standard at traffic levels of up to 130,000 VMT, yet the EIR fails to propose limiting planned development to a level that would not exceed that VMT value. This is a feasible and presently identifiable way to mitigate the GPU's impact.

5. The EIR Fails To Properly Analyze the Increase in Emissions of Ozone Precursors Caused By the GPU.

Issue 4.2-3 notes that the Town violates the state ambient air quality standards for ozone and concludes that those violations are attributable to ozone transported from the Central Valley across the Sierra to the Town. EIR at 4-41. As a result, the Town is expected to continue to violate the ozone standard whether or not the GPU is implemented. *Id.* It therefore concludes that the GPU's cumulative impact is significant and unavoidable. *Id.* at 4-43. Likewise, Issue 4.2-2 describes the exceedance of the state ozone standard as a significant and unavoidable impact of the GPU. *Id.* at 4-40.

While the EIR is undoubtedly correct to conclude that this impact is significant, a conclusion of significance cannot take the place of description and analysis of the impact. *See Stanislaus Natural Heritage Project v. County of Stanislaus*, 48 Cal. App. 4th 182 (1996) (invalidating EIR that had failed to adequately analyze water supply impacts but found them to be significant and unavoidable). The EIR provides no information whatsoever about ozone emissions anticipated to be caused by the GPU. The public and decision maker thus cannot determine whether the GPU will increase such emissions by one percent, 1,000 percent, or 1,000,000 percent. With such information, the Town might decide to scale back planned development under the GPU to reduce ozone precursor emissions. That is precisely the kind of information that CEQA intends an EIR to provide.

Once the EIR has included this information, it must determine whether the increase in ozone precursor emissions is a significant impact in its own right, irrespective of whether the Town will meet the federal or state ozone standard. *See Cmty's. for a Better Env't v. Cal. Res. Agency*, 103 Cal. App. 4th 98, 110-14 (2002) (holding that an EIR

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may not rely on a regulatory standard to the exclusion of an independent analysis of whether a project involves significant impacts); *Berkeley Keep Jets Over the Bay Comm. v. Bd. of Port Comm'rs*, 91 Cal. App. 4th 1344, 1377-82 (2001) (holding that EIR cannot avoid discussion of airport noise impacts on residents by concluding that residents would experience noise less a federal standard). For example, the public health impacts of an increase in ozone precursors produced by the GPU could justify a conclusion of significance whether or not the Town attains the state ozone standard.

Issue 4.2-4 takes steps in this direction by nominally addressing the impact of GPU-generated emissions on sensitive receptors. In fact, however, the impact merely reiterates the analysis of attainment or nonattainment with state and federal standards discussed in the previous impacts. As *Communities for a Better Environment* and *Berkeley Keep Jets Over the Bay* attest, this approach falls short of CEQA's requirements. A regulatory standard cannot supplant independent analysis of whether the project will produce a significant impact and the identification of mitigation for that impact.

Because the EIR relies exclusively on the state and federal regulatory standards, it fails to properly consider whether mitigation for impacts to sensitive receptors is possible. Since the Town will exceed the state ozone and PM₁₀ standards regardless of the GPU, it concludes that the effect is significant and unavoidable. EIR at 4-44. But a proper analysis that looks beyond the standards could show that mitigation is possible. For example, reductions in density of development and attendant reductions in traffic might reduce ozone precursor emissions sufficiently to mitigate the GPU's impact to sensitive receptors. We cannot know, of course, so long as the EIR provides no information about ozone emissions under the GPU.

B. Water Supply

In describing a proposed project and analyzing its environmental impacts, an EIR must provide a thorough discussion of the water supplies relied on to serve the project and the impacts of reliance on those supplies. In recent years, courts have become increasingly sensitive to the adequacy of EIRs' analysis of project water supplies. See *Cal. Oak Found. v. City of Santa Clarita*, --- Cal. App. 4th ---, 2005 WL 2864673 (Nov. 2, 2005); *In re Bay-Delta EIR*, 133 Cal. App. 4th 154 (2005); *Santa Clarita Org. for Planning the Env't v. County of Los Angeles*, 106 Cal. App. 4th 715 (2003) ("SCOPE"); *Planning & Conservation League v. Dep't of Water Res.*, 83 Cal. App. 4th 892 (2000); *Stanislaus Natural Heritage Project v. County of Stanislaus*, 48 Cal. App. 4th 182 (1996); *Santiago County Water Dist. v. County of Orange*, 118 Cal. App. 3d 818 (1981). Moreover, that analysis is no where more critical than in Mammoth, which is lo-

cated in the arid rain shadow of the Sierra Nevada. As discussed below, the EIR's discussion of water supply is inadequate in several respects.

1. The EIR Does Not Adequately Describe Existing Water Sources Relied on to Serve Planned Development.

An EIR must describe the sources of water that the agency anticipates will serve planned development; such water sources must be considered part of the project description. *In re Bay-Delta EIR*, 133 Cal. App. 4th at 232; *Stanislaus Natural Heritage*, 48 Cal. App. 4th at 199-200, 205-06; *Santiago County Water Dist.*, 118 Cal. App. 3d at 829-30. The EIR must also include analysis of the reliability of the supplies relied upon. *Cal. Oak Found.*, 2005 WL 2864673, at *10; *SCOPE*, 106 Cal. App. 4th at 722. The EIR here states that future development projected in the GPU will be served by substantially the same sources of water used to serve existing development: "surface water diverted from the Mammoth Creek watershed, plus eight ground water production wells within the Town." EIR at 4-265. The "Existing Conditions" discussion in Section 4.11 provides a cursory discussion of the groundwater resource that the Town has thus far relied upon to serve urban uses and even less discussion of the surface water resources in the Mammoth Creek watershed. This discussion is inadequate.

a. The EIR Does Not Adequately Describe the Groundwater Resource or the Reliability of That Resource as a Water Source For the Planned Development.

The EIR does not adequately describe the existing condition of the groundwater tapped by the eight wells. In *Save Our Peninsula Committee v. Monterey County Board of Supervisors*, 87 Cal. App. 4th 99 (2001), the court invalidated an EIR that failed to accurately describe the "baseline" condition of an aquifer relied on to serve the proposed project. Here, the EIR provides only a meager discussion of existing groundwater conditions. The document estimates that 4,000 acre-feet per year ("afy") of groundwater is available for extraction by the Mammoth Community Water District ("MCWD"), EIR at 4-254, 4-255, tbl. 4.11-1,³ but provides no justification for the number or explanation of how this number was derived. This number cannot be derived from past withdrawals, which averaged only 1,673 afy in the previous five years, with a maximum of 2,717 afy in 2002. *Id.* at 4-255. Moreover, the document does not describe aquifer recharge. As a

³ Table 4.11-1 refers to "GWTP #1" and "GWTP #2" but defines neither. We assume they refer to the groundwater treatment plants referred to in Section 4.6 and thus consolidate groundwater withdrawals from the various groundwater wells. Please confirm that this assumption is correct.

result, the reader and decision maker have no basis for concluding that extraction of 4,000 afy can be sustained without causing overdraft and “mining” of the aquifer. The EIR thus provides no basis for concluding that the aquifer can support the demands placed upon it by the development proposed in the GPU. The EIR thus lacks the analysis of water supply *reliability* required by the case law. *See Cal. Oak Found.*, 2005 WL 2864673, at *10; *SCOPE*, 106 Cal. App. 4th at 722.

To provide the requisite evaluation of the reliability of groundwater supplies for the planned development, the EIR must describe MCWD’s water rights in the groundwater and the rights of competing users of that groundwater. Because the wells deliver groundwater for use on parcels other than those from which the water is drawn, those uses must be characterized as appropriative rather than overlying. *See City of San Bernardino v. City of Riverside*, 186 Cal. 7 (1921); *see also City of Pasadena v. City of Alhambra*, 33 Cal. 2d 908, 927 (1949). Under California’s common law system of groundwater rights, appropriative rights must give way when necessary to serve overlying users, e.g., agricultural users who pump groundwater for irrigation or stock watering on the same parcel from which the water is pumped. *See City of Pasadena*, 33 Cal. 2d at 926. Accordingly, in the event of overdraft, an overlying user could legally compel appropriative users, such as the Town’s planned urban users, to curtail withdrawals. The EIR must evaluate the likelihood that overlying users—existing or potential⁴—or senior appropriative users could demand that MCWD reduce its withdrawals.

In evaluating the impacts on other groundwater users—and the potential effects of those users on the Town’s water supply—the EIR should also address the risk of well interference. Heavy pumping by MCWD in dry years could form a significant cone of depression that could interfere with other groundwater users. The cone of depression formed by other users’ withdrawals could likewise affect MCWD wells. These risks must be addressed.

The document also fails to discuss groundwater quality as a potential constraint on the availability of groundwater to serve planned development. Section 4.6 notes that water quality is a constraint for groundwater use in the Town, particularly with respect to total dissolved solids, hardness, and several minerals. *See EIR* at 4-148. The document provides no quantitative data regarding groundwater quality, though MCWD plainly has that data available from testing groundwater quality for compliance with applicable maximum contaminant levels (“MCLs”). The EIR must provide this data and compare it to primary and secondary MCLs. Furthermore, the EIR provides no discus-

⁴ A newly initiated overlying use may trump an existing appropriative use. *See Wright v. Goleta Water Dist.*, 174 Cal. App. 3d 74, 86-87, 89 (1985).

sion of groundwater quality *over time*, or any other basis for concluding that groundwater quality will remain as it is throughout the planning period, rather than deteriorating.⁵

Similarly, the EIR includes no discussion whatsoever of MCWD's groundwater treatment. If groundwater quality were to deteriorate with increased withdrawals, would treatment remain feasible? What environmental impacts would be caused by increased or intensified treatment? Would, for example, reverse osmosis treatment become necessary, an expensive process with numerous environmental impacts of its own?

b. The EIR Does Not Adequately Describe the Surface Water Resource or the Reliability of That Resource as a Water Source For the Planned Development.

The EIR also provides no information about the surface water resources that are projected to serve the project. All that the document provides is an estimate of surface supplies of 2,760 afy in normal years, EIR at 4-254, 4-255, and 1,200 afy in multiple dry years, EIR at 4-258, tbl. 4.11-3 n.a. This perfunctory treatment provides no basis for the reader to evaluate the reliability of the alleged supplies. "Water is too important to receive such cursory treatment." *SCOPE*, 106 Cal. App. 4th at 723, *quoted in In re Bay-Delta EIR*, 133 Cal. App. 4th at 232. For example, although the document projects significantly lower deliveries after three dry years, it does not describe to what extent and under what circumstances surface water deliveries may be curtailed. The document must identify, with specificity, the constraints on MCWD's water rights and explain how those constraints affect allowable diversions in dry years.

As noted previously, courts have repeatedly emphasized the need for analysis of water supply reliability in an EIR.⁶ *See Cal. Oak Found.*, 2005 WL 2864673, at

⁵ That the wells currently draw water of differing quality (two wells produce water for consumption without treatment while six wells require treatment), EIR at 4-148, suggests that water quality in the aquifer is not uniform. Increased withdrawals may draw poorer quality water from elsewhere in the aquifer into the well fields.

⁶ The water supply assessment in Appendix E sheds no further light on this subject, and even if it did, it could not substitute for analysis in the *text* of the EIR. *See Cal. Oak Found.*, 2005 WL 2864673, at *11 (citing *SCOPE*, 106 Cal. App. 4th at 722-23). MCWD's Urban Water Management Plan ("UWMP") states that MCWD's surface water rights "are subject to several constraints and conditions imposed in the permits issued to the District by the State Water Resources Control Board and in a Master Operating Agreement between the District and the U.S. Forest Service." UWMP at 5. The EIR must identify these constraints and evaluate their potential effects on future deliveries.

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*10; *SCOPE*, 106 Cal. App. 4th at 722. The EIR must be revised to include information about MCWD's water right in Lake Mary water, past deliveries under that right, any potential constraints on the exercise of that right, and foreseeable actual deliveries—not paper entitlements—under normal and drought conditions. See *SCOPE*, 106 Cal. App. 4th at 722. It must also discuss existing and anticipated water quality in Lake Mary water to allow the public and decision makers to determine whether water quality is likely to constrain future water use.

c. The EIR Must Discuss the Potential Effect of Climate Change on the Town's Water Supply.

In analyzing the reliability of the water supplies relied upon to support development under the GPU, the EIR must take into account the risk that the precipitation that feeds both surface water and groundwater resources in the region may change. Such forward-looking analysis is particularly appropriate in a programmatic document for a long-range plan such as the GPU. Specifically, in light of the known risk of climate change, the Town cannot safely assume that the past will serve as an accurate predictor of future water availability.

Climate experts anticipate that, in the coming decades, global warming will produce changes in the timing and character of precipitation in the western United States. See T.P. Barnett et al., *Potential Impacts of a Warming Climate on Water Availability in Snow-Dominated Regions*, 438 *Nature* 303 (Nov. 17, 2005); Joel B. Smith et al., *Potential Consequences of Climate Variability and Change For the Western United States*, in US Global Change Research Program, *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change* 219, 226 (2001). (A copy of the Barnett et al. article is attached hereto as Exhibit A, and the Smith et al. chapter is attached hereto as Exhibit B.) Of particular importance here, it is anticipated that precipitation that currently falls as snow and is retained in the Sierra snowpack throughout the winter will increasingly be replaced by rain, which is not retained in the snowpack. Increased ambient temperatures are likely to compound this problem by causing the snowpack to melt earlier in the year than at present. For example, one model suggests that "snowmelt would occur more than two weeks earlier than currently in the East Fork of the Carson River and North Fork of the American River in the Sierra Nevada," which climate models "suggest would occur by the 2030s." Smith et al. at 226 (citing A. E. Jetton et al., Water-Resources Investigations Report 95-4260, *Potential Effects of Climate Change on Streamflow, Eastern and Western Slopes of the Sierra Nevada, California, and Nevada*, (U.S.G.S. 1996)).

The state's system of managing surface water supplies relies on the retention of water in snowpack and gradual release of that water throughout the spring and summer months. To the extent snow is replaced with rain or the snowpack begins to melt earlier in the year, this already-taxed system could be significantly affected:

These changes in runoff have important consequences for water management. Any changes in runoff timing or variability could possibly cause problems. Earlier spring runoff is likely to increase risk of spring flooding, complicate seasonal allocation schedules, and create problems for matching supply and demand and meeting environmental in-stream flow requirements in the summer. It is likely to be problematic for the current reservoir system to store earlier spring runoff for use in the summer unless new operating rules and regimes are implemented, and it is not clear that such a change would be sufficient to reduce spring flooding and increase summer supplies. This may be especially true in California, where both climate models used in this Assessment show a substantial increase in runoff, particularly in the winter.

Smith et al. at 226-27 (citations omitted); *see also* Barnett et al. at 305 ("There is not enough reservoir storage capacity over most of the West to handle this shift in maximum runoff and so most of the 'early water' will be passed on the oceans.").

Compounding the problem of earlier, uncaptured runoff, recent studies suggest that global warming would cause significant decreases in the volume of runoff. *See* P.C.D. Milly et al., *Global Pattern of Trends in Streamflow and Water Availability in a Changing Climate*, 438 *Nature* 347 (Nov. 17, 2005) (describing results of an "ensemble of 12 climate models" suggesting "10-30% decreases in runoff in . . . mid-latitude western North America by the year 2050"). (A copy of Milly et al. is attached hereto as Exhibit C.)

Given these anticipated changes in the timing and volume of runoff, new water storage options, such as new or expanded reservoirs, might be needed to maintain water supplies at even their existing levels. Simultaneously, however, as courts and experts have noted, such large scale water projects have become increasingly less viable. *See In re Bay-Delta EIR*, 133 Cal. App. 4th at 232 ("[G]iven today's climate of antipathy toward massive water storage projects and recent effort to decommission existing dams and reservoirs, any attempt to expand water storage by the use of dams or reservoirs will likely meet with stiff resistance."); Smith et al., at 228 ("Although building additional flood controls or storage infrastructure to address the need to store earlier runoff for the summer may be more attractive under climate change, environmental and cost con-

straints could serve as impediments.”). Water supply planners therefore cannot reasonably rely on the development of such projects to protect existing levels of supply.

The EIR relies on surface water both directly to supply the growth planned in the GPU and indirectly to replenish groundwater, particularly after multiple dry years during which groundwater withdrawals have increased. In large part, this surface water derives from the Sierra snowpack, which feeds streams in the Mammoth Basin. The EIR must address the risk that climate-change-induced alterations in the hydrologic cycle will affect the water supplies relied on to serve GPU-planned growth. This analysis must include an assessment of the capacity of storage in the Mammoth Basin to compensate for earlier snowmelt and a change in the form of some winter precipitation from snow to rain.

**d. The EIR Does Not Address the Reliability of Water Supply
In the Event of a Drought Longer Than Three Years.**

Apparently taking the lead of the water supply assessments prepared by MCWD for the GPU, the EIR limits its “multiple dry year” water supply and demand projections to a three-year dry spell. *E.g.*, EIR at 4-267 tbl. 4.11-5. The EIR includes no analysis or substantial evidence to support this artificially limited planning horizon. Limiting analysis of drought effects on water supply reliability to only a three-year drought ignores the fact that droughts of longer than three years have occurred recently in California. For example, the 1987 to 1992 drought was six years long, twice as long as the “multiple dry year” scenario analyzed in the EIR.

The EIR must not limit its analysis of dry conditions to a three year period. Although the EIR need not analyze a catastrophic worst case scenario, such as a twenty-year or hundred-year drought, a drought beyond three years is reasonably foreseeable given recent experience. That recent experience suggests that a six-year drought would be a more reasonable stopping point for the analysis. Three years, however, is not.

**2. The EIR Does Not Adequately Describe the Projected Water
Demand at GPU Build-out.**

An integral part of an EIR’s analysis of the water supply for a project is an accurate estimate of the demand associated with the project. *See Santiago County Water Dist.*, 118 Cal. App. 3d at 830-31. The EIR here reproduces a table from the revised water supply assessment that provides estimates of water demand for land use categories in five-year increments under the existing General Plan. EIR at 4-266 tbl. 4.11-4. The table does not provide equivalent data for the GPU. That missing data must be provided so

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that the public and decision maker can see how the proposed changes in land use designations will affect water demand.

More troubling, however, is the fact that none of the EIR's water demand estimates appears to include the demand associated with the Sierra Star Golf Course. Table 4.11-4, for example, includes a "Golf Course" sector, but that sector includes only the Snowcreek Golf Course. EIR at 4-266 tbl. 4.11-4, n. a. As the document acknowledges, the provision of recycled water to Sierra Star is currently "speculative." *Id.* at 4-267. Accordingly, the EIR must assume that Sierra Star demand will be part of total Town demand at GPU build-out. Tables 4.11-4 and 4.11-5 should be revised to include Sierra Star demand. Given that MCWD has supplied an average of 356 afy over the last three years to the golf courses, Mammoth Community Water District, *Water Assessment for Draft Town of Mammoth Lakes General Plan 13* (undated) ("First Water Supply Assessment"), inclusion of their full demand in the EIR's supply and demand calculations would likely erase the modest 31 afy surplus that the EIR now claims.

Moreover, the First Water Supply Assessment (omitted from EIR Appendix E; see below) indicates that the Snowcreek Golf Course will be expanding from nine to 18 holes, "which will create an additional demand of approximately 200 acre-feet per year." *Id.* The EIR does not address this increase. Because the use of recycled water to irrigate golf courses in the Town is still speculative, this 200 afy must be accounted for in the EIR.⁷ See *Cal. Oak Found.*, 2005 WL 2864673, at *13 (invalidating EIR for residential development because the EIR relied on water transfers for which environmental review had not been completed; finding no substantial evidence of sufficient supply).

3. The Water Supply and Demand Forecasts Do Not Match Build-out of the GPU.

The GPU plans for development in the Town to the year 2024. *E.g.*, EIR at 3-16 (referring to build-out in 2024). By contrast, the water supply analysis estimates of water supply and demand only to 2020. *E.g.*, EIR at 4-265, 4-266 tbl. 4.11-4. This flaw can be considered an inadequacy of the EIR's analysis of water supply impacts or an "instability" in the project description. "An accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR." *County of Inyo v. City of Los Angeles*, 71 Cal. App. 3d 185, 193 (1977); see also 1 Kostka & Zischke, *Practice*

⁷ The assessment is somewhat ambiguous about whether Snowcreek would take the additional 200 afy from MCWD or from its own wells. In either event, the EIR must address that demand, either as part of the demand that must be supplied by MCWD or as demand that will nonetheless have cumulative impacts on the aquifer.

Under the California Environmental Quality Act § 12.21, at 483 (2004) (“The EIR project description, and the accompanying analysis, must be consistent throughout the EIR. If the project description is inconsistent (e.g., if a project is described differently in different sections of the EIR), these shifts prevent the EIR from serving as a vehicle for intelligent public participation in the decision-making process.”). The EIR must analyze the water supply impacts of the project as defined in the document, which anticipates build-out occurring in 2024.

4. The EIR Does Not Adequately Describe the Demand Management Measures and New Sources of Supply Projected to Allow Projected Demand to Meet Supply.

The EIR identifies a shortfall of supply in the summer months at GPU build-out if recycled water is not used for turf irrigation. EIR at 4-267 fig. 2. As just noted, moreover, the EIR underreports the true extent of the shortfall in a variety of ways. The EIR also correctly states that because MCWD’s plans for the use of recycled water for turf irrigation have not yet been fully approved, the EIR cannot rely on recycled water as being sufficient to remedy the shortfall. *See* EIR at 4-267.

Where, as here, a source of supply (or, in this case, demand reduction) is uncertain or unreliable, the agency must identify alternative supplies that are anticipated to make up the shortfall. *See Cal. Oak Found.*, 2005 WL 2864673, at *12; *Napa Citizens for Honest Gov’t v. Napa County Bd. of Supervisors*, 91 Cal. App. 4th 342, 372-74 (2001); *Stanislaus Natural Heritage*, 48 Cal. App. 4th at 205-06. The EIR takes only baby steps in that direction, cursorily identifying other conservation measures and a potential new source of supply, but those steps fall short of the mark.

With respect to the proposed conservation measures, the document does no more than provide a table indicating that “water conservation” has the potential to reduce demand by 397 afy. EIR at 4-269. The conservation measures are not described nor is their reliability discussed. The document thus prevents the public and decision maker from evaluating the likelihood that the measures will be adequate to compensate for what would otherwise be a water shortage. Moreover, by stating demand reductions in *annual* terms, the document does not support a conclusion that the measures would reduce demand adequately in the *summer months* when demand is expected to outstrip supply. The discussion of system water loss reduction is similarly flawed, supplying no information about the likelihood that the reductions will be realized or when over the course of a year they are likely to be realized. The document’s discussion of alternative supplies from the Dry Creek Watershed is even more cursory. *See* EIR at 4-268. It provides no information whatsoever about the source or its likely reliability. This summary treatment is in-

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adequate. See *Concerned Citizens of Costa Mesa, Inc. v. 32nd Dist. Ag. Ass'n*, 42 Cal. 3d 929, 935 (1986) (holding that “[t]o facilitate CEQA’s informational role, the EIR must contain facts and analysis, not just the agency’s bare conclusions or opinions”); see also *SCOPE*, 106 Cal. App. 4th at 723 (“Water is too important to receive such cursory treatment.”).

Without this analysis, it appears that there is inadequate supply to support projected demand in summer months at build-out of the GPU (even assuming that total annual supply exceeds annual demand). Yet it is clear that CEQA does not allow the EIR to simply admit a shortfall and “call it a day.” As the court in *Stanislaus Natural Heritage* concluded, the EIR must “recogni[ze] that water must be supplied, [and] that it will come from a specific source or one of several possible sources.” 48 Cal. App. 4th at 206. A full description of the sources of water for the planned development is essential for an accurate accounting of the environmental impacts caused by reliance on those water sources. As noted below, moreover, the “concurrence” requirement in mitigation measure 4.11-1 does not compensate for this inadequate analysis.

5. The EIR Includes No Evaluation of the Environmental Impacts of the Town’s Use of Water to Serve New Development.

Strikingly absent from the discussion of water supply—and from elsewhere in the document—is any treatment of the environmental impacts expected to be caused by the use of water to serve the development planned for in the GPU. Courts have repeatedly held that CEQA requires such analysis. See *In re Bay-Delta EIR*, 133 Cal. App. 4th at 233 (holding that an EIR “must include an analysis of the impacts of supplying . . . water, from whatever source”); *Stanislaus Natural Heritage*, 48 Cal. App. 4th at 199 (holding that environmental consequences of supplying water to 5,000 unit subdivision with no on-site water must be analyzed); *Santiago County Water Dist.*, 118 Cal. App. 3d at 830 (holding that EIR must analyze the environmental impacts associated with supplying water to sand and gravel mine).

The EIR fails to identify the potential impacts of reliance on groundwater to serve planned development. The document does not indicate whether the Town’s increased withdrawals can be sustained without drawing down the aquifer. Nor does it supply any information about other users of the aquifer who might be affected by the Town’s intensified use. At the least, greater drawdown of the aquifer in dry years could require other users of the aquifer to deepen their wells. As noted above, the document also does not describe the effect of increased withdrawals on water quality in the aquifer. Finally, although additional wells appear to be necessary to serve future demand, see EIR at 4-256, 4-257 tbl. 4.11-3, the document does not disclose the potential locations of

those wells or the impacts of building those wells or the delivery infrastructure necessary to connect them to the Town's distribution system.

The document also fails to acknowledge the potential significance of impacts of groundwater withdrawals on surface water flows. The document concedes that "[t]here is no verification . . . that pumping this volume of water will not impact surface water or spring flows." EIR at 4-256. It also mentions comments submitted by the Department of Fish and Game and the University of California identifying impacts to surface waters and associated ecosystems as a matter of concern.⁸ *Id.* The first water supply assessment also concluded that "[a]dditional withdrawal of groundwater from the Mammoth Basin continues to be questionable as to whether or not there is available water to be pumped without causing environmental impacts." First Water Supply Assessment at 15.

In light of the acknowledged uncertainty regarding the potential impact of groundwater withdrawals on surface streams, the EIR should presume the impact to be significant and identify mitigation to respond to that impact. Such mitigation might involve, for example, imposing a moratorium on new development (pending MCWD's obtaining new supplies or imposing new demand management measures) if MCWD monitoring reveals an effect of groundwater withdrawals on surface waters.

Finally, the document does not indicate whether MCWD's water treatment facilities and distribution infrastructure have sufficient spare capacity to accommodate increased groundwater and surface water flows. The document should describe the current capacities of that treatment and distribution infrastructure and impacts that might be caused by any necessary expansion of that infrastructure.

⁸ The document does not include a citation for these comments, nor are they included in Appendix B with other comments on the draft PEIR. As a result, the reader cannot evaluate the substantiality of these concerns. The EIR must identify where the public may find these comments for review. *See* CEQA Guidelines § 15148 ("The EIR shall cite all documents used in its preparation including, where possible, the page and section number of any technical reports which were used as the basis for any statements in the EIR.").

6. The Proposed “Concurrence” Requirement in Mitigation Measure 4.11-1 Does Not Excuse the EIR’s Failure to Adequately Describe the Water Supplies Projected to Serve Planned Development or to Discuss the Environmental Impacts of Reliance on Those Supplies.

Mitigation Measure 4.11-1 imposes a “concurrence” policy to be added to the GPU that purports to prohibit the Town from approving new development in the absence of water available to serve the development. EIR at 4-270. Even assuming the efficacy of this measure, it cannot substitute for a full analysis of water sources on which the Town anticipates relying to serve the planned development or for the missing evaluation of environmental impacts likely to be caused by reliance on those sources of supply.

In *Stanislaus Natural Heritage*, the court addressed precisely such a mitigation measure. The court concluded that the agency could not rely on such a measure to defer analysis of water supply to later project-specific approvals:

It is not mitigation of a significant environmental impact o[f] a project to say that if the impact is not addressed then the project will not be built. The decision not to build may well rest upon the absence of a suitable water source. However, the decision to approve the EIR of this project does require recognition that water must be supplied, that it will come from a specific source or one of several possible sources, of what the impact will be if supplied from a particular source or possible sources and if that impact is adverse how it will be addressed.

48 Cal. App. 4th at 205-06 (emphasis added). In other words, an EIR may not paper over its failure to identify a sufficient water supply for proposed development by adopting a mitigation measure that conditions future development on finding an adequate supply. Such a measure constitutes an improper deferral of environmental review. Nor may the EIR use such a mitigation measure to avoid analyzing the physical environmental impacts of reliance on an anticipated source or sources of water supply.

7. The EIR Fails to Identify the Level of Significance After Mitigation.

The subsection labeled “level of significance after mitigation” does not characterize the significance of the impact with implementation of the “concurrence” mitigation measure discussed above. Rather, it says only that the mitigation measure would “reduce potential impacts.” EIR at 4-270. Without a final characterization of sig-

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nificance, the decision maker cannot decide whether the GPU has significant and unavoidable impacts and thus whether the GPU should be rejected or modified, an alternative selected, or findings of overriding significance made. See CEQA Guidelines § 15064(a) (“Determining whether a project may have a significant effect plays a critical role in the CEQA process.”); see also Pub. Res. Code § 21100(b)(1) (requiring an EIR to set forth “[a]ll significant effects on the environment of the proposed project”).

For the reasons discussed above, we believe that there is more than ample substantial evidence to show that the GPU’s water supply impacts remain significant after implementation of mitigation measure 4.11-1. Accordingly, the EIR must incorporate additional feasible mitigation, including the measures proposed here.

8. The EIR Contains Several Omissions.

First, the EIR states that the water supply assessments and urban water management plan (“UWMP”) prepared by the MCWD pursuant to SB 610 are attached to the EIR as appendices. EIR at 4-253. Although the second, revised assessment is attached as Appendix E, neither the first assessment nor the UWMP is included anywhere in the document. Because the revised assessment is an “a supplement to [MCWD’s] previously submitted water assessment.” EIR, App. E, at 1, the second assessment is not useful without the first. Although we were able to track down copies of the first assessment and UWMP, those documents should be included in the EIR as promised.

Second, the EIR’s discussion of groundwater omits two graphs referred to in the text, a graph depicting MCWD’s historic water withdrawals and historic groundwater levels measured in MCWD wells. EIR at 4-255, 4-256. These omissions substantially undercut the EIR’s informational function.

These missing components require recirculation of the EIR. In *Ultramar, Inc. v. South Coast Air Quality Management District*, 17 Cal. App. 4th 689 (1993), the Air District had omitted 12 pages of material from the 288-page draft environmental document when it was circulated for public review. Though the Air District had subsequently made that material available for public review during the public review period, the court invalidated the Air District’s certification of the document on the grounds that the public had been deprived of the full opportunity to review the document guaranteed by CEQA. *Id.* at 701-04. Here too, the Town risks invalidation of the EIR if it fails to recirculate the document fully intact.

II. CORRECTION OF THE FLAWS IN THE EIR WILL REQUIRE THAT THE DOCUMENT BE RECIRCULATED FOR PUBLIC REVIEW AND COMMENT.

The above comments demonstrate significant and pervasive flaws in several portions of the EIR. Amelioration of those flaws will require recirculation of the EIR as a revised draft EIR.

The addition of significant new information to an environmental document requires that the document be recirculated for further public review prior to certification. Pub. Res. Code § 21092.1. Section 21092.1 requires recirculation where an “EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project’s proponents have declined to implement” *Laurel Heights Improvement Ass’n of San Francisco, Inc. v. Regents*, 6 Cal.4th 1112, 1129 (1993).

To remedy the document’s flaws here, significant new information will need to be added to the document. The EIR’s flaws require substantial new analysis of impacts and the identification of new significant and unavoidable impacts or the proposal of new mitigation measures to respond to impacts that were previously—and erroneously—considered to be less than significant. Such changes require recirculation under section 21092.1 and *Laurel Heights*.

III. THE GPU’S DENSITY TRANSFER POLICY IS VAGUE AND INCOMPLETE.

GPU Policy LU.1.a provides for transfers of density within the GPU’s higher density land use designations. As drafted, that Policy creates several gaps and ambiguities that could cause problems in later implementation. We believe, however, that the Policy may be readily modified to eliminate these problems.

First, Policy LU.1.a does not limit the density that may be transferred. The EIR asserts that “density may be increased up to double” under the Policy, EIR at 4-177, but the Policy includes no such limitation. We believe that the Policy should be specific about the maximum density increases allowable under the Policy. The following finding would achieve that goal:

- #) The transfer will not result in an allowable density on the receiving property of greater than twice the density authorized for the property in the General Plan.

Second, the Policy does not ensure that the sending or “generating” property will not be developed after the transfer at its original density. The Policy requires a finding that the generating property is undeveloped or will be developed simultaneously with the receiving site. Policy LU.1.a.(1). This allows sending sites to remain presently undeveloped but would allow future development of those sites. To clarify and ensure that future development will be subject to reduced density following the transfer, the Policy should add the following finding:

- #) The Town will not authorize development of the generating parcel at a density that exceeds the density remaining after the transfer, and such development would be inconsistent with the General Plan.

Third, we are concerned that Policy LU.1.a(3) may be read to add nothing to LU.1.a(2). Subsection (3) provides that a density transfer must “result[] in a town-wide decrease in vehicle miles traveled.” Subsection (2) dictates that a receiving site must be located with 500 yards of a ski lift, which the draft GPU suggests (albeit implicitly) will encourage walking and use of public transit. Given this explanation, a project proponent may argue that every transfer to a receiving site within 500 yards of a lift will, by definition, reduce VMT. We recommend that the Policy be clarified to require that the transfer will result in a reduction in VMT *over and above* the reduction that can be expected to result from locating increased density within 500 yards of a ski lift.

Fourth, subsection (5) requires that “the transfer would be neutral with respect to population or result in a decrease of PAOT.” Given that differences in terminology are typically read to intend different meanings, “population” and “PAOT” may be read to refer to have different meanings. For example, “population” might be read to refer to permanent residents rather than PAOT. If so, a transfer that traded permanent housing for transient might comply with the Policy even if total PAOT were nevertheless increased, because the permanent resident population would decline. We recommend changing the language in subsection (5) to read, “the transfer would maintain or reduce PAOT.”

Fifth, subsection (9) requires transfers to “further[] the goals and objectives of the General Plan” followed by three examples from the GPU. This provision may be read to mean that the transfer must be merely consistent with GPU policies, rather than

affirmatively advancing such policies and providing improvement over the status quo. For example, the provision refers to "Protecting environmentally sensitive sites." A project applicant might this language read to mean that a transfer may be approved so long as it does not harm such sites. Based on discussion in the EIR, it appears that the provision was intended to require affirmative improvement over the status quo. *See* EIR at 3-16.

We are also concerned that the three "goals and objectives" referred to appear to be merely examples. The EIR, by contrast, interprets them to be exclusive: "Transfers may only occur if . . . benefits are provided to the community by protecting environmentally sensitive sites, providing additional public services and amenities, or providing additional workforce housing." *Id.* We recommend making the list of goals exclusive (as the EIR interprets it) and expanding the list of goals if necessary. Accordingly, we recommend the following language:

The transfer results in an improvement over and above existing conditions by affirmatively furthering one or more of the following goals and objectives of the General Plan:

- a) Protecting environmentally sensitive sites,
- b) Providing additional public services and amenities,
- c) Providing additional workforce housing, or
- d) [insert additional goals].

Finally, the last, unnumbered paragraph of Policy LU.1.a is ambiguous and grammatically incorrect. The word "provide" appears to be a mistake and should be deleted. It is also unclear whether this paragraph is meant to be a subparagraph of LU.1.a(9) or an alternative standard applicable to workforce housing that need not comply with findings (1) through (9). In either event, it appears that the intent is to make density transfers easier for workforce housing projects. If so, the phrase "In addition to the policies outlined above" should be changed to read "Notwithstanding the policies outlined above."

* * *

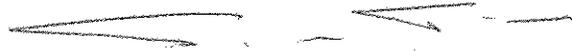
For the reasons discussed above, AFM requests that the Town revise the EIR to rectify its flaws. The necessary revisions to the document also demand that the revised document be recirculated for public review and comment. Pub. Res. Code § 21092.1.

Ms. Sonja Porter, Senior Planner
Town of Mammoth Lakes
December 13, 2005
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Thank you for your attention to this important matter.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP



RICHARD S. TAYLOR



MATTHEW D. ZINN

cc: Advocates for Mammoth
Gary Sisson, Mammoth Community Water District

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Potential impacts of a warming climate on water availability in snow-dominated regions

T. P. Barnett¹, J. C. Adam² & D. P. Lettenmaier³

All currently available climate models predict a near-surface warming trend under the influence of rising levels of greenhouse gases in the atmosphere. In addition to the direct effects on climate—for example, on the frequency of heatwaves—this increase in surface temperatures has important consequences for the hydrological cycle, particularly in regions where water supply is currently dominated by melting snow or ice. In a warmer world, less winter precipitation falls as snow and the melting of winter snow occurs earlier in spring. Even without any changes in precipitation intensity, both of these effects lead to a shift in peak river runoff to winter and early spring, away from summer and autumn when demand is highest. Where storage capacities are not sufficient, much of the winter runoff will immediately be lost to the oceans. With more than one-sixth of the Earth's population relying on glaciers and seasonal snow packs for their water supply, the consequences of these hydrological changes for future water availability—predicted with high confidence and already diagnosed in some regions—are likely to be severe.

Water is essential to human sustenance. Well over half of the world's potable water supply is extracted from rivers, either directly or from reservoirs. The discharge of these rivers is sensitive to long-term changes in both precipitation and temperature, particularly in the snowmelt-dominated parts of the world. Changes in the amount of precipitation tend to affect the volume of runoff and particularly the maximum snow accumulation, which usually occurs near the end of the winter at the onset of the melt season. On the other hand, temperature changes mostly affect the timing of runoff. Increasing temperatures lead to earlier runoff in the spring or winter, and reduced flows in summer and autumn—at least in the absence of changes in precipitation.

In general, the direction and (to a lesser extent) the magnitude of surface temperature changes are much more consistent among climate models than are precipitation changes¹. Near-surface air-temperature predictions from existing global climate models that are forced with anthropogenic increases in atmospheric greenhouse gas concentrations imply a high degree of confidence that future changes to the seasonality in water supply will occur in snowmelt-dominated regions. Even for models with temperature sensitivities near the lower end of the predicted range, impacts on snowmelt-dominated regional water resources are substantial². Indeed, such changes are already obvious in the observational records of key components of the hydrological cycle, such as snow pack in the western USA^{3–5}. Taken together, the predictions and observations portend important issues for the water resources of a substantial fraction of the world's population.

It is generally thought that increasing greenhouse gases will cause the global hydrological cycle to intensify¹, with benefits for water availability^{1,6}, although a possible exacerbation of hydrological extremes may counteract the benefits to some degree. However, in regions where the land surface hydrology is dominated by winter

snow accumulation and spring melt, the performance of water management systems such as reservoirs, designed on the basis of the timing of runoff, is much more strongly related to temperature than to precipitation changes. Even though there is relatively little agreement among the global models as to the magnitude (and even direction of) precipitation changes regionally^{7–10}, there is no indication for a seasonal shift of precipitation to the summer and autumn. The projected changes in temperature therefore strongly imply future changes of seasonal runoff patterns in snowmelt-dominated regions.

The hydrological cycle at the land surface includes the processes of snow/ice accumulation and melting as well as the impact these processes will have on regional changes in evaporative demand. In a warmer climate, snow will melt earlier in the year than it did before and in some places this has already happened^{3,11,12}. Taken together, these impacts mean less snow accumulation in the winter and an earlier peak runoff in the spring.

On a global scale, the largest changes in the hydrological cycle due to warming are predicted for the snow-dominated basins of mid- to higher latitudes, because adding or removing snow cover fundamentally changes the snow pack's ability to act as a reservoir for water storage¹³. Studies in various regions of the globe indicate that the stream-flow regime in snowmelt-dominated river basins is most sensitive to wintertime increases in temperature^{12,13}. Because of this, and also because there is little certainty in precipitation predictions^{7–10}, we focus here on the sensitivity of water resources in snowmelt-dominated regimes to temperature.

All models show warming with increasing greenhouse gases, so we can begin to say with some certainty how some critical components of the hydrological cycle will respond in the future.

Global distribution of snowmelt-dominated runoff

We used a spatially distributed macroscale hydrology model¹⁴ to identify the regions of the globe where snowmelt plays a dominant

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role in the seasonal patterns of stream-flow. The model was run over all global land areas (excluding Antarctica and Greenland) at a spatial resolution of 0.5° latitude/longitude for a twenty-year (1980–1999) period. We approximated the importance of snow to annual runoff by using the ratio R of the accumulated annual snowfall to annual runoff (Fig. 1, colour scale). This allowed us to determine whether or not runoff for each grid cell is snowmelt-dominated by using the criterion that $R > 0.5$ for these cells.

We compared, for each of the world's major river basins, the simulated annual runoff to the estimated reservoir storage capacity^{15,16} in order to determine cases where reservoir storage capacity is adequate to buffer large seasonal stream-flow shifts (and hence exclude basins that, in spite of being snowmelt-dominated, would be insensitive to shifts in runoff timing). Watersheds within the snowmelt-dominated domain that meet these criteria include the Colorado River, the Churchill River and the Grand River (all in North America), and the Angara River (a tributary of the Yenisei River) in Asia. The red outline in Fig. 1 shows the domain where runoff is snowmelt-dominated minus the four basins identified as having large storage capacities relative to runoff. Within this domain, water resources are arguably susceptible to warming-induced shifts in stream-flow seasonality.

In general, the snowmelt-dominated regions occupy parts of the globe that are at latitudes greater than $\sim 45^\circ$ (North and South), with some exceptions. (1) Mountainous regions (except those nearest the Equator) are generally snowmelt-dominated (the inset of Fig. 1 shows the regions of the world that are topographically complex according to a criterion based on average slope¹⁷). (2) Some regions poleward of 45° North that are warmed by oceans do not experience enough snowfall to be snowmelt-dominated (for example, parts of Europe and the coastal regions of the USA Pacific Northwest and British Columbia). (3) Cold dry regions that experience little wintertime precipitation also do not receive enough snowfall to be snowmelt-dominated (for example, northeastern China).

The domain of influence within the red line of Fig. 1 is almost certainly underestimated, because the criterion we used is applied on a grid cell by grid cell basis, and does not account for areas where water availability is predominantly influenced by snowmelt that is generated upstream. Therefore, we extended the domain of influence

into sub-basins where the annual runoff originating in the snowmelt-dominated cells accounts for at least 50% of the runoff for the entire sub-basin (black lines in Fig. 1). These regions include parts of northern China, northwestern India, areas south of the Hindu Kush, sub-basins downstream of the southern Andes, north-central USA, and some coastal areas of western North America and Europe. According to a year 2000 population map¹⁸, approximately one-sixth of the world's population lives within this combined snowmelt-dominated, low-reservoir-storage domain. The population affected by warming-induced shifts in water availability is most probably greater than this estimate because we do not account for populations that derive their water resources from outside the basins in which they dwell. Note that the combined region in Fig. 1 encompasses much of the industrialized world, accounting for roughly one-quarter of the global gross domestic product.

Evapotranspiration in a warming climate

Our discussion so far has focused on the direct effects of warming on stream-flow seasonality in snowmelt-dominated regions. Warming-induced changes to evapotranspiration may also affect regional water availability. Unfortunately, there is little agreement on the direction and magnitude of historical, let alone one predicted, evapotranspiration trends. Observations from various countries in the Northern Hemisphere show that pan evaporation has been steadily decreasing for the past fifty years, contrary to the expectation that warming would cause increased evaporation^{19–22}. Two proposals exist to explain this paradox.

First, decreasing pan evaporation trends may be indicative of increasing actual (as opposed to potential) evapotranspiration in moisture-limited regions because increased land surface evaporation alters the humidity regime surrounding the pan, causing the air over the pan to be cooler and more humid^{23–26}. Second, consistent declines of pan evaporation, diurnal temperature range, and global solar irradiance suggest that actual evapotranspiration is also declining because of increased cloudiness and concentrations of atmospheric aerosols that systematically reduce surface energy availability for evaporation^{19,27–29}. Changes in wind speed or in the attenuation of wind at the surface due to changes in vegetation at observing sites

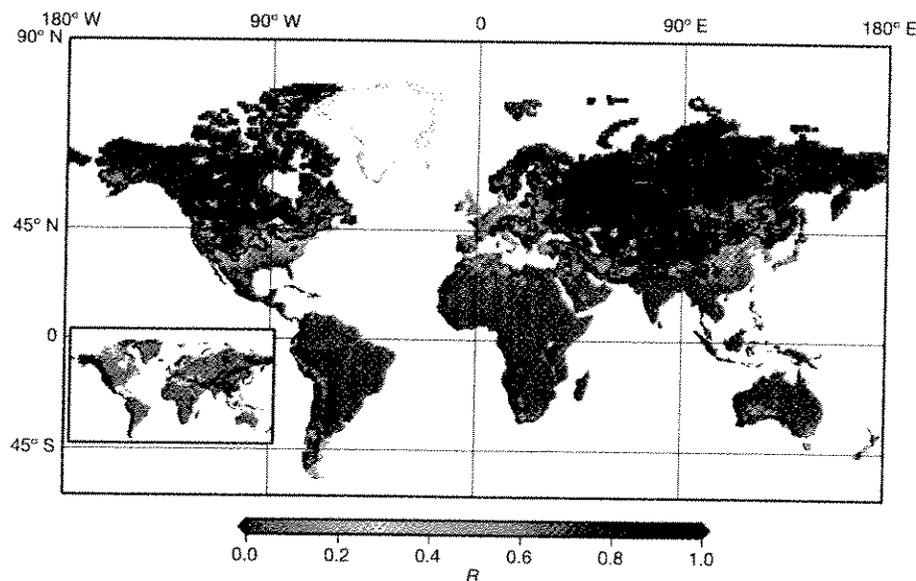


Figure 1 | Accumulated annual snowfall divided by annual runoff over the global land regions. The value of this dimensionless ratio lies between 0 and 1 and is given by the colour scale, R . The red lines indicate the regions where streamflow is snowmelt-dominated, and where there is not adequate reservoir storage capacity to buffer shifts in the seasonal hydrograph. The

black lines indicate additional areas where water availability is predominantly influenced by snowmelt generated upstream (but runoff generated within these areas is not snowmelt-dominated). The inset shows regions of the globe that have complex topography using the criterion of ref. 17.

may also play some role in apparent downward trends in pan evaporation data³⁰.

Ohmura and Wild²⁸ discuss some complications that impede our understanding of global trends in evapotranspiration. In snowmelt-dominated regions, though, these uncertainties are arguably of reduced importance, because changes in the timing of snowmelt runoff induce a negative feedback on changes in evapotranspiration. Earlier melt results in increased soil moisture (and so also the water available for evapotranspiration) earlier in the season, a time when potential evaporation (dominated by net radiation) is low. Later in the year, when potential evaporation is higher, the shift in snowmelt timing reduces soil moisture, and hence evaporative resistance is increased, again reducing the effect of evaporation changes. Therefore, although changes in evapotranspiration are critical to runoff production in most hydrological regimes, their effect (and hence the effects of the above-noted uncertainties) are attenuated in the snowmelt-dominated regions of the globe.

Impacts on regional water supplies

We examine three case studies from different parts of the world that are in the snowmelt-dominated domain. These case studies were selected to help provide an appreciation for the magnitude of the potential regional water problems that may be associated with shifts in the seasonality of runoff associated with climate change.

Western USA. The Accelerated Climate Prediction Initiative (ACPI)² demonstration project was launched in 2000 to investigate the impacts of greenhouse warming on water supplies in the western United States³¹. The methods and detailed results are included in 16 papers in a special volume of the journal *Climatic Change*². The most obvious signature of climate change in the simulations generated by this project was a general warming over the western USA: a warming that by the middle of the 21st century was projected to be 0.8–1.7 °C greater than present values. This warming is projected to be accompanied by little or no change in precipitation according to the climate change scenarios generated for the project by the NCAR-DOE Parallel Climate Model². In the western USA, much of the annual precipitation falls as snow in the mountains during the winter, and then melts during the spring and summer: that is, it is within the red lines shown in Fig. 1.

The most significant impact of a general warming was found to be a large reduction in mountain snow pack and a substantial shift in stream-flow seasonality, so that by 2050, the spring stream-flow maximum will come about one month earlier in the year. There is not enough reservoir storage capacity over most of the West to handle this shift in maximum runoff and so most of the 'early water' will be passed on to the oceans. These hydrological changes have considerable impacts on water availability and are discussed in the literature². For example, in the Columbia River system, less winter snowfall and earlier melting will force residents and industries to face, by 2050 or before, a choice of water releases for summer and autumn hydroelectric power or spring and summer releases for salmon runs. The ACPI research shows that, with the predicted climate change, the river cannot be managed to accommodate both, unless we are ready to accept substantial (10–20%) reductions of hydropower generation or serious harm to the federally protected salmon population of the region (Fig. 2)³².

The Rhine River in Europe. Climate-change simulations project a warming in the Rhine River basin of 1.0–2.4 °C over present values by the middle of the century¹. Hydrological simulations suggest that this warming will shift the Rhine River basin from a combined rainfall and snowmelt regime to a more rainfall-dominated regime, resulting in an increase in winter discharge, a decrease in summer discharge, increases in the frequency and height of peak flows, and longer and more frequent periods of low flow during the summer³³. Socio-economic implications include: a reduction in water availability for industry, agriculture and domestic use during the season of peak demand (which is further stressed by an increase in summertime

demand due to higher temperatures); an increase in the number of low-flow days during which ships cannot be fully loaded on major transport routes (causing an increase in transportation costs); a decrease in the level of flood protection (given no additional implementation of flood defence measures); a decrease in annual hydropower generation in some parts of the basin; and a loss in revenue due to a shortened ski season³³.

Canadian prairies. Climate studies for the Canadian prairies generally agree that a doubling of atmospheric CO₂ will result in an increase in surface air temperature (possibly as much as 8 °C during winter), a decrease in snow pack, an earlier snowmelt, and a decrease in summer soil moisture³⁴. These effects and a longer period of low flows during summer and autumn could lead to an increase in the frequency and severity of droughts³⁵. Historically, nearly 50% of the water use over the Canadian prairies has been for agriculture through irrigation, and this demand has been met primarily with surface water, unlike the prairies of the USA, which rely also on groundwater^{34,36}. For this reason and because stream-flows are limited and extremely variable from year to year, agriculture in the Canadian prairies is very sensitive to drought^{34,36}. Although global climate models do not predict great changes in precipitation for Canada, an earlier spring runoff peak will probably cause agriculture in the Canadian prairies to become more at risk in a warming climate³⁷. Furthermore, increased water demand for irrigation will also lead to heightened competition with other water needs, including stream-flow requirements to maintain aquatic habitat, and the needs of water users downstream of the Alberta–Saskatchewan border (under a 1969 agreement, Alberta must allow 50% of stream-flow to pass downstream of the border)³⁶.

Summary of regional impacts. The studies summarized above show that current demands for water in many parts of the world will not be met under plausible future climate conditions, much less the demands of a larger population and a larger economy.

The physics behind this statement is temperature-driven, not precipitation-driven, and this makes the conclusions robust because all current models predict a warmer future world. The other key factor affecting water availability is the lack of enough reservoir storage to manage a shift in the seasonal cycle of runoff. Current information about the climate-related water challenges facing much of the world, although by no means perfect, is sufficiently robust that major future problem areas can now be defined. The matter takes on a greater urgency because the model-predicted signals are already being observed.

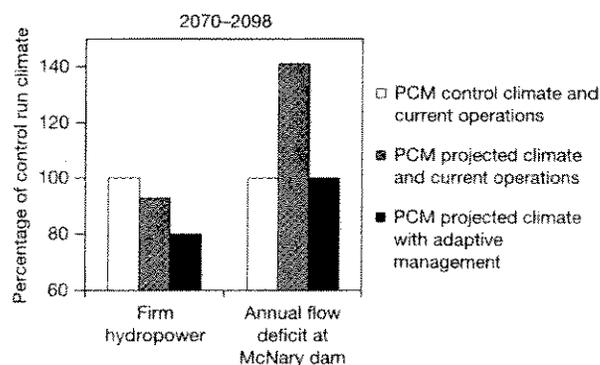


Figure 2 | Trade-off between firm hydropower and stream-flow requirements. The effect of Parallel Climate Model (PCM) climate change projections for the period of 2070 to 2098 on Columbia River Basin reservoir system reliabilities, as compared to the PCM control climate and operations scenario. Implementing adaptive management reduces the annual environmental flow deficit at McNary Dam in southeastern Washington, USA (benefiting salmon), but decreases firm (reliable) hydropower. Figure created by A. Hamlet using results from ref. 32.

Will changes in precipitation patterns offset the problems associated with warming? The most likely answer is 'no'. If less rain falls over a region, water availability will decrease. If more rain falls and the reservoir storage capacity is much less than the annual runoff, then the water will be lost downstream (to the ocean in many cases)—particularly in regions, like the western USA, where precipitation is mainly in winter and the effective storage capacity of winter snow pack will be lost. The changes in precipitation required to ameliorate the problem would have to come through a shift in the seasonal cycle of rainfall towards the dry season, a feature that is not usually exhibited by anthropogenically forced climate models.

Two examples of impacts on glaciers. The results for the regional water resources case studies discussed above and the simple physics behind them seem likely to be qualitatively reproduced in virtually all regions where snowmelt is important to local water availability⁶ and where annual runoff exceeds storage capabilities. Our results in the western USA suggest that even more serious problems may occur in regions that depend heavily on glacial meltwater for their main dry-season water supply. This is because, once the glaciers have melted in a warmer world, there will be no replacement for the water they now provide, in contrast to the present snow-pack-dependent water supply that is renewed seasonally. In this case, the natural storage of fossil water in the glaciers has even more importance than seasonal storage in just the snow pack. It is well documented that glaciers are in retreat over most (but not all) of the world^{1,38,39}, so the threat here seems both real and immediate—a situation also well documented in the world's press over the past several years.

Himalaya–Hindu Kush region. Perhaps the most critical region in which vanishing glaciers will negatively affect water supply in the next few decades will be China and parts of Asia, including India (together forming the Himalaya–Hindu Kush (HKH) region), because of the region's huge population (about 50–60% of the world's population). The ice mass over this mountainous region is the third-largest on earth, after the Arctic/Greenland and Antarctic regions. The hydrological cycle of the region is complicated by the Asian monsoon, but there is little doubt that melting glaciers provide a key source of water for the region in the summer months: as much as 70% of the summer flow in the Ganges and 50–60% of the flow in other major rivers^{40,41,42}. In China, 23% of the population lives in the western regions, where glacial melt provides the principal dry season water source⁴³.

There is little doubt that the glaciers of the HKH region are melting and that the melting is accompanied by a long-term increase of near-surface air temperature (ref. 44 and Figs 2.9 and 2.10 in ref. 1), the same level of warming we saw impacting the western USA. After 25 years of study, the China Glacier Inventory was recently released⁴⁵. It showed substantial melting of virtually all glaciers, with one of the most marked retreats in the last 13 years (750 m) of the glacier that acts as one of the major sources of the Yangtze River, the largest river in China. In total, it is estimated that the entire HKH ice mass has decreased in the last two decades. Furthermore, the rate of melting seems to be accelerating⁴⁶.

The few analytical studies that exist for the region suggest both a regression of the maximum spring stream-flow period in the annual cycle by about 30 days (ref. 47) and an increase in glacier melt runoff by 33–38% (ref. 48). These numbers seem consistent with what is being observed and bear striking similarities to the stream-flow results from the western USA. The huge inconsistency, however, occurs in the impacts on local water supplies. In the western USA, model-predicted impacts are already being seen in the hydrological cycle. The models suggest that the impacts will appear as a long-term trend in snow amount and runoff. But in the HKH region, there may (for the next several decades) appear to be normal, even increased, amounts of available melt water to satisfy dry season needs. The shortage, when it comes, will likely arrive much more abruptly in time; with water systems going from plenty to want in perhaps a few decades or less.

It appears that some areas of the most populated region on Earth are likely to 'run out of water' during the dry season if the current warming and glacial melting trends continue for several more decades. This may be enough time for long-term planning to see just how the region can cope with this problem. Unfortunately, the situation here is that when the glaciers melt and their fossil water is used or lost, their contribution to the water supply of the region will cease.

South American Andes. A large fraction of the population living west of the South American Andes relies on the glacial melt from those mountains to feed the area's rivers to supply water and hydro-power. Without the glacier-supplied river water, the people and economies of the region would have to undergo tremendous adjustments^{49,50}. The physics governing the Andean glaciers are more complicated than simple temperature forcing. Depending on the latitude and on which side of the Andes we consider, the glaciers' mass balance can be controlled by different factors^{51,52}. Although air temperature changes are still important in most areas, other processes (such as moisture flux and precipitation) dominate in some regions. This makes the prediction of what might happen in the Andes much more difficult. Although all greenhouse models predict warming air temperatures, they can disagree on predicted changes in rainfall, moisture flux, and so on.

In spite of this complexity, melting of the glaciers is well documented for the Andes^{53,54}. In Peru alone, the glacier-covered area has been reduced by 25% in the last three decades (as reported at the Conference on Mass Balance of Andes Glaciers, Huaraz, Peru, 6–9 July 2004; http://www.inrena.gob.pe/serusu/serusu_ppoint.htm). At current rates, some of the glaciers may disappear in a few decades, if not sooner. The high-frequency surges and retreats and the uneven spatial distribution of the general glacier retreat makes understanding and predicting the behaviour of glaciers in this area uncertain.

The melting started some decades ago. The International Panel for Climate Change (IPCC) shows a long-term trend in increasing air temperature in the region (ref. 38 and Figs 2.9 and 2.10 in ref. 1). Higher-resolution, more-detailed analysis of many stations in the region show a similar temperature increase, one that seems to be increasing^{55,56}. Consider the case of Quelccaya in the Andes (Fig. 3). When the summit core was originally drilled in 1976, it contained clear annual cycles in its layering that extended back in time for approximately 1,500 years (ref. 38). When it was re-drilled in 1991, the annual layers in the upper 20 m of the core had been obliterated by percolation of meltwater. Together, these two results show that melting at the summit had occurred, a condition that had not previously occurred in the last 1,500 years. The probability seems high that the current glacier melting in the Andes will continue, just as it will in Asia (and other regions of the world). It is fossil water that has been lost and will not be replaced anytime soon, especially not in the context of anthropogenically induced greenhouse warming. The results and projections suggest that current dry-season water resources will be heavily depleted once the glaciers have disappeared.

Some uncertainties in estimating impacts. All of the future climate predictions have uncertainties. We touch on only a few of the more important ones below, with the goal of seeing whether they might overcome the warming signal and make the conclusions above moot. We do not, however, attempt here a complete discussion of all the uncertainties that attend climate models.

In some cases, the uncertainties have to do with the models' inability to reproduce today's climate, casting doubt on future climate predictions. Predictions using regional, high-spatial-resolution models, of the type needed for regional water studies, are only now starting to come into their own in the greenhouse arena, but they carry a whole set of problems in addition to those associated with the coupled atmosphere–ocean general circulation models (CGCMs). For instance, they often have different physics from the CGCMs—there are scale-dependence issues, and new levels of parameterizations are required. However, such regional models will

be required for good quantitative estimates of potential future water problems. Such high-resolution, regional hydrological studies have not yet been undertaken for either the HKH region or South America.

One of the greatest uncertainties in future prediction has to do with how the models are forced. Stated more directly, what are the implications of omitting forcings that we strongly suspect (or know) are important but cannot yet reliably be included in the model physics? Of these, the most important is thought to be the incomplete inclusion of aerosols and their impacts, especially on clouds. Excellent discussions of the current state of the aerosol problem may be found in refs 57 and 58, and ref. 59 shows the sensitivity of climate model predictions to uncertainties in indirect aerosol forcing.

The key question for this paper is: Can the aerosol/cloud problem overwhelm the direct greenhouse-gas-induced temperature forcing that affects the regional hydrological cycle, giving net cooling as opposed to warming? We consider below some of these uncertainties qualitatively to see how they might impact the results discussed above.

Aerosols and clouds. Aerosols are thought to cool the planet's surface through increased scattering and cloud cover and re-radiation of solar energy to space. The representation of clouds in CGCMs carries a large uncertainty all by itself, but the joint interaction of clouds and

aerosols represents one of the major challenges to climate modellers today. Virtually all climate models have some representation of direct aerosol effects (that is, reflectivity of the particles) in them, but none have yet fully included the indirect effects (for example, the effect of aerosols on cloud distributions via their role as cloud condensation nuclei, or other effects discussed below). A preliminary study⁶⁰ suggests that indirect aerosol impacts on clouds are important but, even given the uncertainty in estimating these impacts, this mechanism is not strong enough to counter greenhouse warming effects.

Recent observational studies^{58,60} show that locally, over India, the total aerosol effect (direct plus indirect) has been associated with a surface cooling of 0.3 °C over the last three decades. This is close to the warming expected from greenhouse gases. However, the aerosols are observed to be associated with warming in the lower to middle troposphere—the regions inhabited by the glacier fields. In this case the aerosols may be enhancing the direct temperature forcing by contributing to the melting of the higher glaciers of the HKH region.

Snowfall amounts. Aerosols are found to alter cloud physics in a manner that reduces precipitation downstream from the pollution source^{61,62}. This also reduces the snow particle rime growth, resulting in lower snow water equivalent, a result obtained from direct field measurements^{62–64}. Properly represented aerosols in climate models will apparently also work together with increasing temperature to reduce snow/ice in regions where heavy air pollution exists (for example, China, the western USA and Europe).

Snow/ice melt rates. A common aerosol found in the atmosphere over many regions of the earth is black carbon. This substance absorbs sunlight. It is scrubbed from the atmosphere by precipitation and, because it is ubiquitous, is likely to end up in the snow and ice fields of the planet. There it could decrease the surface albedo, causing the snow/ice to absorb solar energy more readily and thereby melt sooner. Measurements of black carbon amounts and its budgets are only now being made. By whatever means, darkening the surface of a snow/ice field will enhance melt rates. Again, it seems that proper inclusion of aerosols in global climate models will increase early melting of snow packs and, especially, glaciers and sea ice⁶⁵.

The bottom line here is that other important, but poorly represented, atmospheric physical and chemical processes seem unlikely to neutralize or reverse greenhouse warming. This is true even if we take the lower end of the estimated warming by the IPCC (1.4 °C) to be the net thermal forcing on the snow/glacier packs. Our ACPI study² showed that such an increase, coupled with inadequate containment, is all it takes to invoke the water storage problems noted above.

Overview of expected regional water impacts

In this review, we suggest that the simplest of changes associated with global warming (a modest increase in near-surface air temperature) will be responsible for alterations of the hydrological cycle in snowmelt-dominated regions via seasonal shifts in stream-flow. Without adequate water storage capacity, these changes will lead to regional water shortages. The model-predicted changes are already being seen in the observed data. If maintained at current levels, these changes will lead to a serious reduction in dry-season water availability in many regions of the Earth within the next few decades.

The physical principles found to apply in snowmelt-dominated regions (for example, the western USA) are one of the probable causes of the observed early snowmelt and, more importantly, deglaciation that is now occurring in most mountainous regions of the world. The serious situations developing in the HKH region and South America have been briefly presented. It is clear that both regions, as well as others not mentioned, are headed for a water-supply crisis. Better water management techniques can help, but cannot solve the problem without significant changes to agriculture, industry and lifestyle. Detailed studies of the future impact of global warming on water resources in these regions are long overdue.

a 1978



b 2002



Figure 3 | Changes in the Qori Kalis Glacier, Quelccaya Ice Cap, Peru, between 1978 (a) and 2002 (b). Glacier retreat during this time was 1,100 m (L. Thompson, personal communication). Photographs courtesy of L. Thompson.

We have discussed briefly here some of the major uncertainties in the models, in particular the impacts of aerosols and clouds, as well as their suspected impacts on the aspects of the hydrological cycle having to do with snow and ice. In all the cases considered, current scientific evidence suggests that these processes, which are currently either not included, or are marginally included, in IPCC scenario runs, will act to increase the impact of mere temperature increase on the snow and ice fields of the planet.

Time is running out for nations in the sensitive areas we have evaluated, particularly those whose water supplies are dependent on mid-latitude glaciers, to understand just what the future might hold for them. How much they can do is uncertain given the several decades of warming that will occur as a result of past actions, even if greenhouse emissions were halted at today's levels⁶⁶, but perhaps the initiation of strategic planning will be motivated by the prospect (and what is rapidly becoming the reality) of diminished water supplies.

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CLIMATE CHANGE IMPACTS ON THE UNITED STATES

The Potential Consequences of Climate Variability and Change



Foundation

Humanity's influence on the global climate will grow in the 21st century. Increasingly, there will be significant climate-related changes that will affect each one of us.

We must begin now to consider our responses, as the actions taken today will affect the quality of life for us and future generations.

A Report of the
National Assessment
Synthesis Team

US Global Change
Research Program

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CHAPTER 8

POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE FOR THE WESTERN UNITED STATES

Joel B. Smith¹, Richard Richels^{2,3}, and Barbara Miller^{3,4}

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Acknowledgments

CHAPTER SUMMARY

Regional Context

The West is characterized by variable climate, diverse topography and ecosystems, an increasing human population, and a rapidly growing and changing economy. Western landscapes range from the coastal areas of California, to the deserts of the Southwest, to the alpine tundra of the Rocky and Sierra Nevada Mountains. Since 1950, the region's population has quadrupled, with most people now living in urban areas. The economy of the West has been transformed from one dominated by agriculture and resource extraction to one dominated by government, manufacturing, and services. National parks attract tourists from around the world. The region has a slightly greater share of its economy in sectors that are sensitive to climate than the nation as a whole; these include agriculture, mining, construction, and tourism, which currently represent one-eighth of the region's economy.

As a result of population growth and development, the region faces multiple stresses. Among these are air quality, urban sprawl, and wildfires. Perhaps the greatest challenge, however, is water, which is typically consumed far from where it originates. Competition for water among agriculture, urban, recreation, environmental, and other uses is intense, with water supplies already oversubscribed in many areas.

The combination of continued development of the West and climate change is likely to introduce some new stresses, exacerbate some existing stresses, and ease other stresses.

Climate of the Past Century

- In the 20th century, temperatures in the West rose 2 to 5 °F.
- The region generally became wetter, with some areas having increases in precipitation greater than 50%. A few areas, such as portions of Arizona, became drier and experienced more droughts. The length of the snow season in California and Nevada decreased by about 16 days from 1951 to 1996.

Climate of the Coming Century

- During the 21st century, temperatures are very likely to increase throughout the region, at a rate faster than that observed, with the Hadley and Canadian General Circulation Models (GCMs) projecting increased temperatures of about 3 to over 4 °F by the 2030s and 8 to 11 °F by the 2090s.
- The two climate model scenarios project increased precipitation, particularly during winter, and especially over California. However, parts of the Rocky Mountains are projected to get drier and the Canadian model projects most of the region getting drier by the 2030s. Other changes in climate are possible and there is some chance that that climate over much of the West could become generally drier during the 21st century.
- Under the Hadley and Canadian scenarios, runoff is estimated to double in California by the 2090s, though the climate models also suggest the potential for more extreme wet and dry years in the region.
- This chapter considers the effects of warmer and wetter conditions, based on the climate model scenarios used in this Assessment. It also considers a scenario of generally warmer and drier conditions.

Key Findings

Water Resources

- The potential for flooding is very likely to increase because of earlier and more rapid melting of the snowpack and more intense precipitation. Even if total precipitation increases substantially, snowpacks are likely to be reduced. However, it is possible that more precipitation would also create additional water supplies, reduce demand and ease some of the competition among competing uses.
- In contrast, a drier climate is very likely to decrease water supplies and increase demand for such uses as agriculture, recreation, aquatic habitat, and power, thus increasing competition for scarcer supplies.
- Improved technology, planting of less water-demanding crops, pricing water at replacement cost, and other conservation efforts can help reduce demand and vulnerability to drought. Advanced planning for potentially larger floods is needed to reduce flood risks.

Natural Ecosystems

- Vegetation models estimate that under wetter conditions there is likely to be an increase in biomass, a reduction in desert areas, and a shift toward more woodlands and forests in many parts of the West. However, should the climate become drier, forest productivity would likely be reduced and arid areas would expand. It is possible that fire frequency could increase whether the region gets wetter or drier.
- Human development of the West has resulted in habitat fragmentation, creation of migration barriers such as dams, and introduction of invasive species. The combination of development, presence of invasive species, complex topography, and climate change is likely to lead to a loss of biodiversity in the region. However, it is probable the mountains will enable some species to migrate to higher altitudes. It is also possible that some ecosystems, such as alpine ecosystems, would virtually disappear from the region.

- Human interventions to aid adaptation by species will be challenging, but reducing the pressures of development on ecosystems and removing barriers to migration could be the most effective strategies.

Agriculture and Ranching

- Higher CO₂ concentrations and increased precipitation are likely to increase crop yields and decrease water demands while milder winter temperatures are likely to lengthen the growing season and result in a northward shift in cropping areas. However, there is some chance that higher temperatures will inhibit growth of certain fruits and nuts that require winter chilling, and changes in the rainfall and humidity can harm some crops, such as grapes, by increasing potential for disease.
- It is possible that higher temperatures and increased precipitation will increase forage production and lengthen the growing and grazing season for ranching, but flooding and increased risk of animal disease can adversely affect the industry.
- Increasing crop diversity can improve the likelihood that some crops will fare well under variable conditions, while switching to less water-demanding crops and improving irrigation efficiency would conserve water. Improved weather forecasting could aid farmers in selecting crops, timing harvests, and increasing irrigation efficiency; and aid ranchers in timing cattle sales and breeding.

Tourism and Recreation

- Higher temperatures are very likely to result in a longer season for summer activities such as backpacking, but a shorter season for winter activities, such as skiing. Ski areas at low elevations and in more southern parts of the region are very likely to be at particular risk from a shortening of the snow season and rising snowlines.
- Adaptation strategies for tourism and recreation involve diversification of income sources.

POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE FOR THE WESTERN UNITED STATES

PHYSICAL SETTING AND UNIQUE ATTRIBUTES

The West region spans from California to the Rocky Mountains in Colorado and south to the Mexican border. The region contains 19% of the land area and 17% of the population in the United States. On average, the West has low precipitation, although some parts are quite wet. It also has some of the greatest variance in topography and climate in the lower 48 states. The West includes the lowest point (Death Valley, which is 282 feet below sea level) and the highest point (Mt. Whitney, 14,494 feet above sea level) in the lower 48 states. Among its major mountain ranges are the Sierra Nevada, the Wasatch, and the Rockies. The region also contains the Great Basin in Nevada and Utah; in which most of the rivers do not run to the sea. Especially because of its varied topography, climate zones in the West range from deserts to alpine.

Historic and Estimated Population for the West

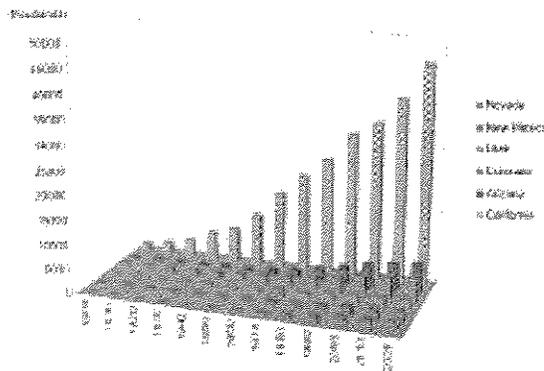


Figure 1: The West's population grew from less than 10 million in 1940 to 46.2 million in 1998 (US Census Bureau, 1998). California's population mushroomed from less than 7 million in 1940 to more than 33 million in 1998 (California Trade and Commerce Agency, 1997; California Department of Finance, 1998). Although more than two-thirds of the West's population lives in California, in recent decades, the intermountain states have become the fastest-growing in the nation. For example, Arizona's population grew from 1.3 million in 1960 to 4.5 million in 1998 (CLIMAS, 1998). Six of the 10 fastest-growing states in the US are projected to be in this region, with Arizona, Nevada, and Utah being the fastest. California's population is projected to rise from its 1998 level of 33 million to about 45 million (NPA Data Services, Inc., 1999). See Color Plate Appendix.

SOCIOECONOMIC CONTEXT

The West underwent a dramatic transformation in the 20th century in its human population, economy, and landscape. Since the middle of the century, the population has increased fourfold (see Figure 1). Although more than two-thirds of the West's 46 million people live in California, more recently the intermountain states have become one of the fastest-growing areas in the nation. Most people in the West live in urban areas. To the large cities of California — San Francisco, Los Angeles, San Diego, and Sacramento — the West has now added Denver, Salt Lake City, Albuquerque, Phoenix, and Las Vegas as major metropolitan areas (see Figure 2). Thus, once predominantly rural states are now among the most urban in the country. The regional population is projected to grow by about one half, reaching 60 to 74 million people, by 2025 (NPA Data Services, Inc., 1999).

The economy of the West has been transformed from one dominated by agriculture and resource extractive industries in the 19th century to one dominated by government, manufacturing, and services such as tourism. Figure 3 displays the relative value of all goods and services produced in the region in 1996. About 11% of the region's output is currently in sectors considered relatively sensitive to climate, including agriculture, mining, construction, and the tourism related sectors of hotels and amusement/recreation. This share of the region's output in these sectors is projected to increase to 12% by 2045, mainly because of increases in tourist related activities, but also because of increases in agricultural services. The share of total output in agriculture is projected to decrease, although the total value of agricultural production is projected to increase (US BEA, 1999a).

ECOLOGICAL CONTEXT

Although much of the West is semi-arid grassland or shrubland, the region's diverse ecosystems contain alpine tundra, coniferous and mixed forests, chaparral, wetland, and coastal and estuarine areas (USGS, 1993).

Water and land in the West have been substantially altered by people. In the West, water is typically consumed far from where it originates. For California users, water is extracted from natural systems primarily in the northern part of the state, and from the Colorado River. More than one-third of the water Arizona uses is from the Colorado River (CLIMAS, 1998). Western water tends to be subsidized (by the federal government and states) and sold to consumers at prices effectively below what it costs to make supplies available. Irrigation is the major consumer of Western water (see Figure 4).

The federal government owns more than half of the land in the West, including 83% of Nevada. Most of the federally owned land is managed by the Bureau of Land Management, Forest Service, Park Service, and Department of Defense (Riebsame, 1997). Indian reservations are scattered throughout the region, and are most concentrated in Arizona, where they comprise about one-third of the state's land area (estimated based on Riebsame, 1997). Between two-thirds and three-quarters of the land in the West is used for pasturelands, agriculture, and forests, with ranching using most of that land (USGS, 1999). However, the amount of land used for farming (including cultivated and non-cultivated land such as pastureland) in the West decreased by 8% between 1992 and 1997 (USDA, 1997).

Continued population and economic growth could result in more demand for water, wood products, and minerals; more roads, and conversion of land to urban uses (which could increase runoff and, in coastal areas, vulnerability to sea-level rise); potentially more automobile emissions (although this depends on future technology and transport practices); and increased demands for recreation. All of these could put more pressure on the remaining undeveloped areas. However, protecting open space could ease the current pressures of development on ecosystems and enhance the ability of species to cope with climate change.

CLIMATE VARIABILITY AND CHANGE

The West experiences great temporal and spatial variation in precipitation and temperature. Temperature regimes range from hot desert environments to cold alpine environments. Precipitation ranges from up to 40 inches per year in northern California to less than 10 inches in the deserts of Nevada, southeastern California, and western Arizona. Although many parts of the region, particu-

Urban Population Growth in the West

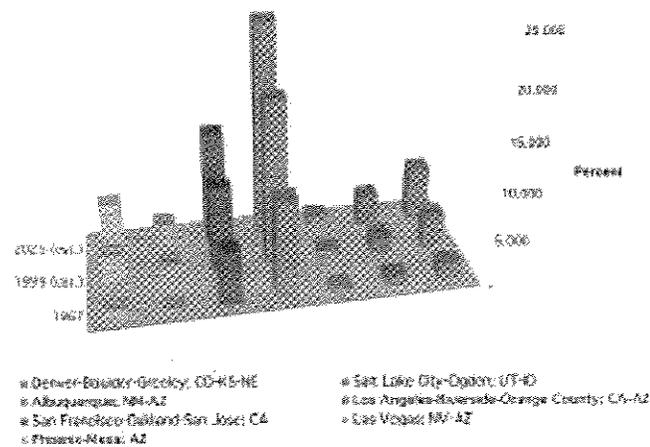


Figure 2: Over 93% of California's residents live in cities, including San Francisco, Los Angeles, San Diego, and Sacramento, and their surrounding metropolitan areas. In intermountain areas, population growth is also largely concentrating in cities, such as Denver, Salt Lake City, Albuquerque, Phoenix, Las Vegas, Santa Fe and Provo. Much of the future population growth is expected to occur in urban areas. Source: NPA Data Services, 1999. See Color Plate Appendix.

The Relative Value of Economic Activity in the West

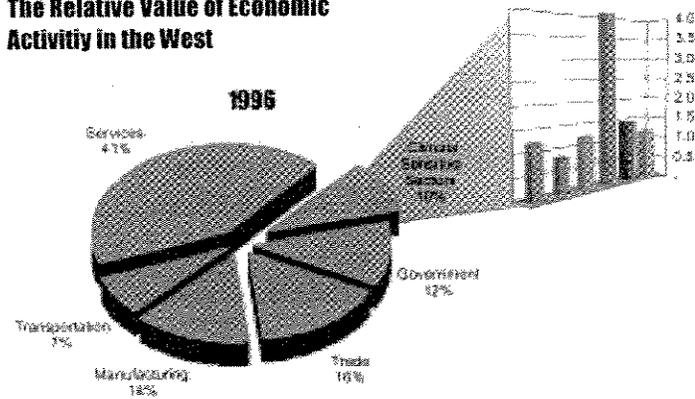


Figure 3: The West produces 18% of US Gross National Product. The region has a slightly greater share of its economy in relatively climate-sensitive sectors such as agriculture, mining, construction, and tourism, than the nation as a whole. While 1.8% of the nation's economic output is from agriculture (which includes forests and fisheries), 2.0% of the West's economic output is from the agriculture sector. The West has 4.1% of its gross product from hotels, amusement/recreation, restaurants, and museums, which are strongly affected by tourism, while the nation as a whole has 1.6% (US BEA, 1999a). With its Gross State Product of \$962 billion, California comprises 72% of the total Regional Product of \$1.3 trillion in 1996 (US BEA, 1999a). Ranked as a nation, California would be the seventh largest economy in the world (California Trade and Commerce Agency, 1997). See Color Plate Appendix.

larly in the Southwest, receive most of their precipitation from summer monsoons, highly variable winter precipitation provides most of the annual runoff in the rest of the region (Bales and Liverman, 1998).

Relative Water Use in the West

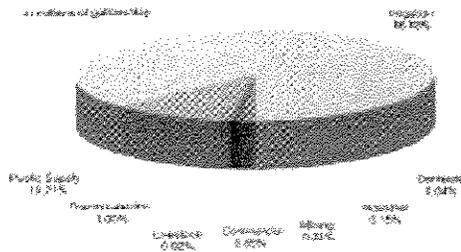


Figure 4: In 1995, 87% of the water consumed in the West was for irrigation (Solley et al., 1998; see Figure 4). However, water use for irrigation has declined slightly since 1980, while municipal uses have grown (Diaz and Anderson, 1995). For example, agriculture accounts for 81% of all water used in Arizona, down from 93% in 1963, while municipal demand currently accounts for 14% of water used, up from 5% in 1963 (CLIMAS, 1998). In addition, irrigated land in the region fell by 8% from 1982 to 1992, although acreage may have increased in recent years (USDA, 1997). Total water use in the region appears to have been declining since 1980 (Templin, 1999). See Color Plate Appendix.

El Niño and Events 1997-1998

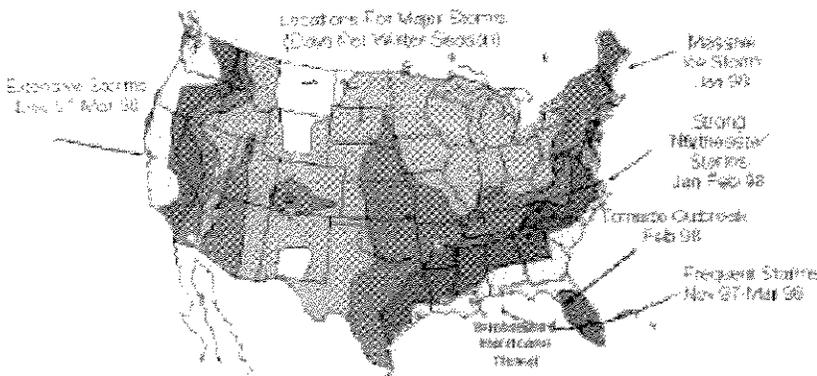


Figure 5: The 1997-1998 El Niño had quite strong effects in the West, with particularly large winter precipitation events. The heavy precipitation lead to such localized consequences as flooding and landslides. See Color Plate Appendix.

In many areas of the West, paleoclimatic data suggest that on some occasions droughts and floods were more extreme over the past few thousand years than was observed during the 20th century (Bales and Liverman, 1998). Since 1900, temperatures in the West have been rising, with increases of 2 to 5°F per 100 years in all areas except southern Colorado, western New Mexico, and eastern Arizona (See Climate Chapter). Averaged over the region, the number of days with high temperatures over 90°F increased in the 20th century while days below freezing decreased (David Easterling, National Climatic Data Center, personal communication, 1999).

Over the 20th century, annual precipitation over most of the region generally increased 10 to 40%. However, precipitation in the Central Valley of California, southeastern California, south-central Utah, northeastern Arizona, and western Colorado decreased and some areas have experienced more drought (Karl et al., 1990; USHCN, 1999). The length of the snow season decreased by about 16 days from 1951 to 1996 in California and Nevada, and stayed about the same elsewhere (David Easterling, National Climatic Data Center, personal communication, 2000). Since the late 1940s, snowmelt has come earlier in the year in many northern and central California river basins (Dettinger and Cayan, 1995). The proportion of annual precipitation from heavy storm events has increased in the 20th century (Karl and Knight, 1998).

The region is quite vulnerable to climate variability, as the 1998 El Niño event demonstrated, particularly in California. El Niño storms during February 1998 brought as much as three times the average rainfall for the month, causing numerous deaths in addition to damages to homes, businesses, roads, utilities, and crops (Willman, 1998). On the other hand, an advanced forecast for El Niño resulted in many protective measures being undertaken (see Figure 5).

With its complex topography, developing reliable projections of climate change in the West is particularly difficult. General Circulation Models (GCMs) tend to be least reliable projecting changes in coastal areas and in mountains, two features prevalent in the West. However, it is possible to develop GCM-based scenarios that give an indication of how increased greenhouse gas concentrations could change the climate. The limitations of GCMs are discussed in more detail in Chapter 1.

Average annual outputs from the Hadley and Canadian GCMs are shown in Figure 6. The Hadley model projects a 3.8°F (2.1°C) winter warming and a 3.1°F (1.7°C) summer warming by the 2030s¹ over 1961-1990 temperatures and an 8.8°F (4.9°C) winter and an 8.3°F (4.6°C) summer increase by the 2090s. The Canadian model projects more winter warming, with a 4.8°F (2.7°C) winter and a 2.5°F (1.4°C) increase in summer temperature by the 2030s and a 12.8°F (7.1°C) winter and 7.7°F (4.3°C) summer increase by the 2090s (NCAR, 1999a).

Both models project a doubling of winter precipitation over California. However, the Hadley and

¹The results for the 2030s are an average for 2025-2034.

Canadian models also show the potential for decreased precipitation in some parts of the Rocky Mountains. The Canadian model shows no change in summer precipitation, while the Hadley model projects that summer precipitation would decrease.

The models do not project a significant change in interannual variation of precipitation. Should interannual variation of precipitation increase, there would be more extreme wet years and more extreme dry years. It is likely that many areas in the West could have wetter winters and drier summers. It is very unlikely that changes in precipitation will be uniform across the West; some areas will likely be wetter while it is possible that others will be drier. Wet periods will very likely be followed by dry periods because, even with climate change, there will still be variability — seasonally, from year to year, and from place to place.

California has experienced relatively less sea-level rise than the eastern United States because many areas are being uplifted by moving of geological plates (Neumann et al., 2000). The coast south of La Jolla, California has been experiencing a relative sea-level rise of approximately 8 inches (20 cm) per century; the coast from Los Angeles to San Francisco has had a 0 to 6 inches (15 cm) per century of sea-level rise; and the coast in far northern California has experienced a relative reduction in sea level of 2 to 6 inches (5 to 16 cm) per century. The Intergovernmental Panel on Climate Change estimates that sea level will rise 6 to 37 inches (15 to 95 cm) by 2100 (Houghton et al., 1996), which would result in net sea-level rise for the entire California coast.

KEY ISSUES

The key issues in the West involve those systems that are sensitive to climate and, in a number of cases, are already stressed by current development patterns. All of these systems will be affected by climate change.

1. Changes in seasonality and amount of water resources
2. Plant and animal changes in natural ecosystems
3. Changes in agricultural crop productivity
4. Precipitation and forage changes for ranching
5. Sea-level rise effects on coastal resources
6. Changes in tourism and recreation

Changes in Annual Mean Temperature and Precipitation

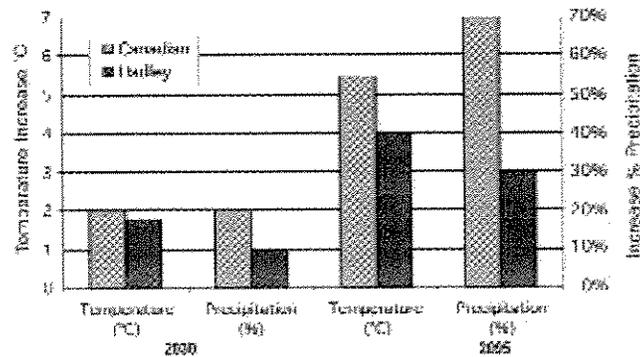


Figure 6: Changes in annual mean temperature and precipitation for the West as projected by the Hadley and Canadian models compared to 1961-90 Base Period.

1. Water Resources

The more than fourfold increase in the population of the West since the middle of the 20th century has dramatically changed the use of natural resources in the West and imposed stresses on these resources. One of the more stressed resources is water. Although agricultural water use is declining,² water supplies are tight because of growth in environmental, municipal, and industrial demands and could become tighter as the population and economy continue to grow and unresolved water rights claims are settled. For example, over the last ten years, California consumed more than its normal year apportionment of Colorado River water, but surplus water and water unused by Arizona and Nevada was available to meet California's needs (US Bureau of Reclamation, 1997; US Bureau of Reclamation, 1999).³ Meanwhile, rapidly growing urban areas such as Las Vegas are demanding more water. In addition, many aquifers are being depleted at rates faster than their recharge, and high-volume groundwater mining has caused land subsidence (sinking) and fissuring (cracking).

² Although total water use for irrigation is declining, agricultural production is sensitive to changes in precipitation and subsequent changes in water allocation. For example, in 1991, during the fifth year of a drought, water supplies to California agriculture were severely curtailed. Overall economic losses were approximately \$400 million — about 2% of total agricultural revenues. In spite of the drought, agricultural revenues in 1991 reached an all-time high (Gleick and Nash, 1991).

³ Use of Colorado River water is allocated between the Upper Basin and the Lower Basin. The Lower Division states of California, Arizona, and Nevada are guaranteed a delivery of 75 maf (million acre feet) in each 10 year period. Also, the Upper Division states (Colorado, New Mexico, Utah, and Wyoming) are to supply one-half of the water required to be delivered by treaty to Mexico, that is, 0.75 mafy (million acre feet per year), if waters over and above the quantities of use apportioned to the Upper Basin (7.5 mafy) and the Lower Basin (8.5 mafy) are insufficient. (House Document No. 717, 1948) Nevada's apportionment of Colorado River water is 0.3 mafy plus 4 percent of the surplus water made available. The Upper Basin states receive the following shares: Arizona 0.05 mafy, Colorado 3.855 mafy, Utah 1.713 mafy, Wyoming 1.043 mafy, and New Mexico 0.84 mafy (NYT, 1999).

Brown (2000) forecast that by 2040 net water withdrawals in the region will increase, with withdrawals for domestic and public use increasing most, and irrigation withdrawals declining slightly except in the Upper Colorado Basin. As water use shifts from agriculture to municipal uses, the ability to reduce withdrawals during droughts declines.

It has become increasingly difficult to build any significant new water resources infrastructure because of economic, environmental, and social constraints. In addition, institutional factors such as water rights, local planning and zoning, and regulations influence and can limit the nature and level of response that water managers can make to changes in supply or demand. Reserved and Native American water rights claims are senior to those of many other water consumers, and many of these rights are not currently being exercised (see box on Native American water claims).

Because of its semiarid climate, water supplies in the West are considered to be more vulnerable to climate change than water supplies in other regions (Gleick, 1990; Hurd et al., 1999a). Detailed hydrologic modeling conducted for the western US projects

a significant change in snowfall and snowmelt dynamics because of higher temperatures. Rising temperatures are likely to shorten the snowpack season by delaying the autumnal change from rainfall to snow and advancing the spring snowmelt. A larger proportion of winter precipitation in mountainous areas is also very likely to fall as rain rather than snow, even if overall precipitation amounts do not change. McCabe and Wolock (1999) found that under the two GCM scenarios, April 1 snowpack in the major western mountain ranges would be reduced, except that under the Hadley scenario, snowpack in the Rocky Mountains would have little change.⁴ Peak runoff is very likely to occur earlier in the year (see Figure 7) (Gleick and Chalecki, 1999). Jeton et al. (1996) found that snowmelt would occur more than two weeks earlier than currently in the East Fork of the Carson River and North Fork of the American River in the Sierra Nevada under a 2.2°C (4°F) warming, which the Hadley and Canadian scenarios suggest would occur by the 2030s.⁵

Wolock and McCabe (1999) projected changes in runoff for the region using the Hadley and Canadian climate models (see Table 1). They estimate that California runoff will increase by the 2030s by about three-fifths and double by the 2090s.⁶ Their study projected small changes in runoff in the rest of the West by the 2030s, and no change to approximately 30% increases in runoff outside of California by the 2090s. The changes in runoff for the areas outside California are not considered to be statistically significant because there is so much variance in year to year runoff. Soil moisture under both scenarios is projected to increase, but in many locations outside of California conditions could be drier during some periods, particularly in the summer (NCAR, 1999b).

These changes in runoff have important consequences for water management. Any changes in runoff timing or variability could possibly cause problems (Gleick, 1987). Earlier spring runoff is likely to increase risk of spring flooding, complicate seasonal allocation schedules, and create problems for matching supply and demand and meeting envi-

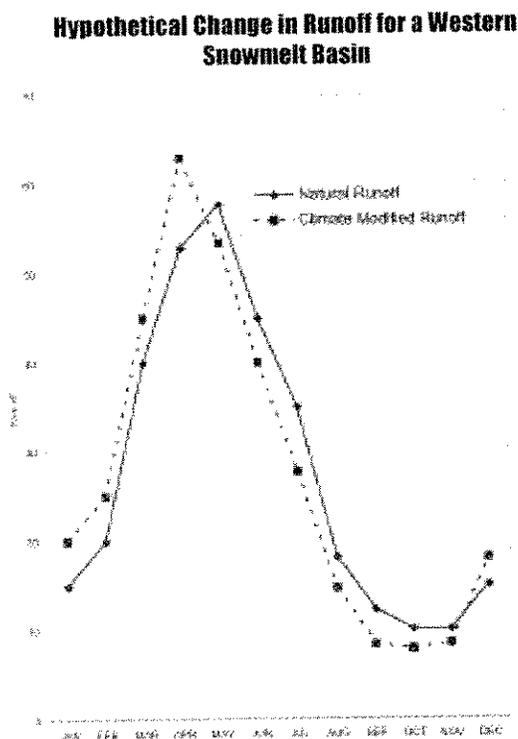


Figure 7: Natural runoff (solid line) peaks in May as winter snow melts. Under conditions of climate change (dashed line), runoff peaks earlier and higher, but is lower in the summer. Source: Gleick and Chalecki, 1999.

⁴The article does not state at what altitude snowpack is measured.

⁵Jeton et al. (1996) also found that total annual flow was insensitive to changes in temperature and much more sensitive to changes in precipitation.

⁶In contrast, Miller et al. (1999a, 1999b) found that total streamflow in the Russian River in northern California, which is not snowmelt driven, would not change significantly under the Hadley 2090s scenario, but peak runoff may occur one month earlier because of a potential change in winter storms. In contrast, snowmelt driven streamflow in the Sierra Nevada would likely happen earlier and peak streamflow would rise. Miller et al. (2000) found that the American River in the Sierra Nevada, which is snowmelt driven, showed both an increase in magnitude and earlier peak flow (see also Hay et al., 2000).

ronmental in-stream flow requirements in the summer. It is likely to be problematic for the current reservoir system to store earlier spring runoff for use in the summer unless new operating rules and regimes are implemented (Lettenmaier and Sheer, 1991), and it is not clear that such a change would be sufficient to reduce spring flooding and increase summer supplies. This may be especially true in California, where both climate models used in this Assessment show a substantial increase in runoff, particularly in the winter. In addition, more intense precipitation events (such as the extreme event in Las Vegas on July 8, 1999 that caused extensive flooding in the city) could increase flooding. The risk of increased flooding is exacerbated by continued urban development, which increases surface runoff during storms. Development in floodplains and expansion of areas that could be flooded because of increased runoff could result in more people and property at risk to the effects of climate change. In addition, higher runoff can increase mudslides.

On the other hand, it is possible that increased runoff would create more water supplies for the West. Presumably, this could contribute to an easing of many current stresses on the water management system because there would be relatively more water available for users. A wetter climate would also likely reduce the demand for surface water and groundwater for such purposes as irrigation and watering lawns.

There is some chance that higher runoff could ease water quality problems although it could also result in more runoff of pollutants from farms and streets, which can degrade water quality. It is likely that hydropower production would increase with more runoff. However, earlier runoff is likely to result in more electricity production in winter time, when demand for heating is very likely to be falling, and less electricity production in summer when demand for cooling is very likely to be rising.

If there is reduced or even only small increases of precipitation, runoff is very likely to be reduced. In addition, both groundwater recharge and reservoir supplies are very likely to be reduced as higher temperatures increase evaporation (Wilkinson and Rounds, 1998a).

Reduced runoff, particularly if combined with higher demands due to hotter and drier conditions, would very likely make allocation of water supplies a more critical issue for the West. It is likely that instream uses such as hydropower and recreation would be among those most affected by a reduction in runoff. It is also likely that urban and industrial users would be less vulnerable to supply reductions. Hurd et al. (1999b) found that urban and industrial users of Colorado River water would have very small reductions in supplies if runoff is reduced. In general, it is very likely that those with more junior water rights claims (those who receive their allocations after the senior claims are met) would be at greatest risk should runoff decline (Miller et al., 1997). In addition it is possible that Native Americans will more fully exercise their rights to water (see box). Furthermore, during droughts there is likely to be increased dependence on groundwater, causing increased overdraft, subsidence, and reduced baseflow of rivers. On the other hand, it is possible that drier conditions would result in a decrease in flood potential and mudslides in California.

With less runoff, water quality is likely to decline if stronger pollution control measures are not undertaken. Higher temperatures alone would decrease dissolved oxygen levels in water while lower streamflow would concentrate pollutants. Lower flows in the Colorado River are likely to result in increased salinity levels, unless additional steps are taken to control the problem (Gleick and Nash, 1991). Lower lake levels could also increase water quality problems. For example, salinity concentrations in the Great Salt Lake are likely to increase with lower lake levels (Grimm et al., 1997).

Table 1: Estimated Changes in Runoff

Current and Estimates Changes in Runoff from the Canadian and Hadley Models (mm)

Region	Historical Runoff 1961-90 (mm/yr)	Change in Annual Runoff 2025-2034 (mm/yr)		Change in Annual Runoff 2090-2099 (mm/yr)	
		Canadian	Hadley	Canadian	Hadley
Upper Colorado	43	-15	3	2	28
Lower Colorado	2	-1	6	0	33
Great Basin	21	-1	4	16	29
California	232	60	63	320	273

Native American Water Claims

Indian water rights remain an unresolved and important issue for water allocation in the West in a number of cases. Under the legal doctrine established by the 1908 Winters case (*Winters v. United States* [207 US 564 (1908)]), Indian tribes have reserved water rights that could amount to 45-60 million acre-feet (Western Water Policy Review Advisory Commission, 1998). However, the vast majority of those claims have never been clearly quantified or developed for the benefit of the tribes. In many cases, non-Indian water users have already fully appropriated and used the sources of water potentially available to satisfy tribal rights. Tribal efforts to protect and develop their water rights have encountered resistance from other water users and state water authorities. There is substantial ongoing litigation (approximately 60 pending cases as of 1995) and about 20 ongoing negotiation efforts aimed at achieving settlements of Indian water rights claims. The low availability of financial resources in certain cases makes it difficult for tribes to develop their water rights or to contest competing uses that interfere with Indian water rights, including instream flow rights for fishery purposes.

Historically, tribes often made significant concessions of their reserved water rights to obtain water development on reservations. Yet, many Indian irrigation projects have fallen into disrepair for lack of project funding. Some projects such as the Navajo Irrigation Project remain uncompleted, and others such as the Animas-La Plata Project have yet to be built despite Congressionally approved water settlements. Recently, the Secretary of the Interior promoted a comprehensive dialogue on a government-to-government basis with tribes in an attempt to develop a water rights negotiation process that responds to the concerns of tribes.

Adaptation Options

Although building additional flood controls or storage infrastructure to address the need to store earlier runoff for the summer may be more attractive under climate change, environmental and cost constraints could serve as impediments. Where both local and imported supplies are available, there will be greater flexibility to deal with changes in water supply availability. If groundwater supplies are maintained as a buffer against drought, local areas are likely to have better coping ability.

Adaptation to potentially increased demand and reduced supply may focus on the demand side of water use. Here too, the development path for the West is critical. Should the increased population continue to use water at the same or an increasing rate, agriculture water allocations could be further reduced. As noted above, this can make it more difficult to reduce demand during droughts.

One source of adaptation lies in changing water pricing structures. Pricing water closer to its replacement cost would discourage wasteful uses. While market-based solutions would increase efficiency, it is possible there will be equity problems: users with limited resources, such as the poor and some farmers, may have to cut back on water use more than others.

Water transfers (between users and across river basins) will almost certainly play some role in addressing future water demand. These transfers

include water savings derived from system enhancement measures such as canal lining and other waste reduction measures, and transfer of water currently used in agriculture for use in urban areas. In addition, institutions to manage groundwater quantity and quality may need to be strengthened (Knox, 1991).

The efficiency of municipal and industrial water uses can be significantly improved. Increased application of conservation technologies such as ultra low flush toilets and landscaping practices such as xeriscaping can reduce the growth of urban demand for water and lower the vulnerability of urban areas to drought. Use of treated effluent could be increased (Wong et al., 1999). Municipalities near the ocean can also reduce water demand by desalting seawater, which is an expensive option. For example, Santa Barbara recently built a desalinization plant.

Increasing flood storage or flood control measures is likely to be an adaptation to increased risk of flooding. However, flood control management is shifting away from reliance on physical structures to effective management of floodplains, including restricting development, using wetlands, and trying to re-create the ability of rivers to spread floods to avoid concentrated downstream impacts (Wong et al., 1999). These adaptations may be effective if implemented in response to climate change, but would be more effective if implemented in anticipation of climate change. If annual precipitation

increases, but summers become hotter and drier, there is likely to still be a need for additional storage to provide more water in the summer or for demand reduction measures to lessen the need for water in the summer.

2. Natural Ecosystems

The wide diversity of natural ecosystems in the West ranges from low-elevation deserts to alpine tundra (see Figure 8). In addition, productivity varies considerably. Most of the West is grassland, shrubland/grassland, and desert shrubland. The mountains contain coniferous forests, woodlands, deciduous forests (mostly aspen), and mixed forests. California has a wide diversity of ecosystems, including mostly coniferous forests in the north and in the Sierras, oak savanna and chaparral along the central coast, and shrubland and grassland along the southern coast and interior. The central and southern Rocky Mountains are dominated by ecosystems associated with mountains: alpine, coniferous forests interspersed with grasslands, and, at lower elevations, woodlands. The very dry environments in the Great Basin support shrublands, some grasslands, and deserts. The wetter parts of the Great Basin support woodland vegetation (USGS, 1993). Aquatic habitats range from cool mountain to desert streams and rivers, including reservoirs which have substantially altered the aquatic ecology of the West. In addition, wetlands in the west, particularly in arid areas, are important habitat for endangered species, fish rearing, and migratory waterfowl.

With this wide diversity of ecosystems and topography comes a wide diversity of species, many of which are in isolated habitats. California's climate zones, from coastal to desert to alpine regions, support a wide variety of plants and animals, as does the area near the New Mexico-Arizona-Mexico borders and Utah, with its deserts, canyons, and alpine peaks (Wilkinson and Rounds, 1998b; US EPA, 1998a and b).

Development has taken its toll on the natural ecosystems of the region. Dams and reservoirs have altered free-flowing streams, numerous plant and animal species have been eliminated or reduced to low numbers, and agriculture and ranching have transformed lowland ecosystems. By some estimates, 90% of California's wetlands have disappeared (Wilkinson and Rounds, 1998b). All of this alteration has made natural ecosystems vulnerable to invasion by hundreds of non-native species.

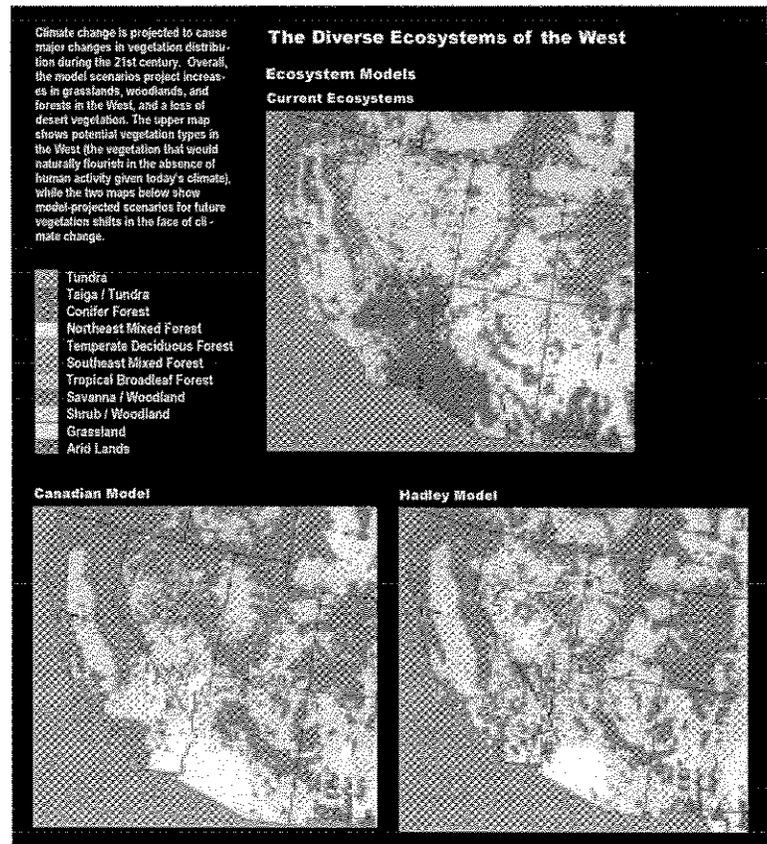


Figure 8: Currently the West has a large diversity of ecosystems. Under the two climate change scenarios, the area in arid and grassland ecosystems would decrease and the area in forest ecosystems would increase. See Color Plate Appendix.

California contains more threatened and endangered species (257) than any of the other lower-48 states (US Fish and Wildlife Service, 1999) and is second highest in rate of species extinction (The Nature Conservancy, 1999). Myers et al. (2000) consider the California Floristic Province as one of the 25 "hotspots" in the world that have exceptional diversity of species and are experiencing exceptional loss of habitat.

The rise in population has resulted in more urban development and development into wooded areas which among other things has exposed human settlements to wildfires (see box on fires). Fire is a natural part of the ecology of the West. However, fire suppression has resulted in an unnatural increase in the density of vegetation, thereby making the landscape more susceptible to severe fires. In addition, some invasive species, such as cheatgrass, have increased fire frequency, while species such as star thistle and *Tamarix* have reduced water supplies and increased flooding (Chapin et al., 2000).

Vegetation

Under both the Canadian and Hadley climate scenarios, using the VEMAP biogeography and biochemistry models, biomass is projected to increase and vegetation to shift from deserts and grasslands to woodlands and forests in many parts of the region. Forests are projected to expand in California, Utah, and Colorado, mostly in the mountains. Nevada,

northern Arizona, and western New Mexico are projected to see a shift toward shrub woodland and savanna woodland, while southwestern Arizona and southeastern California are projected to shift from arid lands to grasslands (see Chapter 2: Vegetation and Biogeochemical Scenarios: Future Vegetation). Across the West, a wetter climate is likely to increase forest productivity, including shifting some conifer forests to broadleaf forests, although there could still

Fire in the West

The rise in population in the West has resulted in more development into wooded areas and increased exposure to fire risk, which was already high (see Figure 9). For example, there were major fires in recent years in urban areas, including Oakland, Santa Barbara, Malibu, and Los Alamos. The Oakland fire destroyed or damaged about six thousand structures. In addition, fire suppression, which has resulted in dense growth and invasion of non-native species such as cheat grass, have made many Western forests more vulnerable to major fires. Continued development into forested areas, along with continued suppression of fires and spread of non-native species, is likely to increase risks of severe fires.

Studies suggest there is a good chance that climate change will increase the risk of fire frequency, whether precipitation increases or decreases in the region. Lower precipitation renders montane forests more fire-prone. These forests are already at risk because of the massive fuel buildup and predisposition to uncontrollable crown fires. Torn et al. (1998) found that warmer and drier conditions could lead to a "dramatic" increase in land area burned and potentially catastrophic fires in California. Higher precipitation increases the fuel loads of sparse vegetation in arid areas. If interannual variability of precipitation does not decrease, wet periods will be followed by dry periods and there is a good chance fires would increase. Modeling with a dynamic global vegetation model (MC1) found that fires across the West could increase under such conditions. As temperatures continue to rise, so would evapotranspiration, which can lead to more drying and more fires (Neilson and Drapek, 1998). Under the Hadley and Canadian scenarios, the fire severity rating in the West increases 10%.

Increased fire could reduce the indigenous vegetation in some cases and promote conversion to nonnative weeds. More fire could degrade water quality because of increased runoff of sediments. Fires also add to air pollution. Should fire increase, there could be increased risks for human settlements within or close to forests and grasslands.



Figure 9: Relative fire severity across the United States in July, 1994. All of the states with high fire severity were in the West. Source: Liverman, 1998. (see <http://udallcenter.arizona.edu/publications/pdfs/swclimareport-final.pdf>, page 22.)

The risk of fire in urban areas and in heavily forested areas could be reduced through a number of measures. Restrictions can be placed on development in fire-prone areas. Building and landscape design criteria have been developed for fire-prone areas. Construction with nonflammable materials and installation of "firescape" landscape designs are also being used in high-risk areas. Controlled burns may also need to be used as part of a vegetation management strategy in urban areas. Many of these adaptations have been implemented in response to urban fires such as those in Oakland. Fires in natural areas should not be suppressed to the degree that a large amount of fuel buildup is allowed. These adaptations should be implemented in anticipation of climate change.

be a net increase in conifer forest cover (Neilson and Drapek, 1998). The higher temperatures, however, are likely to result in many alpine areas virtually disappearing from the West and being replaced by temperate forests (see Chapter 2: Vegetation and Biogeochemical Scenarios). Note that the projected changes do not show steady increases in biomass in all places at all times. Under the Hadley model, vegetation productivity declines in New Mexico and Arizona by the 2030s. One model result shows that in Colorado, forests first decrease in area by 2030, but expand by 2095 to cover an area larger than today.

There are a number of reasons for caution about these projections. First the CO₂ fertilization effect on plant growth and water use efficiency may not be as positive as assumed in the models (Walker and Steffen, 1997). Under the Canadian model, assuming no CO₂ fertilization effect, biomass is projected to decline in some parts of the West (Aber et al., 2001). Modeling conducted for this Assessment and other studies discussed in the box on fire show an increased risk of fire in the West. Climate change could also make conditions more favorable for pest outbreaks and introduction and spread of invasive alien species (Dale et al., 2001). Should high levels of air pollution continue and wind storms increase, these would be additional stresses on forests. It is also uncertain whether transitions from one type of ecosystem to another would be smooth or involve disruptions.

Furthermore, as climate continues to change, the CO₂ fertilization effect (which increases growth and water use efficiency) becomes saturated and declines, and higher temperatures would impose more moisture stress on vegetation.

If conditions become drier, productivity of vegetation is likely to decrease (Neilson and Drapek, 1998). There could be a shift from forests, woodlands, and shrublands, to grasslands and deserts.

Biodiversity

As noted above, development has resulted in fragmentation of habitats, creation of barriers to migration, such as urban areas and dams, and introduction of invasive species. This, in combination with the complex topography and varied climate of the region, is likely to make it difficult for many species to adapt to climate change through migration. It is also likely that development would favor the spread of invasive and non-indigenous species because invasive species are generally better suited to chang-

ing conditions. Without development, the adverse impacts of climate change on biodiversity would likely be substantially reduced.

While the mountains of the West can serve as barrier to species migration, they also provide higher altitude and northern routes for migration as well as many microclimates that can create refugia for some species. But, migration upslope also means migrating to smaller and smaller areas of habitat, which would only support smaller and smaller populations. As climate change continues, species migrating upslope are very likely to be threatened as their habitats figuratively disappear off the tops of mountains.

The faster the rate of climate change, the greater the stress will be on many species and populations.

Terrestrial Species

Hansen et al. (2001) found there is a slight chance that Quaking Aspen and Engelman Spruce will not survive under projected climate change (however, this study did not account for the positive effects of CO₂ fertilization). Interestingly, paper birch is projected to expand southward in the Rocky Mountains. Hansen et al. (2001) also found that animal populations could change. It is possible that higher temperatures lead to a decrease in bird and mammal populations that are currently found in the region because they cannot tolerate higher temperatures. It is possible that higher temperatures could increase reptiles and amphibians in the southern Rocky Mountains because of their greater tolerance for heat.

Murphy and Weiss (1992) projected that a 5°F (3°C) warming would result in a substantial reduction in the area of the Great Basin suitable for boreal species. They estimated that plant species would be reduced from 305 to 254, four of nine mammals would be lost, and 23 to 30% of butterflies living in boreal areas in the Great Basin would become extinct. On the other hand, there is some chance that higher temperatures would enable some southwestern desert plants to invade the Great Basin (Neilson and Drapek, 1998), although such a large-scale change could take thousands of years to be realized.⁷

⁷In warm periods in the past, some species migrated to new locations, while others remained in the same general location (Tausch et al., 1995).

Observed Shift in Range of Edith's Checkerspot Butterfly: 1900 to 1990s

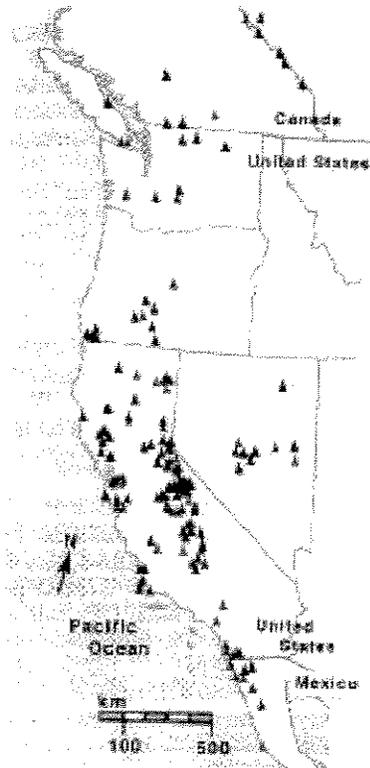


Figure 10: On this map of studied sites, the lighter triangles represent extinct populations of Edith's Checkerspot butterfly, while the darker triangles represent present populations. The mean location of populations of this butterfly has shifted northward by 57 miles (92 kilometers) and upward in altitude by 407 feet (124 meters) since 1900. This is an indication that climate change is already having an effect on the some species ranges. Source: Parmesan, 1996. See Color Plate Appendix.

Aquatic Species

Aquatic and riparian ecosystems in the West are also vulnerable to changing precipitation and runoff regimes. Wetlands may have some resiliency to climate change because they currently cope with highly variable climate conditions (Grimm et al., 1997). While wetter conditions are likely to alleviate some existing stresses, higher temperatures are likely to exceed the thermal tolerances of many fish species and lead to increased fragmentation of many cold water fish habitats particularly in mountains (Meyer et al., 1999). It is probable that some alpine and cold water fish species will not survive in the region (Grimm et al., 1997). In addition, higher temperatures are likely to allow for invasions by non-native fish species (Wagner and Barron, 1998). It is also possible that higher water temperatures would be a problem for salmonid populations, since these fish are near the southern end of their range now in

California and show signs of stress in the warmer years (Wilkinson and Rounds, 1998a). Drier conditions are likely to result in the loss of many small water bodies and aquatic ecosystems (Grimm et al., 1997).

In addition, the change in seasonality of runoff is likely to have adverse effects on many species. It is difficult to anticipate exactly how these changes in flow magnitude and timing would affect particular species or flow-dependent habitats. However, some general predictions can be made based on knowledge of species life history strategies in relation to hydrology. In general, climate-related hydrologic changes are very likely to favor some species more than others, resulting in decreased species diversity and altered composition of native biological communities. For example, it is possible that alterations to the timing and magnitude of spring flows will favor non-native riparian plants that would otherwise be suppressed by high runoff in spring (Kattelman and Embury, 1996). Modified flow regimes are also very likely to affect populations of native fish species. For example, the distribution and abundance of the four seasonal runs of chinook salmon native to the Sacramento River drainage that are already in jeopardy are likely to be further altered by seasonal changes in the availability of spawning flows (Yoshiyama et al., 1996).

Observed Effects on Species

The effects of climate change on species are already being observed. Parmesan (1996) found that the mean location of populations of Edith's Checkerspot butterfly shifted northward and upward in elevation since the beginning of the century (Figure 10). She found that the southern boundary moved northward but was unable to determine if the northern boundary moved further northward (Camille Parmesan, University of Texas, personal communication.) These butterflies do not migrate; in fact, it is their relatively sedentary nature that makes them a good choice for tracking long term trends in wildlife range shifts in response to climatic warming. A range shift northward is a process which takes decades. In theory, as climate change makes the most southern regions less suitable and the far northern regions more suitable, populations at the southern end of the range go extinct while new populations are established northward of the previous boundary. However fragmentation of habitat and barriers to migration are likely to impede northward migration of many species, resulting in decreases in their total range.

Sagarin et al.(1999) found that in the past 50 years, the southern invertebrates have become more common and northern invertebrates have become less common in the rocky intertidal community in Pacific Grove, California. Both of these changes appear to be the result of higher temperatures.

Adaptation Options

A number of steps could be taken to at least help reduce some of the pressures of development on ecosystems and biodiversity and even anticipate the need for species to migrate in response to climate change. Urban development could be managed to better protect riparian areas and reduce habitat fragmentation. There could be concerted efforts to link habitats and even create migration corridors for species to migrate northward or upslope in response to climate change. The current trend toward reduced land for agriculture could present some opportunities if abandoned lands are used for habitat. Reducing offstream water use will also help improve aquatic habitats. These measures would need to be implemented in anticipation of climate change. It is not clear how effective many of these measures, particularly migration corridors, would be in averting negative effects of a warmer and wetter climate on natural systems. In addition, implementing these measures may be challenging, while continued urban and suburban development could result in increased stress on ecosystems and species diversity.

Relative Share of Crop and Livestock Output in the West.

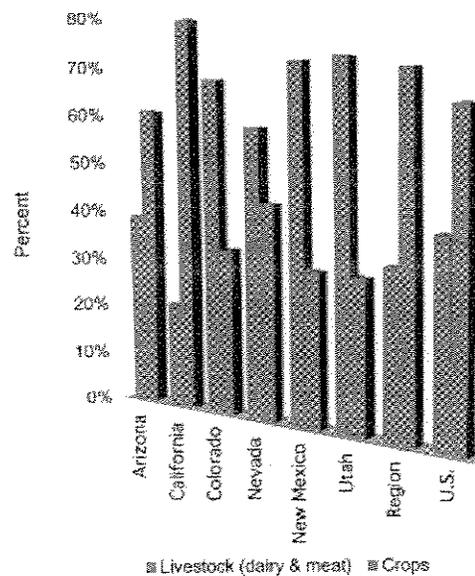


Figure 11: For most of the states in the West, the majority of value-added agriculture production comes from livestock and dairy production. However, because California's agricultural production is dominated by crops (75% of total agricultural output for the state), and because California dominates regional agricultural output (84% of regional crop production, 51% of regional livestock and dairy production), the majority of the region's total agricultural production comes from crops. This difference between the dominant types of agricultural production on a state level and on a regional level highlights the heterogeneity of agriculture in the West. Source: USDA Economic Research Service State Farm Sector Value-Added Data; (<http://www.econ.ag.gov/briefing/fbe/fil/fivadmu.htm>). August 30, 1999. See Color Plate Appendix.

Table 2. Relative Share of Crop and Livestock Output in the West

State	Output	Percentage of Combined Crop and Animal Output
Arizona	Crop	60.94%
	Livestock and Dairy	39.06%
California	Crop	79.02%
	Livestock and Dairy	20.98%
Colorado	Crop	33.14%
	Livestock and Dairy	66.86%
Nevada	Crop	42.66%
	Livestock and Dairy	57.34%
New Mexico	Crop	30.22%
	Livestock and Dairy	39.78%
Utah	Crop	29.75%
	Livestock and Dairy	70.25%
Region	Crop	67.74%
	Livestock and Dairy	32.26%

3. Agriculture

The total value of crop and livestock production in the West in 1997 was \$32 billion (US BEA, 1999a; see Figure 11). About two-thirds of the value of western agriculture is from crops, with the rest from livestock (Figure 11 and Table 2). Fruits, tree nuts, and vegetables comprise about two-thirds of the value of crop production, while seven-eighths of livestock production is from meat animals and dairy products. The West produces 17% of the nation's agricultural output, but three-fifths of the country's fruits and tree nuts, almost half of the vegetables, and almost one-quarter of the dairy products.

Higher CO₂ concentrations are likely to help increase crop yields and decrease water demand, although higher temperatures are also likely to hasten phenological development of crops (resulting in reduced yields) and increase demand for water. Higher precipitation can increase yields but can also cause flooding and waterlogging of crops. The net effect on yield will depend on relative changes in CO₂ concentrations, temperature, and precipitation.

Milder winter temperatures are likely to lengthen the growing season and result in a northward shift of where some crops are planted, assuming the land and infrastructure are available for such geographic shifts. In addition, there is some chance that frost-sensitive plants once grown primarily in areas such as the Imperial Valley of California will be grown in the state's Central Valley.

Conversely, it is possible that crops that prefer cold winters such as winter wheat and potatoes could be limited to more northern areas (although other wheat varieties could be grown). It is very likely to be more difficult to relocate perennial crops such as vineyards, fruits and nuts, than to relocate annual crops, because perennials can take many years to decades to get established. In addition, warmer temperatures can inhibit growth of certain fruit and nut crops that require chilling during the winter. It is also possible that warmer temperatures will increase heat stress, weeds, pests, and pathogens that affect plants, animals, and farm workers.

Changes in the seasonality of precipitation could cause some problems. There is some chance that vineyards, for example, could experience losses if rains increase near harvest time — unseasonable

rain can cause molds, ruining the grapes. Higher air temperatures and humidity can increase risk of diseases that can harm vineyards. However, higher temperatures in the Sonoma and Napa Valleys since 1951, which is mainly the result of nighttime warming, improved the quality and yield of wines (Nemani et al., 2001). Cotton yields can also be reduced by rain at critical stages of growth.

Should the climate become hotter and drier, agriculture would be at particular risk. It is probable that the amount of water available for irrigation will be reduced substantially (Hurd et al., 1999b). Thus, agriculture could be squeezed between an increased need for water and less available water. If additional irrigation water is applied, there would be increased salinity in soils and rivers. Rural communities would be sensitive to declines in agriculture or ranching.

Estimated changes in irrigated crop yields using scenarios derived from the Hadley and Canadian climate models in the 2030s and 2090s for the "Pacific" and "Mountain" regions are displayed in Table 3. The Pacific region includes California, Oregon, and Washington, and the Mountain region contains all of the Rocky Mountain states. The 2030 results assume a CO₂ concentration of 445 parts per million (ppm), and the 2095 results assume CO₂ levels of 660 ppm (Francesco Tubiello, Goddard Institute for Space Studies, personal communication, 1999). The specific numerical results should be treated with caution since they include states outside the West as it is defined here and include optimistic assumptions about the CO₂ fertilization effect while not considering other effects such as pests and disease. The results show increases in yields for many crops, but decreases for some crops such as tomatoes in the Pacific and hard red spring wheat in the mountain states. Although not shown, the results tend to show small changes in demand for irrigation water for the major western crops, but in a few cases, significant decreases in demand. Crop production in the Pacific and Mountain states is projected to increase (see Chapter 13: Agriculture).

Adaptation Options

One strategy to adapt to the effects of climate change is to maintain and increase the diversity of crop types and varieties, because diversity increases the likelihood of having some crops that fare well under variable climate conditions. For example, in California, the artichoke crop was good in 1998, but the orange crop was devastated by freezing conditions. Farmers may also plant low-chill varieties of certain tree crops in anticipation of higher average temperatures. This adaptation is already under way

Table 3: Estimated Changes in Crop Production in the West

Estimated Percent Changes in Dryland Crop Production for the Mountain Region from the Canadian and Hadley Models (%)

Crop	2030s		2090s	
	Canadian	Hadley	Canadian	Hadley
Cotton	4.86	16.73	50.41	38.55
Hard Red Spring Wheat	12.92	16.90	-10.54	27.47
Hay	9.57	11.14	16.77	30.50
Tomatoes (processed)	21.92	23.59	-22.99	35.19
Oranges (processed)	66.90	69.90	114.60	111.60
Pasture	20.90	19.50	51.49	49.27

Estimated Percent Changes in Irrigated Crop Production for the Mountain Region from the Canadian and Hadley Models (%)

Crop	2030s		2090s	
	Canadian	Hadley	Canadian	Hadley
Cotton	74.22	92.11	188.24	170.36
Hard Red Spring Wheat	-16.98	-1.22	-29.62	-1.41
Hay	17.29	30.58	16.32	33.00
Tomatoes (processed)	21.92	23.59	-22.99	35.19
Oranges (processed)	66.90	69.90	114.60	111.60

Estimated Percent Changes in Dryland Crop Production for the Pacific Region from the Canadian and Hadley Models (%)

Crop	2030s		2090s	
	Canadian	Hadley	Canadian	Hadley
Cotton	6.58	22.63	68.22	52.17
Hard Red Spring Wheat	16.25	65.75	137.90	131.10
Rice	6.49	6.27	1.76	5.77
Hay	26.76	28.38	62.24	50.29
Tomatoes (processed)	-19.95	-9.14	-7.62	-19.54
Oranges (processed)	36.87	42.77	77.90	73.03
Pasture	47.53	58.83	102.12	92.55

Estimated Percent Changes in Irrigated Crop Production for the Pacific Region from the Canadian and Hadley Models (%)

Crop	2030s		2090s	
	Canadian	Hadley	Canadian	Hadley
Cotton	41.66	51.70	105.66	95.62
Hard Red Spring Wheat	0.25	4.60	4.80	11.75
Rice	6.49	6.27	1.76	5.77
Hay	38.26	61.06	52.94	70.33
Tomatoes (processed)	-19.95	-9.14	-7.62	-19.54
Oranges (processed)	36.87	42.77	77.90	73.03

and can be enhanced in response to climate change. Breeding crops better suited to take advantage of higher CO₂ levels and more heat may also make sense.

Development of drought- and heat-resistant crops will help reduce the vulnerability of the agriculture sector. Bioengineering could be helpful in this regard, but this is a complicated issue with advantages and disadvantages.

There is substantial potential to reduce current and future water use through less water demanding technologies and better water management practices. Agriculture could switch from high water use crops such as irrigated pasture, alfalfa, cotton, and rice, to less water demanding crops such as soybeans, wheat, barley, corn for grain, and sorghum (USDA, 1997; Gleick et al., 1995). Water-intensive crops grown in desert areas could possibly become uneconomic if water prices increase. More efficient irrigation technologies such as sprinklers or drip irrigation can reduce water demand. Crops may need to be planted earlier to take better advantage of earlier runoff (higher temperatures may also favor earlier planting of crops).

4. Ranching

Ranching is quite sensitive to climate variability. The cattle industry in Arizona reduced herd size by about 80,000 head during the 1994 to 1996 drought, but an increase in precipitation in New Mexico in the same period resulted in an increase of 100,000 head of cattle (McClaren and Patterson, 1998).

It is possible that an increase in temperature and precipitation could have the benefit of increasing forage production in many locations, and lengthening the growing and grazing season on native rangelands. Moreover, increased water supplies and longer growing seasons would make it possible to harvest more alfalfa crops per year (now typically two to three), increase hay supplies, and reduce prices.

A warmer and wetter climate can pose problems for dairy cattle. There is some chance that flooding could wash out holding ponds. If winters become wetter, it is possible dairy cattle will suffer. In the Chino, California area, which produces 25% of the state's milk, some 6,500 head of cattle died during El Niño conditions in February 1998. Cows and calves became mired in mud and weakened by the cold, succumbing to bacterial infec-

tions that breed in the muck. However, should conditions become generally wetter, it is likely vegetation will get more dense, which may reduce winter mud.

Ranching is extremely vulnerable to drought (Liverman, 1998) and should the climate become drier, vegetation productivity, water supplies, and the carrying capacity of land and, hence, livestock production, would be reduced. In addition, higher temperatures can increase livestock diseases and calving problems (Wagner and Baron 1998). The economic impact would be felt most strongly in the rural and intermountain areas.

Adaptation Options

Stakeholders identified improvement in weather forecasting to be the most important adaptation for ranching. The timing of cattle sales and breeding, and the range of management strategies that ranchers employ, depend on knowledge of anticipated and observed range conditions and long-term water availability. Consideration may be given to raising different species or breeds more suitable for hotter conditions (Wagner and Barron, 1998).

Management practices should be adjusted to changes in conditions to reduce stress on ecosystems when appropriate.

5. Coastal Resources

Although a large portion of California's coast is made up of cliffs, many of the state's most populous coastal areas are vulnerable to sea-level rise, including the San Francisco Bay area and the coast south of Santa Barbara. If no protective measures are taken, sea-level rise will inundate hundreds of square miles of low-lying land in California (Gleick, 1988). Unless protected, coastal structures from harbors to houses could succumb to the ocean, as numerous California beachfront homes did in February 1998. Also, beaches will be flooded unless defensive actions are taken. Agricultural lands in the Sacramento-San Joaquin delta, some already as much as 25 feet below sea level, are threatened with inundation. As the ocean encroaches, some aquifers near the coast will become contaminated by saltwater intrusion. Rising sea level could inundate many coastal wetlands and unprotected development (see Figure 12). Should sea walls be used to protect coastal areas downslope, wetlands are likely to be blocked from migrating inland with the sea and could thus be lost.

A study of the costs of protecting the margins of San Francisco Bay from a 3.3-foot (1-meter) sea-level

⁸Gleick and Maurer (1990) also noted that many costs were not, or could not be, quantified.

rise concluded that more than \$1 billion (1990\$) would be needed for new or upgraded levees to protect existing industrial and commercial developments, with an additional annual maintenance cost exceeding \$100 million (Gleick and Maurer, 1990).⁸

Adaptations Options

Strategies for protecting developed coastal areas include defending with engineered fortifications any assets of high economic value such as cities, airports, ports, and delta levees (for water supply security); relocating vital assets to higher ground (or engineering alternative solutions); and, for less economically valued areas of the developed coast (housing on coastal bluffs), retreating. Building coastal defenses can block inland migration of wetlands and result in loss of beaches. Advance planning can prevent new developments from being built in areas likely to be at risk in the future. Avoiding new construction is likely to prove far less costly than trying to protect such development in the future. For new development of any kind, local government agencies such as the Coastal Commission could be authorized to consider "risk of harm" from impacts of climate change. After consideration of risk of harm, developments would be approved only with no assured warranty of safety or loss, and private insurance would underwrite the risk or self-insurance would bear any costs or losses.

6. Tourism and Recreation

The spectacular scenery, favorable climate, and large amounts of public land, especially in national parks, have made the West a major destination for tourists from around the world. Billions of dollars have been invested in ski resorts in all of the region's states, with Colorado, Utah, and California having particularly extensive facilities which attract many visitors. Tourist expenditures in the West are growing. Hotels, lodging, amusement, and recreation provided \$32 billion in revenues in 1996 and are projected to provide \$52 billion in 2045 (US BEA, 1999a).

Since the tourism industry in the West is so strongly outdoors oriented, it is particularly sensitive to climate. The period for winter activities is likely to shrink, while the period for summer activities is likely to increase. Natural vegetation provides part of the aesthetic attraction, and significant climate-change effects on western ecosystems are very likely to change the distribution and abundance of vegetation and animals. Much of the attraction for tourists is associated with water: its inherent aesthetic appeal, and the growing water-related sports

of fishing, whitewater rafting, kayaking, and canoeing. Some of this recreation is on the many artificial lakes such as Lake Powell and Lake Mead. Increases in runoff could possibly enhance these sports while decreases could possibly reduce their attractiveness.

The skiing industry is at particular risk from higher temperatures. With rising temperatures, snowpack seasons are very likely to shorten. Moreover, snow-

Current and Projected Wetlands in South San Francisco Bay

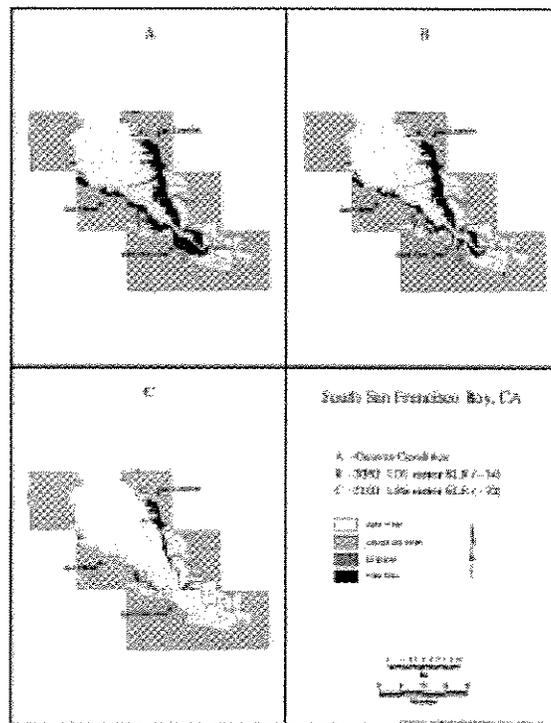


Figure 12: This figure shows the spatial extent and distribution of current and projected wetland habitat types in southern San Francisco Bay (derived from US Fish and Wildlife, National Wetlands Inventory data) following sea-level rise as calculated using the Sea Level Affecting Marshes Model (SLAMM4) (Galbraith et al., in prep.). The sea-level rise scenarios use historic rates that include local subsidence (obtained from tide gages at or close to each of the sites), superimposed on the median estimate of the likely rate of sea-level change due to climate change (Titus and Narayanan, 1996). The historic rate of sea-level rise in the southern part of San Francisco Bay is estimated to be 3.0 feet (0.9 meter) by 2050 and 5.3 feet (1.6 meter) by 2100. This could be due to tectonic movements resulting in land subsidence and/or crustal subsidence due to the depletion of subterranean aquifers. When combined with the projected median estimate of 13.4 inches (34 cm) eustatic (global) sea-level rise by 2100 from climate change, sea-level rise is estimated to be 3.3 feet (1.0 meter) by 2050 and 6.1 feet (1.9 meters) by 2100. The numbers shown in parenthesis on the figure indicate that approximately 57.7% of tidal flat habitat will be lost by 2050 and 62.1% by 2100, compared to the current condition. Using only the historic rate of local sea level rise, approximately 58.9% (2050) and 61.1% (2100) of tidal flat habitat. See Color Plate Appendix.

line elevations will rise. Lower-elevation and more southern ski areas are likely to be at greatest risk.

On the other hand, rising temperatures are likely to result in a longer summer season for warm weather recreation activities. Backpacking, biking, mountain climbing, and rock climbing have been growing in popularity. For example, the number of backpackers in the Canyonlands of Utah rose sevenfold from the early 1970s to the mid-1990s (Riebsame, 1997). But there is some chance that increased precipitation could decrease the number of days desirable for summer recreation activities. Whether warmer and wetter conditions would result in a net increase or decrease in summer recreation is unclear.

Adaptations Options

Adaptations for tourism and recreation generally involve diversification of income sources. The larger, better-capitalized resorts such as Aspen and Vail have already adapted their facilities to serve as summer destination resorts with a range of warm-season recreational activities, conference facilities, and music and dance programs; those with private land have extensive, high-priced real estate development. The smaller areas may not be sufficiently capitalized or have the private land to achieve these forms of diversification. This strategy can be taken in response to climate change and can be done in anticipation of climate change only to the extent that current recreation patterns support it.

ADDITIONAL ISSUES

Mining

The mining industry is quite sensitive to climate variability and change because of the importance of water to its production processes, and the fact that environmental laws hold mines liable for the quality of effluent water. Water is needed for the concentration step of processing. In addition, a typical mining operation is required to collect and use or process all precipitation that falls within the limits of the facility or otherwise comes in contact with unnaturally exposed material. There is some chance that increased precipitation can result in more runoff of pollutants, while decreased precipitation could result in reductions in water supplies for processing. The mining industry is likely to adapt to climate variability by relying on short-term forecasts of precipitation in day-to-day operations, interannual forecasts of precipitation for temporary enhancement of water treatment facilities, and long-term climate outlooks to decide on capital improvements in water holding areas, mechanical pumps, and water treatment facilities.

Air Quality

Air quality is a significant problem in many parts of the West. For example, with 17 million inhabitants occupying a basin subject to many temperature inversions, the greater Los Angeles area has a particularly serious problem with ground-level ozone levels and particulate matter. In addition, San Francisco, Las Vegas, Phoenix, Reno, and Salt Lake City have problems meeting federal government standards for ozone levels, and many western cities have particulate matter concentrations close to or exceeding federal standards.

If precursors are not reduced and temperatures increase, it is possible that ozone levels, which are at their peak in the summer, will increase. Higher temperatures increase ozone formation when precursors are available. Should wetter conditions increase biomass, which emits ozone precursors, air quality could further decline. Fine particulate matter concentrations could also increase. This could lead to more health problems. On the other hand, increased El Niño conditions, which would result in more storms and precipitation in the winter, would be likely to reduce levels of winter air pollutants, such as carbon monoxide and particulates. Reducing emissions of air pollutants, which is needed anyway in many Western cities, may be even more necessary because of climate change.

Health Effects

Since the West is generally dry, it is likely to be at lower risk of increase in vector-borne infectious diseases than more humid regions. Should the West become warmer and significantly wetter, there is some chance that there could be an increase in the potential presence of disease vectors. In recent years, wetter conditions contributed to the outbreak of cases of Hantavirus in the region, particularly in the Four Corners area (Engelthaler et al., 1999). It is possible that wetter conditions would increase the potential for a Hantavirus outbreak and other climate sensitive diseases such as plague (Parmenter et al., 1999), assuming other control measures are not taken. But, because of the capability of the public health system, it is unlikely that there will be large outbreaks of infectious diseases in the West. It is more likely that if climate gets warmer and wetter, the potential for small outbreaks from people carrying the diseases from other countries into the region would increase. To keep health risks low, it is critical that the public health system be maintained.

The region currently has lower risk of heat stress mortality than Midwest and Northeastern cities. Kalkstein and Greene, 1997 found in San Francisco

and Los Angeles, winter mortality would decrease, while in Los Angeles summer mortality would increase. The estimated net change in mortality across the nine large western cities studied is close to zero.

ADAPTATION STRATEGIES

For managed systems in the West, there appears to be significant potential to reduce negative consequences of climate change and take advantage of positive impacts. For example, wise water management can reduce the risks from droughts and floods. The potential for adaptation appears to be high in many of the other potentially affected sectors of the economy. And many of the measures mentioned above would have significant benefits regardless of climate change. Clearly though, these adaptations will involve costs, are not necessarily easy to implement, and can result in both winners and losers. The costs and feasibility of these adaptations were not assessed. Should there be sudden or extreme climate changes, it is not clear how effective adaptations would be in ameliorating adverse impacts.

Risks from climate change are likely to be greatest for those affected sectors or subsectors that lack the resources or capacity to adapt. For example, it is uncertain how effective the adaptations discussed above would be in reducing the vulnerability of natural ecosystems and biodiversity to climate change. Reducing current stresses on natural systems may help, but adverse impacts are still likely to occur. Poor or immobile people are likely to bear particular risks from climate change. In addition, activities that are fixed in place, such as national parks and Indian reservations, are at particular risk because they are unable to relocate in response to climate change. The development of adaptation strategies may need to pay particular attention to these types of situations.

Many development trends can increase vulnerability to climate change. But the development of the West also presents many opportunities to prepare for and thereby reduce the risks of climate variability and change in development plans and projects. For example, development can attempt to minimize water use and degradation of water and air quality. Coastal structures can be designed to minimize the risks of sea-level rise and harm to natural ecosystems. Development in flood plains can be reduced. The tourist industry can further diversify into both winter and summer recreation. The public health

system can be maintained and improved. Riparian areas can be protected, fragmentation of ecosystems reduced, and migration corridors developed or maintained. The capability of the poor and immobile to adapt can be enhanced. The effectiveness of these strategies in reducing the risks of climate change has not been assessed.

One strategy that should help virtually all affected sectors is improved forecasting of climate. In particular, improved seasonal and annual forecasting of climate would help water supply managers, farmers, ranchers, miners, health care professionals, and others plan for wet or dry seasons and extreme heat and cold episodes. Improved multidecadal forecasts of climate change would help infrastructure designers, land use planners, and others in identifying future directions of climate change.

CRUCIAL UNKNOWNNS AND RESEARCH NEEDS

Clearly there are many uncertainties about how climate in the West will change and what the impacts of such changes will be, and there are many research needs that should be addressed to help resolve uncertainties. Improved research is a coping strategy itself, and many of the research areas will help improve the effectiveness of adaptations identified above. A number of general research needs cut across all sectors sensitive to climate change:

- Improve climate forecasts for the West: improve predictions of the sign, magnitude, and seasonality of change of important climate variables such as precipitation, and improve the estimation of probabilities.
- Seek a better understanding of the interrelationships between climate impacts and the institutional structures that facilitate or constrain effective action.
- Improve methods for involving the public in research and communicating research results to the public and decision makers.
- Conduct more research on adaptation, specifically to improve understanding of the potential effectiveness, costs, and impediments to adaptations.

Water

- Develop a better understanding of the human and ecological impacts of climate variability and change on water resources, particularly at the local and regional levels.
- Analyze all water resource options, including full

efficiency potential in all sectors, water transfer options, impacts of pricing changes on all sectors (including the impacts of different water price levels on the types of crops grown in different locations).

- Develop methodologies, analytical tools, and design criteria for incorporating increased climatic variability and change into hydraulic design and water resources planning and management.
- Develop effective long-term strategies for conservation.
- Study improvements in flood forecasting and response, improvements in reservoir management, and enhancement of other infrastructure that may be vulnerable to climate impacts.
- Improve understanding of groundwater resources in terms of amounts, locations, water quality, relationship to surface water, and potential for recharge, including effects of climate variability and altered precipitation. Develop an accurate and complete inventory of groundwater, ascertain the rates of use and potential for natural recharge, examine the extent to which it can be recharged by technology, and understand how all of these parameters would be affected by an increase or decrease in precipitation.
- Examine how to effectively transfer knowledge and technology from the research community to the public, particularly with regard to improving long-term planning and developing more realistic supply/demand water budgets.

Agriculture

Many of the research topics that apply to water resources are critical for agriculture. Additional research topics include the following:

- Improve understanding of the effect of climate change on plant yield and health.
- Enhance knowledge of how climate change and variability may affect pest and disease problems.
- Improve understanding of the effects of ENSO on agriculture.
- Examine the impact of climate change on the competitiveness of agriculture with other regions in the US and globally.
- Analyze the institutional obstacles to adaptation to climate change in agriculture (water laws, endangered species, etc.)

Ranching

- Examine how ranchers cope with climate variability and how their experience can be used to enhance their ability to adapt to climate change. Examine the interactions between urban development, climate change, and loss of land for ranching.

- Examine the impact of climate change on the competitiveness of ranching with other regions in the US and globally.

Coastal Issues

- Develop a statewide (California) map identifying the extent of sea-level rise. Certain areas have been mapped using a simple 1-meter demarcation, but the maps have not been based on the best available mapping technology, such as that used by NOAA and NASA.
- Analyze the impacts of sea-level rise and accelerated cliff erosion on buildings, energy, transportation, coastal infrastructure, and other features. The impacts of altered sediment flows along the coast may also have important implications for harbors and navigation.

Ecosystem Management

- Conduct extensive interdisciplinary ecosystem research, monitoring, and modeling in the region to provide an understanding of ecosystem structure and function on which sound land-management practices can be based.
- Improve understanding of CO₂ fertilization on natural ecosystems.
- Improve understanding of the effectiveness of possible adaptations for preserving biodiversity.

Fire

- Improve modeling and predictive capacity to allow fire personnel to deploy resources as needed.
- Link the remote sensing and GIS-based images being used with models to better understand fire risk and the dynamics of fire to increase ground-truthing. Additional work on the dynamics of fire and ecological communities would improve the modeling efforts.

Health

- Improve understanding of the vulnerability of the region to the spread of infectious diseases and heat waves.
- Improve understanding of the relationships between emissions of air pollutants, climate change, and resulting air pollution.

Landscape Processes

- Conduct more research on how climatic change will affect the land surface, in terms of erosion by wind and water, sediment discharge, and landslide potential.

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Global pattern of trends in streamflow and water availability in a changing climate

P. C. D. Milly¹, K. A. Dunne¹ & A. V. Vecchia²

Water availability on the continents is important for human health^{1,2}, economic activity³, ecosystem function⁴ and geophysical processes⁵. Because the saturation vapour pressure of water in air is highly sensitive to temperature, perturbations in the global water cycle are expected to accompany climate warming⁶. Regional patterns of warming-induced changes in surface hydroclimate are complex and less certain than those in temperature, however, with both regional increases and decreases expected in precipitation and runoff. Here we show that an ensemble of 12 climate models exhibits qualitative and statistically significant skill in simulating observed regional patterns of twentieth-century multidecadal changes in streamflow. These models project 10–40% increases in runoff in eastern equatorial Africa, the La Plata basin and high-latitude North America and Eurasia, and 10–30% decreases in runoff in southern Africa, southern Europe, the Middle East and mid-latitude western North America by the year 2050. Such changes in sustainable water availability would have considerable regional-scale consequences for economies as well as ecosystems.

Streamflow is a temporally lagged, spatial integral of runoff over a river basin. Averaged over many years, runoff generally is equal to the difference between precipitation and evapotranspiration and, hence, to the convergence of horizontal atmospheric water flux. From a resource perspective, runoff is a measure of sustainable water availability. However, streamflow can be affected by anthropogenic disturbances, which may generate spurious (that is, nonclimatic) changes; at the spatial scale of basins to be considered here, the most significant of these disturbances is associated with the diversion of water for the irrigation of cropland.

In support of an assessment of forced climate change conducted by the Intergovernmental Panel on Climate Change (IPCC), many climate-modelling centres recently performed '20C3M' simulations of climate with prescribed external forcing (variations in atmospheric composition and solar irradiance) for the late nineteenth century and the whole of the twentieth century. Forcing was not identical across models, but generally included estimated historical variations of radiatively active atmospheric gases and aerosols (including volcanic emissions) and solar irradiance. Control simulations with temporally invariant preindustrial forcing ('PICNTRL') were also performed, as were integrations into the future with an assumed forcing model ('SRESA1B').

The annual runoff fields from a total of 62 runs of the 20C3M experiment on 21 different models (one to nine runs per model) were integrated spatially over 165 river basins with long-term (28–99 years, median 59 years) streamflow measurements (see Methods). Climate-model runoff commonly does not reflect the time lag associated with storage in river basins. Although the missing time lag may not affect computed climates, it can strongly affect the temporal variability of streamflow, which is important for our

analysis. Accordingly, the climate-model basin runoff time series were converted to equivalent streamflow time series by routing them through a model of a linear reservoir in such a way as to match the observed serial correlation (see Methods).

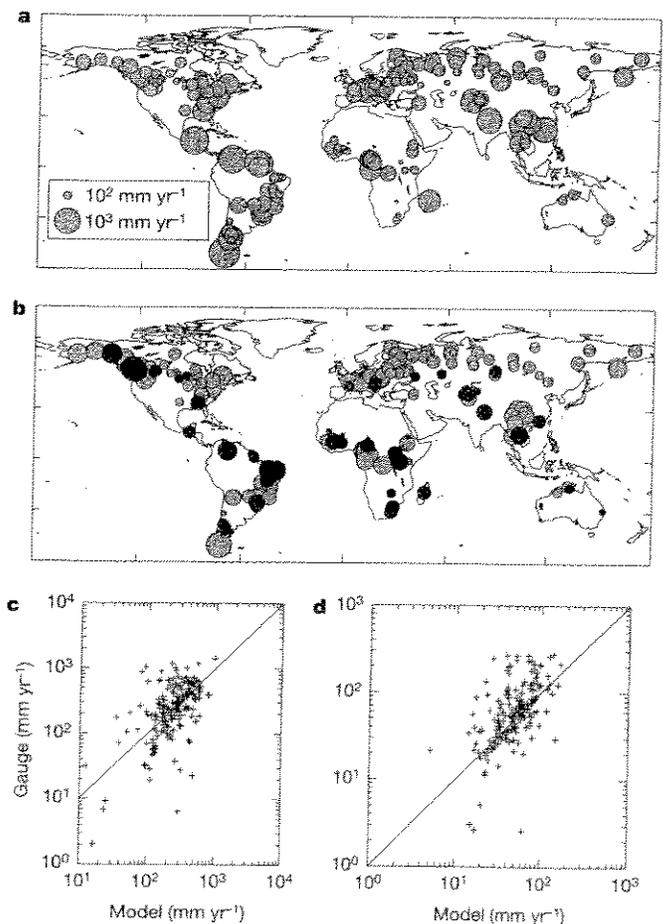


Figure 1 | Annual runoff rate (streamflow per unit basin area, in mm yr^{-1}). **a**, Global distribution of mean values from stream-gauge observations; runoff is proportional to the area of each circle, and each circle is centred at a gauged basin centroid. **b**, Global distribution of ensemble (geometric) means from 35 model runs. Here and in **c** and **d**, gauges with a mean greater than double (smaller than half) the observations are shown in blue (red). (Geometric mean was used because runoff estimates varied greatly across models for a given gauge; results for arithmetic means are similar.) **c**, Observed versus model ensemble means. **d**, Observed versus model ensemble standard deviations.

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To maximize the signal-to-noise ratio in our analysis, we chose to work with an ensemble of models. The realism of hydroclimatic simulations varies across models, so we elected to form the ensemble from a subset of the models, with the selection based on performance. We ranked the models with respect to root-mean-square (r.m.s.) error (over the 165 basins and all runs) of the logarithm of long-term mean discharge per unit area; the logarithmic transform is commonly used in hydrology because flows can range over orders of magnitude. We retained the 12 models (35 runs of 20C3M) with the lowest error for use in the ensemble analyses presented here (see Methods).

The mean and standard deviation of annual streamflows (expressed per unit basin area) for the ensemble model output generally range from about one-half to double the observed values, except in a few regions (Fig. 1). In relation to the observed values, the ensemble model mean values tend to be large in much of Africa, the Nordeste region of South America (northeastern Brazil), and north-west North America, and small in northern low latitudes of the Americas and southern South America. Despite the presence of these large local-scale differences between the model ensemble and observed values, the global-scale relation is strong.

To characterize twentieth-century changes in streamflow at gauges, we used the difference, D , between the average annual streamflows for 1971–98 (based on available sample size m) and

1900–70 (sample size n) (see Methods). Let s and r be the sample standard deviation and lag-1 autocorrelation of the pooled annual streamflow time series. Under the null hypothesis of a stationary climate, the normalized difference, defined as $Z = D / [s(1/m + 1/n)^{1/2} \{ (1+r)/(1-r) \}^{1/2}]$ and henceforth termed the 'trend', is approximately standard-normally distributed⁷. Thus, normalizing D in this way accounts for local differences in record lengths and streamflow variability and persistence. Although Z can be used to measure local significance of change, our objective is not to assess local significance but rather to determine whether the observed Z values for the 165 basins are correlated significantly with the values predicted by the 12-model ensemble. If so, we can conclude that external forcing explains a significant part of global streamflow change for the twentieth century.

The pattern of hydroclimatic change indicated by the ensemble mean of the model trends qualitatively resembles the pattern in the observations (Fig. 2). The observed tendency towards less runoff in sub-Saharan Africa, southern Europe, southernmost South America, southern Australia and western mid-latitude North America generally is seen in the ensemble. The ensemble reproduces the observed increases in runoff in the La Plata basin of southern South America, southeastern through central North America, the southeastern quadrant of Africa, and northern Australia. In northern Eurasia and far northwestern North America, the ensemble shows a strong upward trend of runoff, which is consistent with, though more robust than, a general upward trend in the observations in this zone. (Patterns of change in model precipitation (not shown) are qualitatively similar to those of model runoff, as shown previously for similar experiments⁸.)

Differences between ensemble trends and observed trends are also apparent. Outside the tropics, the observed trends show less coherence in space than the ensemble trends. Consistent disagreement in sign of the trend is most apparent in Central America and northern South America (where a marked bias in average runoff has already been noted), northeastern Europe, and central and southeast Asia.

The correlation between ensemble and observed trends in streamflow across basins is +0.34. The correlations between trends computed from individual models and the observed trends are all positive, ranging from +0.05 to +0.28, with a mean value of +0.16. A linear-regression slope of 1.51 for observed versus ensemble

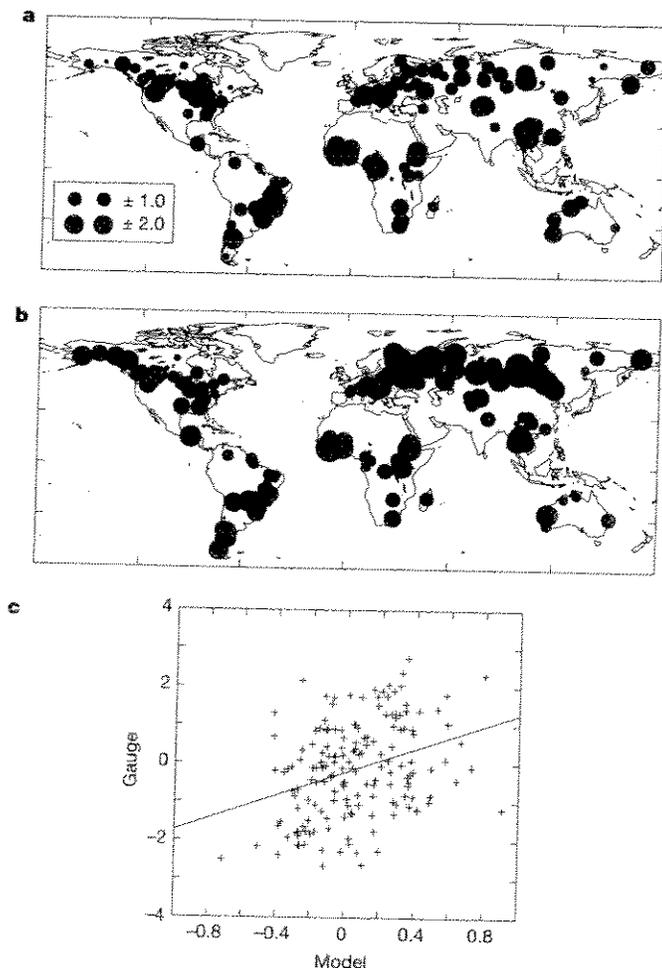


Figure 2 | Global distributions of trend (Z) in streamflow from 1900–70 to 1971–98. a, Stream-gauge observations. b, Ensemble (arithmetic) means of 35 model-run Z values, multiplied by $35^{1/2}$ to account for the reduction in variance caused by averaging. c, Plot of observations against means of 35 model-run Z values. The ordinary least-squares regression line shown has the equation gauge data = $1.51 \times$ (model ensemble) – 0.23.

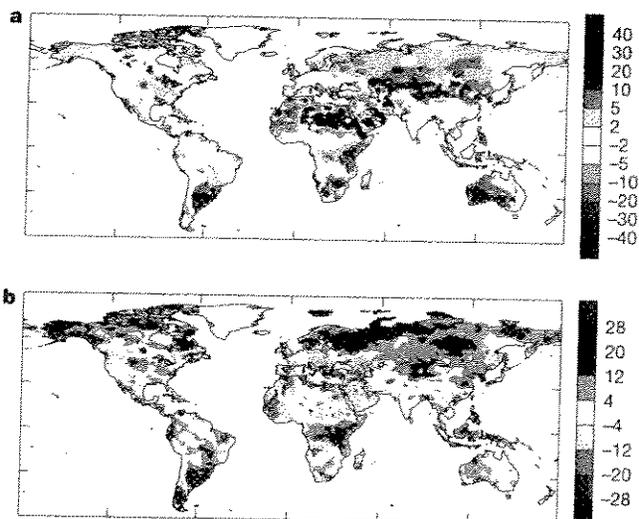


Figure 3 | Relative change in runoff during the twentieth century.

a, Ensemble (arithmetic) mean of relative change (percentage) in runoff for the period 1971–98, computed as 100 times the difference between 1971–98 and 1900–70 runoff in the 20C3M experiments, divided by 1900–70 runoff. b, Number of runs (out of a total of 35) showing a positive change minus the number showing a negative change.

trends indicates that observed trends are larger on average than modelled trends, but not significantly so.

Could the positive correlation between the ensemble and observed trends have arisen, by chance, as a result of internal (that is, unforced, natural) variability in the climate system? To address this question of statistical significance, we needed to estimate the sampling distribution of the correlation coefficient between the ensemble trends and the trends computed from repeated realizations of an unforced climate system. To do this, we formed as many distinct 99-year segments of output from the PICNTRL experiment as were available from the 12 models in the ensemble. This sampling yielded 49 synthetic sets of observations, which were mapped to the period 1900–98, masked to allow the use only of values from years and gauges when and where real observations were made, and then used to compute the trend statistics. We determined the correlation of trends in each of these synthetic observation sets with the ensemble average of those from the 20C3M time series. The 49 correlation values ranged from -0.32 to $+0.33$, with a mean of 0.01 ; the 49 regression slopes ranged from -1.12 to $+1.25$, with a mean of 0.05 . We assume that the 49 correlation values can be used to approximate the distribution from which the value $+0.34$ would have been drawn under the null hypothesis of a stationary hydroclimate. Because none of the 49 values are as large as $+0.34$, we infer that the correlation between the forced-model ensemble trends and the observed trends is statistically significant. This inference relies on the assumption that the models faithfully represent interbasin correlation of internal variations of runoff in the models.

Figures 3 and 4 show twentieth-century and twenty-first-century percentage changes in runoff estimated by the model ensemble, with indications of the degree of agreement among models on the direction of change. The model projections for the twenty-first century are dependent on various assumptions, for example those connected with future greenhouse-gas emissions, volcanic activity and solar variability. Quantitative projections by the model ensemble also are affected by large model errors in some basins (Fig. 1), but the demonstrated retrospective skill suggests qualitative validity of the projections. The ensemble-average change in runoff by the period 2041–60 shows a pattern generally consistent with that of twentieth-century change, although amplified and with important qualitative

differences. In general, areas of increased runoff shrink over time (that is, from the late twentieth century to the mid twenty-first century), whereas areas of decreased runoff grow. Initial increases of runoff in the twentieth century are projected to reverse in the twenty-first century in eastern equatorial South America, southern Africa and the western central plains of North America. Modelled drying of the Mediterranean region extends farther north into Europe in the twenty-first-century runs than in the twentieth-century runs.

Almost all model runs agree on the direction of twenty-first-century change in certain regions (Fig. 4). These agreements include increases (typically 10–40% by 2050) in the high latitudes of North America and Eurasia, in the La Plata basin of South America, in eastern equatorial Africa and in some major islands of the equatorial eastern Pacific Ocean. Prominent regions of agreement on decreasing (typically 10–30%) runoff include southern Europe, the Middle East, mid-latitude western North America, and southern Africa.

On the basis of this analysis, it seems that a significant part of twentieth-century hydroclimatic change was externally forced, that larger changes can be expected in the coming decades, and that climate models can help now to characterize future changes. Henceforth it may be prudent to include projections of forced hydroclimatic change as factors in assessments of water availability, thereby facilitating their consideration not only in water management but also in economic and ecological assessment and planning.

METHODS

From a previously defined set of 663 gauged river basins⁹, we selected the 165 gauges judged most suitable for analysis of hydroclimatic change. To be included, a basin was required to have at least 28 years of data and no more than 10% of values missing during the period of record. To avoid overweighting of relatively gauge-rich Europe and North America in the analyses, only basins with drainage area greater than 50,000 km² were included for those continents. Net diversions for irrigation (diversions minus return flows, estimated as the product of irrigated area in the basin¹⁰ and the excess, if any, of mean potential evaporation¹¹ over mean precipitation¹²) were required to be less than 10% of mean flow. Results reported throughout this paper were only slightly sensitive to these subjective numerical constraints on record length, missing values, basin area, and irrigation. The monthly time series of observed discharge were obtained from the Global Runoff Data Centre and averaged to annual values for all analyses reported here. Delineation of the drainage basin associated with each gauge was determined by use of the Simulated Topological Network (STN-30p)¹³.

For year i , the conversion from basin-average model annual runoff $y(i)$ to model streamflow $q(i)$ was given by $q(i) = r q(i-1) + (1-r)y(i)$. For each model and each gauge, the value of r was assigned the difference between the lag-1 autocorrelation of annual values from observed streamflow and the lag-1 autocorrelation of annual model runoff; in the rare cases in which this difference exceeded the largest of all observed values of autocorrelation in the observed discharge (0.90), it was set to the latter value instead. The initial value of q was set equal to the time-average value of y . For comparability, only years with observations were sampled from the models when making comparisons with observations.

The r.m.s. difference between the observed and modelled natural logarithm of discharge ranged from 0.98 to 3.5. Ensembles were formed from the 12 models for which the r.m.s. difference was less than 1.3. In terms of institutional designations used by the Program for Climate Model Diagnosis and Intercomparison (PCMDI), these 12 models are CCSM3, CGCM3.1(T63), ECHAM5/MPI-OM, ECHO-G, FGOALS-g1.0, GFDL-CM2.0, GFDL-CM2.1, GISS-AOM, MIROC3.2(hires), MRI-CGCM2.3.2, UKMO-HadCM3 and UKMO-HadGEM1.

The 1900–98 time range was selected for our analysis because it was the longest for which all models provided output. The choice of 1970 for the break in analyses of change was based partly on our observation from previous model investigations that global-mean measures of hydroclimatic change became noticeable at about this time; additionally, this choice maximized the number of basins with data both before and after the break. We investigated the sensitivity of our results to changes in the break year and found that the results for a 1980 break were similar to those for a 1970 break. A 1960 break generally resulted in smaller (and less significant) trends, and a 1990 break resulted in more variable (and less significant) trends because of the small sampling period thereafter. For break years of 1960, 1970, 1980 and 1990, we found that 12, 0, 0

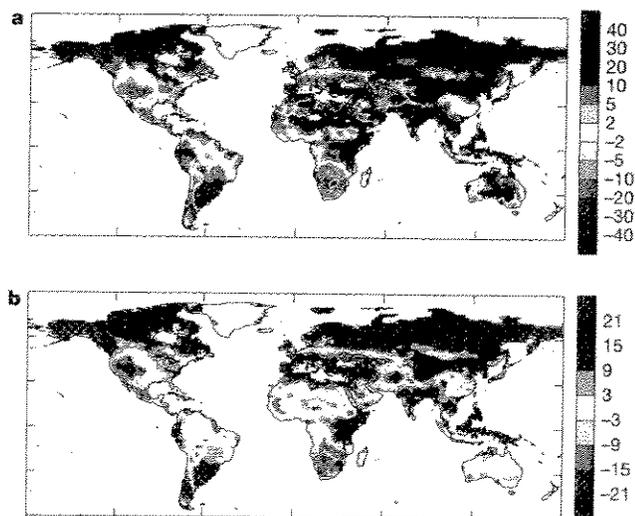


Figure 4 | Relative change in runoff in the twenty-first century. **a**, Ensemble (arithmetic) mean of relative change (percentage) in runoff for the period 2041–60, computed as 100 times the difference between 2041–60 runoff in the SRESA1B experiments and 1900–70 runoff in the 20C3M experiments, divided by 1900–70 runoff. **b**, Number of pairs of runs (out of an available total of 24 pairs) showing a positive change minus the number showing a negative change.

and 5, respectively, of the 49 synthetic observations yielded correlations exceeding those of the real observations. If all 21 models (62 runs of 20C3M and 81 segments of PICNTRL) are used instead of the selected 12 models, the numbers of synthetic observations with correlations exceeding those of the real observations are 20, 6, 1 and 7 (out of 81) when using a break year of 1960, 1970, 1980 and 1990.

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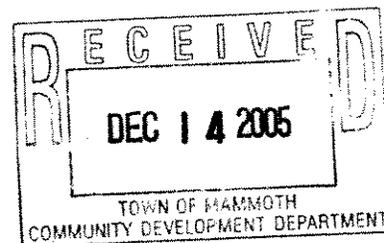
Author Information Reprints and permissions information is available at npg.nature.com/reprintsandpermissions. The authors declare no competing financial interests. Correspondence and requests for materials should be addressed to P.C.D.M. (cmilly@usgs.gov).

Letter 011

Advocates for Mammoth P.O. Box 2005 Mammoth Lakes, CA 93546

December 14, 2005

Sonja Porter
Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546



RE: Response to Draft Program Environmental Impact Report for the General Plan Update

Dear Ms. Porter:

This response represents the comments from Advocates for Mammoth on the DPEIR, including the following overall concerns.

The DPEIR indicates that no feasible mitigation measures have been identified to reduce many of the impacts identified throughout the document. However, there is no quantitative analysis of the four alternatives which would provide decision makers with the complete facts on which to make decisions.

This leads to the misconception that any alternative has the same impacts, which is not correct. Surely, additional policies, implementation measures and mitigations can be considered.

The document is quick to point out significant environmental impacts that can not be mitigated, but there are no analyses or evaluations that explain what mitigations were considered. There is no discussion of why alternative mitigations were rejected that might mitigate these impacts to a level of insignificance or at least significantly reduced impacts. The smaller the project, the easier it will be to mitigate most of the impacts.

An example of where additional steps to mitigate impacts could be taken and might reduce the level of impact to insignificant is Light and Glare. The residents clearly do not want to give up starry skies. Rather, we suggest that the Town toughen the regulations and follow through with enforcement. The following approaches would be practical and achievable options.

- No exceptions for unshielded bulbs (currently 40 watts is acceptable, which unshielded, is like a beacon).
- Complete shielding on fixtures. There is no analysis of the current status and how it should change after March 2006 when commercial and industrial compliance with the lighting ordinance is expected.
- Shield all lights including interior hallways on buildings over 35 feet tall.

- Have a cumulative wattage rule. Current rules allow one thousand 1 watt lights, without an evaluation of the cumulative effect.
- Put time limit on holiday lights.

Other examples of practical mitigations to the impacts ruled significant and unavoidable are.

- Aesthetics – retain the existing height limits rather than have no limit at all.
- Noise – establish and enforce tough laws on outdoor events, diesel engines, and motorcycles, ban trucks on problem streets in residential neighborhoods like Forest Trail, and require sound barriers and or deflectors at venues.
- Air quality – actively enforce no burning days, use Developer Impact Fees to replace wood stoves for residents and in older rental condominiums, switch to geothermal heat, and expand the cinder sweeper program with sufficient water in the equipment so they are really effective.

We would like to suggest, and participate, in a true “give and take” discussion of alternatives and solutions between decision makers that results in an Updated General Plan that allows for a balance between growth, economic stability, and protection of our natural surroundings as is outlined in the Vision Statement. We do not see that any option except “full speed ahead” development has been studied in this DPEIR.

We have also researched the entire document and have found the following specific items which need further analysis and review, by chapter or section. Comments are both general to the element, and also related to specific issues for the element.

Chapter 3 Project Description

1. **Project Location (on page 3-1)** – please include the information that Mammoth Mountain Ski Area is a permittee of Inyo National Forest.
2. **Section 3.2 Existing Land Use Conditions (3-1)** – the second paragraph is misleading in that all soccer, baseball and softball fields are outside the Town Urban Growth Boundary. Also there is no mention of the motocross area. Please show where this is included in the analysis.

Also, the description is limited to the high end accommodations, when most of our visitors are Southern California weekend skiers, campers, hikers and fishermen. Please show where the non-resort parts of our community are analyzed.

Recreational opportunity capacities must be added to this analysis. Promotion of recreational activities has not brought economic stability, since our winter economy is based primarily on snowfall. Please include analysis of more diverse economic stability options, and justification for the primary emphasis on resort activities.

3. **Section 3.4 Purpose of the Plan** – please clarify that there were over 100 attendees at each of the community work shops. Also, please include the results of the modeling/population levels based on land use that were collected at the third workshop, but have never been published. Further, include the comments collected at the fourth workshop that presented, for the first time, what is essentially the current draft of the General Plan Update.
4. **Section 3.7 Land Use Chapter (3-9)** – please show how the first two paragraphs of this section are included in the Land Use section of Chapter 4, as is stated here.
5. **Section 3.7.J Population Density and Intensity (3-14)** – this section must discuss trends and the influence of weather and economic conditions on visitor population. There is no way of knowing if ski area use in the referenced population year is “typical” or not.
6. **Section 3.7.I Key Land Use Policies (3-16)** – we presume that this is a typographical error, and should be 3.7.L. Also, please compare the rate of building for the Updated Plan to the current activity levels in the analysis.

Please also demonstrate where fractional ownership units are considered, included and analyzed in Table 3-4. See also Section 4.9 for additional comments on this concern.

Also, please correct the totals between Tables 3-4 and Table 3-5. Further, please explain how this table demonstrates density and provide the data that supports the assumptions.

7. **Section 3.8 Environmental Sustainability (3-17)** – this is a great summary and tabulation of what the citizens asked for in workshops and hearings, and what GPAG and the Planning Commission seem to be asking for in the General Plan Update.

However, one important item that keeps moving downward in the priorities, until it is hard to find, is preserving large native trees and keeping buildings below the tree line. Please explain how these values can be so summarily dismissed in later sections as impacted and immitigable to achieve some vague and never justified or analyzed economic objective.

Finally, no analysis is given to support the events, facilities, and services needed to enhance resort economy.

8. **Section 3.9 Community Health and Safety (3-19)** – a diverse economy was strongly supported by the community in the work shops, but is essentially neglected in the DPEIR. Please include analysis and justification of this omission.
9. **Section 3.11 Resort Economy (3-30)** – please expand this section to include a discussion of the remaining facets of the economy. Citizens have expressed the desire for a diverse economy. Further, many believe that an economy based wholly on destination resort visitors is not stable, and is strongly affected by economic, political, and weather fluctuations: Also, please analyze how shifting demographics and a constantly changing emphasis on the “sport of the moment” is inherently unstable. The only hope for long term stability is to diversify.
10. **Section 3.15 Updated Plan compared to Existing General Plan (3-23)** – this comparison is not valid. Rather, the population and projected land uses actually envisioned and analyzed in the existing General Plan (48,000 PAOT) must be used in the comparisons to the new plan. Use of some later calculated values using today’s land use and bonus assumptions is not acceptable.

4.1 Aesthetics, Light & Glare:

11. **Inconsistent with General Plan** – the Aesthetics Chapter of the General Plan includes the following policies and implementation measures with potential impacts which are not addressed or analyzed in the DPEIR:
 - area parking districts
 - development of Old Mammoth Road commercial area/definition of the Old Mammoth Commercial Corridor
 - narrower roads in Old Mammoth
 - narrowing roadways for traffic calming
12. **Subjective impacts** – throughout this section, the analysis depends on a statement that aesthetics, light and glare are subjective measures. The General Plan mentions an Implementation and Monitoring Plan will be adopted in conjunction with the General Plan, but no copy is provided for analysis.

Further, the following paragraph appears on page 4-12: “As indicated previously, the standards used to evaluate the significance of impacts...” Please provide the page number for this previous indication, as the entire document has been searched without finding this reference.

13. **Issue 4.1-1 (4-12): Substantial Adverse Effects On Scenic Vistas** – various zoning regulations are the only mitigations listed, without proof that any of these policies would result in less degradation of light pollution. For example, a view corridor study is championed as the way to reduce the impact, without any evidence

of requirements, guidelines, etc. that have been analyzed to reach this conclusion. No substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis.

14. **Issue 4.1-2 (4-15): Substantial Damage To Scenic Resources** – again, various zoning regulations are the only mitigations listed, without proof that any of these policies would result in compliance with the California State regulations for scenic highways. No substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis.
15. **Issue 4.1-3 (4-17): Substantial Degradation to the Existing Visual Character or Quality** – "...due to the permanent change in visual character of newly developed areas of the Town, it is concluded that impacts to the Town's visual character and quality are significant and unavoidable". Provide analysis of the degree of impact based on each of the four plan options cited in Chapter 7. No substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis.
16. **Issue 4.1-4 (4-20): New Source Of Substantial Light Or Glare Which Would Adversely Affect Day Or Nighttime Views** – "Significant and unavoidable adverse impacts on night sky visibility" is not adequately mitigated by the Town Lighting Ordinance. Further, there is no analysis of the cost for enforcement of this ordinance. Show quantitative proof of the efficacy of this implementation measure.

4.2 Air Quality

This analysis does not completely satisfy the requirement of CEQA to disclose to the public the actual impact of the plan in quantitative terms. The analysis contains unsupported assumptions and extrapolations. The claim that emissions will stay the same or be reduced while peak populations increases by about 75% is hardly credible.

CEQA requires comparison of the impact of a project with existing conditions, not conditions many years earlier with fewer and unenforced controls, or conditions hypothesized in some older plan. The courts have held that General Plans are hypothetical. An EIR must compare the actual impacts of a project with existing conditions, and not merely say that the impacts are less than some other plan or previous proposal.

The violation of emissions standards inherent in this plan involves serious public health effects and risk of litigation by those injured as well as state and federal authorities. It also violates the duty of Town government to assure public safety. Besides the injury to citizens, there are direct costs in medical expense and lost work time. Mitigation measures proposed are well intentioned, but for most of them there is no analysis of their actual effectiveness in terms of reducing pollutant concentrations.

1. **Is the Model Still Valid?** - The entire analysis relies on a 15-year-old Air Quality Management Plan and its air quality model. The AQMP was made during a drought period with notoriously low visitation. There is no reason to believe that it is adequate for modern conditions. In particular, the DPEIR says that the model predicted that the PM10 pollution is dominated by wood-burning and road dust, based on measurements made many years ago.

One of the most fundamental principles of science is that a theory that does not agree with experiment is invalid. The air quality model is only a theory, and if it does not agree with measured data, it is wrong. If the mitigations currently in force had been effective, violations of the PM10 standard would not have occurred. We conclude that the mitigation model is invalid. We believe that tailpipe emissions, particularly from diesel machines, may be substantially underestimated.

We ask that this model be revalidated using recent data now that visitation has increased by 50% or more. The analysis should include emissions during a snow clearance day. The AQMP is obsolete and should be revised and reissued before the General Plan Update is approved.

2. **Dilution and Dispersion** - The volume used in the analysis appears to be very large, corresponding to a cube almost 8 km on a side. Yet road dust is generated in a relatively small volume along roadways, and wood smoke is produced mainly in the residential areas of town. What is the maximum concentration of pollutant to which a resident is exposed on a windless day before the pollutants diffuse away?

The PM-10 monitors are located in the Gateway Center, where substantial dilution of pollution created farther to the west can be expected, and so this hardly the worst-case monitoring location. As the AQMP says in its description of the monitoring data, the worst events occurred on weekends when there is both heavy visitor traffic and low winds. As noted above, most of the conclusions were reached in drought years and low visitation seasons. The traffic converges near the Village, with contributions from people driving both to the Main Lodge and Canyon Lodge. Because of the confined space in the Village, we can expect peak pollutant contributions in that area.

For purposes of monitoring wood smoke, monitors should be placed in areas of dense residential concentration, such as along Dorrance Drive and Sierra Nevada Roads. Events occur when winds are low, and by the time pollutants reach the Gateway Center they are substantially diluted. With winds from any direction but southwest pollution from these residential sources is blown away from the Gateway Center.

Not only should there be improved monitoring, the creation and dispersion of pollutants created along traffic paths should be modeled consistent with the traffic

model. In spite of an earlier request, this modeling has not been done.

Monitoring was done only every week day, meaning that there is substantial chance of missing such peak weekends as President's Day, when high pollution events are expected to occur.

There appears to be no reason to conclude that the conditions in the Village area will not exceed the federal PM10 standard almost continually, by a factor of several times, not only at the present time but even more so at the projected high population at build out. No evidence is presented that the proposed mitigations will be sufficient.

3. **Method of Enforcement** - The DPEIR states that emissions will be reduced by limiting vehicle miles traveled, comparing emissions computed with the model to VMT. This approach is circular. The measured emissions must be used.
4. **Vehicle Miles Traveled** - The major mitigation proposed is to limit vehicle miles traveled, but the traffic analysis predicts an increase. Therefore, the General Plan Update violates the AQMP and its obligation to the APCD to enforce its provisions.
5. **What Limitation?** - There is no discussion of just how the miracle of limiting traffic will be accomplished. In fact the traffic analysis does not mention this limitation, but predicts much higher traffic levels. Could one option be that Highway 203 will be closed to motor vehicles except for residents and season pass holders? Please provide details on how the limitation will be accomplished in fact instead of in theory. A mitigation that is not feasible is no mitigation at all. A calculation below shows that substantial mitigation using bus transport is also infeasible.
6. **Use the Actual Peak Day** - Because some emission standards are for the peak conditions, it is invalid to use an "average peak" winter weekend for reference. The actual worst-case peak holiday weekend must be used. This might give results larger by a factor of two or more.
7. **Wood-Burning and Road Dust** - Please clarify whether the stove inventory is for 1990 or the present. The projected growth is only about 17% for the Project Alternative, with many more dwelling units proposed. Please provide an explanation.

There is no reason to assume that road dust is not a problem on wood burning days, or that wood burning is not a problem on road dust days. The worst case occurs when the conditions occur simultaneously. When this happens, the federal standard is exceeded, even with mitigation for the alternative.

These calculations assume 50% compliance on no-burn days. We understand that town surveys have shown much lower compliance, low enough to make emissions exceed standards. Please provide measured, not assumed, evidence of the compliance factor.

The road dust calculations assume zero tailpipe emissions. It is difficult to believe that road dust will be spread by zero-emission vehicles. Please include an updated tailpipe emissions estimate for present-day vehicles including diesels (more on diesels below). The vehicle mix must be characteristic of Mammoth, representing light trucks and SUVs, not low-emission urban cars.

An aggressive program to replace uncertified stoves would be more effective than the present gradual replacement program. There is no evidence showing that permitting the use of pellet stoves will make any substantial difference in emissions. Please provide an analysis of these points.

8. **Road Dust Mitigations** - What will be the actual effect of the proposed mitigations on road dust pollution? Clarify what the plan is. Please include an analysis of whether the diesel street sweepers emit more particulates than they sweep up.
9. **Diesel Machines** - The discussions of the contribution of diesel machines, including buses, is not quantitative. Understanding diesel emissions requires understanding of the snow clearance process.
10. **Snow Clearance Day** - Please analyze another scenario, the peak holiday weekend blizzard scenario, where everyone is trying to get to or from the mountain in stalled traffic with engines idling and with snow clearance vehicles active in the entire town. These vehicles are working hard, not just merely idling on the road, and their emissions and horsepower requirements are determined by the work they must do. There is no analysis of this most important contribution to peak PM10 and PM2.5 emissions.

A single 300 hp wheeled loader produces about 6 kg of PM10 emissions per 24-hour day, and such vehicles do operate day and night in storms. There is a very large fleet of such vehicles in town, operated by the Town itself, the County, Caltrans, Mammoth Mountain, and a number of private contractors. The emissions are again concentrated on roadways. Wood burning occurs at the same time, and traction material is spread simultaneously. Transportation of snow by loader and truck occurs for several days after a storm, typically on maximum road-dust days.

Please provide a quantitative analysis of the emissions under this scenario, and analyze the effect of the mitigation attainable by using lower-emission equipment (including all equipment, not just that owned by the Town). The emissions for such equipment are available from the EPA and others. An inventory of the types, numbers, and sizes of loaders, plows, trucks and other vehicles is required.

11. **Diesel Buses** - Replacing low-emission automobiles with diesel buses may not provide a significant reduction in pollution. To get 6,000 people to the Main Lodge in two hours requires 120 50-passenger busloads, one bus every minute. The buses

will be in stop-and-go traffic and will be idling when loading and unloading. Please provide a quantitative comparison of the emission from buses and cars.

Because the present bus travel replaces a negligible amount of automobile traffic, there is no effective mitigation of vehicle-caused emissions. The calculated emissions appear too low by a factor of two at least, and so the Town needs to replace almost 80,000 vehicle miles per day (half the total). Assuming that each bus makes a 10-mile trip every hour, and is equivalent to perhaps 20 cars, light trucks, or SUVs, some 250 buses are required each 16-hour day. Because there is no room for this many buses, and the cost would be in the tens of millions of dollars plus operation and maintenance, this proposed mitigation is infeasible. The only realistic solution is to adopt an alternative with fewer people in town at one time.

12. **Ozone** - Please provide a quantitative estimate of the cumulative impact of ozone sources envisioned in the General Plan Update, in addition to the ozone transported from the San Joaquin Valley. What will be the effect of mitigation measures adopted in the Valley as a result of recent laws and regulations?
13. **Issue 4.2-1 Conflict with or Obstruction of Applicable Air Quality Plan (4-32)** – The Town's plan is to increase traffic, not to reduce it. This DPEIR expects an increase in vehicle traffic. Mitigation based on a reduction in traffic is inconsistent. Please evaluate the emissions using the traffic predicted for peak winter holiday visitation, not "typical" winter Saturday. Please provide substantial evidence that there is any mitigation that can reduce emission to meet standards.
14. **Issue 4.2-2 Violate Any Air Quality Standard or Contribute Substantially To an Existing or Projected Air Quality Violation (4-36)** – the assertion that tailpipe emissions are not significant is not backed up by substantial evidence. As noted above, the 1990 Ono model is 15 years old and was validated during a severe drought with reduced visitation and snow clearance.
15. **Issue 4.2-3 Result In A Cumulatively Considerable Net Increase Of Any Criteria Pollutant For Which The Project Region Is Non-Attainment Under An Applicable Federal Or State Ambient Air Quality Standard (Including Releasing Emissions Which Exceed Quantitative Thresholds For Ozone Precursors) (4-41)** – Ozone is not discussed in detail, although ozone emission standards are exceeded. Please provide an analysis of ozone emissions. Tables 4.2.2 and 4.2.4 are inconsistent. Table 4.2.2 implies that only stoves and road dust contribute to PM10 emission. Table 4.2.4 shows that vehicle emissions dominate.

No substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis.
16. **Issue 4.2-4 Expose Sensitive Receptors to Substantial Pollutant Concentrations (4-43)** – PM10 and ozone emissions can cause acute respiratory distress. This issue is not treated. Emissions of these pollutants already exceed standards. Please quantify the risk at various locations throughout town. Of

particular concern would be residents within close proximity to all arterials identified in the Transportation & Circulation Section.

No substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis.

17. **Issue 4.2-5 Create Objectionable Odors Affecting a Substantial Number of People (4-44)** – there is no quantitative analysis of the actual impact. Is there a significant impact or not? Particular attention should be paid to odors from diesel vehicles operating up steep grades at 8000 ft or higher.

The Project will rely on an increasing number of buses to limit use of private vehicles, which will most likely be operated by diesel engines. Odors will increase significantly. Please provide information on studies on the effect of altitude on the makeup and toxicity of diesel exhaust. Also, please include data and analysis of the MMSA pilot project to use biodiesel and any related improvements in objectionable odors.

No substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis.

Please note we have asked our attorneys, Shute, Mihaly & Weinberger LLP, to provide a review and comments on the legality of this section. You will receive their comments in a separate letter. We have reviewed their comments and completely concur with their response.

4.3 Biological Resources

1. **Inconsistency with General Plan** – The DPEIR must address the impact of the doubling of the resort population on the surrounding country. A wait and see attitude is not a quantitative analysis. Please provide appropriate data and results of the impacts.
2. **4.3.3 Threshold of Significance (4-73)** – this section includes the statement that under Appendix G of the CEQA Guidelines "...the project would be considered to have a significant impact if the project would interfere with migratory wildlife corridors". The impact on deer migration within the town boundary is very significant.

Page 4-61 # 2. The Mammoth Pass Herd migrates through the Snowcreek Development, Old Mammoth, the Bluffs and the Lakes Basin to Mono Pass which is not "south of the Urban Boundary" as is stated. Mitigation is not less than significant. Deer are throughout town all year, especially on the Golf Courses and in the Snowcreek area. For this issue, the mitigation ought to be to provide open spaces for deer migration, restricted development in migration corridors, no gated communities, and speed limit reduction along town roads.

Policies and Implementation (4-75 & 4-76) need to be modified as noted below:

- I.1.B.d.2 – “Species, habitat and natural community preservation/conservation strategies shall be prepared” - Details of strategies must be listed.
 - I.1.B.d.3 – “2) use of fences, or other barriers and buffer zone” - Eliminate all fences to promote wildlife migration.
 - I.1.B.e.1 – Be specific - what are the “good wildlife habitat management practices” referenced?
 - I.2.A.a.1 – New development is not defined - be more specific.
 - I.1.B.g.3 – Mammoth Creek ...maintain minimum setbacks – how many feet? Be specific.
3. **Issue 4.1-2 (4-15): Substantial Adverse Effect on Species** – this issue states that “The Town has no jurisdiction to implement mitigation beyond its boundaries ...therefore no mitigation measures are recommended. Not so: summer impact with only a small increase in visitors will be very significant. This DPEIR must have a section with an analysis of the impact on the surrounding government owned country, with input from the Forest Service and National Park Service.

The incomplete analysis of Mule Deer in this section is also not adequate. This DPEIR should show the same level of quality in the analysis of the planning area as was presented in the “Upper Basalt Geothermal Exploration Project”, November 2004, Mammoth Pacific, LP. Please provide a complete analysis.

4.4 Geology, Seismicity, Soils, and Mineral Resources

1. **Section 4.4.1.1. Regional Geology (4-89)** – Delete the sentence: “The caldera and other geologic features such as Devil’s Postpile etc.” Devils Postpile, Mammoth Rock, Crystal Crag are not geologically young with an active recent history.
2. **Section 4.4.1.5 Volcanism (4-93)** – Mammoth Mountain is an active volcano and a new eruption can happen at any time – not “the thousands of years” stated. In this region the last volcanic activity occurred 250 years ago and a new eruption in the Inyo-Mono craters is possible at any time. This would mean ash falls in Mammoth and also a fire hazard. Please include an analysis of this hazard.

Further, there is no analysis of the Mammoth Pass and Red Cones area. Long period earthquakes and magma emplacement at this location with possible basaltic magma eruption in the near future should be included. An eruption would mean a fire hazard for the Town.

3. **Issue 4.4-1 Expose People or Structures to Risk (4-104)** – the report includes “Potential impacts to the Town include inundation by ash deposits, lava, or lahars, or complete destruction from catastrophic eruption”...with a level of significance after Mitigation that “No mitigation measures are required.” Further, there is the statement

that impacts regarding ground failure, landslides, and volcanic activity, as well as carbon dioxide from natural sources would be less than significant.

There is no analysis of new development is on steep hillsides, where the weight of large homes could start landslides, or of building in undesirable "wet" areas. Any of these sensitive zones would be impacted by seismic and volcanic activities.

Policies: II.4.C.a.2 Evacuation Routes should include an analysis of keeping the Mammoth Scenic Route to the north open all year, and establishing a new evacuation route on Sherwin Road to Highway 395, also open all year.

4.5 Public Safety & Hazards

1. **Use of Mammoth Creek Park** – the inconsistencies between Flood Hazards in the previous GPU and DPEIR have been removed. In fact, the entire section on Flood Hazards no longer appears in the DPEIR. Please explain the removal of the previously identified impact, and reasons therefore.
2. **Structural Fire Hazards** – No analysis is made of structural fire hazards with the anticipated development characteristics (narrow roadways, closely spaced dwellings and businesses, taller buildings, and lack of escape routes). Further the uncertainty of the water supply, transient visitor use, severe winter weather, and seasonal road conditions that restrict access in the previous DPEIR have been removed. Please provide the analysis and justification for removal of these known problems.
Further, provide a traffic analysis which includes estimates of fire department response times as a function of traffic levels at worst-case holiday traffic peaks.
3. **Evacuation** – The previous discussion of the inability of our transportation and circulation system to handle mass evacuations has been replaced with a list of possible reasons for an evacuation, but no analysis is provided in this version of the DPEIR. The referenced Emergency Operations Plan does not include information or scenarios on using roadways for mass evacuations. Please provide a quantitative analysis of the road capacity and appropriate scenarios.
4. **Issue 4.5-1 Routine Transport, Use Or Disposal Of Hazardous Materials (4-127)** – no specifics are provided on locations in which hazardous materials would be disposed, although land use patterns in the DPEIR would facilitate increased development of light industrial and commercial uses of hazardous materials. No data is provided on current levels of transport in order to determine actual impact. Please identify current and proposed disposal sites, and if appropriate, amend the Public Utilities section if such disposal would be at the Benton Crossing landfill. Or, if the materials are transported out of the area, please identify the transportation corridor and effect on Transportation and Circulation.

Further, there is no discussion of uses within the proposed expansion of the Industrial Park or quantitative analysis of the types of businesses which might be proposed.

5. **Issue 4.5-2 Release of Hazardous Materials into the Environment (4-129)** – no analysis is shown of appropriate sites for businesses in areas removed from and down gradient of sensitive land uses.

No analysis included of the proposed expansion of industrial park as noted in the land use section and public hearings. Also, no data is provided on current sites within Town limits or planning area. Finally, there is only a mention of prior incidents without an analysis of whether Town response in those incidents was adequate.

6. **Issue 4.5-3 Emit/handle Hazardous Materials Within 1/4 Mile of Existing or Proposed School (4-131)** –No substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis.
7. **Issue 4.5-5 Impair Implementation Of Or Physically Interfere With An Adopted Emergency Response Plan Or Emergency Evaluation Plan (4-135)** – No data is provided to indicate any analysis of the capacity of evacuation routes based on increased permanent population or PAOT. Please supply a quantitative analysis.

4.6 Hydrology and Water Quality

1. **Corrections To This Section** – please make the following corrections for inclusion in the analysis:
- 4.6.1.4 – Use 1 acre rather than 43,560 sq. ft.
 - 4.6.1.6 groundwater – same
 - 4.6.1.6 – add the Deeper or Basalt aquifer
 - 4.6.1.8 Groundwater Quality – One supply well, #17, which waters Sierra Star golf course, contains enough arsenic to render it non-potable.
 - The wellhead protection areas around the supply wells should be delineated on a map as well as in the narrative, and results of any testing for compliance with AB 3030 should be presented in the DPEIR.
 - Put north arrows and scales on all maps and show cross-sections on maps and their orientation.
 - Madera County is to the west of Mono County.

4.7 Land Use and Planning

1. **Section 4.7.1.1 Existing Conditions (4-172)** – Most of the Deadman Creek/San Joaquin Area is designated by Forest Service as Roadless, and has potential only for non-motorized recreation uses. Please correct this vague statement.

Since most of planning area land is Inyo National Forest, this section is incomplete without a discussion of this fact. Further, since Devil's Postpile National Monument is in the Planning Area, if it is, it must be included in analyses of traffic, recreation etc.

Please also include a discussion of whether Madera County included in requested review and did Town check for consistency with Madera for consistency with their current and long range plans and factor these into cumulative analysis.

Further, some of the land in the Sherwin Range and along San Joaquin Ridge is either Wilderness or Proposed Wilderness. Please show where impacts on these areas wilderness were analyzed.

Also, there is some Indian Trust Land down along Hot Creek just at planning boundary. Please show where the Bureau of Land Management (trustees of this land) were contacted and included in analyses.

San Joaquin ridge is Northwest of Town not north. The Sherwin Bowl is not a location; it is an aborted ski area proposal that has been eliminated from the General Plan Update. The wording should be "Sherwin Ridge of the Sierra Nevada".

Finally, please show where the Motocross Track has been included in the description and in the analyses. In particular, please address air quality (dust & fumes), noise, traffic, water quality, and cumulative impact.

2. **Table 4.7.1 Comparison of Existing and Proposed Land Use Designations (4-174)** – there is no justification given in the text for many of the changes reflected in the columns, including but not limited to:
 - Under Resort, one of the changes listed is to allow higher densities within 500 yard of a ski lift based on pedestrian access. The use of 500 yard (which is over ¼ mile) is never justified or analyzed in the document. Considering that ski lifts are used in winter under adverse conditions requiring boots and carrying skis or boards, we believe that 500 yard is way too great a distance. If density transfers are allowed, and we don't think they should be, then we purport that 500 feet is the furthest distance that could be justified.
 - What is Industrial Low Density Residential? Is this purely a typographical error in table?
3. **Table 4.7.2 Incremental Development (4-175)** – the current General Plan shows some residential units in the Resort zone. Where are these listed in the update? And, where do townhouses and fractional ownership units get listed? The uncertainty in the number of people per unit must be discussed. We believe that these values will tend to increase due to much larger and more deluxe units, timeshares and fractional ownership, and a maturing residential population with a

changing ethnic mix with more children. A 10% variation in these assumptions could result in large population changes that must be included in the analyses.

4. **Special Conservation Planning (SCP) and Open Space Stream Corridor (OSSC) (4-175)** – there are more conditions attached to these designations than listed in this section. The most important are the provisions for special reviews and consideration by the Planning Commission. These designations strongly reflect citizens' concerns with the impact on our natural environment and should be carefully analyzed. The elimination of these provisions must be carefully and fully justified.
5. **Open Space, Institutional/Public Facilities and Specific Plan Area-Updated Plan (4-178)** – this topic is in the wrong place. It should be in the preceding Existing subsection not in the Updated Plan section.

Industrial use is never discussed as a topic in this section, although a never justified industrial park is mentioned.

6. **Fig 4.7.1 Town Owned Parcels (4-180)** – this map does not include the Trails End Park. Also, please identify the parcel at Manzanita and Main Street with a label.
7. **National Forest Land (4-181)** – the existing RV park is never acknowledged in any text or map and yet it is within the area designated IP on the new Land Use Map. What is the intent for the RV Park which plays a significant role for the Towns' summer visitors? Since it is within the UGB it, be included in impact analyses- traffic, air, water, population, cumulative impacts etc.

The text of the last paragraph on this page states that the additional Industrial area and the additional Mammoth Lakes Foundation area uses are addressed in the DPEIR. However, we have been unable to find this discussion. No justification or discussion of these land exchanges can be found. Please provide details and analysis.

Also, the Mill City recreational tract, MMSA Main Lodge area and other FS Land clearly outside the UGB should be identified as such. If there is consideration for including these areas in the UGB, discussion and analysis must be included. If there is no consideration, these areas should not be under discussion.

Please include a mention of the Shady Rest Affordable housing parcel, and that it contains considerable wetlands. Also include discussion of the strong community interest in designating a portion of this parcel as a Park.

8. **Section 4.7.2.3 Airport Land Use Plan (4-185)** – please include discussion of the fact that much of the land is committed by a Development Agreement and any

effects of the fact that the airport is under County control through the ALUP. Also include the cumulative impacts.

9. **Section 4.7.2.4 Inyo National Forest Plan (4-186)** – this section is incomplete. Just allowing INF to comment should not relieve the Town from reviewing and analyzing the Forest Plan to make sure the proposed General Plan Update is consistent with the Forest Plan. Please compare and analyze the two plans.
10. **Issue 4.7-1 Physical Division of an Established Community (4-188)** – there is no evidence or data provided to show that the many incompatibilities listed (noise, lighting, circulation etc.) will be significantly mitigated by the new “opportunities”. In this section, as in others, the writers seem miss the point that it doesn’t help much to provide bike paths and more pedestrian access during our peak winter visitor periods.

Comments on specific implementation measures are:

- I.3.A.1.a – Make sure the connection of trails is year round.
- I.3.A.1.b – Parking and or transit is necessary for the access to be meaningful, and must be included.
- II.1.B.a – this measure allows “mini marts”, but citizens have almost unanimously asked for a second supermarket which would also relieve congestion around Vons. Please show where is this concern is included in the DPEIR.
- IV.1.A.b.1 and 2 – these measures clearly negate the concept of any meaningful UGB. Automatic consideration of exchanged land as non-contiguous development sites or adjustments to the boundary mean that there is no boundary.
- VII.1.A.a.6 and 8 – include “year round”

We strongly disagree with the conclusion that the proposed development doesn’t physically divide the community or any neighborhood. Looking at the map makes it obvious that the major nodes to be extensively developed as pedestrian friendly resorts (North Village, Lodestar, and Juniper Springs) require connector roads running through them. Mammoth Knolls, the Slopes and Majestic Pines residential neighborhoods will be cut off from the rest of the Town by the intense resort development. These neighborhoods are not planned for any substantial transit service in discussions to date and heavy winter snows often make pedestrian use other than down the middle of the street impossible. With intense development only getting started at Lodestar and NV and with the Eagle Lodge base facility yet to be built, it is almost impossible to get to and from Mammoth Knolls and either the Slopes or Majestic Pines neighborhoods.

The Transportation and Circulation section in this document does not consider the impact of over 20,000 resort visitors, most of whom the Town hopes will be pedestrian, on traffic flow to and from residential neighborhoods. Movement of pedestrians, through the proposed roundabouts in winter is also not considered. It is very shortsighted to say no mitigation is required since the problem is already severe and can only get worse.

- 11. Issue 4.7-2 Conflicts with Adopted Plans and Ordinances (4-191)** – the comparisons between plans must be based on what the current General Plan shows in term of number of units, population etc. and not some calculated number based on some updated assumptions. For instance, the current plan considers about 13,000 units not 17,396. It would also be more useful if the large increase in units from today were more clearly delineated.

No justification can be found for the concluding sentence. "...increase in population.....would not conflict with the USFS Plan." The FS plan does not deal with the huge increase in visitors (over 20,000 more at one time over current numbers). In fact, the Forest Plans and policies set limits on how many people can use the ski area at one time, and most wilderness trailheads within the Town Planning Area already have daily quotas. These quotas are often filled with today's number of visitors.

Also please recognize and discuss the potential restriction of vehicle traffic in the Lakes Basin and provide data on projected use at build out.

No evidence is presented to indicate that the policies and regulations of FS are not conflicted in the DPEIR mitigation measures. A point by point discussion must be provided since INF controls the majority of the land within the Town planning area.

4.8 Noise

- 1. Section 4.8.2.4 Existing Conditions (4-202)** – please note the following:

Recreation vehicles: There is no mention in DPEIR of the impact of increased recreation noise created from motorized recreational vehicles such as snowmobiles and dirt bikes. The State regulated allowable noise levels for OSV's and off-road vehicles are 95 Db. The OSV staging area is near the hospital, a noise-sensitive zone requiring limits of no more than 70Db daytime and 65Db at night. Also, no consideration has been given to the impact of recreational noise on other designated "sensitive areas" such as John Muir and Ansel Adams Wilderness and town residences. No study was done on these noises.

Snow removal: No mention or study of noise generated from increased truck traffic to haul snow due to fewer in-town storage areas as vacant lots are developed. It is

possible, if not probable, that this noise would occur largely at night. Please provide an analysis of this impact.

- Issue 4.8-3 Increase in Ambient Noise (4-209)** – the increase is attributed to traffic doubling in volume. There are three generally accepted ways to mitigate exterior noise impacting inside a residence: closing windows, using ventilating systems or an air conditioning system, and increased (structure) set-back of the residence. None are viable in Mammoth, with its moderate temps in warm seasons (no air conditioning), dependence on natural air circulation, and premium on land (no room for setbacks). A fourth mitigation measure, the construction of buffers and landscaped berms, also disregards the current allowable densities and land availability. The impact on previously existing residences (developed without these mitigations) is not discussed.

It has not been shown that “significant” ambient noise levels are “unavoidable”. Please analyze (1) no density bonuses, where not required by State law, that would mitigate traffic noise and (2) not putting additional workforce housing in IP areas, like the South Gateway, that would mitigate noise in a sensitive area (such as a school, library, or single family residential zone).

In the section on noise levels due to ongoing construction, what is not discussed is the impact on sensitive areas adjacent to the areas that will experience this increased noise level. While these noises are called “temporary in nature” in the DPEIR, the construction projects will go on for periods exceeding 7 to 10 years.

- Issue 4.8-5 Airport Noise Levels (4-215)** – It states that there are no noise sensitive land uses and no people living within the CNEL 65 area. There has been no discussion of future development in that area, only that “currently” there is no one living within the sensitive area. This section does not take into account future planned land use identified in the Airport Land Use Designation, identified in the General Plan to include 250 visitor lodging units, 50,000 feet of commercial development, and potentially an RV Park.

4.9 Population, Housing & Employment:

- Inconsistent with the General Plan** – All of the following items are inconsistent, and must be corrected, then reanalyzed:
 - Pg. 2-9 of the DPEIR states that the maximum density units for the North Village Specific Plan are 3,020 and maximum with density increases is 3,800. However, the General Plan, page I-32 says the maximum is 3,320.
 - Page 4-220 of the DPEIR results in 60,727 total population, but Page LU-4 of the General Plan results in a total population of 60,680 for the same number of units.

Since different categories are used in the two tables, analysis cannot be done. Please make the two figures consistent and re-analyze all related impacts.

- Fractional Ownership is not evaluated anywhere in the DPEIR. This type of development presumes 48 to 50 weeks of occupancy per year, but there is no discussion of the different impacts resulting from this higher occupancy use.
- Single Family Transient is listed in the DPEIR in Table 4.7-2 without a definition. The term Single Family Transient is not found anywhere in the General Plan.
- Neighborhood Commercial Overlay in residential zones is described in the General Plan, page CHS-21, without any discussion of the impacts of this designation in the DPEIR.
- There is no analysis of the regional fair share requirements in the DPEIR, which are current state law, although this information is referenced in the General Plan Housing Chapter. The referenced numbers in the Housing Element for Regional Fair Share through 2008 are different from what is incorporated in the General Plan. Please correct the numbers, and also analyze the fair share through 2024, the projected date used elsewhere in the DPEIR.
- The Draft General Plan Housing Chapter refers to an increasing number of Southern California residents desiring to retire in a town like Mammoth Lakes, but there is no analysis within this section of the DPEIR to recognize this growing segment and its impacts on the community.
- Page 4-229 indicates GP policy limits Shady Rest parcel to workforce housing. But, GP LU-8 wording is "intended primarily for workforce housing".

For all of the above inconsistencies, please provide a consistent number, and then re-analyze the impacts in the DPEIR based on a consistent number.

2. **Average Peak Population** – assumptions are made about average peak population without data or a good methodology. Provide data and a quantitative analysis to support the population levels listed in the DPEIR.
3. **Affordable Housing Statistics Inconsistencies** – there is no analysis of how many units are actually needed. Please supply a quantitative analysis of the true need.
4. **Housing Statistics Inconsistencies with Housing Element** – throughout the Population, Housing and Employment section of the DPEIR, figures are used which are not consistent with the numbers in the Housing. Correct these errors, and re-evaluation this section based on consistent numbers.
5. **Carrying Capacity (4-230)** – is not adequately analyzed in the DPEIR. Provide data to support the statement that "the region has not reached a carrying capacity with respect to human habitation".
6. **Child Care** – is referenced throughout the General Plan, but not mentioned in DPEIR. Please include data and an analysis.

4.10 Public Services

1. **Responsibility of the Town** – The Town, as the Lead Agency, is required to comply with SB 610 and SB 221 of 2001. Under SB 610, if the water supply deemed “insufficient”, which is the case in point with the MCWD describing their supply as “insufficient” and “minimal”, then the lead agency will approve or disapprove the project. Please include an analysis of both code sections in the DPEIR.
2. **Referenced Water Assessment Amendment, MCWD, 11-4-2005** – Please note the following:
 - Detailed methodology (described as a “new methodology”) – the computations and assumptions need to be provided in the DPEIR to provide confidence in these very critical water supply and demand numbers
 - MCWD acknowledges that water supply is “minimal” during 2 and 3 year dry periods. The term “insufficient” is used to describe the supply as the Town nears build out. These tables must be extended to at least a 5 year dry period, and better still to a 7 year dry period, as these lengthy dry periods are known to occur in this area (Wildermuth 2003).
 - An estimate should be made of confidence in the accuracy of the estimates (25%, 50% and so forth)
 - An estimate of an adequate safety margin for water supply must be included
 - The number of units used by MCWD and the charts provided for new development by the town differ. Also, the new units appear to use an infinitesimal amount of water, without explanation. Finally, the new fractional units, expected to be occupied at higher levels than other visitor lodging units, are not analyzed. Please provide detailed data and assumptions used.

Please note we have asked our attorneys, Shute, Mihaly & Weinberger LLP, to provide a review and comments on the legality of this section. You will receive their comments in a separate letter. We have reviewed their comments and completely concur with their response.

3. **Issue 4.10-1 Service Ratios, Response Times or Other Performance Objectives for Fire Protection (4-240)** – no discussion is included of how volunteers will be used in the future, or of the number of volunteers needed under the plan. Further, there is no analysis of how the 275% increase in permanent staffing would be reached. Also, there is mention of land for a third fire station within the implementation measures, without discussion of the location or funding to add this station. There is also no analysis of the sources for the remaining 42% of funding for the required future facilities and equipment.

Finally, there is no mention of the potential for buildings to exceed the previous 55 foot limit. The General Plan implementation measures allow higher buildings, and

the recent proposals by Mammoth Mountain Ski Area include 80-100 foot high buildings. Also, a proposed amendment to the Sierra Star Specific Plan asks for a 200 foot high building. No analysis is made of additional impacts on structural fires in taller buildings. Please provide a complete analysis of the impacts on Fire Protection.

4. **Issue 4.10-2 Service Ratios, Response Times Or Other Performance Objectives For Police Protection (4-242)** – while this section now provides service ratios for different segments of the proposed 60,700 build out population, no basis is provided for the ratios, nor is there substantiation that these ratios are appropriate for the Town of Mammoth Lakes. Please also provide a comparison of actual current activities, such as arrests, to the identified categories of permanent, seasonal, and second homeowner and visitor populations.

This section also references the Manzanita Street town-owned property indirectly as a potential site for a police facility, while this section has been elsewhere identified for Workforce Housing. Also, on page 4-243, sentences refer to fire protection, which is not the topic of this issue.

Further, this section identifies private security as an amenity provided by new development, without any data or analysis of the impact on town-provided police protection.

Finally, there is also no analysis of how the additional 13 officers required by this plan will be funded.

5. **Issue 4.10-3 Service Ratios, Response Times or Other Performance Objectives for Schools (4-244)** – there is no analysis of the number of school age children who would be living in newly developed Workforce Housing, or in Multi-Family Residential rentals and condominiums. The capacity projections are noted for single family homes only. Therefore, the capacity numbers are incomplete and must be re-analyzed.

Also, there is no analysis of the traffic impact of getting students to and from the schools at the stated capacity either in this section or in the Transportation & Circulation section.

6. **Issue 4.10-4 Service Ratios, Response Times Or Other Performance Objectives For Other Public Facilities (4-247) :**

Library – Although the new location is mentioned, there is no analysis of the impact of increased traffic at the new location either in this section or in Traffic & Circulation.

Roadway Maintenance/Snow Removal – no analysis is provided for the traffic impact that will result from trucking snow out of the UGB.

Hospital Services – the DPEIR states that the Hospital emergency room is considered adequate without providing substantiating data. The population figures provided by the Hospital are not consistent with those used elsewhere in the DPEIR. Please provide and analyze consistent population statistics and ratios of inpatient, outpatient and emergency rooms beds for the projected population levels.

Please supply a quantitative analysis of each of these other Public Services.

4.11 Public Utilities

1. Section 4.11.1.1 Existing Conditions Water Supply (4-253) – please reply to all of the following:

- This section references a “different methodology” was used to develop new water supply figures in the Assessment. What is this methodology? Details of both methods need to be provided to understand how the supply figures were generated.
- Also on page 4-253, leave out the reference to “and not by groundwater” in the assessment of snowmelt.
- The General Plan states that water comes 50% from groundwater and 50% from surface water. However, current demand in Table 4.11-1 shows 2,760 from surface and 4,000 from groundwater. Please explain how these are equal number or correct the statement throughout both documents.
- Please analyze the effect of canceling the Master Operating Agreement between the USFS and MCWD.
- Page 4-256 – please clarify whether the groundwater levels recover or just “tend” to recover. The supply well production plots would indicate that water levels recover somewhat but over several years, however the recovery (water levels) is less than the year before. It would appear that the aquifer is over drafted. Well interference is commonly exhibited by the supply wells. A “cone of depression” (Schmidt) exists in the well field.
- The Cal Trout petition re: Mammoth Creek needs to be considered, including the concerns over stream flows and water rights. What would be the effect on water supply of moving the gauging station location on Mammoth Creek?
- The term “expert” on pg 4-256 needs to be defined. Does the term “expert” in this DPEIR define someone who is licensed by the California Board for Engineers or Geologists/Geophysicists and Hydro geologists”? Please name the “expert” and state his/her qualifications. The qualitative term “expert” doesn’t belong in this document.

- The MCWD monitoring program is apparently just getting started with an estimated two years before completion. Then, it will take several years before enough data, modeling, mapping, testing and so forth will be available to start making operational decisions. In the meantime what happens? Does the MCWD begin to refuse connections at some level of confidence in their supply figures?
 - Page 4-258 – please define multiple dry years and single dry year
2. **Section 4.11.1.5 Propane (4-260)** – please correct the narrative. Two lines were laid by Rock Creek Energy from the “tank farm” in the Industrial Park up along Meridian and to Sierra Star. One is for propane and the other for natural gas when and if Liquefied Natural Gas (LNG) is ever available. These lines and propane service is available to whomever desires it as the lines are laid in the Town right-of-way.
 3. **Section 4.11.2.1 Regulatory Framework Water (4-260)** – Define the acronym CWS, and what the certification by CWS means. CWS appears nowhere else in the DPEIR.

Reliability of supply needs to be addressed; 100% reliability, for instance, would imply a reliable supply while 50% reliability would imply that a supply of water is in doubt and drastic measures need to be taken to keep the town a viable entity. If water supplies are deemed “minimal” by MCWD, then a water shortage contingency plan needs to be made and included in the DPEIR. MCWD should establish cut off levels for new connections well short of over drafting the aquifer. There is already well interference between supply wells which implies the deep aquifer is being over drafted

4. **Sewage Collection Systems** – actual data to support the capacity of the Sewage Collection Systems is not available for analysis. Please provide the detailed data on which these statements were made. Further, Mammoth Mountain has announced the intention of connecting to the MCWD sewage system. Please analyze whether the system will be adequate to serve the Town and the combined day skiers and 2,250 lodging units at the Main Lodge.
5. **Solid Waste** – there is no data available to analyze the statement that projected needs covered for next 20 years based on 25% population increase (40% increase in visitors). Again, the population figures stated for this area are not consistent with those used elsewhere in the DPEIR.

Further, there is no mention of the potential loss of the lease of Benton Crossing Landfill owned by the Los Angeles Department of Water and Power and whether or not there are impediments to potential expansion of the landfill.

Also, the Pumice Valley Landfill near Lee Vining is mentioned as an alternative site, with no analysis of any additional impacts on that site or on transportation of solid

waste to this location. There is also no analysis of the capacity and impacts of expansion at Pumice Valley.

The discussion of recycling does not mention the services provided by the Sierra Conservation Project, even though these figures are readily available. Please show recycling data by source, and clearly indicate whether this private operation has been included in the "Town" numbers provided.

6. **Issue 4.11-1 Exceed Sufficient Water Supply (4-265)** – under any multiple dry year scenarios in this DPEIR, water supplies are not sufficient. Any unanticipated upset in the water supply system, be it well problems, leaks, earthquakes destroying well casings, accidents to the distribution system, electrical failures, or water quality problems, could quickly use up any "minimal" surplus that is available. A single day's supply is all that is available in the case of a total cutoff of supply. A wide margin of error needs to be built into any supply/demand scenario.

A three dry year scenario (multi dry year) is not realistic. The Wildermuth study shows 5 to 7 year drought cycles are not uncommon. A seven year drought must be incorporated into the supply/demand tables. Further, the Town's Emergency Operations Plan identifies a four-year drought as one of the emergency scenarios causing activation of emergency operations.

Several multi dry year ("what if" or sensitivity cases) should be investigated. One, 3, 5, and 7 year dry cycles should be calculated. Effects of each dry period should be estimated on supply and resultant impact on the Town, excluding any MCWD mitigation measures (considered last resort and results problematical). Please see attached letter from D. Jung, for additional information.

Finally, please include the following:

- A definition of "overdrafted" is required, and an evaluation of whether the well field is overdrafted
 - There is no definition of "new development applications" or any indication of cumulative effect of all connections made. The current practice of considering only the individual development application when asserting that the water supply is adequate is not sufficient.
 - Dry Creek is included in the discussion and in the chart on page 4-255. By state regulation, no source for which the agency does not have required licenses can be considered in the analysis of available supply. Please remove the references and reanalyze supply without Dry Creek as a source.
7. **Issue 4.11-2 Exceed Wastewater Treatment Requirements (4-270)** – a mitigation measure stating that the Mammoth Community Water District shall increase the capacity of the treatment facility within the timeframe of the plan build out is not

adequate if no timeframe or sanctions are included. No substantial evidence is provided that the listed mitigations will be effective.

8. **Issue 4.11-3 Require Or Result In Construction Of New Water Or Wastewater Treatment Facilities Or Expansion Of Existing Facilities And Construction (4-271)** – again, a mitigation measure stating that the Mammoth Community Water District shall increase the capacity of the treatment facility within the timeframe of the plan build out is not adequate if no timeframe or sanctions are included. No substantial evidence is provided on the environmental effects of the proposed expansions or that the listed mitigations will be effective.
9. **Issue 4.11-4 Inadequate Capacity Of Wastewater Treatment Facilities Wastewater Treatment Inadequate Capacity (4-272)** – again, a mitigation measure stating that the Mammoth Community Water District shall increase the capacity of the treatment facility within the timeframe of the plan build out is not adequate if no timeframe or sanctions are included. No substantial evidence is provided on the environmental effects of the required facility expansion or that the listed mitigations will be effective.

Further, the stated intent of MMSA to connect to the system must be analyzed, both for the increases caused by day use and visitor lodging units.

10. **Issue 4.11-5 New/Expanded Landfill (4-273)** – no substantial evidence is provided that the listed mitigations will be effective. Please supply a quantitative analysis. None of the concerns mentioned in Number 5, above, in this section, are adequately mitigated.
11. **Issue 4.11-7 New/Altered Energy or Communication Facilities Electrical/Geothermal Energy (4-275)** – no data is provided to support the statement that Edison is able to meet current and projected needs. Please provide data and reanalyze the impact of the build out population.

4.12 Recreation

1. **Quimby Act** – this act requires three acres per 1,000 population of park or recreational land. While we applaud the Town's standard of five acres per 1,000 population, there is no explanation of the difference. Further, it is not clear who is included in the "population" numbers.

The calculations in the list of "Existing and Planned Park Land" include many acres that are outside of the Urban Growth Boundaries. Please provide the data and details for parkland by ownership and location. Further, include the following in the DPEIR analysis:

- "The Town shall ensure that parkland dedicated under the Quimby Act is suitable for active recreation uses with a maximum slope of ten percent, appropriate

community access, and free of significant constraints.” Define significant constraints and also add passive recreation.

- Provide a plan as to how land acquisitions are being made and how planned parks are going to be provided as the population increases.
 - MMSA has identified implementation of airport improvement plans as a key element of achieving the mid-week visitation goals. Please include an analysis of the impact on recreation and recreational capacity.
 - One implementation measure states that the Town will “require new development to upgrade or fund facilities to meet increased demand or require reduced density or project redesign for any project that would result in deterioration of service levels or cause available capacity to be exceeded if capacity expansion is infeasible.” “Purchase of land” needs to be included in this.
2. **Urban Growth Boundary** – “Development of recreational facilities, public facilities, and public utility installations outside of the UGB are not a violation of the UGB.” This is not consistent with the original definition of the UGB.
 3. **List of “Recreational Facilities in Mammoth Lakes”** – this list is misleading as it includes many facilities that are restricted: some require a membership fee (athletic clubs), some require an entrance fee (Red’s Meadow/Devil’s Postpile, Crowley Lake Marina, Mammoth Motocross Track), some require payment for use (school grounds, ski areas, and private developments), some require permits (most of the wilderness areas) and some are not really open at all (Valentine Natural Reserve, Camp High Sierra, Mammoth Mountain RV Park). Provide list of recreational opportunities unrestricted and open to the public. Use this total to compute the existing and future “park lands” in Mammoth Lakes.
 4. **Recreational Capacity** – please provide data and analysis of the following:
 - Mention is made of the Town’s 7 miles of off road, Class A bike trail system, totaling 6 acres. Plans for completing the bike trail, including information on whether the Town owns land for this purpose or plans to acquire the necessary additional land must be included.
 - The carrying capacity of a primary recreational attraction (MMSA) has already been reached and right now local forests and wilderness areas are some of the most heavily used in the country. Provide information as to how the projected increase in population will impact these areas in terms of access and loss of enjoyment due to overcrowding.
 - Provide information as to how the Town will incorporate the nationally recognized increase in participation in cross-country skiing, snowshoeing, and snowmobiling into future plans for recreation facilities.
 5. **Issue 4.12-2 Deterioration Of Facilities (4-285)** – Please provide and analyze the plans mentioned in the implementation measures for:

- IV.1.A.c.1 – “The Town shall maintain and update the existing Masters Facility Plan, Development Impact Fee Schedule, and/or participate in public-private partnerships to support the development of facilities and services that enhance mid-week visitation.
- II.1.D.c.1 – Please define and provide the details of the Development Incentive and Exactions Program.

This issue discussion concludes that “Due to the projected increase in demand based on the performance objective, impacts to existing parks and recreation due to increased use of existing parks and facilities would be significant and unavoidable.” However, there is no quantitative analysis of the four alternatives and impacts each population number would have on demand. Please provide data and analysis of the population number at which “significant and unavoidable” would not be an issue.

4.13 Transportation and Circulation

This analysis is not adequately based on existing conditions and does not consistently provide substantial evidence as required by CEQA.

1. **The Traffic Analysis Is Flawed** – please see attached letter from John Cunningham for complete details.
2. **True Peak Traffic** – the traffic analysis does not consider worst-case traffic and how often it may occur, and therefore does not disclose the true impact as CEQA requires. “Average peak traffic on a winter Saturday” is used. The Peak traffic at the worst times must be quantified, and the impact discussed, with evaluation of proposed mitigation measures.
3. **Winter Storm Impact** – the effects of snow storms and poor visibility, reduction of road width due to snow berms, and the presence of heavy, slow snow removal equipment have not been quantified or even included in the traffic analysis.

Analysis of the effect of snow piled on the sides of the road with the proposed road narrowing must also be included.

The Town has increased lot coverage and reduced snow storage requirements for new projects, relying on snow removal by large trucks rather than on-site snow storage. These trucks need to run day and night. They, along with snow removal plows, add to congestion. Please demonstrate that they have been included in the traffic congestion analysis.

4. **Impact of Airport growth** – the Airport, and its potential growth inducing effects, has been ignored. A distorted picture is presented by omitting the airport’s impact and just describing the Town’s plans. The major issues surrounding the airport plan must be described, and evaluated. Also the FAA has written the Town describing

many concerns i.e. the private development proposed is inappropriate on such restricted land, hangers must be moved to meet clearance requirements, more land is required, etc. These are material matters affecting the town and its traffic, and they must be identified, and their impact described.

5. **Summer Traffic** – summer visitation is now greater than winter visitation. Please show traffic data for summer holidays and/or other appropriate summer peaks.
6. **Incomplete Information on Level of Service Definitions** – the Level of Service (LOS) definitions must be provided. The statement on page 4-295 that the town considers LOS D acceptable is not validated.
7. **Pedestrians** – the DPEIR must quantify the effect of pedestrians crossing streets on traffic congestion, and safety. This is already a severe problem at The Village, and a nearly doubling of traffic is being proposed.
8. **Quantifiable Unmet Transit Needs** – the DPEIR must quantify the “unmet transit” needs, propose mitigation, and assess its effectiveness. Will more Buses increase congestion, or relieve it? Our winter experience is that severe congestion associated with streets narrowed by design, or by snow-piles. Clearly Buses discharging passengers greatly increase congestion as well, and this impact is not analyzed. Please quantify the need for, and benefits, of increased public transit.
9. **Issue 4.13-1 Cause An Increase In Traffic Which Is Substantial In Relation To The Existing Traffic Load And Capacity Of The Street System (i.e., Result In A Substantial Increase In Either The Number Of Vehicle Trips, The Volume To Capacity Ratio On Roads, Or Congestion At Intersections) (4-304)** – mitigations should receive the same level of analysis as the primary impact. Without this, there is no substantial evidence that the mitigations work. Great skepticism surrounds the effectiveness of roundabouts during heavy winter storms. Please provide data demonstrating the effectiveness of roundabouts, especially during heavy winter storms when the largest traffic jams now occur.

The data show that the one roundabout that is really needed would be at Main & Minaret, but it is not proposed. Why not? What design standards will be imposed? Will traffic from a two lane road be funneled into a one lane roundabout? What delays are expected at the traffic signals?

Further, there is no discussion of the development of land on both sides of Meridian Blvd. east of Old Mammoth Road, and impacts on traffic and circulation. Potential development of hospital and health services, schools, the library, and housing in this area are not analyzed.

Finally, mitigation 4.13-1 is not feasible because the Town has no control over Minaret Road as a State Highway. Please propose alternative mitigations.

10. **Issue 4.13-2 Exceed Level of Service (4-311)** – this one issue results in fifteen implementation measures and ten mitigation measures. Several of these are onerous, such as prohibiting left turns from Forest Trail to eastbound Main Street. Further, the measures for Meridian Blvd., for example, seem to conflict as to the number of lanes of traffic between each the six intersections. No evidence is provided that the mitigations will be effective. Please reanalyze entire streets, rather than focusing solely on intersections.
11. **Issue 4.13-3 Air Traffic Patterns (4-319)** – please update the referenced 1998 Airport Plan in light of the more recent directions for the expansion of the airport, and reanalyze this section to reflect the current conditions.
12. **Issue 4.13-5 Inadequate Emergency Access (4-324)** – in this version, a reference has been added to the Town's Emergency Operations Plan. However, this referenced plan includes no scenarios for evacuation of the town. No data is provided to indicate any analysis of the capacity of evacuation routes based on increased population has been included. Please supply a quantitative analysis.

These routes are not adequate now, which is missing from the narrative. Please compare current conditions, and also include a scenario for a peak winter Saturday with snow conditions.
13. **Issue 4.13-6 Inadequate Parking Capacity (4-326)** – the effect of inadequate parking throughout town has not been quantified, nor have the benefits of the Town's proposed Transit system. The DPEIR states "congestionappears to be correlated with the shortage of accessible private and public parking" No further discussion is provided. It is necessary to quantify how much additional parking is required now, and for the alternatives. Please show the results of analysis that quantifies the benefit of providing additional parking lots, parking garages, etc.

Also quantify the benefit of added bus service. The DPEIR says that "traffic will increase 88%, even assuming 115% increase in bus rider-ship", and leaves it at that. Please quantify how existing parking will be impacted, and what mitigation is proposed.

Provide analysis to show how increased parking will mitigate the traffic problems. Since the newest projects have demonstrably inadequate parking, please review the adequacy of the town's existing requirements regarding parking spaces needed for new projects. The DPEIR document simply says the Town must make developers provide adequate parking, without specifying what is adequate. It does say the lack of parking contributes to current congestion, but does not quantify this problem.
14. **Issue 4.13-7 Conflict with Adopted Policies, Plans, Or Programs Supporting Alternative Transportation (4-328)** – if the Town is already not meeting the needs, depending on policies rather than quantifiable actions is not mitigation. No substantial evidence is provided that the listed mitigations will be effective.

Further, the needs and benefits of alternative transportation (e.g., bus turnouts, bicycle racks) and additional transit (buses) must be quantified. Will increasing use of buses reduce traffic congestion or add to it?

4.14 Cultural Resources

1. **Issue 4.14-1 Project Would Cause A Substantial Adverse Change In The Significance Of A Historical Resource As Defined In §15064.5** – the survey methodology mentioned in mitigations 4.14-1 and 4.14-3 needs to be clearly defined in order for this mitigation measure to be deemed adequate. Further, the methodology for enforcement of mitigation 4.14-2 must be defined, and financed.
2. **Issue 4.14-2 Change in Significance of Archaeological Resource (4-351)** – mitigation measure 4.14-4 needs to refer to the Town, not the City.

Chapter 5 Cumulative Effects

1. **Table 5-1 Related Projects (5-2)** – is incomplete and must include a full analysis of:
 - MMSA Main Lodge and Inn expansion, Eagle Lodge expansion on FS land, new gondola and lift plans, Tamarack development, transportation and parking plans, the Ski Back trail, and projections of skier and bike park visits. It is indefensible to not include the Town's biggest employer, who is also currently the largest provider of transportation, in the Cumulative Effects as well as the Housing, Transportation and Recreation Chapters. This operation is within the Town municipal limit, principally outside the UGB. The details of some of these projects have only been recently revealed; however they have been in the works for years and have been the subject of wide discussion. Other projects have progressed to the point that project descriptions exist and environmental documents are under preparation.
 - Proposals under evaluation by the Forest Service to expand the size operations and area covered by MMSA Snowmobile Adventures and DJ's snowmobiles for Air Quality and Recreational impacts
 - FS fuel break projects that involve burning, such as the Sawmill/Shady Rest area, the Scenic Loop, and many others in and just outside planning area that could have grave impacts on Air and Water Quality.
 - Valentine Reserve fuel break projects involving burning.
 - It is not clear if the Airport development is included in the Project Alternative assessment. For instance the Airport EA identifies about 50 tons per year of nitrogen compounds. Light from the Airport required by the FAA would be another important factor. Regarding the airport, both the commercial and residential resort impacts must be included in the cumulative analyses.

- There is no evidence as to whether other organizations such as the City of Los Angeles (Campground area called open space), Valentine Reserve (University of California), Kaolin mine, State Fish Hatchery, RV Park, FS housing area, Cal Trans equipment yards, and other entities were contacted for their plans. Please include discussion of these contacts, and include the resulting analysis in this section.
2. **Section 5.1 Aesthetics, Light and Glare (5-1)** – MMSA projects could have large impacts on Aesthetics, Light and Glare. The airport is also clearly visible from Town and must be included. Sky glow is a cumulative effect as areas become more urbanized, not just a line of sight issue. Please include all of the projects in general background light analysis.

Lights from traffic are also an addition to both glare and general background light. The traffic headlights from vehicles associated with the related projects must be included in cumulative analyses.
 3. **Section 5.1 Air Quality (5-3)** – the cumulative impact of the increased traffic, additional diesel buses, motocross, shuttle buses to Devil's Postpile, diesel construction equipment, snow grooming equipment, forest burn projects, snowmobiles, aircraft operations, etc. from the related projects need to be compared to the base case and the proposed mitigations.
 4. **Section 5.1 Sierra Nevada Bighorn Sheep (5-6)** – much of the habitat of the Bighorn is not in wilderness areas and the trailheads do not have backpacker controls. This is particularly true of the Wheeler Crest which can also be reached by an open Jeep trail. Also, the Forest Service does not control day use of any of these areas and most of the sheep areas are within reach of a stiff day hike. The impacts of the increase in visitor population, when combined with the other related projects, must be analyzed.
 5. **Section 5.1 Owens Tui Chub (5-10)** – please clarify whether the proposed Snowcreek second nine hole golf course water supply is included in either the Cumulative Analysis or the Project Alternative. If not, it must be included because the water would appear to have to come from groundwater and would add to the cumulative potential shortfall on the springs that support the Chub
 6. **Section 5.1 Land Use Planning (5-11)** – the General Plan apparently makes provision for certain areas outside the UGB (Chapter 4 of DPEIR) to be automatically included in UGB if land trades occur. This is particularly true if the projects noted above in number 1 and 2 of this section, such as the MMSA projects, are included. Every parcel inside the Town municipal limits must be analyzed for compatibility of land use.
 7. **Section 5.1 Noise (5-12)** – the cumulative analysis must include MMSA snowmaking, grooming, and transport vehicles, diesel geothermal drill rigs next to Shady Rest Park, Motocross, increased Snowmobile use, increased OHVs without

noise controls, increased traffic including commercial trucks servicing an expanded ski area and commercial/retail/industrial uses, and increased aircraft traffic.

8. **Section 5.1 Traffic (5-12)** – please correct the statement that Benton Hot Springs is to the north.

Further, the effect of the Project's population expansion on the intersection of Highway 395 and Hot Creek Road (airport turnoff) must be analyzed since this is an increase in traffic above the Airport Environmental Analysis.

Traffic resulting from the forthcoming MMSA projects must also be analyzed.

9. **Section 5.1 Public Services and Utilities (5-13)** – MMSA projects will impact potential water availability as well as almost all other utilities. The Snowcreek second nine holes on their golf course will also impact water availability. Please include these factors and any others added based on our above comments into the Services et al analysis.

Also, this section is inconsistent with Chapter 4 where Public Services and Public Utilities have been separated. Please correct here and in Chapter 6 for clarity.

10. **Section 5.1 Recreation (5-13)** – please justify the statement that the projects would not have an impact on Recreation. They cannot help but increase Population.

Further, there is no discussion of the professional employees needed to support the increased population, such as doctors, nurses and teachers. There is also no discussion of TSA specialists needed at the airport, who would most likely not come from the existing population.

Many of the related projects listed (like rodeo grounds) and others unlisted (MMSA) will have large effects on recreation, both of the organized type requiring formal parks and the more natural type like fishing and hiking on Public Lands. Under the Project, the only remaining parklands for organized outdoor recreation will be outside the UGB and, in the case of Whitmore Pool are shared with the County. The analysis of needs, impacts and mitigations must include the entire planning area plus the anticipated expansions in June Lake.

Finally, there is no indication that increased impacts on Yosemite National Park have been analyzed. The National Park Service is not even listed in the DPEIR distribution list. Please include information on their involvement in the DPEIR preparation.

11. **Section 5.1 Population, Housing and Employment (5-14)** – as noted above, the need for additional specialized TSA employees at the airport has increased since airport documents were written. No mention is made of this impact either here or in the appropriate section of Chapter 4.

Chapter 6 Other CEQA Considerations

1. **Entire Chapter (6-1)** – please reformat this sections to be numbered consistent with other chapters for clarification and cross-referencing.
2. **Section A. Irreversible Environmental Changes (6-1)** – the fourth paragraph must indicate significant and irreversible impact on public lands, particularly wilderness areas that can not be replaced. Also include Roadless areas, riparian areas and lakes.

The final paragraph of this section states that the infrastructure improvements identified in the Project, such as massive roadway and Intersection improvements, requiring access corridors to public lands, connecting trails to public land trails and paths, providing public transportation to resort nodes that give access to public lands will all clearly will have environment impacts on the public lands that must be analyzed and mitigated.

Chapter 7 Alternatives to the Project

It must be noted that nowhere in the DPEIR is there a clear-cut definition of the objectives against which all these impacts will be evaluated. Please provide a concise list of the objectives mentioned in Section 7.1 Introduction. Further, in Section 7.2 Alternatives Considered but Rejected, there are again references to project objectives but none are found.

1. **7.3 No Project Alternative Narrative (7-3)** – it must be pointed out that the current General Plan EIR only describes and analyzes impacts of 48,000 PAOT. The population numbers used for the No Project Alternative appear to be a worst case application of currently required bonuses and build out assumptions to the original land use designations. Wouldn't it be more reasonable to simply analyze and change the land use to keep within the original vision? A detailed breakdown of how you get from 48,000 to 61,376 should be given, such as how much are density bonuses added since the original plan, how much was added by Specific and Master Plans such as the North Village and Airport, and how much is due to changes in land use, such as redefining IP and applying it to additional areas in the South Gateway.
2. **Inconsistency within the DPEIR** – The Total number of units used in Table 7.1 does not match with those in Table 4.9. Please reconcile the two totals, and then reanalyze whichever sections are based on the incorrect totals.
3. **Land Use Designations (7-4)** – this section says that the land use designations remain unchanged, but makes no mention of the loss of the Open Space Stream Corridor in the Project Alternative. This designation clearly is in tune with the Towns' environmental sustainability objectives.
4. **Industrial Project (Updated Plan) (7-9)** – several statements are made to industrial uses needed to support a resort community. The amount of land needed is never quantified and no analysis is done anywhere in the DPEIR. The amount needed will

vary with the size of the resort and the size of Town. Please analyze here and in Chapter 4.

5. **Section 7.3.2.1 Aesthetics (7-11)** – the existing plan clearly has less intensive development in resort areas. Taller buildings and higher density must negatively impact aesthetics, i.e. what is the aesthetic impact of over 700 additional units crammed into North Village, surely requiring taller buildings? This intense resort development will also result in more light and noise impacts. The Village at current construction is a good example, with under one third built it casts a sky glow that can be seen in Lee Vining and is generating numerous noise complaints. Please provide analysis that Towns' position that new project is superior.
6. **Section 7.3.2.7 Land Use Planning (7-14)** – because it provides more intensive nodes of resort development at key transportation nodes and corridors, the new project clearly causes more isolation of residential communities in Mammoth Knolls, Majestic Pines and the Slopes. It also will prevent residents from conveniently accessing MMSA Main Lodge Area. Please justify the statement that the No Project Alternative would not divide the community.
7. **Section 7.3.2.8 Noise (7-15)** – see comments under 7.3.2.1 on affects of concentrated resorts on noise.
8. **Section 7.3.2.11 Public Utilities (7-17)** – stating the No Project Alternative requiring 11% more water with only 1% more population seems hard to justify. Also, please provide the referenced April 26 letter from Gary Sisson and any related analyses.
Also, please explain the statement that the No Project Alternative generates 239,200 sq ft more of non-residential development. Please provide details and justify this statement.

Finally, please move the referenced table 7.4 into the Public Utilities section for clarity.

9. **Section 7.3.2.12 Recreation (7-17)** – since the No Project Alternative retains the only Town Park within the Town UGB it clearly is the superior alternative. In the No Project Alternative, we fail to see why impacts would be significant and unavoidable when the Town owns considerable acreage within the UGB, and has strong influence on how land is used in the Shady Rest Tract and the Gateway area. Explain why these new plans policies and implementations that supposedly provide superior protection can't just be codified by ordinance or by additions to current plan, and therefore not an advantage to new project.
10. **Section 7.3.3 Conclusions (7-19)** – clustered high intensity development in the resort areas will clearly have greater detrimental impacts on aesthetics, noise, light, glare, circulation, parking, transportation, need for workforce housing and water demands than the 48,000 clearly intended in the current general plan. These impacts must be analyzed and the results presented so a clear choice between the project and the existing general plan could be made. It is disingenuous to discard the

current plan because it is missing a few paragraphs updating policies and procedures to conform to current conditions, laws and community environmental protection wishes. These can be added and subtracted from any plan. The analysis in the alternatives should concentrate on real physical differences between the plans, such as differences in parkland, building heights, maximum allowable densities, etc.

11. **Analysis of Section 7.4 Workforce-Affordable Housing Alternative (7-20)** – please make the same analyses identified in numbers 1 through 10 above for this option.
12. **Section 7.5 Institutional/Public (7-36)** – please clarify that under this alternative no IP designated land would be eligible for workforce housing. The current sentence is convoluted.
13. **Section 7.5.2.1 Aesthetics (7-37)** – adding 25% to the Resort density and over 30% to the North Village density has to result in significant additional negative impacts. The resulting taller and higher density buildings must be analyzed in detail. These differences should not be downplayed just because you can not eliminate all impacts entirely under the old plan.
14. **Section 7.5.2.2 Air Quality (7-38)** – the analysis that justifies only reducing the air quality due to VMT by 10% when population goes down by about 20% should be demonstrated or referenced.
15. **Section 7.5.2.3 Biological Resources (7-38)** – it should be pointed out that the large reduction in visitors using Public Land under the Reduced Development Alternative would result in a reduction of these impacts.

The standards and regulations mentioned in the second paragraph, particularly for steam setbacks, are subject to variances which then negate the protections. Removal of SCP protection will result in potential increased impacts for the project. This section also claims Open Space land not available for recreation, not so we hope, and if so why?
16. **Section 7.5.2.6 Hydrology and Water Quality (7-41)** – if the Reduced Development Alternative includes SCP protections and Mammoth Creek Stream Corridor overlays that are eliminated in new, then the Reduced Development Alternative should be superior in terms of water quality. Less development, particularly fewer large-scale resorts that require extensive excavations, should result in less construction run off.
17. **Section 7.5.2.8 Noise (7-42)** – why does reducing the development density by 20% only reduce the VMT by 10 %? A 20% reduction in noise might tip the balance toward inaudible. An exact analysis is required.
18. **Section 7.5.2.9 Population, Housing and Employment (7-42)** – since most of the employment opportunities lost by the 16% decrease in PAOT will be seasonal and/or entry level, it is hard to see how the increase in population in the new project will not

cause a less stable economy compared to the Reduced Development Alternative. The Town must include analysis to back up its claim that greater resort development results in a more stable year round economy.

19. **Section 7.5.2.11 Public Utilities (7-43)** – please explain why an increase in population of 18% results in a 0.04% increase in water demand. The table shows more, not less, water for the Reduced Development Alternative, visa versa in the text.
20. **Section 7.5.2.12 Recreation (7-44)** – retaining the Bell Shaped parcel and Mammoth Creek Park as Open Space or Parkland, adding pocket parks, adding a park in the Shady Rest Parcel are just some of many of opportunities to mitigate parkland impact to less than significant under the Reduced Development Alternative.
21. **Section 7.5.2.13 Traffic & Circulation (7-45)** – having to build less circulation mitigation projects by 20% will result in less disturbance to the environment and less cost and disruption to town residents.
22. **Section 7.5.3 Conclusions (7-46)** – the text of the first paragraph clearly demonstrates that the conclusion of the final sentence is **WRONG**. Impacts for the Updated Plan are listed as greater by the preceding detailed descriptions within the DPEIR. If the prior 35 pages of comments are considered, then these differences between plans are even greater.

No data, analysis or even qualitative studies are given to support the statement "...would not meet project objectives to the same extent as the project." No analysis is given in or referenced by the DPEIR on how much resort development is needed, nor is the amount of Industrial or Commercial justified. As mentioned previously, over development and overtaxing of the natural environment and the recreational recourses that bring both residents and visitors to the area could be easily as damaging to a stable economy and would be a lot harder to correct if we overshoot. If the Town is too crowded, has bad air, has no dark night skies, is noisy, has water rationing, has lift lines and has a surrounding environment that has been trashed by overuse, people will not come, particularly the high end visitors the Town has been targeting. We believe the Reduced Development Alternative is closer to the optimum amount of development for the town and that greater development would actually decrease the chances of the Town achieving its vision statement particularly with respect to economic stability. A detailed analysis must be presented to support the Town position as this is a key conclusion, more is better, that is sure to be challenged

With the amount of development proposed under the Reduced Development Alternative, there would clearly be less workforce housing required. Please show where is this analyzed to support the conclusion that the alternative could not support sufficient housing.

The Reduced Development Alternative would still permit a large number of visitor accommodations. Please provide an analysis of what the number of visitor lodging units actually needed for this alternative.

Finally, no analyses provided on the effect of existing Developer Agreements. Please explain how the DPEIR has determined this is significant.

23. **Table 7.7 Summary Comparison Impacts (7-48)** –we believe that if detailed analysis were performed there would be more of a strong tilt in the direction of favoring the Reduced Development Alternative. Additional comments on items in the table not covered previously in text are as follows:

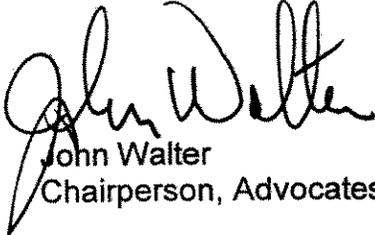
- Reduced development should have less impact on wildland fires – fewer people equals fewer opportunities for careless folk to start fires:
- The proposed Project will have significant negative impacts on water quality. See comments on Water Quality section.
- Noise – in the Reduced Development column impact should be determined less than the Project:
- Population, Housing and Employment – no conclusion should be reached on any column, because no analyses is presented as to what the real needs are. Please justify the seemingly blind assumption that bigger is better.
- The Project will have significant impact on Schools, and Police and Fire Protection unless careful mitigations, more cops and jails, two new classrooms units and one new staff plus two new teachers are added per 100 affordable housing units. Please reanalyze based on the comments in the previous sections of Chapter 4. Taller buildings also mean different fire equipment and staff training.
- Lack of inadequate response in terms of meaningful analysis from responsible agencies should not relieve the Town from doing a meaningful comprehensive evaluation. It is the responsibility of the Town to make the contacts with the agencies, and ensure that sufficient data and analysis is included in the DPEIR and in the evaluation of all alternatives.
- Libraries and Hospitals - Reduced Development column should be found to have less impact than the Project based on a lower population figure: In the Reduced Development Alternative, all Public Utilities, Recreation, Transport and Circulation, and Cultural Resources sections also result in less impact than the Project due to a lower population:
- Please include an analysis of the cumulative impacts and growth inducing impacts in the summary table and in the preceding narratives on alternatives. Again, these will surely be less for the Reduced Development Alternative than the Project.

Please note we have asked our attorneys, Shute, Mihaly & Weinberger LLP, to discuss the density transfer issue in detail. You will receive their comments in a separate letter. We have reviewed their comments and completely concur with their response.

The preceding 37 pages of comments and corrections show that the DPEIR is flawed in several crucial respects. We therefore request that the Town revise the document and recirculate it for further public consideration and comment pursuant to Public Resources Code section 21092.1.

Again, we appreciate the opportunity to comment on the DPEIR. Should you need clarification of any of the comments provided in this letter, please do not hesitate to contact me at (760) 934-1767.

Sincerely,

A handwritten signature in black ink, appearing to read "John Walter". The signature is fluid and cursive, with a large initial "J" and "W".

John Walter
Chairperson, Advocates for Mammoth

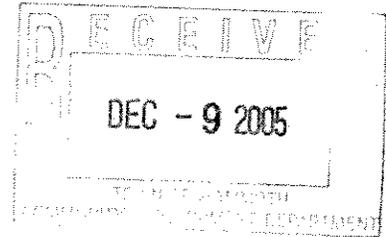
Letter 012

mountain 山 - river 水 - landscape 山水



December 8, 2005

Town of Mammoth Lakes
Planning Commission
P.O. Box 1609
Mammoth Lakes, CA 93546



Dear Planning Commission,

Thank you for the opportunity to comment on the revised Town of Mammoth Lakes General Plan Update and Environmental Impact Report. We are highly supportive of concluding this process through community-based dialogue and consensus.

As a collaborative and solution-based organization, ALIMAR has been carefully listening to members of the community, local organizations, GPAG, Town staff and the Water District regarding the General Plan Update. We are highly concerned about the amount of community contention and polarization caused by, we believe, a general lack of confidence and trust in the planning process. We believe many citizens feel disenfranchised by this process, overwhelmed by large documents, constantly changing numbers and a general plan that doesn't seem to implement the vision statement or public input. Many citizens are frustrated by a perceived lack of response to public comments and feel their voices have no power.

No one is specifically to blame for the current situation, and indeed pointing fingers would be a useless exercise anyway. Instead, we'd like to propose that there is a better way; a way to build consensus and community confidence in the planning process.

We propose a transparent and inclusive process involving community stakeholders, Town staff, Town Council and the Planning Commission in a series of charettes mediated by a professional facilitator and an external planner specializing in general plans. With stakeholders at the table and professional mediation, we feel viable solutions can be crafted that would allow Mammoth to grow without sacrificing our character or quality of life.

We proposed this same process in April of this year through a grant funded by the EPA, but were told it would take too long to complete within the desired timeline. With 16 unresolved issues still on the table and the potentially time-consuming and expensive legal consequences of a hastily passed plan, we feel our proposal is still viable. And in fact, we feel that solutions could be reached more easily than expected. We've often found that disputing parties are actually saying similar things from different perspectives, and that disagreement is driven more by anger and lack of trust than differing opinions.

Our proposal is only one way to foster solutions and understanding, but there are other ways. If our particular proposal does not meet specific needs, ALIMAR would be happy to

to assist with any alternative strategy designed to seek resolution and build consensus together as a community.

We hope you will seriously consider our offer to coordinate a mediated, solution-based process, or any other appropriate strategy.

Thank you,

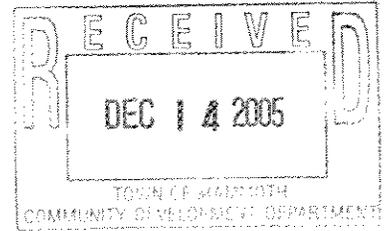
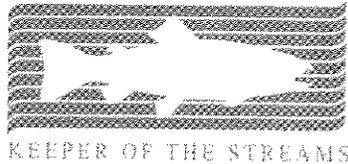


Andrea Lawrence, President



Wendy Sugimura, Operations Director

CALIFORNIA TROUT



William Taylor
Town of Mammoth Lakes
PO Box 1609
Mammoth Lakes, CA 93546

December 14, 2005

Comments on the Town of Mammoth Lakes 2005
General Plan Update Revised Draft Program
Environmental Impact Report

Dear Mr. Taylor,

California Trout (CalTrout) appreciates the opportunity to comment on the Town of Mammoth Lakes 2005 General Plan Update Revised Draft Program Environmental Impact Report (Revised Draft PEIR). CalTrout is a state-wide non-governmental and non-profit organization dedicated to wild trout sustainability, the restoration of its habitat and healthy watersheds. CalTrout has reviewed the referenced document with relation to sections 4.3 (biological resources) and 4.6 (Hydrology and Water Quality). We have several specific concerns related to these sections of the document and ask that these concerns are addressed. In addition, we also incorporate by reference the comments we filed on May 5, 2005.

Biological Resources (Section 4.3)

1. What types of baseline biological surveys were conducted by the Town to assess 1) the presence of species that occupy the planning area and 2) to develop baseline population data for all plants and wildlife that occupy the planning area in an attempt to understand and document current species population dynamics?
2. Under *Impacts and Mitigation* (4.3.4) please discuss expected downstream impacts to both the Owens Tui Chub and Owens Sucker populations from increased development within the Mammoth Basin including, but not limited to, sedimentation, storm water runoff, pollution discharge, and potential changes in water quality parameters including temperature. Specifically, what mitigation or monitoring is the Town preparing pertaining to these potential impacts and what steps are in place to protect these federally endangered and special status species?
3. The federally endangered Owens Tui Chub population, located near the Hot Creek Hatchery, is considered a genetically-pure population. The species is highly susceptible to water temperature and water quality changes. Additionally, water development is listed as a potential source of disturbance to these populations.

Please discuss the potential impacts of groundwater pumping within the Mammoth Basin that may affect spring discharge near the hatchery or affect the chemical properties of that discharge. What expected impacts to the Tui Chub population are associated with increased water development within the Mammoth Basin? Similarly, please discuss impacts to the Owens Sucker, a special status species native to the Owens River watershed, from the proposed increases in groundwater pumping in an effort to meet future water demand.

4. In the Department of Fish and Game's response to "Notice of Preparation Draft Environmental Impact Report Town of Mammoth Lakes General Plan Update 2003", the Department asks the Town to examine project impacts that may affect offsite habitats including an assessment of impacts to fishing, hunting, bird-watching and other recreational activities. All of these activities provide both aesthetic and economic stimulus to the Town and County. DFG further recommends that "the DEIR should provide analysis, including angler and hunter surveys, of the potential impact of the proposed project to the quality of experience for anglers, hunters and other outdoor fish and wildlife viewing recreationists utilizing these areas".¹ We support DFG's recommendations.

What type of surveys has the Town conducted to gain insight on potential impacts which may affect the Mammoth and Hot Creek trout fisheries? Please discuss specifics relating to sedimentation within the creek and the necessary entrainment flow velocities needed to purge those sediments. How are the project alternatives expected to impact these fisheries and quality of experience of the angler? What mitigation measures or monitoring has the Town identified to ensure minimal or no adverse impacts to the downstream fisheries of Mammoth Creek and Hot Creek?

5. CEQA Section 15131 states that economic effects of a project may be used to determine the significance of physical changes caused by the project. Considering that increased development associated with the project alternatives may adversely impact downstream resources, please quantify the expected impacts to the wild trout fishery of Hot Creek and the upper Owens River. The Hot Creek wild trout fishery serves as an economic engine for the Town of Mammoth Lakes and the general region of the eastern Sierra. Please discuss both offsite environmental and economic impacts that may adversely affect the Hot Creek wild trout fishery and upper Owens River within the cumulative impacts section of the Revised Draft PEIR (CEQA 15130).

Hydrology and Water Quality

6. *Water Quality*: As the Revised Draft PEIR states, the Lahontan Regional Water Quality Control Board reports that water quality in Mammoth Creek has been adversely impacted by years of development in Mammoth Lakes. We request that you document the specific reasons for these impairments and clearly state what management practices, enforcement policies and monitoring the Town will adopt to ensure that this does not continue. We are aware of the Town's municipal codes pertaining to development especially in proximity to the creek, however, it's apparent that these management

¹ Department of Fish and Game. 2003. Notice of Preparation Draft Environmental Impact Report Town of Mammoth Lakes General Plan Update 2003. May.

practices are 1) not sufficient or 2) lack the necessary enforcement to ensure minimal impacts to the watershed.

7. What type of sediment budgets will be developed for the Mammoth Basin and what type of water quality monitoring will be instituted for Mammoth and Hot Creek? Please list specific plans and measurable and objective success criteria that the Town will employ to ensure that further degradation to Mammoth Creek will not continue.

8. What types of riparian corridor monitoring will the Town employ along Mammoth Creek and Hot Creek to ensure only natural changes in channel morphology, rather than anthropogenic induced changes? Please quantify expected erosion, pollutant discharge, water quality, and water temperature impacts that may adversely affect the ecology of Mammoth Creek and Hot Creek as the Town nears build out.

9. We are concerned that Mammoth Creek and Hot Creek are adversely impacted by the Town's construction practices specific to increased sedimentation within the creek corridors. Minimum instream flows for Mammoth Creek are currently being reviewed by the Mammoth Community Water District (the District) and we request that you work collaboratively with the District to understand how development and construction in the Mammoth Basin may be affecting downstream resources. Are current peak flows, as a function of storage diversions in the Lakes Basin, able to mobilize current sediment loads in Mammoth Creek and Hot Creek? Will these flows be able to entrain sediments as the Town nears build out?

10. Specifically, please list what types of plan implementation, enforcement and monitoring the Town will use to ensure 1) surface and groundwater quality are not adversely impacted by construction, development and the use of pesticides, herbicides and other chemicals on golf courses and 2) that the drainage pattern of Mammoth Creek is not altered due to the updated plan implementation. Simply stating that "creek corridors SHOULD be carefully identified, corridor setbacks established, and strict regulations precluding riparian vegetation removal and creek regime modification SHOULD be followed" is not adequate. Please replace "should" with "shall" under all implementation measures pertaining to surface water, groundwater, and Mammoth Creek.

11. Please list the specific pesticides, herbicides and other chemicals which are currently being used on golf courses. What has the Town historically done to curb this use in an attempt to protect surface waters (both within the planning area and downstream offsite areas)? How does the Town propose to protect the quality of groundwater from these same sources and what type of monitoring is currently established to detect these sources in groundwater or surface water? In addition, please quantify the expected increase in use of these pollutants under all project alternatives and with the expansion of the Snowcreek golf course.

12. *Groundwater*: It is noted within the Revised Draft PEIR that the "boundaries of the groundwater basin have not been specifically defined due to the complex hydrogeologic conditions of the basin" (p. 4-147). In general, there needs to be a greater understanding of these complexities and those recharge rates associated with the two assumed groundwater aquifers in the Mammoth Basin to ensure only sustainable groundwater

yields are produced. We recommend that the Town work closely with the District and implement the following scientific studies to 1) better understand the local groundwater aquifers and complex hydrogeology of the basin and 2) ensure a safe and sustainable groundwater supply for the Town:

a. Provide a constant rate pump test for wells #1, 15, and 16 during low flow or base flow conditions to understand if groundwater pumping is influencing specific reaches in Mammoth Creek

b. Determine permeability, transmissivity, safe yield, aquifer recharge rates and discharge rates to Mammoth Creek for the major production aquifers.

c. Produce additional subsurface geologic cross-sections and provide additional surface water gages and shallow monitoring wells along Mammoth Creek to monitor groundwater movement in relations to Mammoth Creek stage and pumping.

d. Perform a fracture flow study using additional stable isotopes to assess connections between surface and subsurface flow and groundwater contributions to Mammoth Creek.

13. CEQA Section 15124 subsection (d) mandates the lead agency to consult with other agencies and integrate CEQA review with other related environmental review. The District recently worked with local stakeholders on updating their Groundwater Management Plan for the Basin. During these meetings, it was noted that there may be a connection between groundwater pumping and surface flows within Mammoth Creek (at least specific to production wells #1 and #15). Groundwater pumping may be influencing gaining and losing reaches within Mammoth Creek. In the future, this may limit groundwater production near Mammoth Creek during peak flow and/or dry periods in an attempt to minimize impacts to riparian corridor and associated aquatic resources. Please consult with the District.

14. In 1995 the USGS conducted an independent study which reviewed the current hydrology of the Mammoth Basin and potential impacts to spring discharge and Mammoth Creek surface flows from groundwater pumping. The report was referenced in the Revised Draft PEIR, but the specific conclusions are not accurately detailed. A copy of this report was submitted with our original comments last May. Please review the report and incorporate the findings into the Revised Draft or Final PEIR.

15. **Water Supply:** The Water Assessment provided to the Town by the District is confusing. The assessment states that “the original assessment (should) be amended to include the updated information”. Please combine the two assessments into one official document and present to the public. At this point, we’re not entirely sure what data and assumptions are valid from the original water assessment compared with the current assessment, and therefore, cannot not properly analyze the entire document and those conclusions.

16. Currently, the District is drafting an Environmental Impact Report for Changes in Mammoth Creek Bypass Flow Requirements, Point of Measurement, Watershed

Operations Constraints, and Place of Use. There are several issues in this EIR pertaining to surface water diversions and storage diversion in the basin which may affect water supply at a future date. Additionally, CalTrout filed a petition to the State Water Resources Control Board in December of 2004 with specific concerns related to water conservation policy, surface flow appropriation, and the lack of CEQA analysis concerning the proposed changes in instream flow requirements. The District has recently done a good job of moving in an expeditious manner to release a CEQA document pertaining to the minimum instream bypass flows. The draft version of the District's report should be released during the spring of 2006. We strongly recommend that you stay apprised of the issues and the final version of the EIR before making premature determinations about future water supply in the basin.

17. Although the District is allowed to divert up to 2760 acre-feet/year from Mammoth Creek, historically this has never occurred. The maximum diversion from the Lake Mary intake appears to be 2450 acre-feet/year in 1984. In part, this may be due to the District's limited abilities to use their full instantaneous flow diversion capability at Lake Mary. In addition, and to protect the beneficial uses and public trust of Mammoth Creek and Hot Creek, the District must comply with minimum instream flow requirements which may limit their ability to divert water, even during "normal" years. Between 2000 and 2004, the District could only divert an average of 1519 acre-feet/year. In 1997, a wet water type year, the District could only divert 2161 acre-feet/year. The ability to divert 2760 acre-feet/year is not currently feasible. Supply figures should be reviewed and amended as necessary.

18. We are concerned about the projected demand of 4461 acre-feet/year under the new proposed project alternative. Upon review of *Investigations of Groundwater Production Impacts on Surface Water Discharge and Spring Flow*, written by the District's consultants in 2003 we noted that Table 3-3 depicts a total demand production (groundwater and surface water diversions) in 2002 of 4050 acre-feet/year. Please thoroughly compare supply numbers with historic water use numbers in Mammoth Lakes and base your analysis on those calculations. We do not believe 4461 acre-feet/year is a realistic demand calculation, and furthermore, do not believe 31 acre-feet/year under a multiple dry year situation is a safe margin of error. Accurate demand calculations should be based on the historical water demand numbers for the Town.

19. In the previous water assessment provided to the Town, the District stated that over the past thirty years, 50% of those years experienced below-average precipitation. Additionally, 30% of those years have experienced less than 70% of average precipitation.² Neither the District's water assessment nor the Revised Draft PEIR state what is considered to be "normal or average precipitation" in the Mammoth Basin. As previously noted, 50% of the precipitation years in the Mammoth Basin have been characterized as 'below average'. It would be prudent to base future water demand calculations and eventual Revised Draft PEIR conclusions on dry year or multi-dry year scenarios (greater than three years). For instance, until water type year 2004 the Mammoth Basin experienced six consecutive dry precipitation years. We request that the

² Mammoth Community Water District. 2005. Mammoth Community Water District Water Assessment for Draft Town of Mammoth Lakes General Plan. January.

Revised Draft PEIR or Final PEIR discuss future water supply and demand within the context of an extended dry period.

20. Please define 'normal precipitation' and the methodology used to determine different water type years. How were average precipitation conditions calculated? Were these calculations merely based on a thirty year period? If so, we recommend that the Revised Draft PEIR study longer historical periods of precipitation in the Southern Sierra in an attempt to project future precipitation and in an effort to meet increasing water demands associated with the project alternatives. Long term trends in annual precipitation variation within the Mammoth Basin must be identified (i.e. greater than 30 years).

21. The Revised Draft PEIR does not discuss global warming and climatic change in relation to the future water supply within the Mammoth Basin. In 2004, the National Academy of Sciences released a paper documenting the magnitude of future climate change in California. Hayhoe et al. state "rising temperatures, exacerbated in some simulations by decreasing winter precipitation, produce substantial reductions in snowpack in the Sierra Nevada Mountains, with cascading impacts on California winter recreation, streamflow, and water storage and supply."³ Expected impacts of global warming on water supply within the Mammoth Basin must be discussed and in terms of all future project alternatives and water supply and demand calculations.

22. The Dry Creek aquifer is not well defined. Additionally, the surface water/groundwater interaction and potential downstream impacts to Big Springs and the Owens River are unknown. A study by Breibart et al. on the impacts of additional groundwater pumping within the Dry Creek watershed strongly suggests that further studies, data collection, and monitoring are needed to understand what these impacts may entail.⁴ The Dry Creek aquifer is located upstream of one of the most productive wild trout fisheries in California and there may be both environmental and economic impacts associated with groundwater pumping in this region.

23. As stated in the District's original water assessment for the PEIR, significant capital costs and intensive environmental review (both CEQA and NEPA) are needed before additional groundwater pumping could begin within the Dry Creek drainage. Groundwater production around Dry Creek and the proposed recycled water project for Mammoth Lakes will both require additional entitlements and are not considered firm water supplies. We request that you reevaluate your supply calculations and base those calculations on known and currently existing water supplies.

24. We believe the Town's Revised Draft PEIR should strongly consider implementing stringent water conservation policy before considering additional groundwater production in the Mammoth Basin or Dry Creek drainage.

25. CEQA Section 15384 (a) states "'Substantial evidence' as used in these guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions

³ Hayhoe et al. 2004. Emissions pathways, climate change, and impacts on California. June

⁴ Breibart et al. 2001. Mammoth Groundwater Extraction: A Hydrological Analysis of Potential Recharge to an Eastern Sierra Nevada Watershed. June.

might also be reached.” The current existing information pertaining to water supply and demand is neither sufficient nor substantial to conclude that there will be enough water to meet future demand expectations associated with the project alternatives.

26. Water Code Section 10911 (b) states that the city or county will determine if the available water supply is sufficient to satisfy the demands of the project (including planned future uses). What is the Town’s assessment of the current and future water supply? What additional water supply alternatives are there to meet future demand over a multi-dry year scenario or extended dry period? The Revised Draft PEIR mirrors the District’s water assessment. However, the District simply projects possible additional sources of water to meet demand and does not make any recommendations or conclusions as to if these are viable strategies to actually meet future demand. A determination of the future water supply is needed by the Town.

CalTrout would like to thank the Town for the opportunity to comment on the Revised Draft PEIR for the 2005 Mammoth Lakes General Plan update.

Please send all further correspondence to:

Robert A. Lusardi
California Trout, Inc.
PO Box 3442
Mammoth Lakes, CA 93546

Respectfully submitted,

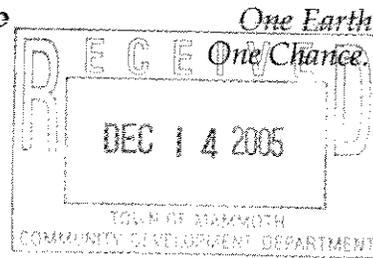
A handwritten signature in black ink, appearing to read "Robert A. Lusardi", with a stylized flourish at the end.

Robert A. Lusardi
Eastern Sierra Conservation Manager
California Trout



Letter 014

Range of Light Group
Toiyabe Chapter, Sierra Club
P.O. Box 1973
Mammoth Lakes, CA, 93546



December 14, 2005

Thank you for the opportunity to comment on the Revised Draft Program Environmental Impact Report (RDPEIR) for the Town of Mammoth Lakes proposed 2005 General Plan Update dated October 2005. The Sierra Club Range of Light Group submits the following comments for your consideration.

This document has many improvements over the previous draft, but we strongly believe that the document still does not meet the requirements of CEQA and requires significant additional analyses and additions before it should be certified. The principle purpose of the EIR is to give the decision-makers adequate data and analyses to reach decisions on proposed programs and for the public to draw their own conclusion as to the ultimate impacts of projects and the practicality of proposed mitigations. The shortcomings in the RDPEIR are such that it must be redone and recirculated for additional comments.

There are several shortcomings that are applicable to most of the topics and are listed below. Among the most serious defects are:

The documents fails to include and consider the plans and projections of Mammoth Mountain Ski Area (MMSA), the biggest employer, transport operator, and recreation provider for residents and visitors, in the planning effort and in the data used to determine impacts and potential mitigations.

Chapter 4, Land Use, is particularly confusing putting some land-use designations in the wrong category and failing to list others. As a decision-making document, it should be complete and readable so the general public can make their evaluation of the wisdom of the General Plan Update.

There is no evidence that potential mitigations were actually evaluated. Many of the impacts may be mitigable. The document seems to also ignore or downplay the effect of population and the extent of its impacts on water supply, noise, wildlife, and recreation.

It appears that an environmentally inferior alternative was selected because of some undefined and unanalyzed economic growth objectives.

The documents fails to adequately consider the tremendous impact of over 20,000 plus visitors at one time on adjacent public lands, skiing opportunities, fishing locations, wilderness trailheads, wilderness camping and hiking areas, and rock climbing venues, that are already overcrowded. It also neglects impacts of increased OSV and OHV use on public lands.

The document emphasizes differences with reference to a hypothetical calculated number for population based on the old General Plan. Comparisons should be to the current condition and the actual populations analyzed in the old GP (48,000).

The document is concerned chiefly with the resort economy. The rest of the Town, retirees, second-home owners, small businesses, the college, artisans and writers, and telecommuters are almost completely ignored.

Other more specific defects are:

Parks: The inability of the Project to provide for parkland is inexcusable. It takes away the only in town park. Yet the Town owns other lands like the Bell-Shaped Parcel, and has access to others such as the Inyo National Forest lands in the gateway area. The Town could acquire more parkland and open space through establishing and enforcing developer requirements, all within the Urban Growth Boundary.

Physical Segregation of Neighborhoods: Segregates many of the residential neighborhoods by putting resort nodes with large pedestrian populations on connector roads.

Impacts on Schools Not Analyzed: These must be analyzed even if the Town is not financially responsible for required mitigation.

The document doesn't attempt to meet environmental sustainability objectives of General Plan objectives on air quality, night skies, noise, or aesthetics.

The water use model is unrealistic (20% increase in PAOT equals less than 1% increase in water requirements) and has no margin for uncertainties, longer dry spells, or well failures.

This document violates its own principles of the Urban Growth Boundary by having provisions to automatically include land exchanges from outside the Urban Growth Boundary (UGB) into the UGB, and violates the intent of the previously ratified Town UGB by allowing housing in the south gateway parcels that had previously been designated only for institutional use and open space.

In Chapter 4, the Land Use chapter, the document fails to completely list and explain the new land use designations. Some are omitted and others are listed in the wrong sections and out of order.

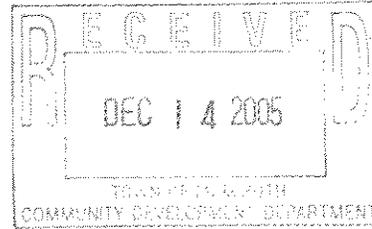
Please accept the Range of Light Group comments. The Group asks that this document be revised to address these concerns and other concerns raised by the public and then be redistributed for public comment.

Sincerely



Wilma Wheeler, Chair

Letter 015

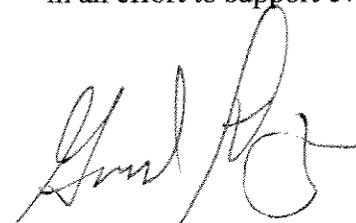


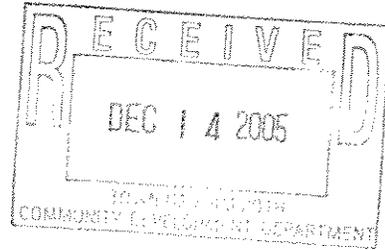
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The emphasis on dense hotel like development in a village type setting should be encouraged. We need to recognize that these new lodging types transfer occupants from existing condominium and motel lodgings. This would be the natural outcome of the ski area strategy. The result will be greater opportunities for the purchase of work force and employee housing. It will also allow for a larger per-cent age of idle second homes, occupied less than three weeks per year. What does this shift in property use mean to us as a community? Some developers want to create fractional ownership of SFH and further erode the community nature of our neighborhoods. This needs to be identified and made part of the GP.

Yet another issue not properly vetted before being incorporated into the draft, is the proposed land use change which, for openers, will allow housing on land zoned IP. There is strong community opposition to allowing new developments to occur in land presently zoned either IP or SP. In spite of this opposition Planning has decided to incorporate land use and zoning to allow development of twenty-five acres of college property as housing. Members of GPAG have provided testimony before both the Planning Commission and the Town Council, advising both groups that this idea was unanimously rejected by GPAG. How does it show up in the draft plan?

The Gateway District had been zoned as SP, allowing schools, hospitals, government building and up to 100 single-family lots. Now without any public input this parcel is rezoned IP without any restriction on how much housing may be located there. This zoning clearly will create a new population center, for which the town has no infrastructure nor is the increase in population accounted for. Once again we see a GP change made without public input that is contrary to the Vision statement. See Paragraph 2.3.6. for planning department rationalization for this zoning change. It is clearly made in an effort to support even more development and a far larger build-out population.

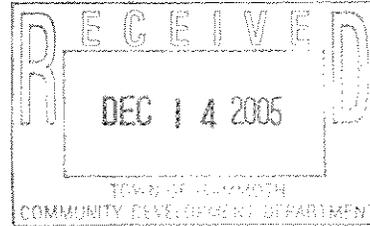

Gordon Alper



Future Population Projection Assumptions

I refer to the Verification analysis of PAOT as of January 1,2004, Table 3-3, on page 3-16 of the report and Table 3-4, page 3-17, Incremental Development for Build out of the updated General Plan. There is a basic logical flaw in the assumptions made that take us from today's PAOT to the projected PAOT at build-out. Build-out occupancy rates are based on the data provided in Table 3-3. The build-out population of 60,727 is a growth of 77% over the data provided in Table3-3. However the data in Table3-3 can't grow more than the maximum allowed skiers on MMSA, which can only grow 30%. Therefore you cannot logically use any data from Table3-3 to justify any future PAOT past the 30% limit imposed by the MMSA limitation. The report must provide new assumptions regarding our PAOT to support the build-out population. When this is accomplished logic tells me we will have develop a whole new game plan to support this PAOT. Based on expanding all the data in Table3-3 by 305 the maximum sustainable PAOT would be 43,000. I believe we can make some assumptions regarding the shifts in our needs that would allow for at least another 5-10,000 PAOT. I do not believe that you can past that hurdle. If this is, in fact, the case then the logic tells us we should concentrate on a plan similar to the Reduced Development Alternative as a beginning point, which would lead us to the best choice for the build-out of our town.


Gordon Alper ✓



December 13,2005

**COMMENTS DRAFT PROGRAM ENVIRONMENTAL IMPACT
REPORT AND GENERAL PLAN**

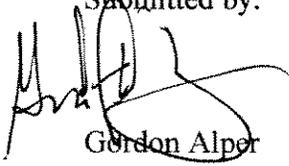
The General Plan update is meant to be a community developed document encompassing all of the known The emphasis on dense hotel like development in a village type setting should be encouraged. We need to recognize that these new lodging types transfer occupants from existing condominium and motel lodgings. This would be the natural outcome of the ski area strategy. The result will be greater opportunities for the purchase of work force and employee housing. It will also allow for a larger per-cent age of idle second homes, occupied less than three weeks per year. What does this shift in property use mean to us as a community? Some developers want to create fractional ownership of SFH and further erode the community nature of our neighborhoods. This needs to be identified and made part of the GP. and foreseen plans. This plan is lacking in that regard.

The GPAG urged the Planning staff to interview or invite Mammoth Mountain, Mammoth Lakes Hospital, The Mammoth Lakes Foundation, etc., to a workshop, so that we could learn of their future plans and better understand the community needs that this plans would require. This did not happen. As so often is the case now that the plan has been fully developed and given to the community to adopt, some of these plans are becoming better known. The GP should not be adopted without serious consideration of these new plans.

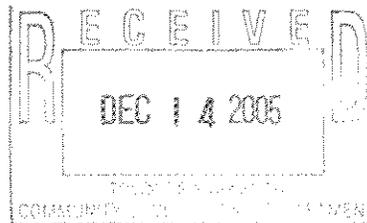
The most important strategy that must be added into the GP, is the stated goal of Mammoth California to concentrate on increasing longer mid-week visits at the expense of reduced maximum skier volume on the weekends. If successful they will reach peak weekend daily attendance of 18,000 instead of their maximum capacity of 24,000, and midweek daily volumes in excess of 10,000 skiers. Our GP cannot be meaningful without filtering this information through every element of the Plan. The obvious changes will affect land use issues. People extending their stays will demand more non-ski related services. We should provide for more retail/commercial land uses. Plan for better pedestrian friendly areas by reducing parking and snow storage requirements by creating off-site parking areas. We need to improve our transportation system. Non-ski related recreation amenities are required. Cultural events need to be expanded and additional event encouraged. These improvements can't be put off longer. They must be in place before proceeding with additional development.

We still have not heard publicly from either the Hospital District, the Mammoth Lakes Foundation on their future plans in context with their GP needs. We must hear from them before certifying this Update.

Submitted by:

A handwritten signature in black ink, appearing to read 'Gordon Alper', written over the printed name below it.

Gordon Alper



December 4,2005

**COMMENTS DRAFT PROGRAM ENVIRONMENTAL IMPACT
REPORT AND GENERAL PLAN**

The General Plan Policy and Implementation measures are inconsistent with the Vision Statement, which is to guide the General Plan. It is not appropriate to conclude, as the draft GP too often states, "Due to projected increase in demand based on the performance objective, impacts to existing... would be significant and unavoidable."

Chapter 4.12 Recreation.

At some time we have to properly arrange our priorities. We continue to approve development prior to identifying, purchasing and developing parks and recreational facilities. We then indicate that the town cannot mitigate the adverse effects of this development. The town needs to identify a minimum of 22 acres of land to be used for future recreational needs, as part of our land use plan, before approving additional development.

The plan fails to address several of our needs for multiuse land. We strongly support summer activities that require the generous use of private property for these community benefits. But, this property is quickly being developed and will no longer be available to the community. The Jazz Festival, our most successful summer activity, along with various Arts and Crafts events rely heavily on their ability to use these properties to stage their events. We cannot afford to lose these defining events. The plan needs to address how we will provide replacement properties to insure the continuation of these important festivals.

Winter play is becoming more important each year as families forgo traditional skiing for sledding and tubing. The plan fails to identify property that can be developed for these activities. We see that our visitors are taking matters into their own hands. Sledding is a popular activity that has taken hold behind the church site at Minaret road and Lake Mary road. These activities are also being pursued out along the Mammoth Scenic hwy and at Dead mans summit along hwy 395. These are to be ever more important activities and should be planned for now. When considered along with MMSA future plans this type of activity becomes critical to our success.

We worked as a community to obtain and develop Mammoth Creek Park. There has been no reason provided to the public to support a zone change to IS. What development is being considered for our park, if none than leave the zoning as is. If you are planning to develop in the park, make that part of the plan. It has become clear going through this process as a member of GPAG, that the town already probably knows what is planned for this park. This is being withheld from the public for fear that the community will not agree to this zoning if it knew what the intention of this IP zoning change was. This park is important to Mammoth as a park and should remain zoned as a park. Our vision

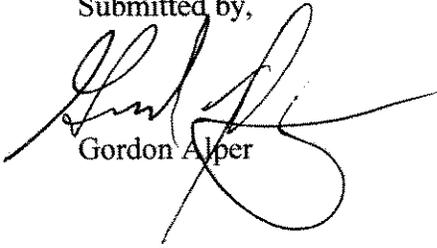
statement demands it. It is presently the only park within walking distance of our population.

I am deeply concerned that the town represents that it has 81.22 acres of park and recreation land present and planned. In fact, the town will only own 12.78 acres of the needed 75 acres at build out. Land that is not owned or controlled by the town should not be included. For instance, the USFS dictates uses and hours of operation of Shady Rest Park, not the town.

The town must avoid developing an incentive program as the carrot to induce the development of parks as stated in IV.1.D.c1 of the implementation measures. It should be part of the plan to assess development to provide designated needs of the community. These incentives would be contrary to the goals of the vision statement and should be avoided.

I conclude as I began. Parks are essential to achieving our vision statement. Approval of developments should only be allowed as we achieve our goals for public lands and facilities. For starters identify the land we need for our community needs. Then zone this property accordingly, and finally acquire the land. Isn't that the rationale behind the DIF we now collect?

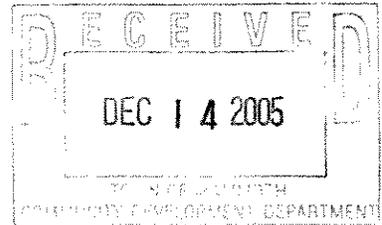
Submitted by,



Gordon Alper

Letter 019

December 14, 2005



Sonja Porter
Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

RE: Response to Draft Program Environmental Impact Report for the General Plan Update

Dear Ms. Porter:

Below are several concerns and comments I found on my review of the DPEIR. In each instance, I am requesting consideration of the comments, and a reanalysis of each point that includes the requested data.

According to state law, and EIR is "an informational document which will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project." What has been provided so far is not adequate to meet this need.

One example is that the impacts to visual quality and character are identified as significant and unavoidable in the DPEIR. A quantitative analysis of the impacts of the four alternatives has not been completed. It is not acceptable to say that the impacts are the same for all four, or to expect the Planning Commission or Town Council to make their decisions without clear distinctions between the project alternatives.

Also, there are several sections of the DPEIR where conclusion of a significant and unavoidable impact the blanket statement that "there are no feasible mitigations" This is not acceptable. Surely, there are a number of ways to mitigate the identified impacts, the most obviously being that a lower total population would presumably have a lower impact. We should expect, and must demand, better information, and an opportunity to discuss solutions.

To paraphrase the Vision statement, our General Plan should emphasize:

- The sustainability and continuity of our unique relationship with the natural environment
- A strong, diverse, small-town community that supports families and individuals
- Adequate and appropriate housing that residents and workers can afford
- A year-round destination resort community based on diverse outdoor recreation and tourism

Unfortunately, this DPEIR has proposed a Project Alternative under which striving for the maximum number of visitor lodging units overshadows all other considerations. No financial analysis is included that justifies this alternative, nor is there any assurance that the focus on additional hot beds will result in a sustainable economy.

We might be at risk of overbuilding our customer base, which could have negative impact on our economy. We might also lose all that is special about Mammoth Lakes that makes this a place visitors come to and return to many times. However, we don't have information to make a decision. Nowhere in any of the documentation do we see a "Business Plan" which substantiates the emphasis on visitor lodging.

The Traffic Study for the DPEIR deals only with intersections. In doing so, several crucial pieces of data are not analyzed. These include:

- Analysis of entire streets. For example, Meridian Blvd. has six identified intersections in the study, between Main Street and Majestic Pines. The study and DPEIR result in conflicting implementation measures and mitigations (see below for details).
- Pedestrian interaction with traffic is not quantified, only estimated.
- The study does not include snow conditions, whether this is during the storm or in the following hours and days of "clean up", including impacts on traffic for snow removal, berms reducing traffic lanes, trucking snow out of town, etc.
- The study complete ignores summer peak days, such as the Fourth of July weekend, or any recognition that we actually have more total visitor days in the summer than in the winter.

Since the Traffic and Circulation sections and appendices are extensive, I focused on Meridian Boulevard for a detailed analysis. I can only presume that the same problems and issues apply to other streets, but did not have time during the comment period to go through every street and intersection in the town.

The General Plan contains implementation measures that state Meridian west of Old Mammoth should be a maximum of three lanes (one each direction and a two-way left turn lane). However, Mitigation 4.13 in the DPEIR results in Meridian changing from one lane in each direction at Sierra Park, to two lanes in each direction at Old Mammoth Road, then back to a single lane at Azimuth, again back to two lanes at Minaret, and finally back to a single lane at Majestic Pines. Further, even with these mitigations, those same intersections are rated C through F except for Meridian/Sierra Park.

The Traffic Study says that projections were based on the proposed land use. After extensive review of Appendix F, it turns out that no data is provided to substantiate this. The tables in Appendix F include four columns titled "alternatives", but there is no definition of these alternatives and no cross-referencing to the DPEIR alternatives.

Also related to Traffic and Circulation, the Population, Housing and Employment, Land Use Designation, and Public Services sections include estimates of an increased

number of students, increased use of hospital services and related increases in staff, relocation of the Library to the Gateway area, and redesignation of part of the land as Industrial. There is no analysis of the impacts these changes will have on traffic.

The Water Assessment contains several shortcomings if it is to be considered adequate. These shortcomings include:

- No reserve cushion has been built in to the calculations for either water supply or water demand.
- The potential loss of surface water as a result of the MCWD Mammoth Creek EIR process (currently under way) is not analyzed.
- Dry Creek is included in the projected supply, in violation of the State Water Code. MCWD must have licenses and permits before the water supply can be counted.
- Conclusions stated in Chapter 7 regarding the water use under the different alternatives do not include enough data. For example, page 7-17 states that the No Project Alternative requires 11% more water with only 1% more population. Detailed data is needed to fully justify and explain the summarized demands based on the different population scenarios.
- Fractional Use, presuming nearly year-round occupancy of 48 to 50 weeks per year, is not identified. In fact, there is no way to determine what occupancy level was assumed by lodging type, and the total number of units used by MCWD does not match the Town's figures in the DPEIR.

Recreational capacity has not been dealt with, even though both documents openly state that we are a recreation-based economy. There is no analysis of the impact of the build out population on the Inyo National Forest, such as an analysis of Wilderness Permit quotas or overcrowding of the Lakes Basin. Nor is there any discussion of the impact on Yosemite National Park. In fact, the DPEIR does not include any information from these sources, although their input is vitally important. The DPEIR and General Plan need to reflect a clear plan to scale growth to available recreational capacity. I propose that this information be gathered and included, so that decision makers have information to help them determine recreational capacity.

I fully support identification of Sensitive Lands by continuation and expansion of land use overlays. The policy should:

- Identify all creeks and streams, even where in culverts such as through the Sierra Valley area
- Identify access points to wilderness
- Identify biological resources
- Flag individual parcels for Sensitive Lands Consideration. This will ensure that the objectives of the policy are clearly met during the planning process, since many of these applications are handled only through administrative review and not brought to the attention of the Planning Commission.

To clear up the confusion about what is open space, passive recreation or active recreation, and to identify the additional 22 acres of parkland needed to meet the Quimby Act requirements, I propose we create a Parkland Land Use Designation. The General Plan should set up a clear Land Use Designation for both existing parks and for the future acquisition and development.

Towards this objective, the following Land Use Designations should be changed:

- Change Mammoth Creek Park from IP to Parkland. This would protect the park which faces potential loss under the General Plan Update.
- Change the Bell Shaped parcel from Resort to Parkland.
- Purchase land along the Mammoth Creek Corridor and designate it as Parkland.

The DPEIR states that impacts on Aesthetics will occur mostly in an around resort nodes, as if this is in some way acceptable. However, the proposed 500 yards around a ski terminus puts the following neighborhoods into this highest impact area— part of Valentine Reserve, and large portions of Majestic Pines, Mammoth Knolls and the Slopes. This is a large portion of our community, but this is glossed over in the DPEIR.

The General Plan and DPEIR also propose changing building heights. What results is no limit, and that needs to be fully realized and included in the DPEIR analysis. One example of inadequate analysis in the current DPEIR is that neither the Public Safety section on structural fire hazards nor the Public Services section on staff and equipment needed for fire protection analyze the impacts of fighting fires in taller structures.

Rather, I propose that the building heights be left as they are in the current zoning ordinances. Then, allow individual projects to request consideration of taller buildings through a Variance or General Plan Amendment. Don't open door to discretionary exemptions, so that everyone presumes that "the sky is the limit."

The Population, Housing and Employment section includes a "snapshot" of what the remaining development will look like. In your deliberations, you need to understand and acknowledge this and consider the "livability" of the new developments. Table 4.9-4 shows that remaining development will be at nearly double the density of existing units. For example, Multi Unit Transient density is currently averages 16 units/ac, but is projected to average 33 units/ac for the remaining developments. The recent tour of some completed projects plainly predicts the look and feel of our future developments.

Also in the Public Services section, there is no mention of the impacts associated with the proposal from MMSA to hook up to wastewater treatment and how this would affect capacity. In fact, any impacts based on the operations of our largest employer, biggest recreational opportunity, and focus for most of our visitor lodging days is ignored throughout the DPEIR.

Finally, I am requesting a simple chart showing density changes (density per acre allowed) from the current plan to the General Plan Update by each land use designation that shows each designation's potential total with the state-mandated bonuses. Table 7-

3 on page 7-8 is so complicated that I would expect most of the community cannot read it, much less interpret the results, in the current format. Since density is one of the most debated issues in this process, it benefits everyone to have a clearer representation of what this General Plan is proposing.

Should you have any questions, or need further information, please do not hesitate to contact me at the address and phone number below.

Sincerely

A handwritten signature in black ink that reads "Bacon". The signature is written in a cursive style with a large, prominent initial "B".

Jo Bacon
P.O. Box 100 – PMB 134
Mammoth Lakes, CA 93546
(760) 934-4932

12/20/05

11-12-05

Brigitte H. Berman
P.O. Box 9753
Mammoth Lakes, Ca.

Comments on the Revised EIR of the General Plan Update:

4.3 Biological Resources

Under CEQA Considerations - B. Growth -Inducing Impacts Page 6-7 it is stated that the impact of substantial population increase to the wilderness and open land areas is "significant and unavoidable".

4.3-1 "The Town has no jurisdiction to implement mitigation beyond its boundaries ... therefore no mitigation measures are recommended. Not so: summer impact with only a small increase in visitors will be very significant. This EIR should have a section with an analysis of the impact on the surrounding government owned country, possibly with input from the Forest Service and National Park Service.

Compare with the excellent EIR: "Upper Basalt Geothermal Exploration Project". November 2004, Mammoth Pacific, LP. This report analyses the impact of well drilling and a pipeline through Inyo Forest and BLM Land.

The General Plan Update EIR must address the impact of the doubling of the resort population on the surrounding country - no wait an see attitude!

4.3.1.3. Special Status Species Page 4-60 Mule Deer

Table 2-3 p 2-22 : Issue 4.3-1 wildlife migration: Level of Significance: "would be less than significant".

Not so! Compare the treatment of the deer migration in the above mentioned EIR for the Basalt Canyon Project. See Figure 11 of the above report.

4.3.3 Threshold of Significance

"Appendix G of the CEQA Guidelines: the project would be considered to have a significant impact if the project would interfere with migratory wildlife corridors"

The impact on deer migration within the town boundary is very significant. Page 4-61 # 2. The Mammoth Pass Herd migrates through the Snow Creek Development, Old Mammoth, the Bluffs and the Lakes Basin to Mono Pass. Which is not "south of the Urban Boundary".

Mitigation is not less than significant. Deer are throughout town all year especially on the Golf Courses and in the Snow Creek development.

Mitigation should be: Open spaces for deer migration, restricted development in migration corridors, no gated communities, and speed limit reduction along town roads.

Policies and Implementation . P 4-75-76

I.1.B.d.2 - Detail needed: Species, habitat and natural community preservation/conservation strategies shall be prepared.... Details of strategies should be listed.

- I.1.B.d.3 “2) use of fences, or other barriers and buffer zone” No fences!
Eliminate all fences to promote wildlife migration.
- I.1.B.e.1 Be specific what are the “ good wildlife habitat management practices”.
- I.2.A.a.1 “New development . . be more specific.
- I.1.B.g.3 Mammoth Creek – maintain minimum setbacks – how many feet? Be specific.

4.4 Geology, Seismicity, Soils and Mineral Resources

4.4.1.1. Regional Geology

Delete the sentence: “ The caldera and other geologic features such as Devil’s Postpile etc.”

Devils Postpile, Mammoth Rock, Crystal Crag are not geologically young with an active recent history.

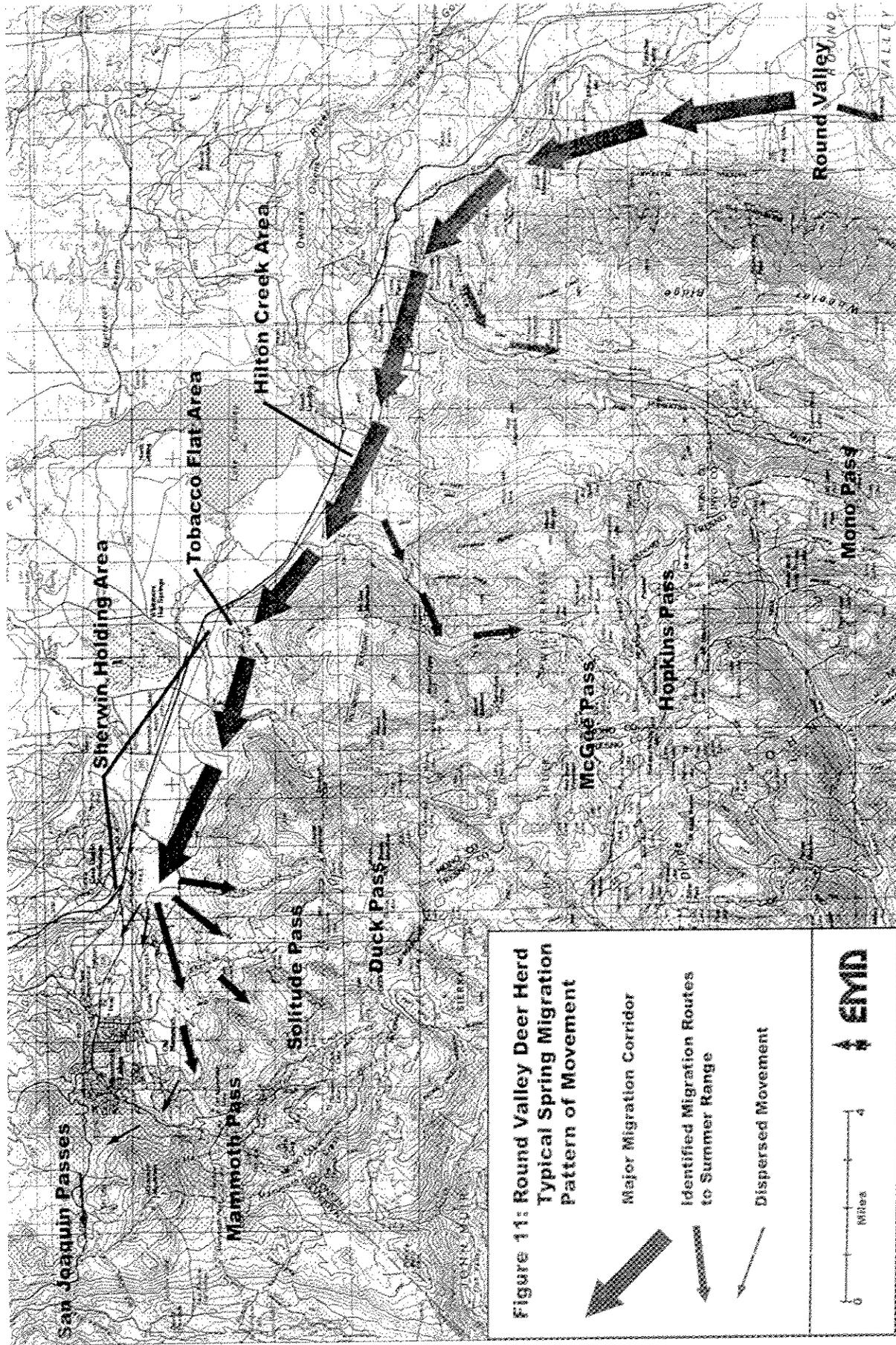
4.4.1.5 Vocanism : Mammoth Mountain is an active volcano and a new eruption can happen at any time – not “ the thousands of years”. In this region the last volcanic activity occurred 250 years ago and a new eruption in the Inyo-Mono craters is due any time soon. Hazard: This would mean ash falls in Mammoth and fire hazard.

Mammoth Pass – Red cones long period earthquakes and magma emplacement at this location with possible basaltic magma eruption in the near future should be mentioned. An eruption would mean a fire hazard for the town of Mammoth.

4.4.4 Page 4-104: You write” Potential impacts to the Town include inundation by ash deposits, lave, or lahars, or complete destruction from catastrophic eruption” with Level Significance after Mitigation: No mitigation measures are required. Impacts regarding ground failure, landslides, and volcanic activity, as well as carbon dioxide from natural sources would be less than significant.

4.4-1, 4.4-3 It is very significant! New development is on steep hillsides, weight of monster houses could start land slides, building in undesirable “ wet” areas all would be impacted by seismic and volcanic activities.

Policies: II.4.C.a.2 Evacuation Routes: Plow in winter: Scenic Route to North and establish a new route on Sherwin Road to 395 plowed in winter for escape from Old Mammoth and Snow Creek developments.



Letter 021

TRAFFIC ANALYSIS – John H. Cunningham – 11/18/2005

The traffic analysis applied a standard model to predict future flows on roads and at intersections associated with a nearly doubling of traffic. Unfortunately the model does not deal with Mammoth's unique problems that are the major causes of real congestion.

It grossly underestimates the traffic problem.

The analysis is defective for the following reasons:

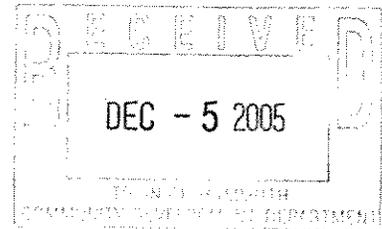
1. The model fails to recognize the existing traffic jams that occur on Saturday afternoons. Vehicles coming down from the Main Lodge take 45 minutes on a clear day, and routinely 90 minutes during a snowstorm, to do a trip that takes 10 minutes when not crowded.
2. Although average winter traffic volumes were analyzed the effect of snowstorms are neglected. Neither the loss of visibility, nor the narrowing of traffic lanes are analyzed.
3. The density of traffic in The Village is grossly underestimated. The large new fractional use projects underway and proposed are not included. The effect of the 27% extra density bonus proposed for the Village was not included in the analysis.
4. Pedestrian crossings were not explicitly analyzed. Instead max. road capacity was arbitrarily reduced by a factor. No quantitative rationale is provided to justify this arbitrary factor. At The Village many new condos are proposed to be built on the existing parking lot and as many as 600 pedestrians an hour will be crossing Minaret, in ski boots, and carrying skis on their way to the gondola. This when the road is already congested with vehicles going to or coming from the Main lodge. This needs to be analyzed, especially when snowing.
5. The frequency of congestion is not described. The single point analysis is for an average winter weekend with an almost doubling of vehicles from today. How often congestion is expected to occur is not presented. If LOS D conditions occur every winter weekend and holiday that will have a chilling impact on visitors pleasure, their time, and the Town's economy.
6. No schedule is presented for implementing the proposed traffic mitigations (x new traffic signals and/or roundabouts) The Town's Long Range Economic Forecast document uses developers projected building schedules that indicate the Town will be almost built out over the next 5-7 years. We have seen no plan, budget or schedule for the traffic mitigations proposed in the Traffic reports. If built in tandem with the condos, the torn up intersections will result in chaos. If instead they are implemented later the anticipated doubling of traffic will result in extreme congestion that will severely impact business. A schedule for building condos and for implementing the mitigations should be prepared, and analyzed.

- 7 The Town has plans to narrow roads (Meridian, etc.). This has not been analyzed, and will certainly contribute to congestion. The effect on traffic congestion should be analyzed and made visible to decision makers.

Letter 022

December 4, 2005

TO: Bill Taylor
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546



FROM: Pat Eckart
P.O. Box 7525
Mammoth Lakes, CA 93546
(760) 934-3726

RE: October 2005 Draft General Plan and EIR
Comments on Water Availability

Creating a city with over 60,000 PAOT near the top of a watershed is unsustainable and absurd, especially when based on assumptions as is the case here.

Comparing the information on projected water availability in the two draft EIRs, I must conclude that little has changed. At first I was puzzled by the lower demand numbers and higher surpluses in the New Proposed Alternative compared to the earlier EIR. Then I noted that the total "savings" in Table 4.6.2 [Feb. EIR] were 2,292 AF. This is what accounts for the difference, a meaningless 7 AF. Table 4.6.2 addressed the anticipated water deficiencies by citing four areas to meet them: water conservation, water loss reduction, use of recycled water, and development of new supplies. These new savings are all based on *assumptions*, which is why my earlier comments are applicable here.

I am convinced that, sooner or later, the Town's development plan will result in exceeding water supplies. What then? I have high regard for the Water District but feel they are caught in a political bind when it comes to town officials who are hell-bent on development at any cost and who are blind to the consequences and responsibilities that come with living in high-altitude watersheds. Common sense and sound knowledge of the limitations of our physical environment *must* be applied to development issues.

The February Draft Program Environmental Report (DEIR), by itself, raised red flags, which have not changed:

"... the full Plan development scenario *depends upon supply sources that do not have required approval*. . . ." (and may never get them)

"... the potential *environmental impacts* of these project[s] *are not yet known*, and it is *not assured* that these sources will become available." (forcing dependency on groundwater sources)

"... the potential *impacts on groundwater supplies* are considered *significant and unavoidable*." [Feb. DEIR, 4-122, emphasis mine]

A. Development of New Water Sources

To better understand our region and the choices and limitations associated with water supply, I strongly recommend (beyond current studies) Boyle Engineering's Feasibility Study of Alternative Sources of Water Supply and Methods of Reducing Demand, Draft Report, January 1992. Included in the sources examined, besides the most obvious, were Duck Lake and the San Joaquin River. The first recommended source was Convict Creek despite details illuminating the high cost of pumping water uphill and the problem of storage.

In addition to limited sources for water, high cost of development, environmental concerns, legal restrictions, and lack of storage, political issues also create obstacles, especially when water is to be taken from other watersheds. When Convict Creek was under consideration by the Town in 1992 (as a result of the Boyle Study), a strong opponent stated, "We're your *neighbors*, not a *colony*!" [Mammoth Times, 1992]. If the updated General Plan goes into effect, welcome to the water wars!

Obstacles to development of new water sources are almost certain to prevent Dry Creek from ever being developed. In addition, legal restrictions on the transfer of water from one watershed to another are on the increase as water, universally, becomes scarcer.

B. Groundwater Reliability (another red flag)

"Ground water hydrology in the Mammoth Hydrologic Basin is *complex and not well understood*." [4-145, Oct. DEIR; 4-112, Feb. DEIR]

Hmm. Where does the water go and whom does it serve? (Note: Horseshoe Lake)

Graphs of MCWD's production wells during the 7-year drought (1980s-early 90s) show rapid decline and gradual recharge to the point (if memory serves me) that water in Well #6 and Well #10 dropped to or near the bottom of the wells. Overdrafting is almost sure to occur under this Plan. Not all wells produce as planned. Check out the problems with Well #16.

C. Water Deficits (more red flags)

As referenced earlier, Table 4.6.1 [Feb. DEIR, 4-121] shows that, under the Project Action Alternative, "deficiency" of water *increases* over current conditions as well as adding a deficit in the One Dry-Year category. See attachment. In other words, all conditions worsen. What happens if there is another 7-year drought? Why are worst-case (four or more years of consecutive drought) not analyzed? What if the *assumed* additional water supply sources fail to produce the expected and needed results?

D. Potential Additional Water Supply Sources

"Additional water volumes from *firm* supply sources (i.e., *water conservation* and *system loss reduction*) would augment available supplies by 797 AFY."

I don't believe this for a second.

During our most recent seven-year drought, Mammoth Lakes' residents showed that they were willing and able to conserve water—but within limits. Very limited or no watering restrictions brought out people screaming for development of more water sources. Golf course

owners will insist (as Dennis Agee did) that water for golf courses is an “economic necessity.” In a drought snowmaking will also be declared an “economic necessity.” During the 1990s MMSA sought as much as 300AF for snowmaking (not included in any of these assumptions). Life can get ugly if high restrictions are imposed on some but not others.

Recent reduction in large water losses, attributed to pipeline replacement, have indeed occurred. However, based on MCWD’s past record of monthly “unaccounted for” water losses, I have little confidence that their expectation of an *average* monthly loss of 11 million gallons will hold. So far, it isn’t. My view is based on a record of widely varying losses over a long period of time, which, when compared annually, appear inexplicable and perhaps due to something other than pipeline leaks. Diversions come to mind.

E. Coordination of Development and Water Supply [Feb. DEIR, 4.6.o]

The Town’s past record in coordinating development and water supply with MCWD is poor (i.e. Lodestar golf course permits were granted *before* reclaimed water supply was even started, much less assured.) I have no confidence that the Town will comply with this provision. Town staff needs to be knowledgeable about all aspects of MCWD water and supply issues, including historical records. The Town should not force the water district to take the heat when moratoriums and/or denial of connection permits occur.

E. Global Warming

The impact of global warming on our water supply has not even been addressed! Demand for water will substantially increase as supplies decrease. What then?

Ignoring these red flags, the Town will overbuild and overpopulate without the necessary water supply. Water is the lifeblood of every community and must not be taken for granted—ever.

Thank you for the opportunity to comment.



Pat Eckart
MCWD Director, 1994-1998

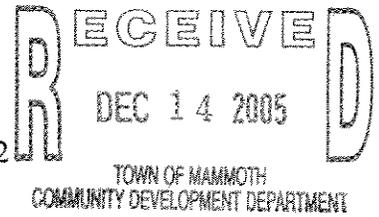
Attachment: “Supply and “Demand” figures from MCWD’s November 17, 2005 Board Meeting, Agenda Item: D-7. (Note increased deficits in dry years.)

Supply and Demand For Normal and Multiple Dry Years

Supply and Demand	Normal Year (acre-feet)	Multiple Dry Year (acre-feet)
Exist Supply	6682	4492
2004 Demand Surplus or (Deficit)	3276 3406	3276 1216
2005 Demand Surplus or (Deficit)	3427 3255	3427 1065
200 General Plan Update Surplus or (Deficit)	4460 2222	4460 32
2005 General Plan + 25% Density Surplus or (Deficit)	4553 2129	4553 (61)
2005 General Plan + 25% Density + 25% Occupancy Increase Surplus or (Deficit)	5734 948	5734 (1242)
2005 General Plan + 25% Density + 25% Occupancy Increase + Continued Sierra Star irrigation Surplus or (Deficit)	5992 690	5992 (1500)

Letter 023

1070 Las Pulgas Road
Pacific Palisades, CA 90272



December 12, 2005

Sonja Porter
Senior Planner, Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Dear Ms. Porter:

We have reviewed the new DPEIR for Mammoth Lakes and have serious concerns about its impact on the quality of life in Mammoth and the ultimate viability of the existing commercial establishments. The new planned high-density developments and the projection of over 60,000 people at any given time suggest to us that the attractive qualities of this unique Eastern Sierra area will be seriously compromised, with the result that many people will ultimately stop coming here. We are particularly concerned about increased air, light, and noise pollution; traffic congestion; and the impact on water supply.

We do not think it is in anyone's best interest, either residential or commercial, for Mammoth to become another Aspen or Lake Tahoe, areas which are easily reached but are becoming less attractive to visitors because of some of the problems which the DPEIR would visit upon Mammoth.

As owners of a condominium at Snow Creek and long-term frequent visitors to this area, we strongly urge that the Town of Mammoth Lakes reject this plan and take additional time to study its long-term effects.

Sincerely,

A handwritten signature in cursive script that reads "Marty Epstein, Gloria Fowler".

Marty Epstein and Gloria Fowler

Letter 024

Date: December 14, 2005

From: Julie Fisher & Tom Gasaway

Re: Public Comments for DEIR for proposed General Plan.

Submitted: via email attachment, Word 2000 doc.

Mammoth's Vision statement needs to be reflected in goals and policies and Codes. It does not. The only assurance the DEIR makes is that mitigation is (usually) not offered and infeasible, or that weak and un-measurable and non-existent (future) policies will correct the impacts.

What the new Gen Plan and DEIR does insure is that citizens and Town officials will be tossed into a vague world of uncertain policies and goals...perfect for the developers who are the only ones whose goals are met with the plan as it is currently written.

Required Elements of a General Plan

As stated on p. 15 of the proposed General Plan, California Government Code section 65302 requires 7 elements to be included in a General Plan.

Are these required (separate) elements in the proposed General Plan?

The Open Space element and Conservation element are now discussed in various chapters, particularly the biological resources section. However, there is no detail presented as a means to measure what open spaces, if any, the Town hopes to save. There is no wetlands delineation map presented, and no goals of protecting natural resources other than vague assurances that the Town will adopt careful plans and strategies at some point in the future. The DEIR simply states that this loose wording and deferral of mitigation to a future date is sufficient. This is inadequate, as it allows no measure of how the Town will achieve the already vague goals.

Furthermore, the DEIR simply states that impacts to open space within the Town limits and even outside the town limits will be significant, and no detailed alternatives are given to lessen or prevent that impact. In fact, passive open space with natural features (versus active open space and recreation such as tennis courts, pools, ice rinks, etc) is given virtually no assessment or mitigation alternatives.

p. 17 of the new Gen Plan cites well-designed and accessible open spaces that enhance community livability. The next sentences describe, "the linear open spaces of Main St. Old Mammoth Rd. and Meridian.

Does the new Gen Plan imply that roads are now open spaces?

Does the DEIR comment upon this description of roadways as open spaces?

This section also cites pedestrian plazas as open space.

Does the DEIR comment on just how pedestrian plazas are considered open space? Is this consistent with an open space classification?

This section also discusses the private developments of Snowcreek, Sierra Star, and Eagle Lodge as having open spaces.

Does the DEIR discuss whether these (private?) open spaces are really available to the general public in a manner consistent with regular open space uses (i.e. free access and use for the general

public for walking, hiking etc.? Are gold courses now considered community open space even though they cater to a narrow segment of the population and are quite expensive?

The current 1987 Gen Plan does not count private open spaces and private recreational facilities as part of community open space and recreation.

Does the DEIR discuss whether the new Gen Plan is now counting those private amenities as open space? If it does, this seems to run in contrast to the “environmental justice” goal of providing quality open space and recreational opportunities for all income levels.

p. 56 describes uses allowed in OS zoning. The wording is loose and says the zone may include environmentally sensitive areas. “May” is a very vague word. OS zoning now mixes in active recreational uses such as golf courses, athletic fields, etc.

The draft EIR notes that most, if not all of the passive open spaces (which highlights the natural resources) may be developed to active recreational uses.

What alternatives does the DEIR propose to mitigate this loss?

Does the DEIR discuss mitigation measures that will allow currently undeveloped lots in environmentally sensitive areas to be acquired for permanent preservation as passive/natural open spaces?

p. 64 provides open space guidelines that are significantly weaker than in the current Gen Plan. Essentially saying “where feasible, it may be saved”. Does the DEIR recommend mitigation to improve the obvious potential impacts of such weak policy language?

p. 65 says the City will formulate open space programs with outside agencies (USFS, DWP, etc.) but gives not specific goals, no specific policies to implement that. It does not even say why that would be needed given that these other lands (USFS, DWP, etc) are already in open space. This cursory review is so vague as to not constitute any meaningful discussion. It also defers to the future something the city will do, but creates no measure of what the Town hopes to achieve or whether the Town actually will do anything.

p. 76 last chapter says the Town will require new construction to incorporate design to minimize impact to views and the natural environment. This is an amazingly vague policy. The DEIR should discuss alternative language that provides for stronger protections.

p. 82 discusses water courses (including intermittent streams). The policies are weak on protecting natural drainage courses, and in fact, do not mandate protection. The DEIR needs to present alternatives that would allow for more protection of watercourses.

p. 82 also says that town will continue to efforts to pursue a continuous corridor along Mammoth Creek, including a defined width. The DEIR needs to discuss how the Town has not pursued this effort in the past, despite 19 years of opportunity to buy out remaining parcels near or within the creek OSSC area. The DEIR needs to present alternatives and action plans that improve upon this weak claim that the Town has not pursued in the past. The new Gen Plan and the DEIR present no detailed action plan to acquire properties that are good candidates for full preservation.

p. 83 discusses wetland mitigations as required via Federal or State Fish & Game, but where could these mitigations go? The DEIR needs to discuss alternatives that reduce or eliminate the possibility of wetland losses within the Town.

The DEIR p. 4-72 mentions Town Codes that protect natural resources. Does this list include the current 50' streambank setback? That setback should be presented in DEIR, as it is a measurable Code; therefore it carries some strong protections.

The policies and implementation measures in the updated General Plan, which relate to protection of natural resources and open space, are inadequate. The DEIR states that implementation of these policies will reduce the impact of development to less than significant. However, reliance on the minimal standards of the Army Corp and State Fish and Game cannot lead to that conclusion. Those agencies are restricted in their scope of comments and in their enforcement.

The vague language in these new Gen Plan policies does not create any measure upon which to judge whether these policies will mitigate impacts to less than significant. In fact, the policies defer even the creation of strategies and plans to a future date.

The new Gen Plan policies related to natural resources do not offer guidelines to present to the other agencies (BLM USFS, etc.) upon which to discuss strategies, so the promise that the Town will work closely with those agencies to ensure that regional ecosystems is maintained is not a measurable policy. The Town has not presented any defined areas that they wish to maintain in natural open space, or to what measurable extent they hope limit impacts, so there is nothing to measure. The DEIR cannot then claim that the impacts of these policies reduce the level of impacts to less than significant.

The DEIR fails to note that this deferring of plans and strategies to a future time is inadequate and does not permit an assumption of mitigation to less than significant levels.

State law mandates an ambitious and detailed planning effort for open space that is comparable only to the requirement for the Housing element. Such vague wording and deferred future plans and strategies do not appear to meet this test. The DEIR needs to present alternatives that would meet the test of the required open space element, including actual strategies that can be measured today, not at some future date.

The DEIR needs to assess the fact that the Town has very little natural open space now. The new Gen Plan leaves the very real probability that the remaining open space will be developed or sold. It is the Town itself that claims that it wants natural open space preserved within the Town, not mitigated with restoration projects outside of the Town. The DEIR needs to assess that the Town's vision statement is not consistent with policies that may very well delete remaining natural open spaces from within the Town limits.

The DEIR goes on to state that there are no mitigations offered for impacts created by the Town on natural resource and recreation areas outside the Town's boundaries. The DEIR is remiss in not assessing the Town's ability to alter this new Gen Plan such that impacts will be reduced or eliminated on resources outside of the Town's boundaries. The DEIR's assertion that the Town has no jurisdiction over lands outside its boundaries, therefore impacts cannot be mitigated is specious in that it is the Town's new Gen Plan, applicable to within the Town, that is a major contributing cause to future impacts on natural open space areas both within the Town and outside the Town. The Town has the power to adopt policies that will reduce those impacts, perhaps greatly.

The current and new General Plan make much reference to the importance of preserving natural resources both within and outside the Town's boundaries, in large part because visitors come to the Mammoth region for the natural outdoor scenery and recreational opportunities, particularly the summer tourists. Therefore, the new Gen Plan should contain policies that reflect that concern for the natural environment and the economy that is so directly connected to it. The DEIR should offer alternatives that achieve better internal consistency of Gen Plan goals and policies.

The DEIR simply lists passive open space and conservation areas that are outside the Town and which are available for the residents and the Town's tourists to use. However these USFS, wilderness, DWP lands are already at or beyond carrying capacity. The Town has profited from its location next to Federal and DWP lands, yet the proposed General Plan will lead to impacts on those Federal and DWP lands that cannot be mitigated. How is this consistent with the goal of "sustainability with the natural environment" and "supporting that relationship with visitors"? And how is that consistent with the goal of attracting summer visitors whose interest is in nature-oriented activities (camping, fishing, hiking, biking, etc.)

The DEIR does not mention the lack of detailed element policies, and it makes little or no effort to discuss alternatives to lessen or eliminate those impacts. It simply notes that under the proposed General Plan, the current open spaces within the town may be converted to developed/active recreational uses (ice rinks, etc.) and that some open spaces may be sold for private development. This is inadequate as it leaves the decision maker with no alternatives from which to choose as a means to modify the proposed General Plan policies and lessen impacts to open spaces (which is very likely the intent of leaving out alternatives).

Past Documents

Incorporated via reference and for comparison purposes is the current 1987 General Plan and its full EIR, including supporting documentation (inc the Mono County Plan that was used as one reference for that 1987 General Plan) and more recent MCWD documents and EIRs.

Natural resources in this submission of comments includes: natural habitats, view amenities of natural resources, trails in and near natural resources, natural vegetation including large trees, wetland areas, and vegetation associated with wetlands and stream corridors, and animal species associated with those habitats).

The Draft EIR for the Proposed General Plan presents insufficient alternatives to mitigate impacts.

The DEIR is extremely weak on presenting alternatives that lessen or eliminate impacts associated with the proposed General Plan. There is a pattern of assurances that the Town will formulate future policies and guidelines that will lessen impacts. But a future action is vague and uncertain and does not provide tangible policies upon which the public can comment or rely upon, as they do not exist as yet. In many cases, the DEIR notes that the city may not even formulate such policies since many of the policies contain non-mandatory language (might, can, may, where feasible, etc.). Thus, an impact is impossible to determine based on a “might policy”, and even more difficult upon which to make public comment.

Furthermore, the proposed General Plan contains policies that say that the Town will rely on other agencies for natural resource protection policies (Army Corp. of Engineers, USFS, State Fish & Game, etc.). However, the DEIR does not discuss alternatives to this reliance upon other agencies (i.e. stronger Town policies that would better protect the natural resources). (More detailed discussion of this below).

Old General Plan versus New General Plan

Does the DEIR for the proposed General Plan assess alternatives that include keeping portions of the current 1987 General Plan and incorporating them back into the proposed General Plan?

If not, why not?

The most obvious alternative to mitigate negative impacts of the proposed General Plan is to review the previous General Plan for policies that lessen or eliminate those impacts. Years of research and expense went into creating that 1987 document, including the documents that were referenced for the 1987 General Plan. A thorough examination of those policies should be made as a means to offer better alternatives that lessen or mitigate impacts of the proposed General Plan.

Where the current 1987 General Plan failed to achieve its goals regarding natural resource protection, an assessment should be done by the DEIR to note how that can be improved. Was the failure due to lack of implementing policies strictly (as occurred under the Mono County Plan) or was it a failure of the policy itself? Such an assessment can lead to viable and effective alternatives to lessen or eliminate impacts associated with the proposed General Plan.

It's useless to simply write new General Plans when an assessment of the successes and failures of the current General Plan has not been made. Otherwise, the Town runs the risk of failing to meet goals again, particularly goals that have long been part of Mammoth's values, and a big stated goal has always been to protect the Town's natural resources.

Specific policies and goals in the current 1987 General Plan, including OS, SCP, and OSSC overlays and current Town Codes (including height limits) provide significant protection (when followed without the use of variances or liberal use of density bonuses) for the Town's natural resources.

Does the proposed (new) General Plan provide as much protection as the current General Plan for the Town's natural resources, including the view shed amenities and protections offered via the current OS/SCP/and OSSC overlays? The DEIR should compare the current and new Gen Plan to determine which is stronger in protecting natural resources, etc.

Does the proposed General Plan have more, or fewer, detailed protections for natural resources? Specifically, more or fewer detailed protections for habitat types, not just certain protected/listed species?

Which policies relating to natural resources in the current 1987 General Plan contain mandatory language? (shall, will, must, require, etc.)

Does the proposed General Plan change or delete mandatory language policies of the current General Plan related to protecting natural resources and view shed amenities?

If so, which specific mandatory language protecting natural resources and habitat types and view shed amenities of the current General Plan are deleted or changed?

As a result of those changes/deletions, is the current General Plan or the proposed General Plan more likely to protect natural resources (including resources within the Town?)

What policies (relating to natural resource protection) of the proposed General Plan contain non-mandatory language (should, could, may, can, might, where feasible, where possible, etc.) From a legal standpoint, looser language allows for more development, not less. The DEIR should offer alternative, mandatory, language that will improve the changes that resources will be protected.

As it relates to natural resource protection, does the DEIR examine how effective (or ineffective) such non-mandatory language is compared to mandatory language?

Comparing the current 1987 General Plan and the proposed General Plan, which one contains the stronger mandatory language for protecting natural resources?

Does the proposed General Plan preserve any of the OS/SCP/OSSC overlays within the Town? How does any deletion of these overlays reduce the probability of those resource areas being protected as strongly as in the current General Plan? What mitigations are offered, and how do they compare in effectiveness to current General Policies and overlays?

The 1986 EIR for the current 1987 General Plan cited that the Mono County Plan did not go far enough in protecting natural resources. Is the proposed General Plan a step forward or a step backward in its probable effectiveness for protecting natural resources as compared to the current General Plan?

Meaningful Citizen input

The record of citizen input listed in the DEIR gives the appearance of meaningful citizen input, but is it?

The DEIR makes much mention of numerous public input and citizen committee meetings related to developing/reviewing the new General Plan. But a meaningful input is more than just collecting people's views, it also means incorporating them.

Does the DEIR assess whether the opinions and recommendations of committee participants and of those citizens who commented on the new General Plan and the DEIR were (or were not) incorporated into the new General Plan?

Were any of the committee members who gave recommendations for the General Plan, or any of the general public who submitted comments, interviewed to see if they felt their concerns were actually incorporated into the General Plan in a meaningful way?

Without such an assessment, the inference made by the DEIR that citizens had significant input into the actual General Plan is unsubstantiated.

Vision statement of new General Plan

As the overriding goals, this list includes references to the importance of protecting the Town's natural resources. Yet the General Plan policies that follow are extremely vague and weakly worded, providing, in effect, only a suggestion that the Town attempt to protect natural resources where feasible, or where mandated by other agencies (Federal or State). This does not appear to be consistent with the overriding Vision Statement.

Secondly, regarding protecting natural resources, including wetland areas, the General Plan places much emphasis on relying upon the standards of the USFS, State Fish and Game, and other regulatory agencies, even though such agencies are not intended to provide the primary guiding policies for a Town or County agency. In fact, those agencies (USFS, etc.) defer the specific planning to the Town. Therefore, the policies of that Town had better be strong, specific, and measurable. The current General Plan avoids that responsibility by shifting the burden for resource protection to agencies that are known to be underfunded, understaffed, and overburdened with too large a caseload.

Furthermore, the protections offered by these Federal and State agencies are very weak as compared to what a Town or County can create through Town/County policies. And legally, stronger policies generally override weaker ones. It is this police power of local government that the Town can use (or not use) to increase protections for natural resources.

How does the DEIR address this reality? What impacts are likely to occur with a General Plan that relies on agencies that do not have the time, staff, or money to properly monitor and protect natural resources within the Town's limits, certainly those agencies will not have time to review every site specific, small project that might have a significant impact?

Does the DEIR address the effectiveness of Federal and State policies as compared to the power that a Town/County can exercise if that Town chooses to adopt stronger policies that go beyond the limited scope of power of Federal and State Agencies?

Without such an assessment, the DEIR fails to point out one of the most effective and legal means that a Town has to increase protections for natural resources, thereby greatly reducing or eliminating impacts that are likely to occur if the Town relies extensively on Federal and State policies.

Open Space impacts on Residents and Tourists

Does the current 1987 General Plan, with its current SP/SCP/OSSC overlays and Codes (which set streambank setbacks of 50') provide more or less probable protection than the proposed General Plan for the Town's and the areas natural resources?

The proposed General Plan states that current, in Town, open spaces may be developed. The Town will also need to lease Federal lands and other agency lands just to attempt to meet it's own, in Town generated recreational needs. The General Plan is thus creating a high probability that not only will in Town natural resources and open space areas be vulnerable to loss or impacts, but the new General Plan will also spread that impact out to Federally owned or DWP lands which are already near maximum capacity.

Does the DEIR address the impacts to tourists who are entitled to a quality experience on lands owned by the public? What mitigations are offered?

The DEIR states that mitigations can be implemented (even wetland impact mitigations), but how can mitigations be implemented within Town boundaries when there is virtually no open space available to which impacts can be mitigated?

The new General Plan leaves the real possibility that the current open spaces may be developed to some greater level than is likely under the current General Plan zoning (when policies and open space overlays are followed strictly and variances are not used).

How is the first vision statement then consistent with the rest of the General Plan? As stewards, the Town, via its new General Plan, is not meeting its first vision statement to protect natural resources and it certainly is not meeting its stated obligation to the Town's visitors/tourists. The General Plan EIR clearly states that impacts will be greater on natural open spaces via the new Gen Plan policies and those impacts will spread out to property not owned by the Town, indeed, not even within the Town limits. This does not appear to meet internal consistency of the Gen Plan.

The goal to increase Summer Visitation

The current and new General Plan aspire to increase summer recreation, with a goal to attract summer tourists to even out the income flow to the yearly economy. The summer visitor is documented to be interested in the natural environment, fishing, camping, boating, hiking, backpacking, horseback riding, etc.

However, the proposed General Plan, with its maximum growth policies, density bonuses, and greatly reduced open space protections within the Town are in seeming contrast to the goal of attracting the nature oriented summer visitor. Furthermore, the fact that the new General Plan policies will likely result in loss of in Town open spaces, only adds to the loss of a natural amenity (within the Town) that would likely attract the summer tourist and his/her dollar. Worse, the new policies will create more impacts from residents on Federal & DWP lands, further pushing the nature oriented summer tourist out to less crowded areas of the Federal & DWP lands.

Does the DEIR address this conflict? This does not seem to meet the measure of internal consistency of policies and goals.

Biological Resources section of the new General Plan

The new General Plan talks of using other agencies guidelines for home-owners so that they can properly manage their lands in areas of sensitive natural resources. Does the DEIR exam the effectiveness of advisory guidelines for home-owners, condo managers, etc. when it comes to long term management?

How is any Town official going to know if a home-owner improperly disposes of household products, or uses harmful chemicals, or even uses common (not as harmful) chemicals, that due to their use near sensitive resources, do create an environmental impact?

Does the DEIR address the likelihood of the Town monitoring and discovering non-compliance with suggested guidelines? How realistic is that, given the Town's limited ability to staff such a site by site assessment on a year round basis, and on a daily basis?

What is the likelihood that a home-owner will report him/herself for letting grease or soap from washing of a car, which grease and soap then creeps into a sensitive resource area?

How effective is such a policy that states that guidelines will be given to home-owners so that they can follow them on their own? The DEIR needs to address the reality of such a hopeful and unrealistic scenario.

To allude that guidelines handed out to home-owners or condo managers will mitigate impacts to sensitive resources is insufficient without some evidence that this can actually work.

Past and present studies of the water quality of Mammoth Creek indicate a continued problem with pollution and siltation, and this continues to occur even with the relatively stronger policies of the current General Plan.

Does the DEIR address whether the proposed General Plan policies (including home-owner guidelines for self compliance) are likely to be more or less effective than current General Plan policies (which include streambank setbacks and OS/SCP/OSSC overlays)?

Urban Growth Boundary

The p. 12 of new General Plan states that the Urban Growth Boundary is limited to lands not now designated for open space. This implies that current open spaces would remain undeveloped. Please clarify since the new General Plan also sets policies to delete many areas currently zoned as some form of open space.

p. 30 of the 2005 DEIR??? states that Design Guidelines do not apply to Single Family Residential.

An internally consistent General Plan document must provide policies that interrelate at all levels from the General Plan on down to more detailed policies such as the Town Code and Design Guidelines.

The undeveloped portions of the Mammoth Creek Corridor are zoned Residential and are also currently (as of 2005) zoned Special Conservation Planning and Open Space Stream Corridor. Therefore, design guidelines that do not apply to SFR areas would provide zero protection to the Mammoth Creek areas with Residential zoning and current SCP and OSSC overlays.

How then do design guidelines provide internal consistency if they do not apply to single family residential areas, which is a zoning category that occurs adjacent to, and within, the Town's only major creek, a creek which feeds one of the largest fish hatcheries in the state?

If design guidelines do not apply to SFR areas, how is this impact assessed in the DEIR and what mitigations are suggested.

Of the mitigations, which ones provide the greatest protection for scenic views as well as for protection for streams, including the visual amenity provided by wetland areas surrounding the creek, such as vegetation (inc. trees) within and near the currently zoned OSSC and SPC overlays?

Does the DEIR address the impact of the new General Plan policies (including deletions of the SPC/OSSC overlays) on those currently zoned SPC/OSSC areas?

What mitigations are offered?

Are the new General Plan policies (and deletions) as effective in providing protection of the currently zoned SPC/OSSC overlay areas as the current General Plan that is still in use as of 2005?

The DEIR does not appear to make reference to the current 1987 Gen Plan as a possible alternative for stronger policies that could mitigate natural resources impacts created by the new Gen Plan.

The DEIR should consider current Gen Plan policies as an alternative to mitigate impacts.

Forest Service Exchange Lands

P. 35 shows a map with yellow around the Town. Does this yellow indicate Forest Service land that may be exchanged to the Town? If yes, does the DEIR address this added growth?

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Recreation Element

Why is town allowed to use federal/state lands outside of it's jurisdiction as a means to absorb recreational demands generated from within the Town. The General Plan states that open space and recreation areas outside the town boundaries are already at, near, or are over capacity.

Does the Quimby Act require **passive** open space allotments per 1,000 people. The General Plan appears to focus only on active recreation, and most of that occurs on leased land from USFS, which impacts the visitors to Mammoth who rely on USFS and other open space lands for their recreational needs.

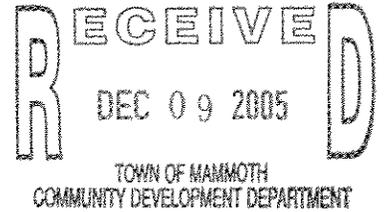
The General Plan is very thin on assessment of impacts to Non-Town owned open space and it's affect on tourists who come to the Mammoth area. If the town's residents are heavily using non-town owned (but leased) land, then that leaves less for tourists.

As a whole, the new Gen Plan and the DEIR do not offer sufficient data upon which the Town or citizens can measure progress towards goals, that is particularly true of the open space/conservation strategies, most of which are deferred to plans and strategies not yet created.

Letter 025

robert hall realty co.

real estate brokerage • management • development
17671 Irvine Blvd., #103 • Tustin, CA 92780-3178 • 714/544-9353 • Fax 714/544-4545



December 2, 2005

Ms. Sonja Porter, Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Re: DPEIR

Dear Ms. Porter,

Let's slow down and rethink this plan, what's the rush? Let's wait for this June's election and be sure this is what the people want.

There is no going back.

Sincerely,

A handwritten signature in cursive script that reads "Robert Hall".

Robert Hall
797 Majestic Pines Dr.

Letter 026

Thom Heller
PO Box 1765
Mammoth Lakes, CA 93546

Town of Mammoth Lakes
PO Box 1609
Mammoth Lakes, CA 93546

Re: Comments on the Revised Draft EIR for the General Plan Update

Thank you for the opportunity to comment on the General Plan. I have three comments to offer concerning the plan and each relate to workforce housing.

1. Workforce housing needs to be located throughout the community. There needs to be a mix of new and purchase of existing housing possibilities for employees to obtain/rent. As a general rule, there should not be large accumulations of units, possibly not greater than 40 units. Certainly that may not be possible throughout town, but the larger projects that are currently underway should not be the standard. While I understand that smaller projects are going to be more expensive in the big picture, the ability to scatter the workforce housing will offer a more cohesive setting and less concentrations of possible problems associated with the larger housing groups.
2. There should not be a large component of workforce housing placed in the South Gateway parcel. The GPAC was unanimous in not wishing to see any type of concentrated housing project at that location. A housing subdivision with a mix of different housing types (single family, duplexes, multi-family units) might work, but developing a concentrated housing project at the entry of town should be avoided at all cost. The concept was not looked at favorably when the Trails Subdivision was created and the effort to try to keep our existing private land boundaries intact should be paramount in our minds as we move forward. With the spread of workforce housing throughout town, the expansion of the private boundary should not be necessary.
3. The bell shaped parcel should be declared open space, but only the northern portion of the parcel should fall into this designation. The southern portion should be available for development and based upon the location, workforce housing would seem to be the best use of the land. The southern parcel is located adjacent to existing housing, has no wetland characteristics, and is positioned near existing transit opportunities. The northern portion could be minimally developed as a neighborhood park with large passive areas contain within.

Thank you again for the opportunity to comment on the plan. It has been a lot of work, but it finally appears that we may be on the way to a decision and whatever will follow.

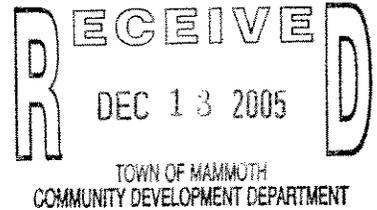
Sincerely,

Thom Heller

Letter 027

December 10, 2005

Sonja Porter, Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546



Dear Ms. Porter,

As second homeowners, a Fairway home in Snowcreek V, we are writing to express our deep concern regarding the over development of our cherished Mammoth Lakes community and to support the positions of the Advocates for Mammoth.

We are VERY concerned our children and grandchildren will not be able to enjoy the beauty and openness of what was once the Mammoth Lakes we have loved over the past 50 years. We are concerned we are losing open space which is so valuable to the ambiance of the entire area. We are concerned our children, and those in the future, will lose their "kid-friendly" Mammoth Creek Park, where they have spent many happy hours. We have read about the water situation and are concerned how that will impact all of us. This past Thanksgiving, after our dinner, we all went out on the golf course to "star gaze," showing our grandchildren the many constellations visible in the clear night sky. We fear that will be lost too with the development and addition of artificial lights at night. Already, our view toward Mammoth Rock is being ruined with the mega houses being built on the hillside. When will it stop? The increased population does not improve our outdoor recreational experience but rather, diminish it.

PLEASE be very careful what you decide in the way of future development. What you take away today can never be put back again in its natural way. Please help us keep Mammoth Lakes and the surrounding area as undeveloped as possible for our future generations.

Sincerely,

A handwritten signature in cursive script that reads "Sandra Jacobsen".

Richard and Sandra Jacobsen
Snowcreek V, Unit 711

Letter 028

11/24/2005

To: Town of Mammoth Lakes
Community Development
PO Box 1609
Mammoth Lakes, CA 93546

From: Keith D. (Doug) Jung, PE, PG
PO Box 151
Mammoth Lakes, CA 93546

Ref: Revised Draft Program

Environmental Impact Report
Town of mammoth Lakes
2005 General Plan Update

Staff:

I have reviewed certain sections of the draft EIR and offer the following comments:

The Town (Lead Agency) is required to comply with SB 610 and SB 221 of 2001. Under SB 610 if the water supply deemed "insufficient" which is the case in point with the MCWD describing their supply as "insufficient" and "minimal" then the lead agency will approve or disapprove the project.

1. Water Assessment Amendment, MCWD, 11-4-2005
 - a. detailed methodology (described as a "new methodology"), computations and assumptions need to be provided in the DEIR to provide confidence in these very critical water supply and demand numbers (tables 1, and 2, chart 1 and the figure bottom of pg. 2. MCWD acknowledges that water supply is "minimal" during 2 and 3 year dry periods. The term "insufficient" is used to describe the supply as the Town nears build out. These tables should be extended to at least a 5 year dry period and better still to a 7 year dry period as these lengthy dry periods are known to occur in this area (Wildermuth 2003).
An estimate should be made of confidence in the accuracy of the estimates (25%, 50% and so forth).
2. 4.11 Public Utilities
 - a. 4.11.1.1 a "different methodology" (pg. 4-253, see above) was used to develop new water supply figures in the Assessment. What is this methodology? Details of both methods need to be provided to understand how the supply figures were generated.
 - b. Pg. 4-253 pp 3 could leave out "and not by groundwater".
 - c. What will be the effect of canceling the Master Operating Agreement between the USFS and MCWD?
 - d. Top of pg 4-256 do the groundwater levels recover or just "tend" to recover. The supply well production plots would indicate that water levels recover somewhat but over several years, however the

recovery (water levels) is less than the year before. It would appear that the aquifer is over drafted. Well interference is commonly exhibited by the supply wells. A "cone of depression" (Schmidt) exists in the well field.

- e. The Cal Trout petition re: Mammoth Creek needs to be considered. What would be the effect on water supply of moving the gauging station location on Mammoth Creek?
- f. The term "expert" (pg 4-256) needs to be defined. Does the term "expert" in this EIR define someone who is licensed by the California Board for Engineers or Geologists/Geophysicists and Hydro geologists"? If one passes him or herself off as licensed and is not it's against the law. Please name the "expert" and state his/her qualifications. The term qualitative term "expert" doesn't belong in this document.
- g. MCWD monitoring program apparently is just getting started with an est. of 2 years to complete). Then it will be several years before enough data, modeling, mapping, testing and so forth will be available to start making operating decisions. In the meantime what happens? Does the MCWD begin to refuse connections at some level of confidence in their supply figures?.
- h. Pg 4-258 define multiple dry years and what is single dry year?
- i. Mammoth Mt. Is preparing connect to the MCWD sewage system. Will the system be adequate to serve the Town and Mammoth Mt.?

4.11.1.5 Propane : Actually 2 lines were laid by Rock Creek Energy from the "tank farm" in the Industrial Park up along Meridian and to Sierra Star. One is for propane and the other for natural gas when and if Liquefied Natural Gas (LNG) ever comes to town. These lines and propane service is available to whomever desires it as the lines are laid in Town right-of-way.

4.11.2.1

- a. Define the acronym CWS, and what does certification by CWS mean?.
- b. Reliability of supply needs to addressed- 100% reliability for instance would imply a reliable supply while a 50% reliability would imply that a supply of water is in doubt and drastic measures need to be taken to keep the town a viable entity.
- c. Since water supplies are deemed "minimal" by MCWD water shortage contingency plan needs to made.
- d. Since water supply is at best minimal MCWD should establish cut off levels for new connections well short of over drafting the aquifer. There is already well interference between supply wells which implies the deep aquifer is being over drafted

4.11.4 impacts and mitigation (issue 4.11-1)

Under any dry year scenario in this EIR water supplies are not sufficient. Any unanticipated upset in the water supply system be it

well problems, leaks, earthquakes destroying well casings, accidents to the distribution system, electrical failures, water quality problems, could well dry up any "minimal" surplus that is available. A single days supply is all that is available in the case of a total cutoff of supply. A wide margin of error needs to be built into any supply/demand scenario.

- a. A three dry year scenario (multi dry year) is not realistic. The Wildermuth study shows 5 to 7 year drought cycles are not uncommon. A seven year drought should be incorporated into the supply/demand tables.
- b. Several multi dry year ("what if" or sensitivity cases) should be investigated. One, 3, 5, and 7 year dry cycles should be calculated. Effects of each dry period should be estimated on supply and resultant impact on the Town excluding any MCWD mitigation measures (considered last resort and results problematical).
- d. Mitigation measures should not be included ("due to uncertainties of implementation as well as the effectiveness") in the "what if" studies 4.11-above since these measures (top of pg. 4-268) are deemed either a long way into the future (Dry Creek, 2014)), or have proven difficult to achieve (pipeline replacement), recycled water (no time of implementation known) and water conservation, pg.4-268 PP2, (who will allow Sierra Star and our lawns to dry up?).
- c. New supply from the Mammoth Basin (where the 8 supply-well field well-field is located) is highly problematical since exploration for Deep or Basalt aquifer exploration has exhausted high potential areas for new low risk drilling. The complex nature of the fractured basalt aquifer renders simple, reliable location of new wells extremely risky (estimate a 50/50 chance of success at best). Completion of studies by the MCWD to address this problem won't be completed until late 2007.
- d. RISK needs to be included all supply/demand calculations. Single number or point estimates and "multi dry year" scenarios for such estimates border on the suicidal. Risk factors for supply in the 100 to 200 per cent range would be more appropriate.
- e. 4.11-1 ADD: an amount of risk or "cushion" well above (100 to 200%)calculated supply should be incorporated in the supply figures to allow for unforeseen upsets in the supply system.
- f. A definition of "overdrafted" is required.
- g. Is the well field overdrafted? What is the evidence?
- h. What would be the effect of the CalTrout petition?

4.6 Hydrology and Water Quality

a. 4.6.1.4 Use 1 acre rather than 43,560 sq. ft.

b. 4.6.1.6 groundwater discussed above

c. add: the Deeper or Basalt aquifer

4.6.1.8 Groundwater Quality One supply well, #17, which waters Sierra Star golf course contains enough arsenic to render it non-potable.

a. the wellhead protection areas around the supply wells should be delineated and results of any testing for compliance with AB 3030 should be presented in the EIR.

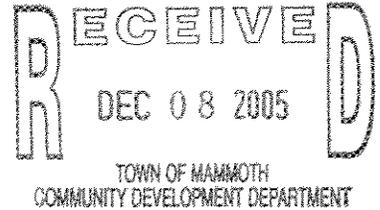
Other

a. put north arrows and scales on all maps and show X-sections on maps and their orientation.

b. Madera CO. is to the west of Mono Co.

Letter 029

December 4, 2005



Sonja Porter, Senior Planner
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, Ca 93546

To whom it may concern:

We have owned our home since 1986 and our large family has enjoyed our retreat in the Sierras. A certain amount of growth is good but we feel what you are proposing now is out of control. We do not want large hotels, we do not want to lose our open space, we fear the lack of water resources with all this building, the traffic alone will be terrible, and we love our dark nights.

Please put a stop to this materialistic insanity. Every time I go down to the new village I get claustrophobia from the heights of the buildings. We do not need more high-rise buildings in that area.

I want answers before the planning commission approves these plans.

Most Sincerely,

A handwritten signature in cursive script that reads "Millicent & Chuck Kennedy".

Millicent and Chuck Kennedy
2102 Forrest Trail
Mammoth Lakes, Ca 93546

Mailing Address:
11122 Valley View Ave.
Whittier, Ca 90604

Letter 030

KENNETH M. KLEIN, D.D.S.

Diplomate, American Board of Periodontology

POST OFFICE BOX 1654 ♦ MAMMOTH LAKES, CA 93546-1654 ♦ 760-934-4467 ♦ FAX 760-934-4467 ♦ E-MAIL gumdoc@earthlink.net

8 December 2005

Town Council
P.O. Box 1609
Mammoth Lakes, CA 93546

Dear Madams and Sirs:

I am very concerned about the seeming shift in emphasis within the town of Mammoth Lakes toward maximum density. Even though the town has finite borders and cannot expand outward, parks, creeks, open space and viewscape are integral components of well-managed growth within a community. A contrary approach seems to be occurring whereby generous concessions appear to be granted to developers. These include: Waiving existing maximum height restrictions on buildings; increasing the number of allowed structures on available sites; and, permitting variances to existing and rational setback requirements. Not only do these concessions violate the first Guiding Principle in the Vision Statement of the General Plan – that the community “places a high value on the sustainability and continuity of our unique relationship with the natural environment.” – they will inevitably undermine that very sense of “community” that has brought most of us to Mammoth Lakes. I urge prudence and restraint.

The continued course of development to be permitted (or controlled) by the General Plan and Draft Program Environmental Impact Report will likely define the image and liveability of the town of Mammoth Lakes going forward. It is incumbent on the decision makers that these decisions are made in the best interests of the majority of residents and are not simply a license to grow and profit. I question whether unbridled development, resulting in a “build-out” number approximating 61,000 individuals, is feasible when one considers water usage, infrastructure requirements, greenspace maintenance, traffic management and snow removal.

The timelines for input from the citizenry and cogent response from the Council and Planning Commission is inadequate. Additionally, the timing for the completion of the General Plan and EIR, which falls over a major holiday period, seems ill-advised and restrictive. It seems that far too many critical issues remain unanswered for final decisions to be made by the middle of next month. Respecting the tremendous amount of effort that has gone into these documents and the pressures to finalize decisions, it would be imprudent to adhere to artificial deadlines without appropriate input from the residents and reasoned resolution to our concerns. The future of the community of Mammoth Lakes is in your hands, please proceed cautiously and exercise due diligence in balancing growth and lifestyle. Your efforts and prudence are appreciated.

Sincerely,

K. M. Klein

Kenneth M. Klein, DDS

Letter 031

Council
Mark W.

P.O. Box 1654

Bob

Mammoth Lakes, 93546

Sanja
B.T.T.

9 December 2005

Town Council
P.O. Box 1609
Mammoth Lakes, CA
93546

Dear Town Council Members:

I have been a permanent resident of Mammoth for a little more than a year. My husband and I have been coming up here for about 16 years after we moved to California. We lived in many places over 25 years while my husband was in the Navy.

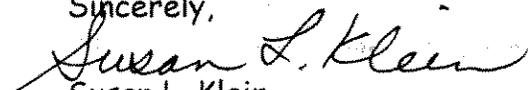
Because we have lived in many communities, we have been fortunate enough to see things we liked and things we didn't like. We came to Mammoth because there were so many things about this community that we liked and made sense.

One of the things that make a community special is the amount of open space devoted to beautiful scenery or parkland. With all the new and proposed development, I am seeing more and more concrete and less open space that will be available for our enjoyment, as well as for our children and grandchildren.

Once you build these big high-density buildings, you cannot turn back. The space in Mammoth is limited because of the surrounding forests, but the open space within the community cannot be stressed enough as an important feature of a vibrant community.

I urge you to scale back the development and wait and see what happens with the airport service and increased tourists before you go any further. You only get one chance. Please don't waste it!!

Sincerely,



Susan L. Klein

Retired teacher and Navy wife

Letter 032

-----Original Message-----

From: Owen Maloy [mailto:owen.maloy@verizon.net]
Sent: Sunday, December 18, 2005 1:13 PM
To: Sonja Porter
Subject: Error in GP DEIR

Hi Sy:via -

The tables in section 4 have the wrong units for pollutant [sic] concentration,[sic] especially PM10 and possibly others.

Air pollution concentrations are given in mg/m³. The mg (milligrams) should be micrograms/m³ (Greek mu followed by g/m³). I'm sure the Town does not [sic] want to say that [sic] the air pollution is 1000 times higher than it is.

I'm not sure how Greek letters go through email. so I spelled it out.

Owen Maloy <owen.maloy@verizon.net>

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12/16/2005

Letter 033

Comments to The Town of Mammoth Lakes Planning Department on the
2005 General Plan Update

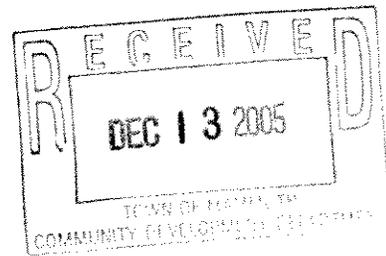
By Steve Miesel, PO Box 7383, Mammoth Lakes, CA 93546 on 12-13-05

1. The 2005 General Plan Update has potentially significant impacts on air quality. For it allows for such growth that increases production of air bourn particulate material, PM10, in an amount that exceeds the threshold of significance even when all the listed mitigation measures are implemented.
2. The 2005 General Plan Update has potentially significant impacts on water quality. For it allows for such growth that increases household hazardous waste entering the local waters in an amount that exceeds the threshold of significance even when all the listed mitigation measures are implemented.

Sincerely,



Steven W. Miesel

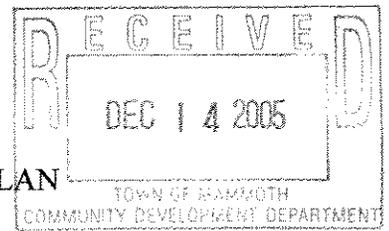


Letter 034

COMMENTS ON DRAFT EIR AND GENERAL PLAN

Mary K Prentice, Mammoth Resident

Dec. 14, 2005



The Vision Statement guiding the General Plan is well expressed. Achieving these goals of the highest quality of life for its residents & quality of experience for its visitors seems to be more elusive. The vision statement includes the phrase "participatory town government" I would hope this means community consensus about master planning our community.

From all I've read & heard, we are not yet close to a community consensus. There are glaring issues with no answers yet. Since the General Plan is the primary policy document for planning the Town's future development and the basis for future decisions which express and are in harmony with the Vision statement, shouldn't we have some better alternative answers before rather than after adopting the general plan?

About a month ago, you, the Planning ^{DEPT.}Commission summarized major policy questions for consideration. You asked, "Should the build out capacity of the GP be reduced?", "Should the transfer of density policy be refined?", "Should housing be allowed in South Gateway?", "Is the GP consistent with the urban growth boundary?", "Should the GP regulate the rate of growth?", "What policies should the GP have on open space & sensitive area?" There were far more questions than answers. So how are these questions going to be answered, when and by whom? Before or after the adoption of the GP?

If these questions do not have reasonable alternative answers with a reasonable degree of community consensus before the GP is adopted, then the default mode of planning takes over, and development is driven by developer projects rather than by the primary policy document, or general plan.

Of course there are many other critical issues with no good answers yet, such as water availability at build out. There have been many conflicting numbers given and the unknown aquifer capacity is a little troubling.

Much has already been said about the circulation, parking and transit issue. It obviously needs more work. But the most troubling thing I heard is that it couldn't be resolved until developers give their input. Whose driving policy here?

In the EIR, a lot of these problems are called "unmitigated and unavoidable" That really says we can't plan ahead. It put developers and single projects in the drivers seat. When it should be natural resources, infrastructure and community consensus as expressed in a good general plan that drives the process.

I'm also concerned that the recommendations GPAG, the community appointed body were not adequately integrated into the GP. One of their recommendations about keeping South Gateway free of housing development was ignored. Housing there would be a planning disaster,

encouraging sprawl and destroying the view shed for a potentially beautiful development of educational and a community performing arts center.

More master planning needs to be done. There are specific, master plans for North Village, Snowcreek etc., but what about some master planning and community vision for Main street, for the Bell shaped parcel, for Mammoth Creek Park, and very importantly for South Gateway?

The importance of community consensus cannot be overstressed. I would like to support Alimar's proposal for an external planning specialist consultant to assist our process, of gathering more needed data, putting alternative options out to the community and ultimately deriving a document that really corresponds to our vision statement.

Letter 035

Sonja Porter

From: DS12711@aol.com
Sent: Monday, November 28, 2005 6:13 AM
To: Sonja Porter
Subject: Concerns

Q: What has gone wrong with Mammoth Lakes in recent years?

A: Large scale construction projects that have slowly eroded the quaint charm of this mountain community.

The town is in too much of a hurry to let the Real Estate Industry make money.

Dennis & Patricia Sherrill
Home Owners

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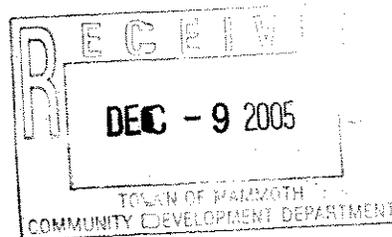
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Letter 036

P.O. Box 8244
Mammoth Lakes, CA 93546

December 8, 2005



Planning Commission
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Dear Planning Commission,

Thank you for the opportunity to comment on the General Plan Update and DPEIR. I appreciate all the hard work the Commission and Town staff has put into this project and sincerely hope we can find some resolutions to successfully conclude this process.

I attempted to read and truly understand the EIR, but I found it beyond my expertise as a scientist and research ecologist. Instead of laboring through the document, I've chosen to base my comments on the General Plan Update and previous Planning Commission workshops, focusing on Town growth, water supply and unresolved policy issues.

Both Mammoth Mountain and the Town have publicly stated the desire to increase mid-week occupancy, yet the general plan focuses on approximately doubling our current bed base. This increased capacity seems intended to accommodate more weekend and holiday demand, but doesn't address midweek occupancy rates. Local air service will help but won't fill the midweek bed base by itself. With Town primarily funded by TOT taxes, midweek occupancy is terribly important. I would like to see a more balanced development strategy pacing growth with the development of Town services and a focused drive to increase mid-week visitation through marketing, recreation opportunities, and quality Town amenities and infrastructure. Development is necessary and healthy for our Town, but we must balance it with our services and give it direction to grow successfully instead of rampantly.

Regarding water supply, a new analysis (not the one included in the EIR) by the Water District based on 2005 usage indicates enough water for about 2,449 more units in multiple dry years, assuming each single family home uses 0.3777 acre-feet of water per year. Granted, condominiums and apartments will use slightly less, perhaps 0.3 acre-feet when landscaping needs are included, bringing the total to 3,083 units if we only build apartments. (Please see the attached computations for complete numbers.) Regardless, Table 3-4 in the EIR indicates 6,839 more units to be constructed between January 2004 and build-out, over twice as many apartments that can be built with the existing water supply. At full build-out, the Water District estimates a shortage of 903 acre-feet, or 275,415,000 gallons a year, assuming Sierra Star is using recycled water. The Dry Creek drainage appears to be the only source to significantly increase our water supply, but it is a politically sensitive and expensive proposition for the Water District. I would like to see the Town work with the Mammoth Community Water District to comprehensively address water supply, growth and pace of development. A fully integrated plan is necessary to accommodate the level of growth we seek within the constraints of our natural resources.

Water Supply Numbers from Mammoth Community Water District, 11/28/05

- * Existing supply provides 4492 acre-feet in a drought year
- * 2005 projected use = 3567 ac-ft
- * Water usage by a single family home per year:
 - o SFH uses (~9600 gallons * 12 months) = 115,200 gallons/year
 - o 1 acre-foot = 305,000 gallons
 - o 115,200 gallons/year divided by 305,000 gallons/ac-ft = 0.3777 ac-ft/year
- * Condos/apartment use ~0.3 ac-ft/year when landscaping needs are included

- * 4492 ac-ft dry year supply (minus) 3567 ac-ft current use = 925 ac-ft available for new water permits
- * Single family homes: 925 ac-ft (divided by) 0.3777 ac-ft per unit = 2449.0 units can be built on existing water supply from 2005 to build-out
- * Apartments only: 925 ac-ft (divided by) 0.3 ac-ft per unit = 3,083 units can be built on existing water supply from 2005 to build-out
- * Table 3-4 in EIR shows 6,839 more units to be constructed from 2004 to build-out; Round to 6,500 units to be built from 2005 to build-out to account for some construction in 2004
 - o Best case scenario: 6,500 (minus) 3,083 = 3,417 units without water given our existing supply
 - o Worst case scenario: 6,500 (minus) 2,449 = 4,051 units without water given our existing supply

Water District Build-out Analysis assumptions:

- * Includes 25% state-mandated density bonus to account for some, but not all properties, receiving the actual bonus of 35%; has potential to increase PAOT
- * Includes 25% increase in occupancy; does not affect PAOT, just more people more often
- * Includes 5% buffer
- * Assumes Sierra Star is on recycled water; Snowcreek has their own access rights

Water District Build-out Analysis:

- * At build-out, 903 ac-ft deficit per year in dry year conditions
- * No deficit in normal years

Comments from Wendy Sugimura

Letter 037

Revised Draft Program EIR
Town of Mammoth Lakes

Elizabeth Tenney edits and comments
Received 11/9/05

2.0 Executive Summary

1) Table 2-3 Summary of Environmental Impacts, Mitigation Measures and Levels of Significance After Mitigation, p. 2-42

- 4.13-6 - Clarify phrase: "...this inconvenience may work to lessen the *existing Forest Trail cut-through problem*..."

3.0 Project Description

1) 3.1 Project Location, p. 3-1

- Paragraph 1, last sentence: "Neighboring counties include: Fresno County to the south and Madera County to the east." is incorrect. Correct - Neighboring counties include Inyo County to the south, Fresno County to the southwest and Madera County to the west.
- Paragraph 3:
 - a) Should mention that U.S. Highway 395 is a designated State Scenic Highway.
 - b) Sentence 3 and 4 - Change "...State Road 203..." to "...State Route 203..."

2) Figure 3-1 Regional and Project Vicinity Map, p. 3-2

- Inset should show project area as Southern California, not as the greater Bay Area.
- Inset spelling correction "Navada" to "Nevada"

3) Figure 3-3 Existing Land Use Designations

- Base map shows St. Joseph's Church at wrong location. Church should be on the parcel on the southwest corner of the intersection of Old Mammoth Road and Ranch Road (problem on any figure using this base map including: Figure 3-4, 4.5-1, 4.6-2, 4.7-1, 4.8-1, 7-1, 7-2, 7-3 and Figure 5 in Noise Appendix).

4) 3.4 Purpose of the 2005 Updated General Plan, p. 3-6

- First bullet point: Should add "Four public workshops, with over 100 attendees *per workshop*."

5) 3.7.I Key Land Use Policies, p. 3-17

- Last bullet point, last sentence: "These node include North Village, Snowcreek, Sierra Star, Main Street, *Old Mammoth* and Eagle Lodge."
Is "Old Mammoth" Old Mammoth Road or the Old Mammoth area?

6) 3.15 Updated Plan Compared to Existing General Plan, p. 3-26

- Seventh bullet point: Should add "Provide more policies *that* support creation of amenities and services"

- Eight bullet point: Should add “Provide more policies *that* support retention and creation of workforce housing”
- Ninth bullet point: “Provide energy efficiency and other environmental policies are stronger” does not make sense.
- Tenth bullet point - Replace “which” with “that”: “Provide policies *which* support resident oriented services have been included (child care, health care, education)” to “Provide policies *that* support resident ...”
- Twelfth bullet point, second sentence - Change “designate” to “designated”: “Areas *designate* as Special Conservation Planning...” to “Areas *designated* as Special Conservation Planning...”

4.0 Description of Environmental Setting, Project Impacts and Mitigation Measures

1) Figure 4.1-1 Major Viewpoints from the Town, p. 4-8

- Placement of Mammoth Crest and Crystal Crag images should be switched to represent correct locations.

2) 4.1.2.2 Outdoor Advertising Act, p. 4-9

- The Mono County sign ordinance should be referred to here.

*3) VII.3.C.a.1. p.4-14

- U.S. Highway 395 is already designated as a State Scenic Highway.

4) 4.2.1 Existing Conditions, p.4-22

- Paragraph 2:
 - a) First sentence: “...characterized by...hot summers” maybe change to be “*relatively* hot summers.”
 - b) Fourth sentence: “...upper 20s degrees Fahrenheit...” change to “...upper 20 degrees Fahrenheit...”
 - c) Sixth and seventh sentence: “Summer winds are northerly at night as a result of cool air draining off the sides of the surrounding mountains. Southerly winds during the day result from strong solar heating of the mountains causing up-slope circulation.”
 This information does not seem accurate. According to Howard Sheckter, Local Weather Expert at www.mammothweather.com, this south/north summer diurnal wind pattern is more associated with the valleys, not Mammoth Lakes. Mammoth Lakes’ typical summer winds are west blowing starting around 11am to 12pm and last until 8 or 10pm. The winds then tend to die off at night. However, these typical summer winds patterns do vary.

5) 4.2.4 Impacts and Mitigation, p. 33

- Car idling should be mentioned.

6) 4.3.4 Impacts and Mitigation, p. 4-78

- A substitution or alternative to straw bales should be discussed.

*7) I.1.B.e.2 p.4-83

- Last sentence should add, "...making sure that all trash enclosures, *recycling* and food storage areas are animal resistant."

8) 4.8 Noise, p. 4-194

- Should mention car idling and car stereos. Both are not part of the "small-town resort character."

5.0 Cumulative Impacts

1) 5.1 Impacts, p. 5-11

- Public Safety and Hazard should mention the bars and bar scene as a public safety issue.

7.0 Alternatives to the Project

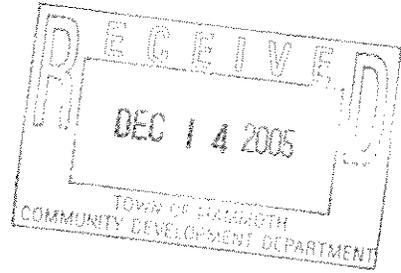
1) 7.5.1 Description, p.7-34

- PAOT is not the same thing as density. Make sure there is a distinction between them.

*These comments are for changes to the General Plan policies. These comments are also stated in Elizabeth Tenney's October 2005 Draft General Plan comment letter.

Letter 038

*Bryce & Wilma Wheeler
P.O. Box 3208
Mammoth Lakes, CA 93546*



December 14, 2005

Town of Mammoth Lakes
Planning Commission
Mammoth Lakes, CA 93546

Thank you for the opportunity to comment on the Revised Draft Program Environmental Impact Report. We are concerned that this document does not address many concerns that have been stated in many meetings and discussions by interested residents and by the General Plan Advisory Commission.

We believe that the document is inadequate and should be rewritten to address these concerns.

The document does not adequately consider the huge impact of the projected population growth and impact of more than 20,000 visitors at one time on public lands, wilderness areas, Mono Basin Scenic Area, Devil's Postpile, and on the recreation opportunities that we now enjoy.

Water supply is not adequately addressed. With the projected population and visitor increase, there will be a correspondingly large increase in demand for water. There is no planning for drought or well failures. Water is becoming more and more a critical issue everywhere.

What about the effect of population and visitor growth on air quality, quiet neighborhoods, night sky visibility and scenic values? This document does not attempt to meet environmental sustainability objectives of the General Plan in this regard.

The Plan should provide for more not less public parks. Public parks in town are needed for children to play and for everyone to enjoy. Public parks are a great economic benefit to people and to towns.

Mammoth Mountain Ski Area has plans for redevelopment. These are not considered in this document.

We have lived here seventeen years and love this town. We don't want the quality of life for residents and visitors diminished.

Please listen to the public comments and concerns. This document needs to be redone to address these concerns.

Sincerely,


Bryce A. Wheeler


Wilma Wheeler

Letter 039

Allen Matkins Leck Gamble & Mallory LLP

attorneys at law

Allen Matkins

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telephone. 213 622 5555 facsimile. 213 620 8816 www.allenmatkins.com

writer. Sonia J. Ransom t. 213 955 5593

file number. C2244-002/LA702712.04 e. sransom@allenmatkins.com

December 14, 2005

Town of Mammoth Lakes
Community Development Department
Post Office Box 1609
Mammoth Lakes, California 93546
Attention: Mark Wardlaw, Community
Development Director

Re: Town of Mammoth Lakes Draft General Plan Update

Dear Mr. Wardlaw:

This firm represents the Snowcreek Investment Company ("**Snowcreek Investment**"), the owner of approximately 161 acres of property (the "**Property**") located in the southeastern portion of the Town of Mammoth Lakes (the "**Town**"). The Property is subject to the Snowcreek Master Plan approved by Mono County in 1975 and 1981 (the "**Master Plan**"). At Chuck Lande's request, Allen Matkins has reviewed the Town's Draft General Plan Update ("**DGPU**"), dated September, 2005, and the associated Draft Environmental Impact Report ("**DEIR**"), dated October, 2005. As you are aware, on behalf of our client, we previously submitted to you a letter dated May 17, 2005 containing certain comments regarding the previous draft of the DGPU dated April 25, 2005 and the previous draft of the DEIR dated February, 2005 (the "**May 17 Letter**"). Section 1.0 of the DEIR "Introduction" states that instead of responding to comments received in connection with the previous version of the DEIR, the Town opted to re-circulate a revised version of the DEIR. The DEIR also provides that new comment letters should be submitted. Consequently, Snowcreek Investment requests that you consider the comments contained in this letter and the comments contained in the May 17 Letter, a copy of which is attached hereto as Exhibit "A".

The May 17 Letter, sets forth Snowcreek Investment's concerns about some of the specific language in the DGPU and the DEIR, which appeared to create an ambiguity between what has been permitted on the Property by the Master Plan for over 30 years and what was contemplated in the previous draft of the DGPU. Generally, Snowcreek Investment requests that the Town further consider revising the DGPU for consistency with the Master Plan. Snowcreek Investment also restates its request for revision of the DGPU to address the following issues: (1) the definition of the "Resort" designation and the residential density permitted under that designation; (2) the difference between "clustering" and "density transfers"; and (3) confirmation that density transfers are not required for the clustering of development within a master planned project. Further, the DEIR incorporates certain mitigation measures (the "**Mitigation**

Town of Mammoth Lakes
December 14, 2005
Page 2

Measures") to address potential impacts associated with the implementation of the project. The DGPU incorporates implementation measures (the "**Implementation Measures**") to implement the policies of the DGPU. Below you will find comments regarding some of these Mitigation Measures and Implementation Measures.

A. The Current Maximum Density Permitted Under the Resort Designation Should be Maintained.

The Property is designated in the DGPU as Resort. According to the existing General Plan and current zoning regulations, the residential density for properties designated Resort is eight dwelling units per acre, and densities for hotel/motel uses are computed at a ratio of two guestrooms for each unit, for a total of 16 guestrooms per acre. Both the DEIR and the DGPU now, however, reflect a reduction in the maximum density permitted for residential development in Resort designated lands from eight units per acre to six units per acre, while maintaining the same density for hotel/motel uses found under the existing General Plan and current zoning regulations. The higher density would permit greater flexibility for the project to adapt to market demand without exceeding the total number of units originally envisioned for Snowcreek in the Master Plan. Accordingly, Snowcreek Investment requests that the DGPU be revised to permit the continued development of Snowcreek consistent with the Master Plan, the existing General Plan and current zoning regulations.

1. Maintaining Density Would Promote a Destination Resort; Golf Course.

Snowcreek Investment's proposal to develop the Property is consistent with the entitlements of the Master Plan and would fulfill a 30 year vision and buttress the Town's desire to create a world-class year-round destination resort by providing a resort development consistent with this vision. Snowcreek Investment's proposed development scenario comes closest to achieving both our understanding of what is permissible under the Master Plan and the 30-year old premise underlying the development of Snowcreek. As discussed in more detail below, proposed amenities include the development of a 94 acre parcel (the "**USFS Parcel**") which was recently acquired from the USFS and which is designated Open Space in the DGPU. This parcel is outside the Town's Urban Growth Boundary (the "**UGB**") and is planned to be developed with the second nine holes of the Snowcreek golf course. Snowcreek Investment recognizes that the USFS Parcel is outside the Master Plan, but it nonetheless abuts those portions of the Property within the Master Plan and will provide Snowcreek and the Town with substantial benefits. This attraction will help facilitate an increase in travel to the Town in summer months, and is consistent with the creation of a world-class year-round destination resort economy. The inadvertent and unintended DGPU ambiguities in density for Snowcreek would only serve to hinder years of work toward the realization of the Town's vision.

Town of Mammoth Lakes
December 14, 2005
Page 3

2. Revision of the DGPU and DEIR.

If the Town agrees that the residential density of Resort designated land should be maintained at eight units per acre, the DGPU must be revised to reflect this decision. Specifically, on page LU-11, under the Resort designation, ten lines from the top, the number six should be changed to the number eight to reflect the Town's desire to maintain density in Resort designated land at its current level. The Resort definition on page 2-8 of the DEIR and in section 3.7.E on page 3-13 of the DEIR, currently reflects this density level.

Alternatively, the Town could revise the Resort definition on page LU-11 of the DGPU and the Resort definition on page 2-8 of the DEIR and in section 3.7.E on page 3-13 of the DEIR to reflect a range of density for residential dwelling units other than visitor lodging within Resort designated land. Such revision would incorporate the following language beginning at the location noted above: "Density for the R designation may range from six units per acre to eight units per acre for residential development other than visitor lodging, and up to a maximum of eight dwelling units per acre for visitor lodging; provided that this density does not apply if there is a master plan in effect. The following master plans are in effect; North Village Specific Plan, Lodestar at Mammoth Master Plan, Juniper Ridge Master Plan and Snowcreek Master Plan."

A third alternative is to retain the density for Resort designated land as contemplated within the DGPU, but to carve out an exception for Snowcreek that would permit the development of the Property consistent with the Master Plan. This revision would require the addition of the following sentence at the end of the Resort definition on page LU-11 of the DGPU and the Resort definition on page 2-8 of the DEIR and in section 3.7.E on page 3-13 of the DEIR: "Notwithstanding the foregoing density range for the R designation, density within Snowcreek shall be permissible at levels consistent with the Snowcreek Master Plan as described on Page I-33."

B. USFS Parcel; Permitted Uses.

Clarification of the DGPU is necessary to reflect that the contemplated golf course proposed for the USFS Parcel is expressly permitted. Page I-33 discusses a second nine holes of golf "planned" for Snowcreek on land to the southeast of the existing Master Plan. It does not indicate, however, that this specific use will be permitted on land designated Open Space and outside the UGB, i.e., the USFS Parcel. Objective V.1.A.a of the DGPU provides that no residential, commercial or industrial development will be permitted outside the UGB (UG-5). Implementation Measure V.1.A.a.1, however, states that development of recreational facilities outside the UGB will not violate the UGB. In addition, the Open Space designation permits development of facilities such as parks, athletic fields, golf courses, and community gathering

Town of Mammoth Lakes
December 14, 2005
Page 4

spaces that support the environment and recreational objectives of the community (LU-6). The second nine holes of golf for the Snowcreek golf course will assist in fulfilling the recreational objectives of the community. In order to avoid any confusion over what the DGPU permits on the USFS Parcel, please clarify that a golf course is a permitted use on land designated Open Space outside the UGB.

C. Clarification of Clustering Versus Density Transfer.

Snowcreek Investment agrees with the concept of clustering as described in the definition of Resort contained on page LU-11 of the DGPU, which states that "densities may be clustered within individual Resort developments." The concept of clustering will be used within Snowcreek to promote a more dense village core in order to preserve open space. Clustering is different from the concept of density transfer contained in the DGPU as set forth in Objective LU.1, found on page LU-15, which provides for the transfer of densities between properties designated Resort, Specific Plan, and HDR-2. Clustering allows for the development of the aggregate density allowed for the Property on certain portions of the Property. This is consistent with the Master Plan, which allows for the clustering of densities across lot lines within the Property as a matter of right. Density transfers, on the other hand, as set forth in the DGPU, permit the transfer of density from one parcel to another within and among certain designated land, but require approval by the Town Council and a series of findings before such transfers may be made.

Clarifying the distinction between clustering and density transfer and clearly stating that clustering is not subject to the findings applicable to density transfers as set forth in LU.1 or any ordinance or regulation subsequently enacted in implementation thereof would facilitate the provision of open space within a Resort development and enhance the Town's mountain resort character. Snowcreek Investment's utilization of clustering as explained in the definition of Resort would similarly promote the Town's development as a world class year-round destination resort. Our discussions with Community Development Department staff suggest that clustering and density transfer are different concepts and that the DGPU's requirements for density transfer do not apply to clustering on the Property. Consistent with these discussions, Snowcreek Investment again request clarification of the DGPU so that readers will not confuse the concept of clustering with the concept of density transfer and incorrectly assume that the requirements set forth in Objective LU.1 applicable to density transfers are applicable to clustering.

One simple revision to avoid any potential confusion would be the deletion of the word "cluster" in Objective LU.1 on page LU-15 and replacement with the following phrase: "transferred between properties." This language mirrors the italicized language directly beneath the LU.1 Objective Statement. In addition, the concept of clustering as set forth in the Resort

Town of Mammoth Lakes
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designation on page LU-11 should be revised to include the following sentence on the thirteenth line of the Resort designation, immediately after the clustering sentence: "This concept shall not be interpreted as a density transfer and in no event shall it be subject to the requirements for a density transfer set forth in Objective LU-1."

D. Comments Relating to DEIR Section 4.1 "Aesthetics, Light and Glare".

The DEIR provides that in order to protect the important environmental, scenic and recreational corridor, the Town has already secured an easement along most of Mammoth Creek within the UGB. Mitigation Measure 4.1-1 would extend such easement, it provides that "The Town shall extend the existing easement along Mammoth Creek to the remaining undeveloped parcels to protect scenic resources along the corridor." Further clarification is needed to determine how this easement will be used and how it will be expanded.

E. Comments Relating to DEIR Section 4.3 "Biological Resources".

1. DEIR pages 4-60 to 4-62 describe the "migration corridors" for the "Round Valley Herd" and the "Casa Diablo Herd". However, based on this description it is difficult to determine what parts of the Town are affected by these corridors. Please provide further information regarding the location of such corridors.

2. DEIR Page 4-65, Section 4.3.1.4, , sixth line, please delete "and a CDFG Streambed Alteration Agreement." CDFG has jurisdiction over streambeds and wetlands that are part of the "streambed," but its jurisdiction is not co-existent with that of the U.S. Army Corps of Engineers.

3. DEIR Page 4-73. Section 4.3.3, third bullet point, please replace "through direct removal, filling, hydrological interruption, or other means" with "through filling some or all of the wetland." Based on the existing language it is difficult to determine what is meant by "removal" of a wetland (unless the intended meaning is "draining" a wetland, in which case the word "draining" along with "filling" should be included). In addition, the terms "hydrological interruption" and "other means" are overly broad, over encompassing, and have no definite meaning. Please consider redefining these terms in a more concrete fashion.

4. DEIR Page 4-76, Section I.1.B.d.4. please change "as required by CDFG and Department of Fish and Game" to "as recommended by California Department of Fish and Game." (this follows the form of section I.1.B.e.1). Except for CESA-listed and "fully protected" species, CDFG is not in a position to make any other "requirement", but it may always make "recommendations" following consultation.

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5. DEIR page 4-80, last paragraph, reference is made to the "Mammoth Creek corridor" and required setbacks. However, the DEIR does not set forth the setback requirements. In order to avoid ambiguity, such requirements should be set forth in the DGPU.

6. DEIR Page 4-85, Mitigation Measure 4.3-1 requiring a disclosure statement regarding mountain lions appears excessive. Snowcreek Investment understands that there is not any greater incidence of lion attack in this area than any other area of California. This disclosure may unintentionally serve to unreasonably raise fears of lion attacks, thereby lessening resident awareness of a myriad of other even more potentially dangerous conditions (i.e., fire, heavy winter, etc.), Please consider deletion of this Mitigation Measure.

F. Comments Relating to DEIR Section 4.4 "Geology, Seismicity, Soils and Mineral Resources".

1. DEIR Page 4-105, two implementation measures seem slightly inconsistent with one another. Implementation measure II.3.A.b.2 proposes that the Town, "Require soils reports for new developments to identify the potential for liquefactions, expansive soils, ground settlement, and slope failure." This measure seems to indicate that all new developments will be required to prepare soils reports; however, in measure II.3.B.a.2 provides that "The Town shall require a soils report on all development permits within areas of known slope instability or where significant potential hazards have been identified." This second measure seems to indicate the Town's intent only to require soils reports from developments in areas of slope instability or areas with significant potential hazards. It is also unclear what "significant potential hazards" would be. The Town should consider revising these Implementation Measures to make them consistent with one another.

2. DEIR Page 4-112, Implementation Measure II.4.B.a.1 states that when mineral extractions occur within the Town, "The Town is responsible for and shall prepare the Surface Mining and Reclamation Act." It appears that there is something missing in this sentence. Perhaps the DEIR should state that the Town shall be responsible for preparation of any reports required to be prepared pursuant to the Surface Mining and Reclamation Act. Furthermore, the Town seems to indicate that it will pay for the preparation of such documents, regardless of who undertakes the mineral extractions, the DEIR should clarify this issue.

G. Comments Relating to DEIR Section 4.5 "Public Safety and Hazards".

DEIR Page 4-127, the second to last sentence in the first paragraph under "Discussion" states, "It can be concluded that any additional non-residential uses would increase the use and transport of hazardous materials and an increase in the generation of hazardous

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waste.” As is, this statement would support the conclusion that “resort uses” and “open space uses” in the Plan area will lead to greater use and transportation of hazardous wastes than “residential uses.” Such a conclusion would be incorrect based on the evidence presented in the DEIR, thus this sentence should be revised to state, that “some” non-residential uses would have such an effect.

H. Comments Relating to DEIR Section 4.6 "Hydrology and Water Quality".

1. DEIR Page 4-144, Section 4.6.1.3 indicates that Bodle Ditch is a watercourse. We understand that other Town residents and developers have asserted that Bodle Ditch is not a watercourse.

2. According to the Investigation of Groundwater Production Impacts on Surface Water Discharge and Spring Flow, Final Report," prepared for the Mammoth Community Water District, November 2003 (Wildermuth Environmental, Inc.) groundwater pumping in the Snowcreek area has no impact on flows in Mammoth Creek/Hot Creek, even if groundwater pumping were to increase. DEIR Page 4-145, Section 4.6.1.6 should be revised accordingly.

3. The description of groundwater supply regulation is missing from DEIR Section 4.6.1.6. Please consider adding an explanation that groundwater supplies are regulated by the County, Town and MCWD. Groundwater is also subject to private ownership. Where groundwater is a source for surface watercourse, state water control board regulation is also applicable. Groundwater needed by federal uses may be subject to federal reserved rights as well.

I. Comments Relating to DEIR Section 4.7 "Land Use and Planning".

Policy/measure I.3.A.1.b on DEIR Page 4-188, provides that "All new development along [or] adjacent to National Forest Lands shall be required to provide pedestrian access routes." This policy requires clarification. The mandatory nature of this requirement leaves no flexibility. This mandatory requirement may unnecessarily restrict development along National Forest Lands, which appears to an unintended outcome. The Town may consider replacing the above language with the following: "Where feasible, all new development along [or] adjacent to National Forest Lands shall provide pedestrian access routes."

J. Comments Relating to DEIR Section 4.10 "Public Services".

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1. DEIR Page 4-237, Section 4.10.1.5, a sentence in the second paragraph reads: "The Town currently requires a ten-foot roadside easement for snow storage." This sentence is very vague and should be revised to state whether such easements are required for all roads, or whether the regulation differs as to public roads, private roads, service roads, paved roads and gravel roads. The DEIR should also specify the process and timing for obtaining such easements.

2. DEIR Page 4-238, Section 4.10.2.1 "Fire Protection," the first sentence refers to the "Health and Safety Code," but does not state whether it is the state or federal code that apply. This sentence should be revised to reflect which code source governs the building law.

3. DEIR Page 4-240, the paragraph entitled "Discussion" refers to the relocation of the training tower currently located at Fire Station No. 2, 1574 Old Mammoth Road, in response to community complaints about it being a nuisance. The MLFPD reportedly owns a parcel of land in town to which it plans to move the training tower as the area around Station No. 2 develops; however, the DEIR does not disclose the proposed relocation site. The DEIR should disclose the location of the proposed relocation site in order to properly analyze the environmental impact caused by such relocation.

4. DEIR Page 4-241, Implementation Measure II.4.A.e.4 refers to the "development of a third fire station" but again, the DEIR does not disclose the proposed relocation site. The DEIR should disclose the location of the proposed relocation site in order to properly analyze the environmental impact caused by such relocation.

5. DEIR Page 4-242, the paragraph entitled "Discussion" refers to the police department's plans to build a new police facility on a parcel of land it owns in the Town. It also refers to a proposed land exchange with the USFS for "a second larger property" on which to build a 12,500 square foot public safety facility and jail/holding cells. Again, the DEIR does not disclose the sites of either new development. The DEIR should disclose the location of the proposed relocation site in order to properly analyze the environmental impact caused by such relocation.

6. DEIR Page 2-243, the first full sentence at the top of the page refers to "the cost of the fire suppression facilities, vehicles and equipment;" however, this is a repeat from the previous section on fire hazards. This sentence should be revised to read "the cost of law enforcement facilities, vehicles and equipment" to reflect the correct percentages for this section.

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7. DEIR Page 4-247, the first paragraph under “Library” refers to the fact that a parcel of land has been purchased to accommodate a new library being built by Mono County. Moreover, the DEIR provides that because the library system is controlled by the Mono County, impact caused by the project at hand is significant and unavoidable [Issue 4.10-4, DEIR Page 2-35]. However, lack of control over this service does not automatically make this impact significant and unavoidable. Please consider implementing a Mitigation Measure in connection with the impact that the project will cause on library services.

8. Similarly, the DEIR provides that the impact to hospital and health services is significant and unavoidable because this service is out of the control of the Town [Issue 4.10-4, DEIR Page 2-35]. However, lack of control over this service does not automatically make this impact significant and unavoidable. Please consider implementing a Mitigation Measure in connection with the impact that the project will cause on hospital and health services.

9. DEIR Page 4-249, Implementation Measure IV.1.A.c.2 requires that “resort visitor developments provide on-site and off-site amenities for their guests’ benefit and enjoyment” and that such amenities be “available to the public as appropriate.” However, mandatory public access could be detrimental for business purposes. Please consider revising the language of this Implementation Measure to encourage public access where feasible provided that provision of such public access will not be detrimental to or overly burdensome on the business model of the affected development project.

K. Comments Regarding DEIR Section 4.11 “Public Utilities”.

1. DEIR Pages 4-255 and 4-256, there appear to be two (2) graphs missing from the document. The final sentence of the last full paragraph on page 4-255 states, “The following graph shows historical annual groundwater volumes pumped by the District.” There is no table following that sentence and the next available table shows current and future volumes, not historical volumes. The first full sentence on page 4-256 states, “The following graph depicts historical groundwater levels in one of the District’s production wells...”, but there is no graph following and the next available graph contains groundwater pumping projections, not historical data. Please revise accordingly.

2. DEIR Page 4-256, last paragraph, states that the “USGS reviewed the monitoring data”, but the document does not make clear which data has been reviewed. This sentence should be revised to state “the monitoring data provided by CDFG, referred to in the above paragraph.”

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4. DEIR Page 4-265, in the second to last full sentence on the page, the DEIR provides, counter to the data provided in the Water Assessment charts, that "it appears that the three dry years would be a surplus of 31 rather than a deficit of 31 acre-feet per year." assertion seems unsupported by the evidence set forth on the charts. That sentence should be deleted.

L. Comments Concerning DEIR Section 4.13 "Transportation and Circulation".

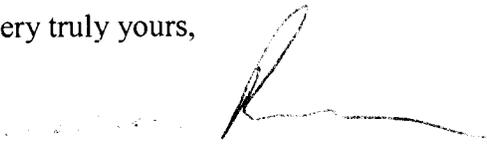
Mitigation 4.2-1 (DEIR Page 4-36) proposes to limit VMT (vehicle miles traveled) in order to meet a federal PM-10 air quality standard. This would apply to larger (500 daily trips) projects with mitigation credit for elimination of certain activities/uses (wood stoves, fireplaces and traction materials). This could be very problematic. Exceeding PM-10 air quality standards is a regional problem, it is unclear how these analyses would be applied to individual projects or how regional effects would be accounted for (i.e. the Town could have 0 emissions and the PM-10 standard could be exceeded from regional effects). It is unclear how this Mitigation Measure will be applied, but more importantly, it could result in making every potential development project infeasible because no mitigation is available. Snowcreek Investment asks that you please consider revision of this Mitigation Measure.

M. Conclusion.

For all the foregoing reasons, the DGPU should maintain the density for the Snowcreek Master Plan at eight dwelling units per acre as contemplated in both the existing General Plan and the Master Plan for Snowcreek. The DGPU should be clarified to reflect that a golf course is permitted for the USFS Parcel, and the DGPU should clarify the distinction between clustering and density transfers as set forth in Objective LU.1. Generally, Snowcreek Investment also respectfully requests that the Town consider the other comments on the DEIR and the DGPU included herein.

Please call with any questions or if Snowcreek Investment or I can provide additional information with respect to this matter.

Very truly yours,


Sonia J. Ransom

SJR:d1

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cc: Charles R. Lande
Daniel McGregor

EXHIBIT A

May 17, 2005

Town of Mammoth Lakes
Community Development Department
Post Office Box 1609
Mammoth Lakes, California 93546
Attention: Mark Wardlaw, Community
Development Director

Re: Town of Mammoth Lakes Draft General Plan Update

Dear Mr. Wardlaw:

This firm represents the Chadmar Group ("Chadmar"), the owner of approximately 161 acres of property (the "Property") located in the southeastern portion of the Town of Mammoth Lakes (the "Town"). The Property is subject to the Snowcreek Master Plan approved by Mono County in 1975 and 1981 (the "Master Plan"). At Chuck Lande's request, Allen Matkins has reviewed the Town's Draft General Plan Update ("DGPU"), dated April 25, 2005, and the associated Draft Environmental Impact Report ("DEIR"), dated February, 2005. As you are aware, we have some concerns about some of the specific language in the DGPU and the DEIR which appears to create an ambiguity between what has been permitted on the Property by the Master Plan for over 30 years and what is presently contemplated in the DGPU.

For the reasons set forth below, we request that the Town consider revising the DGPU for consistency with the Master Plan. We also request revision of the DGPU to address the following issues: (1) the definition of the "Resort" designation and the residential density permitted under that designation, (2) the difference between "clustering" and "density transfers," and (3) confirmation that density transfers are not required for the clustering of development within a master planned project. The DGPU should also be revised to reflect that the contemplated land exchange between Snowcreek and the United States Forest Service ("USFS") has been completed and that a golf course is a permitted use on such land. We also request that the Town consider our comments pertaining to the mitigation measures contained in the DEIR and the Implementation Measures contained in the DGPU.

A. The Master Plan Has Always Contemplated a Total of 2,332 Units for the Snowcreek Project.

The Property is designated in the DGPU as Resort. According to the existing General Plan and current zoning regulations, the residential density for properties designated Resort is eight dwelling units per acre, and densities for hotel/motel uses are computed at a ratio of two

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guestrooms for each unit, for a total of 16 guestrooms per acre. Section 3.6.5 of the DEIR describes in detail the implementation of the DGPU, which the DEIR refers to as the Project Action Alternative. The Project Action Alternative does not contemplate a reduction in density for the Resort designation and is consistent with the density projections of the Master Plan. Section 3.7 of the DEIR provides that the only change to the Resort designation under the Project Action Alternative is to permit the development of grocery stores. After the circulation of the DEIR, however, the DGPU was revised to reflect a reduction in the maximum density permitted for residential development in Resort designated lands from eight units per acre to six units per acre, while maintaining the same density for hotel/motel uses found under the existing General Plan and current zoning regulations.

For approximately 30 years, the Snowcreek Master Plan has provided for the development of 2,332 units in the Master Plan area. Discussions with Town Community Development Department staff suggest that it has been and should continue to be the DGPU's intent to permit the residential density for Snowcreek that is contemplated in the Master Plan. Approximately 1,000 units have either been constructed or are under construction in the Master Plan area. Accordingly, approximately 1,332 units remain to be developed. The description of the Master Plan in both the DGPU (Page I-28) and Section 4.7 of the DEIR (Page 4-141) is consistent with the aforementioned figures. The DGPU nevertheless proposes to reduce the residential density within the Resort designation to six dwelling units per acre, but maintains the current density levels for hotel/motel uses. The higher density would permit greater flexibility for the project to adapt to market demand without exceeding the total number of units originally envisioned for Snowcreek in the Master Plan. Accordingly, we request the DGPU to be revised as set forth in Section A.2 below, to permit the continued development of Snowcreek consistent with the Master Plan.

1. Maintaining Density Would Promote a Destination Resort; Golf Course.

One major goal of the DGPU is to create an economy for the Town founded upon a world-class year-round destination style resort. Objective IV.1.D.c of the DGPU provides that a "destination resort development that achieves a variety of economic needs and implements the goals, objectives and policies of the General Plan is encouraged." The Implementing Measure thereof, labeled IV.1.D.a.1 on page RE-16, states that the Town shall develop a program that provides resort development incentives including density bonuses and development entitlements in exchange for specified community benefits. The DGPU's proposed density reduction is inconsistent with Objective IV.1.D.c, and the creation of a world-class year-round destination resort economy.

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Chadmar's proposal to develop the Property consistent with the entitlements of the Master Plan would fulfill a 30 year vision and buttress the Town's desire to create a world-class year-round destination resort by providing a resort development consistent with this vision. Chadmar's proposed development scenario comes closest to achieving both our understanding of what is permissible under the Master Plan and the 30-year old premise underlying the development of Snowcreek. As discussed in more detail below, proposed amenities include the development of a 94 acre parcel (the "USFS Parcel") which was recently acquired from the USFS and which is designated Open Space in the DGPU. This parcel is outside the Town's Urban Growth Boundary (the "UGB") and is planned to be developed with the second nine holes of the Snowcreek golf course. We recognize that the USFS Parcel is outside the Master Plan, but it nonetheless abuts those portions of the Property within the Master Plan and will provide Snowcreek and the Town with substantial benefits. This attraction will help facilitate an increase in travel to the Town in summer months, and is consistent with the creation of a world-class year-round destination resort economy. The inadvertent and unintended DGPU ambiguities in density for Snowcreek would only serve to hinder years of work toward the realization of the Town's vision.

2. Revision of the DGPU and DEIR.

If the Town agrees that the residential density of Resort designated land should be maintained at eight units per acre, the DGPU must be revised to reflect this decision. Specifically, on page LU-8, under the Resort designation, ten lines from the top, the number six should be changed to the number eight to reflect the Town's desire to maintain density in Resort designated land at its current level. The Resort definition on page 2-7 of the DEIR and in section 3.6.5 on page 3-7 of the DEIR, currently reflects this density level.

Alternatively, the Town could revise the Resort definition on page LU-8 of the DGPU and the Resort definition on page 2-7 of the DEIR and in section 3.6.5 on page 3-7 of the DEIR to reflect a range of density for residential dwelling units other than visitor lodging within Resort designated land. Such revision would incorporate the following language beginning at the location noted above: "Subject to Town approval, density for the R designation may range from six units per acre to eight units per acre for residential development other than visitor lodging, and up to a maximum of eight dwelling units per acre for visitor lodging; provided that this density does not apply if there is a master plan in effect. The following master plans are in effect; North Village Specific Plan, Lodestar at Mammoth Master Plan, Juniper Ridge Master Plan and Snowcreek Master Plan. A total of 1,332 additional units may be built in the Snowcreek Master Plan area."

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A third alternative is to retain the density for Resort designated land as contemplated within the DGPU, but to carve out an exception for Snowcreek that would permit the development of the remaining 1,332 units on the Property consistent with the Master Plan. This revision would require the addition of the following sentence at the end of the Resort definition on page LU-8 of the DGPU and the Resort definition on page 2-7 of the DEIR and in section 3.6.5 on page 3-7 of the DEIR: "Notwithstanding the foregoing density range for the R designation, density within Snowcreek shall be permissible at levels consistent with the Snowcreek Master Plan as described on Page I-28." If this approach is taken, please revise DGPU page I-28 under the heading Snowcreek Master Plan, third line from the bottom to read "2,332 residential units..." In addition, please revise DEIR page 4-141 under the heading Snowcreek Master Plan, second line from the bottom to read "2,332 residential units..."

B. Completion of USFS Parcel Exchange; Permitted Uses.

The DGPU, page I-30, discusses the Town's desire to exchange lands under the control of the USFS for other lands outside the Town. Page I-30 also identifies the USFS Parcel as one of the parcels under consideration for exchange with permittees. As noted above, this exchange has been completed. The DGPU should therefore be revised to reflect that the exchange for the USFS Parcel has been completed. One suggested revision would be to simply delete the reference to Snowcreek contained in the second parenthetical of the first paragraph on page I-30.

Clarification of the DGPU is also necessary to reflect that the contemplated golf course proposed for the USFS Parcel is expressly permitted. Page I-28 discusses a second nine holes of golf planned for Snowcreek on land to the southeast of the existing Master Plan. It does not indicate, however, that this specific use will be permitted on land designated Open Space and outside the UGB, i.e., the USFS Parcel. Objective V.1.A.a of the DGPU provides that no residential, commercial or industrial development will be permitted outside the UGB (UG-5). Implementation Measure V.1.A.a.1, however, states that development of recreational facilities outside the UGB will not violate the UGB. In addition, the Open Space designation permits development of facilities such as parks, athletic fields, golf courses, and community gathering spaces that support the environment and recreational objectives of the community (LU-6). The second nine holes of golf for the Snowcreek golf course will assist in fulfilling the recreational objectives of the community. In order to avoid any confusion over what the DGPU permits on the USFS Parcel, please clarify that a golf course is a permitted use on land designated Open Space outside the UGB.

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C. Clarification of Clustering Versus Density Transfer.

Chadmar agrees with the concept of clustering as described in the definition of Resort contained on page LU-8 of the DGPU, which states that "densities may be clustered within individual Resort developments." The concept of clustering will be used within Snowcreek to promote a more dense village core in order to preserve open space. Clustering is different from the concept of density transfer contained in the DGPU as set forth in Objective LU.1, found on page LU-12, which provides for the transfer of densities between properties designated Resort, Specific Plan, and HDR-2. Clustering allows for the development of the aggregate density allowed for the Property on certain portions of the Property. This is consistent with the Master Plan, which allows for the clustering of densities across lot lines within the Property as a matter of right. Density transfers, on the other hand, as set forth in the DGPU, permit the transfer of density from one parcel to another within and among certain designated land, but require approval by the Town Council and a series of findings before such transfers may be made.

Clarifying the distinction between clustering and density transfer and clearly stating that clustering is not subject to the findings applicable to density transfers as set forth in LU.1 or any ordinance or regulation subsequently enacted in implementation thereof would facilitate the provision of open space within a Resort development and enhance the Town's mountain resort character. Snowcreek's utilization of clustering as explained in the definition of Resort would similarly promote the Town's development as a world class year-round destination resort. Our discussions with Community Development Department staff suggest that clustering and density transfer are different concepts and that the DGPU's requirements for density transfer do not apply to the Property. Consistent with these discussions, we request clarification of the DGPU so that readers will not confuse the concept of clustering with the concept of density transfer and incorrectly assume that the findings set forth in Objective LU.1 applicable to density transfers are applicable to clustering.

One simple revision to avoid any potential confusion would be the deletion of the word "cluster" in Objective LU.1 on page LU-12 and replacement with the following phrase: "transferred between properties." This language mirrors the italicized language directly beneath the LU.1 Objective Statement. In addition, the concept of clustering as set forth in the Resort designation on page LU-8 should be revised to include the following sentence on the thirteenth line of the Resort designation, immediately after the clustering sentence (lines 12-13): "This concept shall not be interpreted as a density transfer and in no event shall it be subject to the findings required for a density transfer set forth in Objective LU-1."

Alternatively, the Town may wish to consider exempting Snowcreek from the density transfer finding requirements. To achieve this, we suggest adding the following language to both

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Objective LU.1 and Implementation Measure LU.1.a on page LU-12: "Clustering within Snowcreek does not require a density transfer as set forth herein, and is not subject to the findings required pursuant hereto."

D. Concerns Relating to Mitigation Measures and Implementation Measures.

The DEIR incorporates mitigation measures (the "Mitigation Measures") to address potential impacts associated with the implementation of the Project Action Alternative. The DGPU incorporates implementation measures (the "Implementation Measures") to implement the policies of the DGPU. After careful review of both the Mitigation Measures and the Implementation Measures, we have some concerns pertaining generally to the lack of flexibility contained in both, as well as specific comments with regard to certain measures. Set forth below are specific suggestions that we believe would benefit the Town as well as project developers.

1. Mandatory Mitigation Measures May Prohibit Flexibility.

Many of the Mitigation Measures and Implementation Measures are mandatory in nature, not permissive. This would make it extremely difficult to change a Mitigation Measure in the future, say for example, if the actual impacts created by the development of a project are different and require creative mitigation not contemplated in the DEIR. It may benefit the Town to use permissive terms rather than mandatory terms when describing mitigation measures to allow the Town flexibility to deal with changed future conditions. For example, Mitigation Measures 4.1x on page 2-23 and 4.3h on page 2-29 and Implementation Measure VI.1.A.a.3 on page A-8 provide that the Town shall require projects adjacent to watercourses to "integrate the watercourses into new development in such a way that they enhance the aesthetic and natural character of the site." Committing to this measure, rather than crafting a mitigation measure requiring project by project study of the feasibility and practicability of integrating watercourses, may leave the Town in a position where such integration is economically infeasible or aesthetically unacceptable. Federal permits could be required for each such change and could require review under NEPA. The Town may ultimately desire that a specific project not integrate an adjacent watercourse, but create a stark visual contrast between such project and watercourse. A mandatory measure requiring integration may unnecessarily bind the Town.

Similar mandatory Mitigation Measures and Implementation Measures that could lead to unnecessary and unanticipated inflexibility are sprinkled throughout the DEIR and DGPU. The following list of such Mitigation Measures and Implementation Measures also flags some of the potential problems that may spring to life in the future:

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- a. Mitigation Measure 4.7p on page 2-29 requires zoning regulations that provide for vegetative buffers between Open Space areas and incompatible land uses which will likely prevent the Town from later crafting creative conditions of approval on a project by project basis when such project abuts Open Space.
- b. Mitigation Measures 4.3.f on page 2-29, 4.6.p on page 2-43, 4.6.y and 4.6.ee on page 2-44, and 4.6.ll on page 2-45 establish a mandatory requirement that the Town use the Town Development Code to retain primary community watercourses, which would be better addressed by crafting a mitigation measure that allows for flexibility (requiring future study on a project by project basis) in addressing this issue. For example, a future project may require a minor displacement of an existing watercourse that may actually provide benefits to the community.
- c. Mitigation Measures 4.1.a through 4.1.c on page 2-21, 4.1.q on page 2-22, and Implementation Measure I.5.A.a on page ES-22 require the implementation of zoning regulations as well as development review to protect view corridors. This policy would be better implemented though the development of a design review process which would provide the Town with greater flexibility to structure projects in a manner that produces the least impact on scenic vistas.

While we do not take issue with many of the concepts contained within the aforementioned Mitigation Measures and Implementation Measures, the use of mandatory rather than more permissive language does give cause for concern. As outlined above, the inflexibility of these Mitigation Measures may lead to unintended and unanticipated consequences. Thus, some flexibility should be built into these Mitigation Measures to militate against these potentially unintended consequences. In short, the inclusion of a flexibility theme in these, and other, Mitigation Measures would not detract from their enforcement, rather, it would allow the Town to weigh the costs and benefits of such measures as applied to a particular project.

2. Mitigation and Implementation Measures Requiring Clarification.

In addition to the inflexible Mitigation Measures and Implementation Measures described above, there are Mitigation Measures and Implementation Measures that require clarification. Mitigation Measure 4.7.p on page 2-49 requires Open Space to be designed to be "usable and accessible." Presumably the use of the USFS Parcel as a golf course would qualify as both usable and accessible. We request the Town to define, however, what is meant in Mitigation Measure 4.7.p by both usable and accessible. Implementation Measure I.1.B.c.1 on page ES-14 requires a continuous public corridor along Mammoth Creek in order to implement the objective of protecting wetlands, wet meadows, and riparian area from development impacts. What is

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intended by a "public corridor"? Does it require a public path along Mammoth Creek, and if so, how does this protect from development impacts? Similarly, Implementation Measure I.3.A.1.b on page ES-21 requires all development adjacent to National Forest Land to provide pedestrian access routes. We would like clarification on (1) whether development next to National Forest Land will be required to provide a public access easement, (2) whether access routes will be required to be located on the peripheries of parcels adjacent to National Forest Land, and (3) how much pedestrian access is required and how it will be measured. Mitigation Measures 4.2.g and 4.2.i on page 2-26, 4.2.p and 4.2.r on page 2-27, and 4.2.x and 4.2.dd on page 2-28 ban solid fuel burning. We respectfully request that you consider allowing one wood burning fireplace in each unit. Units with two fireplaces should be required to have an EPA-2 fireplace, as the second fireplace.

E. Conclusion.

For all the foregoing reasons, the DGPU should maintain the density for the Snowcreek Master Plan at eight dwelling units per acre as contemplated in both the existing General Plan and the Master Plan for Snowcreek. The DGPU should be clarified to reflect the completed exchange for the USFS Parcel as well as expressly permitting the contemplated uses thereon, and the DGPU should clarify the distinction between clustering and density transfers as set forth in Objective LU.1. The Town should also consider our comments on both the Mitigation Measures in the DEIR and the Implementation Measures in the DGPU.

Please call with any questions or if we can provide additional information with respect to this matter.

Very truly yours,

Sonia J. Ransom

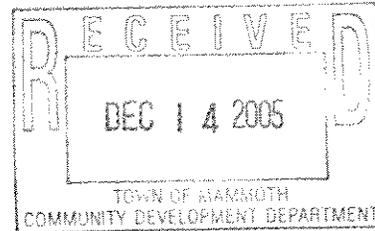
SJR:dl

cc: Charles R. Lande
Daniel McGregor



December 14, 2005

Mammoth Lakes Planning Commission
c/o Bill Taylor
PO Box 1609
Mammoth Lakes, CA 93546



Subject: Zoning of Property at 2 Meadow Lane at the corner of Old Mammoth & Minaret Roads, APN 40-020-01

Dear Mammoth Lakes Planning Commission,

Cardinal Real Estate Investments, LLC is currently in escrow with the Seller of the property located at 2 Meadow Lane situated on the corner of Old Mammoth and Minaret Roads, APN 40-020-01. The current RMF-2 zoning permits 36 rooms per acre for a condominium hotel. The proposed General Plan for the Town of Mammoth Lakes plans to down zone this property to 20 rooms per acre for a condominium hotel. We are requesting that hotel zoning for this site remain unchanged under the new General Plan.

We have been planning a five star full-service condominium hotel to include a dramatic view restaurant, spa and other luxury amenities. The subject property is in a prime location for many of the year round and off-season activities Mammoth has to offer outside of skiing.

Change in Development Type

The current zoning allows us to support the goals of the General Plan as documented in our letter to the Planning Commission dated June 2, 2005 attached hereto. With the proposed down zone for the condominium hotel on the property, it would require us to look at using the zoning for a Single Family Residence/Condominium development which would not serve the goals of the General Plan, in our estimation.

A development of 50-60 condominium units would greatly change the developmental make up of the site. A single family or residential condominium development would require us to maximize the build able footprint for the site as that market demands more space between units. We would not be able to keep the development in a denser hotel composition with a more limited footprint but rather it would be spread out over the site minimizing the open space.

This would limit the nature aspect on the site as well as hinder the community amenity that could be provided by the creek and natural areas. This would eliminate any plans to preserve an area south of the creek for community benefit.

There are many instances in the draft General Plan that reference open space and the desire to keep as much nature in tact as possible. We support the movement towards maximizing open space and have invested time and money to support this.

In conjunction with the draft General Plan, we wish to provide resort amenities for community benefit. A condominium development would not provide the opportunity for public amenities such as a spa and a destination restaurant to be enjoyed by the community.

Financial Aspects

As stated in the General Plan, the Transient Occupancy Tax (TOT) is 65% of the revenue for the town. The 190-room condominium hotel will have a higher occupancy rate and produce more TOT than a condominium community.

Cardinal Real Estate Investments has put forth time and money on this parcel under the direction from the town that the condominium hotel zoning would not change.

Impact of the Proposed Zone Change on the Subject Property

The below tables outline the impact that the proposed zoning will have on the subject property. Under the current zoning, the zoning allows for 36 rooms per acre. Under the proposed zoning, the zoning is reduced to 20 rooms per acre. The proposed zone change will decrease the density of the 5.297-acre property from 190 rooms to 105 rooms.

This is a decrease in density by 44%.

CURRENT ZONING				PROPOSED ZONING			
Density	36 rooms/acre			Density	20 rooms/acre		
Property	5.297 acres			Property	5.297 acres		
Total rooms	190.7			Total rooms	105.94		
Type	No Rooms	No Units	Total Rooms	Type	No Rooms	No Units	Total Rooms
Studio	1	30	30	Studio	0.5	20	10
1 BR	1	31	31	1 BR	0.5	19	9.5
2 BR	2	30	60	2 BR	2	25	50
3 BR	3	23	69	3 BR	3	12	36
TOTAL		114	190	TOTAL		76	105.5

We don't feel that it is fair under the proposed General Plan to reduce zoning for our parcel and up zone other areas.

We appreciate your consideration to retain the current zoning on the property located at 2 Meadow Lane to provide for a feasible development that provides community benefit.

We are not asking for increased density but rather the current density to remain the same as to when we began development of this project. Our proposed development mirrors many of the goals detailed in the General Plan and can provide benefits desired by the Town of Mammoth Lakes.

Sincerely,

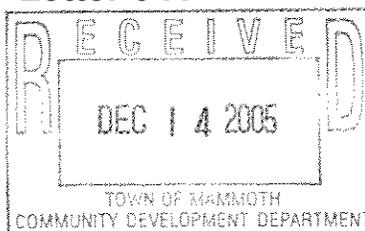


Kyle Ransford
Principal
Cardinal Real Estate Investments



Jesse Langley
Partner
Cardinal Real Estate Investments

Letter 041



June 2, 2005

Mammoth Lakes Planning Commission
c/o Bill Taylor
PO Box 1609
Mammoth Lakes, CA 93546

Subject: Zoning of Property at 2 Meadow Lane at the corner of Old Mammoth & Minaret Roads, APN 40-020-01

Dear Mammoth Lakes Planning Commission,

Cardinal Real Estate Investments, LLC is currently in negotiations with the Seller of the property located at 2 Meadow Lane situated on the corner of Old Mammoth and Minaret Roads, APN 40-020-01. The current RMF-2 zoning permits a 180-room condominium hotel.

We plan to purchase the land and develop a five star full-service condominium hotel to include restaurants, spa and other luxury amenities. The subject property is in a prime location for many of the year round and off-season activities Mammoth has to offer outside of skiing. In addition, there is an opportunity to work with the town for the development of a public trail near the creek running along Old Mammoth Road and a roundabout on the corner of Old Mammoth and Minaret Roads to benefit the community.

We are aware that the Town is currently updating the General Plan for the Town of Mammoth Lakes and that this property may be down-zoned; however, after reading the Draft of the General Plan Update we believe this development supports the goals of the Planning Commission as addressed in the General Plan. We are requesting the zoning remain unchanged in the new plan.

Below we address (I) the impact the change in zoning will have on this property followed by (II) the benefits that this development will bring to the Town of Mammoth Lakes and the areas of the General Plan that support the development.

I. IMPACT OF THE PROPOSED ZONE CHANGE ON THE SUBJECT PROPERTY

The below tables outline the impact that the proposed zoning will have on the Subject Property. Under the current zoning, the zoning allows for 36 rooms per acre. Under the proposed zoning, the zoning is reduced to 20 rooms per acre. The proposed zone change will decrease the density of the 5.297-acre property by 45% from 190 rooms to 105 rooms. The tables provide a breakdown by unit size, which is 114 condominium hotel units under the current zoning and 76 condominium hotel units under the proposed zoning, a decrease in units of 33%.

CURRENT ZONING				PROPOSED ZONING			
Density	36 rooms/acre			Density	20 rooms/acre		
Property	5.297 acres			Property	5.297 acres		
Total rooms	190.7			Total rooms	105.94		
Type	No Rooms	No Units	Total Rooms	Type	No Rooms	No Units	Total Rooms
Studio	1	30	30	Studio	0.5	24	12
1 BR	1	31	31	1 BR	1	19	19
2 BR	2	30	60	2 BR	2	25	50
3 BR	3	23	69	3 BR	3	8	24
TOTAL		114	190	TOTAL		76	105

II. BENEFITS THE PROPOSED DEVELOPMENT PROVIDES TO THE TOWN OF MAMMOTH LAKES

II-1. TRANSIENT OCCUPANCY TAX (TOT)

The 180 rooms in our proposed development will produce TOT Revenue for the Town of Mammoth Lakes. We understand that the TOT accounts for the majority of the Town's Budget and the TOT generated from this development will enhance the Town's revenues.

II-2. PROMOTE MAMMOTH AS A YEAR ROUND RESORT PROVIDING LODGING IN CLOSE PROXIMITY TO MANY OFF-SEASON AND MID-WEEK ACTIVITIES

Providing a five star condominium hotel development on the south-side of Mammoth will help promote Mammoth as a year round resort by providing a short-term, luxury housing product with close access to many of the off-season and non-ski activities that Mammoth has to offer. Our proposed development consisting of a condominium hotel, spa and restaurants supports nightly, non-ski

and off-season visitors. These accommodations are near off-season and mid-week activities such as golf, fishing, hiking and cycling.

Vision Statement, Section II-7, of the Draft General Plan Update, the Town “supports the relationship with visitors as one way to maintain high quality of life”. The Town also seeks to provide a “year round destination resort community based on diverse outdoor recreation and tourism”.

Destination Resort Economy, Section I 39-40, “to increase its success as a tourist destination, Mammoth Lakes needs activities, facilities and accommodations that encourage mid-week and off season business and provide a year round alternative to downhill skiing on the weekends.” “A mix of visitor accommodations that reflects Mammoths varied markets, both existing and potential.”

Resort Economy, Section RE-11 Visitor Amenities, “In order to be successful in today’s tourism market and provide options for a greater number of visitors while not overburdening the resources, Mammoth intends to augment the existing opportunities with a greater number and variety of recreation and leisure activities. New development will be expected to provide amenities, services and activities in addition to accommodations. These will be needed for the community to succeed in its objectives of increased mid-week visitation and high-occupancy visitor accommodations while protecting the natural environment that provides the basis for our business.”

Our on-site spa, restaurants and other full-service hotel amenities will preserve the town’s goals to provide new leisure activities while supporting the natural resources.

Resort Economy, Section RE-3, Modern Resort Trends, “There are opportunities for fishing, skiing, camping, hiking, horseback riding, golfing, sightseeing, road and mountain biking, boating, hunting, snowmobiling, tennis and other recreational pursuits.” Many of those activities are easily accessed on the south side of town and our proposed condominium hotel development will allow visitors close access to those activities.

II-3. PROVIDE THE FIRST FIVE STAR CONDOMINIUM HOTEL DEVELOPMENT ON THE SOUTH-SIDE OF TOWN WITH A SHORT-TERM HOUSING PRODUCT IN CLOSE PROXIMITY TO THE PROPOSED SNOWCREEK VILLAGE.

Aesthetics, Section A-4 Built Environment, “Many of the newer multiple family developments have taken on the form of a “condo hotel” where units are individually owned, but the premises have a front desk and amenities associated with a hotel.”

Resort Economy, Section RE-10 New Visitor Lodging Units, “In recent years, several larger condominium hotels have been constructed, providing a more contemporary resort accommodation. These projects will add diversity to Mammoth Lakes’ accommodation base and will appeal to a new market segment. For Mammoth Lakes to be competitive in the national and international resort market, visitor accommodations must meet current trends and evolve with the needs and expectations of the guests.” The success of condominium hotels in the town will be spread to an area of town where this type of lodging is not currently available but can hosts many non-ski and full-season activities.

Destination Resort Economy Section I-41, Strategic direction of the General Plan, “cluster density adjacent to transit routes and major activity areas to decrease private vehicle use.”

II-4. DEVELOP A PROJECT THAT PRODUCES COMMUNITY BENEFITS.

The development would provide an opportunity to work with the Town of Mammoth on a public trail alongside Mammoth Creek. The trail in the creek corridor will help connect the path around Mammoth for biking, walking, jogging and hiking. This will be especially beneficial in summer months to promote pedestrian traffic.

To alleviate traffic flow and enhance the trails a roundabout on the corner of Old Mammoth Road and Minaret Road could be developed. The location of the condominium hotel and spa development, as well as development of the creek trail and roundabout, provide pedestrian traffic to activities such as golf, fishing, hiking and the proposed Snowcreek Village. These routes will also provide pedestrian traffic to the spa and restaurants at the proposed development and decrease private vehicle use on the south side of town.

This land usage and underground parking for owners and guests will alleviate the growing problem of snow storage and eliminate large parking lots that can have a negative visual effect.

Section II-7, Vision Statement VII, “variety of transportation options that emphasis connectivity, convenience and alternatives to personal vehicle use with strong pedestrian emphasis.”

Environmental Sustainability, Section ES-10 Visual Resources, “Community strongly supports the retention of major landscape characteristics and unique natural features.”

Strategic Direction of the General Plan, Section I 41, “cluster density adjacent to transit routes and major activity areas to decrease private vehicle use”.

We appreciate your consideration to retain the current zoning on the property located at 2 Meadow Lane to provide for feasible development. Our proposed development mirrors many of the goals detailed in the General Plan and can provide benefits desired by the Town of Mammoth Lakes.

Sincerely,

Kyle Ransford
Principal
Cardinal Real Estate Investments

Jesse Langley
Partner
Cardinal Real Estate Investments

Letter 042



MAMMOTH MOUNTAIN SKI AREA
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December 14, 2005

Sonja Porter, Senior Planner
Town Of Mammoth Lakes
Community Development Department
P.O. Box 1609
Mammoth Lakes, CA 93546

Dear Ms. Porter:

Mammoth Mountain Ski Area (MMSA) thanks you for the opportunity to comment on the Revised Draft Program Environmental Impact Report (RDPEIR) for the Town of Mammoth Lakes General Plan dated October. One of our primary reasons for commenting on the RDPEIR is to ensure that MMSA's proposed developments are consistent with the direction of the updated General Plan. In particular, improvements at the three base lodges (Eagle, Canyon, and Main) are important not only to MMSA but to the U.S. Forest Service as the permit holder, which recognizes that redevelopment is in the public interest. The goal is to allow growth to an acceptable level while protecting the environment and natural resources that make Mammoth Lakes the ideal location for residents and visitors alike. We have organized our reply by providing comments on the Draft Program Environmental Impact Report in order of its contents.

- **Project Description**

1. Section 3.0 Project Description, Page 3-5, It should be noted in the FPEIR that MMSA skier visits in 2004/2005 were 1.43 million and with additional uses including Tamarack X-Country Ski Center, Scenic Gondola Rides, and Snowmobile Adventures, MMSA accounted for a total of 1.46 million guests.

- **Aesthetics, Light and Glare**

2. Section 4.1: Aesthetics, Light, and Glare – 1.5.B.b.4 “no new development on prominent ridge lines” could create a potential conflict with MMSA's master plans. MMSA will build future skier support facilities on Lincoln Mountain/Saddle, not to mention other chair lift replacements or additions. Such projects will follow the appropriate NEPA environmental approvals as administered by the Forest Service at the time of implementation. This measure should be re-written to state that all proposed development on prominent ridge lines will be required to meet visual quality analysis criteria as may be administered by the applicable public agency having jurisdiction, whether or not required by the zoning code applicable to the land use designation. As currently drafted, the overall policy statement appears vague and overreaching. For example, it does not specifically indicate which ridge lines are prominent from particular

vantage point(s). Ambiguities of this nature should be addressed in the project specific approval process.

- **Air Quality**

3. Section 4.2: Air Quality – With respect to Section 4.2, MMSA believes that its plans for the Ski Back Trail to the Village and Eagle Lodge development will contribute to the reduction in PM-10 particulate matter from re-suspended road dust. One of the goals for each of these projects is to reduce motor vehicle traffic by ski area guests, especially along Highway 203 from the Village to Main Lodge. The Ski Back Trail would help accomplish this by offering guests a way to ski back to the Village at the end of the day and thus avoid waiting for shuttle buses, the Village Gondola, or private vehicles at guest pick-up or day skier parking areas in the Main Lodge area. Ecosign Mountain Resort Planners has estimated the Ski Back Trail comfortable carrying capacity at 900-1200 skiers. Ecosign has also estimated that each privately-owned vehicle (POV) carries an average of 2.5 skiers. Thus, if the Ski Back Trail were utilized at even the low end of the trail capacity (900 skiers), approximately 360 POV trips in the Main Lodge area could be eliminated, or roughly 2,880 vehicle miles traveled (VMT).

Additionally, the Eagle Lodge development will further reduce PM-10 levels by offering more guestrooms and amenities in that area, so that once guests have arrived they will not have to drive their personal vehicles until the end of their stay. Projected traffic reduction figures (or VMT) will be presented in the NEPA analyses for the Ski Back Trail. As is the case with the proposed Eagle Lodge as well, by providing destination services that allow guests to park their cars or arrive in Mammoth via air service without a private vehicle, an overall reduction in town-wide VMT is achieved with a commensurate reduction in PM-10 levels.

Implementation measures should incentivize private developers by providing offsets to other mitigations where reductions in PM-10 (and also ambient noise from autos) are realized through comprehensive development designs which reduce overall traffic levels in Town as verified through project-specific traffic analyses. Projects such as Eagle Lodge and the Ski Back Trail are examples of this process. Where a project, such as the Ski Back Trail, is not attributable to a specific development of dwelling units per se, the project proponent should be allowed to quantify to the extent possible and bank credits towards mitigation on future projects.

4. On page 4-35, Implementation Measure VII.2.B.a.1 states that, “The Town shall require major traffic generators, including the school district and ski resort to develop and implement trip-reduction measures. In particular, ski area ops should be managed to reduce the overall pm peak traffic generation and to disperse these trips between the various mountain portals.” It should be noted in the FPEIR that at current peak visitation to MMSA, traffic is at or near maximum levels and will not change drastically with build-out relative to peak daily VMT associated with alpine skiing at MMSA. The incremental increase in peak daily VMT will be attributable primarily to non-skiers, as MMSA does not anticipate an increase in its currently permitted 24,000 SAOT during

the term of the contemplated community build-out. Implementation measures should be amended to allow for offsets or banked credits (see above). Furthermore, the Traffic and Circulation and Air quality sections of the FPEIR should acknowledge that MMSA is already providing free public transportation to and from its major portals via bus service and the Village Gondola.

- **Biological Resources**

5. Species impacts. The RDPEIR identifies several broad policies regarding special status plant and animal protections that would be implemented by the TOML when discretionary approvals are sought. In certain respects, these policies can be read to impose burdens and requirements above those required by existing state and federal species laws. The FPEIR should clarify that the TOML does not intend to independently develop or implement species protection measures beyond those required by state and federal resource laws. The RDPEIR further states that the implementation of the TOML's General Plan policies regarding wildlife assures that no significant impacts will occur to candidate, sensitive or special status species with the Town's urban growth boundary and that no mitigation is therefore required (RDPEIR page 4-77). Given this analysis, the FPEIR should state that any development proposal within the urban growth boundary that is subject to the same TOML General Plan policies identified in the RDPEIR will not generate significant impacts to candidate, sensitive or special status species and not require further mitigation.
6. Wetlands and waters. The General Plan update and RDPEIR should define wetlands in terms of the U.S. Army Corps of Engineers 1987 Delineation Manual three-part criteria (soils, vegetation and ponding) and not utilize the more ambiguous Code of Federal Regulations definition (see, RDPEIR, page 4-65). The RDPEIR identifies several broad policies regarding wetland, waters and riparian protections that would be implemented by the TOML when discretionary approvals are sought. In certain respects, these policies can be read to impose burdens and requirements above those required by existing state and federal aquatic and riparian area regulations. The FPEIR should clarify that the TOML does not intend to independently develop or implement wetland, waters and riparian protection measures beyond those required by state and federal resource laws. The RDPEIR also states that, with the implementation of the TOML's General Plan policies regarding riparian and aquatic areas, no significant impacts will occur to wetlands or waters within the Town's urban growth boundary (RDPEIR page 4-80 and 4-82). Given this analysis, the FPEIR should state that any development proposal within the urban growth boundary that is subject to the TOML General Plan policies would not generate significant impacts to wetlands, waters or other aquatic areas and would not require further mitigation.

- **Geology and Soils**

No comment.

- **Public Safety/Hazards**

7. Section 4.5: Public Safety and Hazards – As the airport is to be included as part of the Proposed Action Alternative, then the analysis of Community Health and Safety should include the airport, including fire protection (especially since there are proposed residential units at or near that location).

- **Hydrology and Water Quality**

8. Creek and hydrology protection. The General Plan update and RDPEIR should clarify that the TOML policies (i.e., General Plan policy II.4.A.a.3) and mitigation measures designed to “preserve” creeks to the “maximum extent possible” (i.e., RDPEIR at 4-163) apply to perennial waterbodies within the Town’s jurisdiction. Intermittent and ephemeral watercourses would continue to be regulated by state and federal resource agencies and protected consistent with TOML policies by obtaining applicable permits from these agencies. The RDPEIR states that, with the implementation of the TOML’s General Plan policies, no significant impacts will occur to water quality as a result of new or existing stormwater facilities (i.e., RDPEIR pages 4-164 and 4-170). As a result, the FPEIR should state that any development proposal that is subject to TOML General Plan policies would not generate significant impacts to water quality and would not require further mitigation.
9. Section 4.6: Hydrology and Water Quality – This section currently can be read to suggest that MCWD has finished the upgrades to the wastewater facility. To be accurate, the RDPEIR should note that these upgrades are proposed for completion in 2006. On page 4-258 it is acknowledged that the upgrades are not yet complete but in the Executive Summary and Project Description and Hydrology Section, and in the discussion of issue 4.11-2, the RDPEIR appears to assume that the upgrades are already complete.

- **Land Use and Planning**

10. Revised Population Growth Projections. MMSA does not support the reduction in HDR2 from 12 DU’s per acre to 10 DU’s per acre in the Canyon Lodge Area. This proposal is inconsistent with one of the explicit goals of the General Plan, the clustering of density immediately adjacent to the resort amenities and public transportation facilities. Reducing existing zoning densities adjacent to major resort destinations such as the Canyon Lodge area and along public transportation corridors would, in contrast, created incentives for development away from major resort amenities. MMSA supports the prior plan to designate at least certain of the Canyon Lodge area as HDR3 with a 48 unit per acre density. at a minimum, MMSA requests that HDR2 densities be maintained at the present 12 DU’s per acre in all areas generally adjacent to public transportation corridors and/or resort amenities to help create affordable workforce housing and/or an improved transient occupancy bed base.

11. Rezoning of Arrowhead Drive/Chaparral Road Properties. MMSA does not support the rezoning of three MMSA-owned properties at the corner of Arrowhead Drive and Chaparral Road from the previous RMF2 designation to the proposed HDR1 designation. These locations provide critical seasonal employee housing for MMSA and the proposed rezoning will adversely affect MMSA's current and planned future employee housing operations. The entire adjoining neighborhood has already been developed under the RMF2 zoning and would be subject to the new HDR2 designation. As a result, it would be inconsistent to rezone the three MMSA parcels to HDR1 in conflict with historical and future adjacent uses. MMSA also requests that the existing density of 12 DU's per acre be retained specifically for each of the three MMSA-owned parcels.
12. Density transfers. The RDPEIR should clarify that although HDR areas have been nominally downzoned to 10 units per acre, the Town expects that the new General Plan density transfer policy will allow for appropriate concentration of development at or near recreational hubs, including ski lifts. The RDPEIR further states that density transfers must conform with a number of policies, including reductions in traffic and the avoidance of "new significant environmental effects" or an increase in a previously identified effect (RDPEIR at 4-193). The FPEIR should clarify existing language in the RDPEIR (e.g., page 4-193) regarding the need for additional environmental review and indicate that, given the transfer criteria, no review would be necessary beyond the simple determination of no new impacts.
13. Density transfers. Table 4.7-1 states that "density may be increased within 500 yards of a ski lift through HDR2 transfers or other Resort Properties." A similar statement should be added to the RDPEIR Executive Summary and Project Description and in the discussion of Land Use Designations for the HDR2 and Resort zone to fully characterize the allowable uses in the applicable areas.
14. Density transfers. Table 4.7-1. The discussion of both the HDR and Resort land use designations must include the statement that densities may be transferred to the HDR2 land use designation in addition to the Resort and NVSP designations. Without this specification density transfers may be adversely affected in the immediate vicinity of Canyon Lodge and other areas within 500 yds of a ski lift terminus and thus conflict with a significant General Plan update objective.
15. Industrial and commercial development projections. The General Plan update will significantly increase build out levels of industrial and commercial development (see Table 3-5). It is not clear that the reallocation of the TOML economic development capacity from the area's core visitor-serving and resort -residential business to industrial and commercial/office uses represents an achievable or desirable result. As a result, the FPEIR and General Plan update should be revised to allow for the reallocation of unused commercial or industrial capacity to visitor-serving uses in the event that TOML growth deviates from the RDPEIR projections.

16. Page 4-185, Juniper Ridge Master Plan. Amend FPEIR to include the proposed Eagle Base Lodge development, a currently submitted application, as part of the overall Juniper Ridge Master Plan.

- **Noise**

No specific comments. The Noise section should generally note that proposed Ski Back facilities will reduce traffic and noise associated with skier transportation (see comment #3 above).

- **Population, Housing, and Employment**

17. Section 4.9, Page 4-217 and 4-218 analyze and interpret data to derive current average peak population figures (PAOT). As this data points out, a major contributor to the current PAOT figure is the 18,476 skiers on an average peak winter Saturday. Following this same logic through to the estimated 60,700 PAOT at build out, the TOML needs to identify what additional winter time recreational amenities will be provided to support the 60,700 PAOT population at build-out. MMSA does not anticipate any substantial growth in the average peak winter Saturday visitation figures (ref. Page 4-286, paragraph 2). Therefore, the FPEIR must provide some type of combined analysis of the overall “comfortable” carrying capacity for all community and resort recreational amenities to support the estimated 60,700 PAOT at build out in some fashion similar to the current PAOT calculation as represented in Table 4.9-3.

18. Daycare Facilities. The RDPEIR does not discuss the significant impact on employment due to a lack of daycare facilities within the community. This is a major issue that has been brought to the attention of town authorities at recent Planning Commission and Town Council meetings. MMSA provides one of the few infant and pre-school day care facilities in town at a net operating loss. This issue should be discussed as one of the impacts of increased population and employment. Implementation measures should encourage the development of further daycare facilities within the community. Commensurate mitigation should be required of developers in direct correlation to employee generation figures to account for the incremental demand created for daycare facilities.

- **Public Services**

No comment.

- **Public Utilities**

19. Water supply. The RDPEIR concludes that, at build out, Mammoth Community Water District (MCWD) water supplies are not adequate to meet demand during three consecutive drought years. An element of this analysis is the assumption that Sierra Star Golf Course will use recycled water. The FPEIR should clarify that Sierra Star Golf

Course is under an obligation to use recycled water at the time that the MCWD develops such supplies for its use but is not required to build recycled supplies on its own.

20. Mitigation Measure 4.11-1 states that no development will be approved that would “result in an excess of water demand” above the levels indicated in the MCWD 20-year analysis. The FPEIR should clarify this measure to mean that as long as a proposed project is consistent with (i.e., does not cause an exceedance of) the population and water use projections cited in the RDPEIR, the project would not conflict with the availability scenarios identified in the RDPEIR. Mitigation Measure 4.11-1 should primarily apply to projects that would result in an exceedance of the projected 60,700 PAOT level or that propose substantially more intensive and unanticipated water uses compared with those considered in the RDPEIR.

21. On page 4-256, there is no corresponding graph to the sentence in paragraph one.

22. Pg 4-276, re: Electricity and Geothermal, Implementation Measure 1.1.C.b.3 should be expanded to provide off-set or banked mitigation credits to private developers who provide a significant contribution to the realization of geothermal district heating within the community or attainment of LEED certification. MMSA is pursuing the potential for both LEED certification and direct use geothermal heating at Eagle Lodge at significant out-of-pocket cost, yet for benefits that may potentially serve the entire community.

- **Recreation**

23. Page 4-279 references a children’s daycare facility. As noted above, no daycare facility is provided by the Town for public use at this or any other location. The FPEIR should specifically address infant and child care measures and polices to be integrated into the General Plan update.

24. Page 4-280, MMSA accommodated 1.43 million skiers in 2004/2005 on Mammoth Mountain and 1.46 million guests annually when Tamarack X-Country Ski Center, Scenic Gondola Rides, and Snowmobile Adventures are included.

25. Page 4-282, Table 4.12.2, Meeting Facilities, should also include the Village’s Grand Sierra Lodge, Main Lodge Mountainside Conference Center, and Eagle Lodge is also available. The ski museum might also be appropriate for Table 4.12.2.

- **Transportation and Circulation**

26. Section 4.13: Transportation and Circulation. The traffic analysis appears to include certain significant errors that should be corrected in the FPEIR. Attachment “A” to this letter includes comments from LSA Associates that identify specific analysis concerns. The FPEIR should re-evaluate the traffic study based on LSA’s comments and particularly assess whether the projected LOS at some negatively impacted intersections will be improved under the corrected assumptions.

27. Live-work policies and zoning. The TOML should clarify that the proposed General Plan update zoning already incorporates substantial consideration of the live-work policies identified in the RDPEIR (i.e., page 4-308 to 4-310). Absent such a clarification, the live-work policies could be read to require significant zoning modifications in the future to reduce traffic loads, a result inconsistent with other General Plan provisions and possibly requiring further environmental review.
28. Parking. RDPEIR Section 4.13-6 should be revised to state that LSA Associates has prepared a parking analysis that has been considered and circulated by the TOML. The analysis indicates that the Town's construction of a planned parking facility along Canyon Blvd. in the North Village Specific Plan area is essential to address regional parking needs. As a result, the construction of the Canyon Blvd. facility should be added to Section 4.13-6 as a specific mitigation measure to be implemented by the TOML as soon as possible.
29. On page 4-296 it is stated that the parking lot on the corner of Old Mammoth and Tavern is free parking and implies that it will remain in this form and use. The Land Use section map on page 4-180, however, designates the lot as the future site of the Police Station. This should be clarified as it appears to be in error.
30. In Table 4.13.1, the superscript "a" in the Project Action Alternative (2024) column is not defined. One of the most impacted roadway-intersection combinations is Highway 203 from Main Lodge through the Village to the Minaret-Main Street intersection. It would be helpful to assign a LOS to that section of roadway for both existing conditions as well as the alternatives. The mitigations listed in Table 4.13.8, or a substitute approved by a traffic engineer, should be enforced by the Town so that development can proceed as described in the Project Action Alternative. The analysis should also specifically state that LOS exceedances will occur only on *peak* days and that mitigation measures will ensure acceptable LOS performance for *average* winter (and other low volume) days.

- **Cultural Resources**

31. RDPEIR Section 4.14 should be revised to note that cultural resources are regulated by state and federal agencies and that the primary TOML protection policies focus on implementing applicable state and federal law. Mitigation Measures 4.14-1 to 4.14-7 should be clarified to state that they are intended to implement state and federal requirements and not to generate an independent TOML regulatory process. Section 4.14 should conclude that compliance with state and federal cultural protection requirements will reduce impacts associated with the implementation of the General Plan to less than significant levels.

- **Irreversible Environmental Changes**

No comment.

- **Growth-Inducing Impacts**

No comment.

- **Significant Unavoidable Environmental Impacts**

32. Significant and unavoidable impacts. RDPEIR Section 4.3 repeatedly states that the TOML General Plan policies will reduce biological impacts to less than significant levels. RDPEIR Section 6 should be revised to be consistent with this approach and to state that since the General Plan will be limited to focus in the urban growth area, impacts to biological resources will *not* be significant and unavoidable. Similarly, given that the RDPEIR concludes that air impacts are generally being caused by extra-regional factors that the TOML cannot control, the FPEIR should also indicate that air quality impacts associated with the General Plan update will be mitigated to levels that are not significant and unavoidable.

- **Potential Secondary Effects**

No comment.

Again, thank you for the opportunity to comment on the RDPEIR for the Town General Plan.

Sincerely,

Tom Hodges
Director of Planning
Mammoth Mountain Ski Area

Alexandria Fabbro
Government Relations Manager
Mammoth Mountain Ski Area

ATTACHMENT "A"

MEMORANDUM

DATE: December 2, 2005

TO: Scott Schoenfeld and Alex Fabbro

FROM: Les Card

SUBJECT: Comments on Town of Mammoth Lakes (Town) General Plan and Draft EIR Transportation Elements

I have reviewed the subject documents and prepared the following comments. Some of the comments are very technical in nature but have profound impacts on future land development permitting and required mitigation measures. For these reasons and the fact that many times during a formal EIR comment and response process there is misunderstanding and final responses do not accurately address the intended comment, I recommend that a face-to-face meeting with Town staff and their consultants be conducted to fully elaborate and clearly articulate these issues.

1. General Plan LU-12: The exhibit illustrating North Village Specific Plan (NVSP) does not reflect abandoned streets and new alignments for Berner Street and Canyon Boulevard.
2. General Plan T&C-6: The circulation plan shows Berner Street connecting to Minaret Road, which is inconsistent with the adopted NVSP.
3. General Plan T&C-21: The description of congestion on SR-203 overstates actual conditions. The description should be revised to emphasize that the congestion on SR-203 typically occurs only on winter weekends and holidays and only in the afternoon.
4. General Plan T&C-21: The local transit discussion should highlight the significant system provided by MMSA during the most congested traffic conditions. This system provides extensive coverage throughout the Town for free.
5. EIR Page 2-40: Mitigation Measure 4.13-1 regarding Minaret Road is not required. The traffic demand at the north end of the segment is not over capacity (1,029 demand equals 0.79 v/c ratio or LOS C) and at the south end of the segment, Minaret Road is already four lanes.

In addition, the traffic model highway network for 2024 assumes Berner Street connecting to Minaret, which will influence Minaret Road traffic volumes inconsistent with the adopted NVSP. It is recommended that the overall traffic network and traffic analysis zone loading assumptions be reviewed in the NVSP area due to their sensitivity to traffic demand on Minaret Road.

6. Page 2-41, Mitigation Measure 4-13-3: The need for the eastbound acceleration lane has not been technically demonstrated. The primary mitigation measure, providing separate southbound left- and right-turn lanes, appears sufficient to adequately mitigate the deficient LOS condition. It is recommended that the eastbound acceleration lane recommendation be deleted.

ATTACHMENT “A”

7. Page 4-305/306: The peak-hour traffic volume shown for Minaret Road, 1,346 vehicles, represents the volume at the approach to the Main Street/Lake Mary Road intersection, where the roadway is four lanes, and therefore has a capacity of 2,600 vehicles, not 1,300 vehicles. See additional discussion on comment #5.
8. Page 4-309, Policy VII.1.B.c.1: This policy appears to require a full general plan build out cumulative analysis for a land development project. This analysis should only be required if a project exceeds or is otherwise inconsistent with the adopted General Plan intensity. If a project is consistent with the general plan, then the analysis in this General Plan EIR is adequate.

The cumulative analysis for General Plan-consistent projects should be the existing traffic condition plus all projects in the pipeline (approval or in process, but not built) plus the specific development project.

9. Page 4-318, Mitigation Measure 4.13-7, Main Street/Meridian: The traffic volumes driving this mitigation measure appear out of context with the design day of a typical winter “Saturday.”

The projected peak-hour volume of 521 northbound left turns seems way out of context, as well as 375 east-bound right turns. These 521 left turns drive the deficiency and should be reexamined to verify accuracy.

The traffic generation for TAZ 114 (immediately adjacent to the intersection) does not appear to realistically reflect typical winter Saturday conditions. This zone assumes a generation of 44,245 daily trips and the vast majority are a Home to Other attraction. This is probably the college, which would not be in full session on a Saturday.

In summary, the Traffic generation of TAZ 114 should be reevaluated to reflect the design day and the mitigation at Meridian/Main Street should be reconsidered.

10. Traffic generation in TAZ 119: This zone assumes 150,000 sf of retail use and generates in excess of 30,000 trips, one of the highest zones in the Town. This appears unrealistic since the type of retail use expected in this zone would not be comparable to other conventional retail use like North Village.
11. Peak Hour Factor: Level of Service Analysis (12/6/04) by LSC Consultants: It should be acknowledged that the long-range Town build out traffic forecasts represent an extremely conservative assessment of traffic conditions by assuming two critical factors: (1) an occupancy rate of 100 percent for all residential units, and (2) a “peak hour factor” that increases the projected traffic an additional 10 percent (5 percent on Main Street [Old Mammoth to Lake Mary] and Old Mammoth [Main Street to Meridian]) above that forecast by the traffic model.
12. Typical Winter Saturday Design Day: It appears that the previously stated Town policy of designing a highway system for a “typical winter Saturday” has been lost in the analytical traffic modeling process. The town has consistently stated that it was not its intent to design a transportation system sufficient for the 10 to 15 peak winter days of the year. Yet, it appears that the Town build out 2024 traffic forecasts represent a “peak” Saturday condition. This is

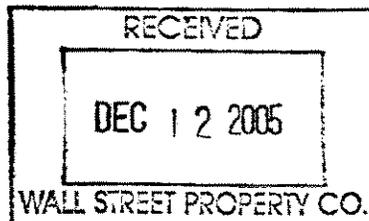
ATTACHMENT "A"

substantiated by the assumption of 24,000 skiers, 100 percent occupancy of all visitor accommodations, and further, the increase of all traffic volumes, an additional 10 percent above the 100 percent occupancy levels via the Peak Hour Factor (PHF) adjustments noted in comment #11. All of these conditions combined represent that mitigation measures are being recommended for the absolute highest traffic day of the year.



Family of Fine Stores

December 9, 2005



Mr. Mike Perry
Wall Street Property Company
221 15th Street
Del Mar, CA 92014

RE: Mammoth Lakes, CA

Dear Mike:

I understand that you will be submitting a proposal to develop a Raley's supermarket in Mammoth Lakes. The purpose of this letter is to communicate our interest in this area and our desire to work with Wall Street Property Company as our Preferred Developer.

Our interest in opening a store will be subject to review of the overall feasibility of the specific location including an acceptable site plan, sales volume study, economics and Board of Director's approval. Please convey the benefits that our long standing relationship with your company and our approach of working in partnership with Wall Street and the other local stakeholders will bring to the Town of Mammoth Lakes.

A few items that you can share to help introduce Raley's to the people we will be working with are summarized below. Raley's was voted No. 1 supermarket chain in the U.S. by readers of a leading national consumer magazine each of the last three times this survey was published. It also was awarded the top spot in both the best meat and best produce categories, as well as the most outstanding regional chain. According to the November 2005 issue of Forbes magazine, Raley's is the eighth largest private company in California.

Please keep us advised on the status of this opportunity and let us know what we can do to assist with your efforts.

Sincerely,

Kent Haggerty
Vice President-Real Estate
For Raley's

Raley's BELFAIR NOB HILL FOOD SOURCE

Letter 044

December 13, 2005

Ms. Karen Johnston
Director of Community Development
Town of Mammoth Lakes
P.O. Box 1609
Mammoth Lakes, CA 93546

Via email to kjohnston@ci.mammoth-lakes.ca.us

Re: Raley's Shopping Center
Mammoth, CA

Dear Karen:

As a follow-up to our previous meetings and your conversation with Michael Pavlovich this letter will serve to register interest on behalf of Wall Street Property Co. to continue discussions about how we can creatively incorporate a Raley's Supermarket into a mixed use development on the "Bell Property".

Wall Street Property Co. is a community shopping center development company that has been in business for 25 years. We have developed and currently operate 19 community shopping centers in the California and Nevada markets. As we discussed at our previous meetings, some of our projects that you may be familiar with include the Gateway Shopping Center in Truckee, CA anchored by Safeway and Rite Aid and 5 shopping centers in Reno of which 3 are anchored by Raley's Supermarkets, 1 anchored by Safeway Supermarket and 1 lifestyle center anchored by Borders Books, Cost Plus World Market, Bed Bath & Beyond, Chevy's Mexican Restaurant and the Claim Jumper Restaurant.

Regarding the development of a community shopping center in the town of Mammoth Lakes, our company is the exclusive developer for Raley's Supermarkets. I have enclosed a copy of a letter from Kent Haggerty, Vice President of Real Estate for Raley's, indicating their interest in locating a store in your community and their commitment to our company as their preferred developer. We believe that a collaborative effort between Raley's, the town of Mammoth, and our firm will result in a new, vibrant shopping center with a supermarket to serve the growing community. Our vision is to create a shopping center incorporated into a mixed use development featuring multi-family housing and retail with convenient street level parking for the retail component and structured parking for the multi-family component. We envision clusters of small shops, with one- and two-story elevations surrounding the Raley's building creating a village environment that welcomes shoppers and diners.

We propose that our company and the Town of Mammoth Lakes form an alliance and enter into an exclusive negotiating agreement to design this new commercial center. It is my understanding

that the town is currently going through a general plan update. I believe this would be the ideal opportunity to create an open forum with the community with regards to this project.

We are excited about the opportunity this presents for our firm and the community. Please feel free to discuss our proposal at the next planning commission meeting scheduled on December 14, 2005. We at Wall Street Property Co. and Raley's Supermarkets are available and would welcome the opportunity to discuss this project in greater detail with the town.

Thank you for your consideration of our request and we look forward to hearing from you in the near future. Should you have any questions, please feel free to contact me.

Very truly yours,

WALL STREET PROPERTY COMPANY

Michael R. Perry
Managing Partner

SIGN IN SHEET

<u>NAME</u>	<u>ORGANIZATION</u>
Michelle H. Berema	Retired (Geologist)
Doug Jung	retired Petr. Engr., Geologist
Robert & Sally Drake	Drake wood milling (Geologist)
Mahmud & Shaima Clark	Concerned Citizens
Don Sage	"
Shelle Genevieve	"
Jo Bacon	"
Margaret Douglas	"
Dan Dawson	Univ. of CA, Volcanic Resource & studies
Wendy Sugimura	ALIMAR
Pat Eckart	Concerned citizen
Nancy ^{Peterson} Walter	" "
Marshall Minobe	"
John Cunningham	"
Muriel Jardine	Concerned citizen
Michael Liu	USDA Forest service
Kew Warner	RETIRED
Julie Gost	not much
Feather Johnson	concerned home and land owner
Wilson Wheeler	Sierra Club
Boyer Wheeler	Sierra Club
Joe Pospisil	NPS - Denib Post pile
Ruth Manning	DSES
Greg Manning	DSES
Susan Klein	DSES / CONCERNED CITIZEN
KEN KLEIN	DSES & UMMA
V. Fabbro	

name

organization

Kathy Copeland

Disabled Sports Eastern Sierra (DSES)

E.L. Smoogen

" " " "

Gary Small

Self

Peter Bagnascioni

ToPML

Paul Payne

Citizen of Mammoth

Ted Carleton

" " "

Partial list of Advocates for Mammoth DPEIR Concerns 11/30/05

1. Completely Ignores MMSA plans- Key to Transportation, recreation availability and Housing.
2. Loss of Mammoth Creek Park.
3. Housing in Institutional Public Zone.
4. Loss of SCP designation that protected sensitive environments and loss of stream corridor overlay.
5. Almost doubling the amount of Industrial without analysis or justification.
6. No clearcut height limit (We thought the 200ft lighted building proposed for Sierra Star was a typo, wrong)
7. 500 yd (quarter mile) walking distance to ski lifts.
8. 780 room bonus and transfer rights in North Village.
9. Inadequate water assessments and no concrete plan to resolve problems.
10. Ignores noxious odors from diesel buses, trucks, autos, snow removal and construction equipment.
11. Ignores the noise and air pollution from the equipment listed in 10.
12. Requires 10 intersections and streets to be reworked without consideration of cost or inconvenience during rework.
13. Accepts traffic service level D on an average winter Saturday.
14. Ignores obvious mitigations to environmental impacts (better regulations and enforcement, new and better equipment, design changes, etc.)
15. Zones Bell shaped parcel as Resort.
16. No concrete solutions to parking problems
17. Fails to analyse the effect of over 20,000 additional visitors on public lands and the recreation experience.
18. Rejects the clearly environmentally superior alternative, because it does not meet a supposed Town objective requiring intense development with no quantitative analysis as to how much development is needed.
19. Fails to provide enough park land even though there is obviously enough vacant land (Gateway, Bell Shaped Parcel, Shady Rest Tract, Mammoth Creek corridor, etc.
20. Completely emphasizes resort economy which is inherently unstable while ignoring features to diversify economy, (Telecommuting- make town wireless, Encourage writers artists and artisans- zoning and art venues, retirees-they bring built in paychecks and lots of paying skiers, and shop on Wednesday
21. No solution as to how to route a state highway to a major ski area and a National Monument through the center of a 6000 person pedestrian "village".
22. Intense development with huge numbers of visitors in NV and Juniper Springs effectively isolates residential neighborhoods in Knolls, Slopes and Majestic Pines.
23. No provision for second Super Market.
24. Doesn't address difficulty of winter pedestrian passage through roundabouts.
24. Complete emphasis on high end visitor. No consideration to traditional California guests that built ski area- Joe six pack and Suzie boarder. Where will ski clubs stay and park their buses?

Letter 046

11-30-05

Brigitte H. Berman
P.O.Box 8754
Mammoth Lakes, Ca.
93546

Comments on the Revised EIR and the General Plan Update:

1. **Building Code:** At one of the first town General Plan Update meetings we placed dots on the preferred building façade for new buildings in town. We voted for the "Village Look". What have we got: ugly plain buildings (Starbuck's building) and affordable housing of bland looking density. *sound v.s. roof*
2. **The MM new development at the Main Lodge** has to be included in the EIR.
3. **MM Ski Area** has to be included in the EIR. How can MM handle double the skiers from today. Is the town even talking to MM management?
4. **Back Country impact of doubling of visitors:** The EIR states "no significant impact since the town has no jurisdiction beyond the town boundaries. Not so! Summer impact with only a small increase in visitors will be very significant. Doubling the summer visitors will be devastating to the back country. The EIR must address the impact by consultation with the Forest Service and National Park management.
5. **Mule Deer migration to Mammoth Pass** is not outside the town boundary, but through Snow Creek, Old Mammoth, Bluffs, Valentine. The EIR has to address that issue -see Power Plant EIR. Mitigation: Open spaces, no gated communities, reduced speed limits.
6. **Seismic activity and volcanism in the Mammoth area** is considered in the EIR as "less than significant" and "no mitigation measures are required". Not so! Hazards from volcanic ashes and especially fire, and a new escape route along Sherwin Road have to be addressed.

EIR Water Notes PC Mtg. 11/30/2005

1. Introduction final draft
 - A. Doug Jung, Colo. Mines, PE (#1151), PG (#2871), MBA USC, retired after 40 yrs in E&P, various oil companies

2. Discussion (MCWD 11/4/2005, Water Assessment, rev)
 - A. MCWD assessment indicates only a “minimal” supply is available, margin of error is too slim, need a “cushion” and/or a risk factor built in
 - C. 5 and 7 yr drought periods have not been considered. These do occur.
 - D. wettest years 78-86 in 63 yr records, followed by driest years 87-94 in 63 yr record, history shows water yrs precip is highly variable
 - E. An unnamed “expert” is cited in the EIR – who is it? Qualifications? Licensed by CA?
 - F. a new “methodology” for calculating S&D, what is it? Assumptions and so on
 - G. what is “CWS” mentioned in the EIR?
 - H. My calculations indicate a shortage in any multiple dry year scenario, well interference and overdrafting in the well field is being observed

3. Recommendations

- A. Develop a "safe water supply" ASAP to provide a 100% excess of supply over demand.**
- B. Do not permit connections that would exceed the "safe water supply" AF number.**
- C. Do not count on additional supply from line repair, waste water, Dry Creek, irrigation cutbacks, or anything other than surface and new groundwater supply that can be developed**

kdj 11/30/2005

Comments regarding General Plan

Please consider plans which promote economic diversity.

Advantages of economic diversity:

- Provide for sustainable income not dependent on tourism
- Increase cultural and economic diversity among community residents
 - Cultural opportunities
 - Education
- Make Mammoth Lakes a better place to live

Examples of economic diversity not dependent on tourism:

- Artistic endeavors
- Software and product design
- Meetings and conventions

These businesses require communication and mobility.

Among the things the Town could provide would be:

- Support for high speed internet connectivity
- To promote dependable air transportation
(This isn't merely a tourism issue.)

Thank you,
Don Sage
Mammoth Lakes resident

Comments Mammoth General Plan

Thank you for this opportunity to address the commission on this important Issue.

You will be happy to know my comments will take 3 minutes 25 seconds including this remark.

My name is George Sandvig and I am a property owner in the Mammoth Creek condominium complex. My unit fronts mammoth Creek and the Sherwin and I have no plans to sell in the next 5 to 7 years.

First I would like to thank the planning commission and city staff for the job you all have done in getting us to where we are today. As a proponent of quality growth in the town of Mammoth I believe our new general plan may serve as a critical yardstick regarding future projects. The recent revision of the general plan gives an encouraging depiction of the best case scenario assuming the spirit of the plan prevails.

The next few years may be the most challenging for the city council and city staff due to the volume of major projects proposed. Again, for this reason, it is so important to finish the general plan prior too many of these project being proposed.

Now for the reason for my appearance here today, I wish to remind the planning commission that the current zoning in Mammoth gives the planning process a lot of flexibility to approve projects that may be inconsistent with the neighborhoods they may enter. An example of this is 5.3 acre parcel at the corner of old mammoth road and minaret.

Mammoth Creek condominiums, which are adjacent to this 5.3-acre lot, have 61 units, with a height limit of 35 feet. I recently learned from city staff the adjacent lot could be approved for 24 units per acre or more. It would also be possible to build a major hotel at this intersection with a restaurant on site. The height limit for a hotel is 55 feet I believe.

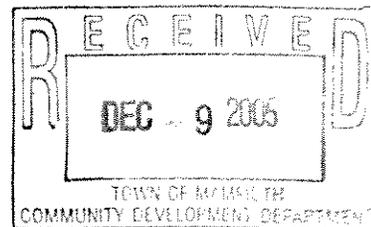
Our new general plan has an entire chapter on environmental sustainability, which I believe is one of the highlights of our revised plan. As you know better than I, this section of the plan talks about "maintaining a balance of fragile ecological cycles", protection of mammoth creek setbacks and vegetation, tree preservation, noise abatement, view shed protection, night visibility, and many other issues that make Mammoth the special place it is today. Imagine a 100 plus unit hotel and restaurant on the corner of old mammoth road and minaret. It may be 55 feet high, and the restaurant would be accessed either on minaret or meadow lane. Clearly this is not the intent of our new revised general plan. In this example, I view this as a commercial project and much higher density injected into a residential neighborhood. I bring up this example because our revised general plan at least in spirit may be in conflict with zoning.

I will confess as an outsider to the process I know very little about the dynamics of the planning process and how a project gets final approval. I do know however, what I see and experience every time I come back up to mammoth. So in conclusion, I would only ask, please continue with the environmental sustainable development, with consideration to the spirit of this general plan in making the town of Mammoth worthy of David McCoys vision. Continue to consider the character and density of neighborhoods prior to

final approval. Again thank you for your time and more importantly your hard work and commitment to keeping Mammoth the special place it is.

Respectfully,
George Sandvig
Mammoth Creek Condominiums, Unit 31

Letter 050



COMMENTS ON THE RDPEIR. THE CULTURAL RESOURCES SECTION MAMMOTH LAKES, CA OCTOBER 2005

Comments from Nancy Peterson Walter, PhD
PO Box 2383
Mammoth Lakes, CA

30 Nov 2005

I am very impressed with the Cultural Resources section, it is certainly better than the first one I read but there are still a few problems. The inclusion of the various state and federal laws is very important. It is also important to refer to cultural resources since it includes all of areas that are covered by law: prehistorical, historical, and paleontological.

Table 2.3 is well done although there are still a few minor details I would like to see incorporated into the document. The comments about little mitigation measures referring to the possibility of below ground resources forgets to include mention that below ground is just that. How can you rule out the possibility of something being below if you have never seen below? Granted the probability is low — but it is still there! The foundations of building around the North Village have made me shudder as I wonder what may have been around the tree roots that were pulled out, much less if there were artifacts there because of land shifts through time. “Little mitigation” is a term with little meaning to me. How do you define “little mitigation”? Is this a phrase that matches “below ground”? Vague phrases often lose cultural resources. Please don't forget that the city of Troy was the seventh city down from the surface and several other cities were below Troy. Very little was on the surface to indicate where to excavate.

On page 2-47: under mitigation measures it still refers only to historical resources when it should say cultural resources.

Throughout the RDPEIR there is constant reference to the Town Archives. As a town, Mammoth Lakes is not very old. There is a great deal of historical data in the vaults of our County seat in Bridgeport. The documents are easy to work with, very accessible. I have used them often for my own research as well as to check things for Ginny Smith.

Throughout Table 2.3 and the section dealing with Cultural Resources (4-) there is mention of the public needing to be educated about Cultural Resources. This is very true but has to be well done or like much of the mines in the Mammoth area it will disappear as people disregard the laws. I have often found throughout the Eastern Sierra that a great deal of “pot hunting” takes place. I have had surgery at Mammoth Hospital with one of the doctors telling me about his latest “find” as he was backpacking as I went under— they told me later I drifted off saying that picking up artifacts was illegal! IT IS ILLEGAL on public lands.

On page 4-337 I would correct the statement to say ALL THE EASTERN SIERRA.

On page 4-338 many of the Paiute that lived in Long Valley were Mono Lake Paiute.

There are still a few spelling errors. Page 4-338 paigi is spelled wrong – the text has paigt. Part of this confusion is that the word does not exist in our language. The linguists say that the i at the end of the word is a barred (i). The mention of piagi Page 4-343 has the same problem. For your purposes, you might just want to leave it piagi.

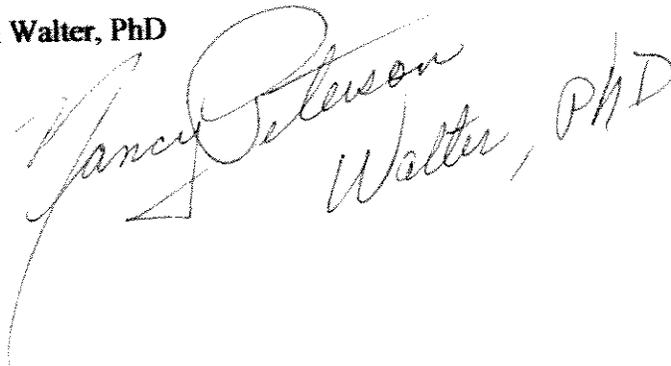
Dr. Catherine Fowler (UNR) and I harvested piagi in Shady Rest Park with several of the Paiute in the early 80s, Harvesting Pandora Moth Larvae with the Owens Valley Paiute, JOURNAL OF CALIFORNIA AND GREAT BASIN ANTHROPOLOGY Vol.7, No. 2, pp155-165 (1985).

There are thousands of recorded archaeological sites that are tied into food collection of piagi. For this see Aboriginal Exploitation of Pandora Moth Larvae in East-Central California, JOURNAL OF CALIFORNIA AND GREAT BASIN ANTHROPOLOGY Vol. 8, No. 2, pp.161-179 (1986). Richard A. Weaver, U.S. Army Corp of Engineers and Mark E. Basgall UC Davis.

There are also misspellings on 4-339 Miwok is spelled Miwot and on 4-342 creek is misspelled creed..

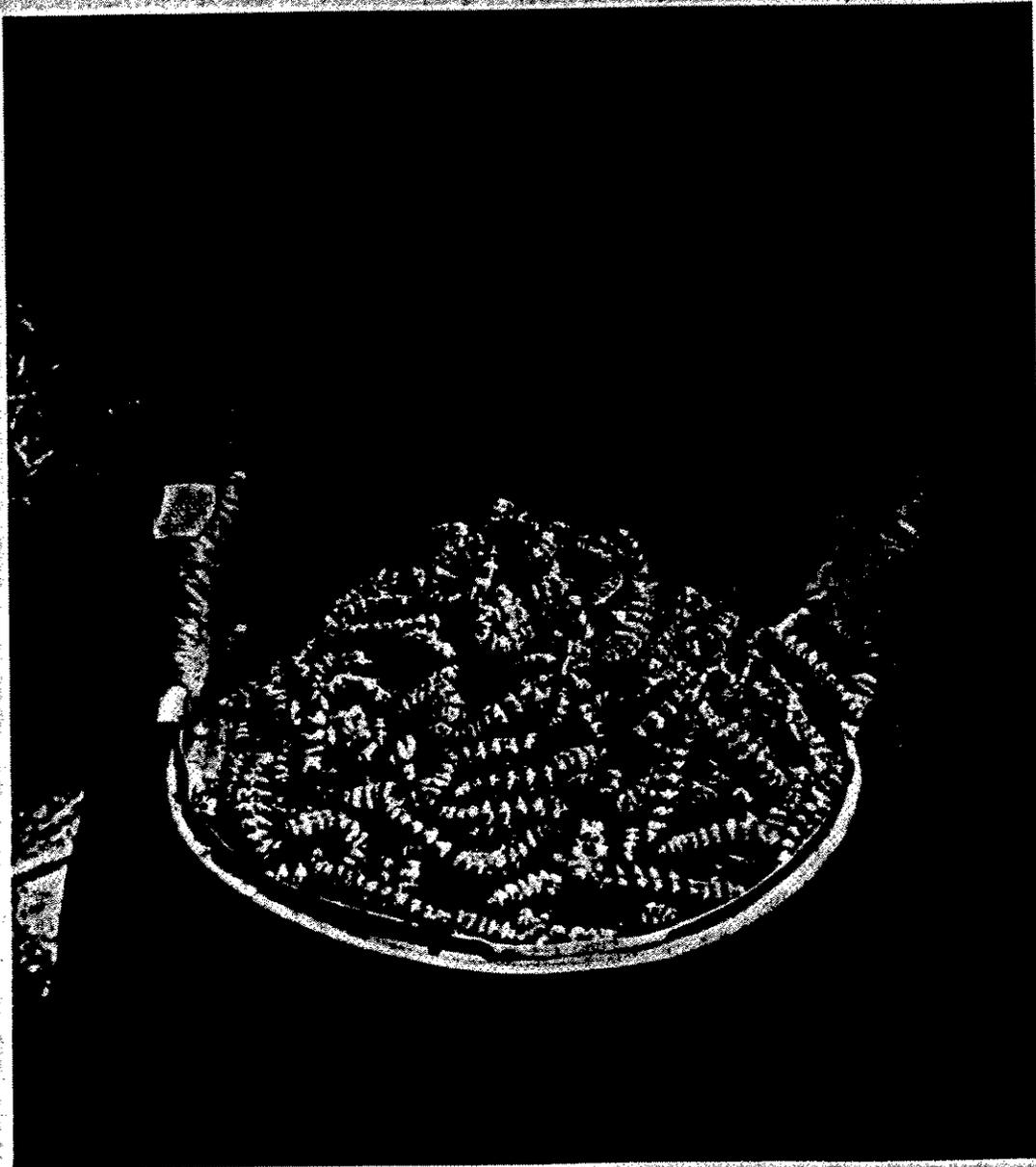
The people who inhabited the Eastern Sierra often chose lovely places to live and camp, just as we do. They put their camps in places like Doe Ridge, Mammoth Creek, Hot Creek, and all the nice places around our community. They liked to camp in the coolness of the trees; taking the obsidian blanks they had gathered and reducing them to projectile points; taking the basketry materials they had collected and preparing it for making their baskets when they moved to warmer areas in the winter. Bluffs were often used as sacred areas. The medicine people went there and today all you see are ceremonial objects if you are trained and know what to look for. Trees that have been uprooted for construction often have artifacts in the upper root sections.. These shamans regularly went to the high areas of the White mountains, Glass mountains, and the passes of the high Sierra as well as the Bishop Tuff area.. Obsidian is everywhere and it was used for many things. The resources of this area are rich with flora and fauna and are often still collected. For over thirty years John and I have taken Paiute and Shoshone elders into the forests to collect traditional foods. A few years ago the Natural History Museum of Los Angeles County needed to replace some Great Basin materials for a display so a Mono Lake Paiute and I took her out and harvested medicinal plants, and some foods – all within a few miles of downtown Mammoth Lakes. Just because you don't see what is here does not mean it was never here until you came.

Nancy Peterson Walter, PhD

A handwritten signature in cursive script that reads "Nancy Peterson Walter, PhD". The signature is written in dark ink and is positioned below the typed name.

Journal of California and Great Basin Anthropology

Vol. 7, No. 2, 1985



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Journal of California and Great Basin Anthropology

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VOL. 7

1985

NO. 2

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Harvesting Pandora Moth Larvae with the Owens Valley Paiute

CATHERINE S. FOWLER
NANCY PETERSON WALTER

THE harvesting of Pandora moth larvae (*Coloradia pandora lindseyi* Barns and Benjamin), or *piagi*, by the Owens Valley Paiute and other native peoples of the Sierra Nevada of California, has attracted varied attention since the turn of the century. Early papers by entomologists, including Aldrich (1912, 1921), Eldredge (1923), Englehardt (1924), Patterson (1929), and Essig (1934), described the basic process, but were based more on hearsay than on direct observation. They thus created some fanciful impressions. Later ethnographic descriptions, such as those by Steward (1933) and Davis (1965), helped sort fact from fancy, although not completely, as they too were based on second-hand information rather than direct observation.

In June, 1981, we observed elderly Paiute from Bishop, California, harvesting and processing Pandora moth larvae. At that time, cost/benefit checks were made on both collection and processing, to which basic nutritional data were added. That season the larvae were collected by hand rather than by the tree-base trenching method that is well attested in the archaeological and ethnographic records. In June, 1982, we planned some additional experiments with the trenching method of collection, in order to compare the basic efficiency of the two techniques. Although

unable to complete the experiments because of a population collapse among the larvae, we were able to extrapolate some data from other sources toward these comparisons. This paper focuses on these results, after first describing and illustrating the basic harvesting techniques.

LIFE CYCLE OF *COLORADIA PANDORA* *LINDSEYI* (Barns and Benjamin)

The life cycle of the Pandora moth is of specific interest as it sets both the dates and years of harvesting. Basically, it is a two-year cycle, thus making caterpillars available for harvest in large numbers only every other year. It is also a relatively brief harvest period, lasting from 12 to 25 days in late June and early July. In addition, there is also a peaking and collapse of Pandora moth infestations, reported by entomologists as occurring on roughly a 20-to-30-year cycle (Patterson 1929).

The actual life cycle begins with the emergence of adult moths from their pupal cases in early July of the first year. During their short life span (ca. one month), the moths lay a cluster of subspherical eggs in rough, sheltered places in the bark or on the needles of Jeffrey pine (*Pinus jeffreyi*) trees, their principal food plant. On hatching, roughly 30 to 40 days later, the larvae ascend the trees and begin feeding on the needles. This continues for the remainder of the summer. By fall the larvae are in the tops of the trees where they overwinter in clusters of

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Fig. 1. Larvae of *Coloradia pandora* on the forest floor, Inyo National Forest, California, 1981.

four to thirty individuals. With the cessation of winter conditions about the first of April, the caterpillars disperse and resume feeding. During the spring, they consume enormous quantities of needles (an average of 21 needles per day per caterpillar [Patterson 1929:15]), and they reach their full size of about 6 to 7 cm. in length. It is during this period in particularly heavy hatch years that defoliation of the trees is most apparent. The high food intake of the *piagi* creates masses of droppings at the base of the trees, a sign used by the Paiute to gauge the caterpillar production of any one tree or area. In heavy caterpillar years, according to entomologist Englehardt (1924:35), "the constant dropping of excrement [makes] a noise like a sleet storm."

In roughly the last week of June or no later than the first week of July, the caterpil-

lars descend the trees in great numbers to pupate in the ground (Fig. 1). It is during this short period of roughly two weeks that harvesting and processing take place. Although the Klamath, Modoc, and Western Mono are reported to have harvested the pupae by sifting the soil and duff at the base of trees (Miller and Hutchinson 1928), the people of Owens Valley and Mono Lake seem to have only occasionally used this method. Once the caterpillars enter the ground to pupate, they remain there through the winter to emerge the following July as adults (Patterson 1929).

Based on this largely biennial life cycle, people could count on a good harvest of Pandora caterpillars only every other year. In the off years, a few stragglers or a small hatch might occur in selected areas. However, few



Fig. 2. Circular trench around Jeffrey pine tree, dug to contain larvae as they descend tree to pupate in the ground. Last used in 1979. Photo taken in 1982.

individuals apparently considered these harvests worthwhile, and the caterpillars were generally ignored. The focus of attention was the peak production period, from the end of June through early July. Then the people of Owens Valley and Mono Lake removed themselves in family groups to the harvesting areas in the Jeffrey pine forests between the headwaters of the Owens River and Mono Lake.¹

HARVESTING AND PROCESSING, 1981

Caterpillars are ordinarily collected in trenches (*odtabi*) dug around the bases of trees selected for their accumulations of caterpillar frass (Fig. 2). According to the elders, old trenches were cleaned and new ones dug when the people first arrived at the harvesting grounds. Old trenches take a person roughly ten minutes to clean, "if you get

right at it." The trenches were approximately one-third meter deep and roughly one-third to one-half meter from the tree, and totally encircled it. Cleaning takes the trenches to the level of the old soil or just below. All litter such as pine needles and twigs, as well as other debris, was removed. The elders noted that trenches had either vertical or back-cut walls to prevent the caterpillars from climbing out.

New trenches were made in the same manner, being excavated roughly one-third to one-half meter from the base of the tree, and roughly one-third meter wide and one-third meter deep. In former times, a wooden digging stick (*woobi*) was used for excavating the trenches. New trenches were placed around trees that showed an accumulation of caterpillar frass or other obvious caterpillar



Fig. 3. Mrs. Minnie Williams collecting larvae from the ground with a stick and bucket, 1981.

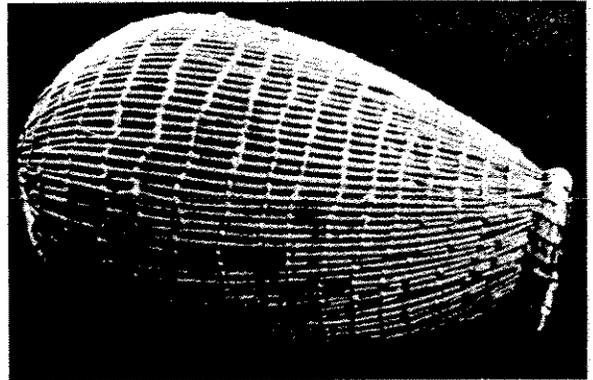


Fig. 4. Open, plain-twined basket used to collect and store *piagi*. Collected by J. W. H. Hudson, Long Valley, California, 1904. Field Museum of Natural History, No. 59029. 40 cm. in length.



Fig. 5. Caterpillars being mixed with hot sand in circular roasting pit, 1981.

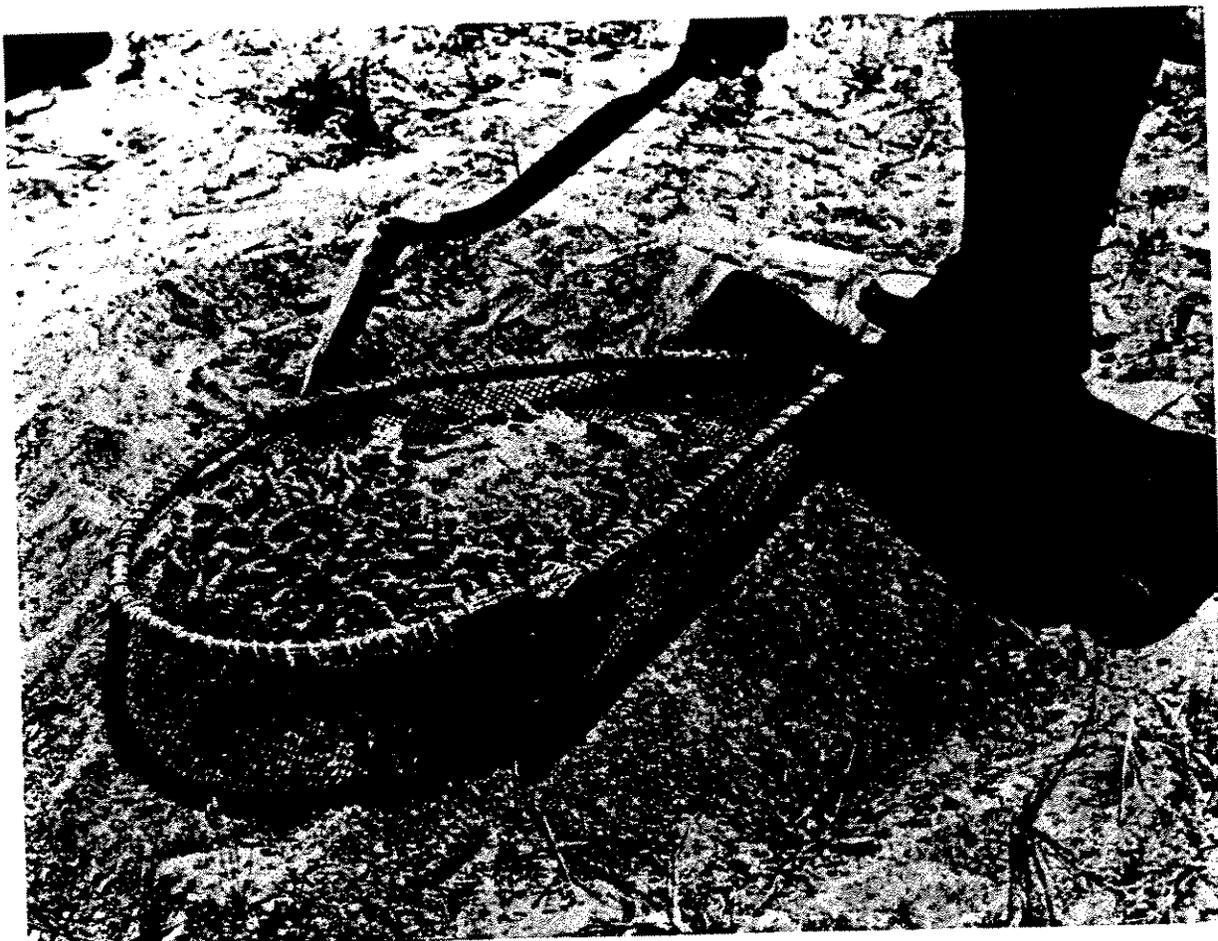


Fig. 6. Removing caterpillars from roasting pit to fan-shaped hardware-cloth sifter, 1981. In former times, an open, plain-twined winnowing basket was used.

activity. The only social restriction placed on excavation of new trenches was that they must be located in one's own family area. Trenches were private property, usually inherited through the female line.

None of the Owens Valley elders felt that building fires around the bases of trees, as reported by entomologist Aldrich (1912) as well as by Steward (1933: 256) and by Davis (1965), to smoke the caterpillars would necessarily bring them down faster. "They come down on their own," the elders said, and indeed in June, 1981, they were observed descending the trees in large numbers.

Trenches were cleaned of caterpillars

twice daily and processing took place coincidentally. During the 1981 harvest, caterpillars were merely gathered from the ground at a rate of roughly 100 per 30 minutes (Fig. 3). In the past, the caterpillars were kept in the shade in open-twined globular baskets (Fig. 4) or in a "large pit" (Warren 1963) while awaiting processing. Today, plastic buckets serve as well, as the caterpillars are prevented from climbing out by the slick sides.

Processing begins in a sandy area with the construction of a roasting pit about one meter in diameter. In the past, larger pits may have been used depending on the catch. A conical mound of sand is first made and then hol-



Fig. 7. Sorting washed, roasted caterpillars in preparation for boiling, 1981.

lowed in the center. A fire is built to heat the surrounding sand. The coals are removed and the live caterpillars are then placed in the hollowed center of the pit (Fig. 5). They are mixed with the hot sand at the bottom of the pit, covered, and left to roast for 30 minutes to one hour, depending on what additional processing is planned.

After roasting, the caterpillars are removed from the pit and sifted to remove the sand. An open-twined parching basket (*paco*) was formerly used, now replaced by the ingenious device of willow, reinforcing rod, and hardware cloth shown in Figure 6. The roasted caterpillars are then washed and sorted. Any "flat" (possibly diseased), overcooked, or discolored caterpillars are discarded in favor of nice, plump, yellow ones (Fig. 7). *Piagi* to be eaten immediately are

boiled for roughly one hour in either salted or unsalted water, depending on individual taste. Boiled caterpillars are taken from the water and their heads removed. The results are enjoyed by all (Fig. 8). Caterpillars are eaten plain or made into a stew with other meat and/or vegetable products. The skins of the caterpillars are rather tough and they retain their shape when cooked.

Caterpillars to be dried for storage are placed in the shade for two or three days to two weeks. In former times, pole-and-bark drying sheds were used, at least in some areas. According to the elders, if the caterpillars are sun-dried they will rapidly become rancid. In the opinion of one individual, caterpillars boiled in salted water also would taste "old" by next spring. Dried caterpillars were stored in a "cool place," sometimes being cached at



Fig. 8. Plate of boiled caterpillars, ready to eat, 1981.

the harvesting grounds in the pole-and-bark sheds or in pits. They kept well through the winter, and with care into the spring and early summer.

NUTRITIONAL DATA

It was reported by Aldrich (1921: 36-37) that Chief Jake Garrison of Mono Lake put

up one and one-half tons of *piagi* during the summer of 1920. Given the nutritional data (Table 1), such a quantity would result in a considerable amount of fat, protein, and carbohydrates.

The protein content of *paigi* (11.78%) is from twice to three times that reported for most Owens Valley plant foods; e.g., *Balsamorhiza*, *Calochortus*, *Perideridia*, *Wyethia* spp. (Yanovsky and Kingsbury 1938). However, the fat content (10.94%) is roughly one-half, and the carbohydrates (4.33%) less than one tenth that of pinyon nuts (*Pinus monophylla*) (Farris 1982: 119). But rough estimates of calories/hour returned for collecting and processing caterpillars are nearly twice those of pinyon nuts and considerably above those for most plant foods studied by Simms (1984: 86).

EFFICIENCY OF HARVESTING TECHNIQUES

Given the short harvesting period, processing Pandora caterpillars was probably well worth the effort. But, just what was that effort and how efficient and effective were the techniques developed by the people to lessen its impacts? We had hoped to answer this question with substantive field studies in the 1982 season, focusing on the comparative value of collecting caterpillars in trenches vs. gathering them individually as we did in 1981. We reasoned that trenching must offer some advantage, but what was the advantage and how could it be measured? Unfortunately, the 1982 season proved to be an unusually poor year for a mid-cycle caterpillar hatch. We had hoped for some good isolated local hatches upon which to base our harvesting comparisons. However, very little evidence of caterpillars was found, and subsequent years from 1982 to the present (1985) have shown that a predicted population collapse, the down side of the roughly 20-to-30-year peaking cycle, is in effect.

Lacking the possibility of deriving data experimentally, we turned to verbal and written accounts of harvesting totals for some comparative figures. From one of the Owens Valley elders, who had collected caterpillars by the trench method in 1979, we learned that by working five or six trees at the normal rate of two times a day over a weekend, he had gathered roughly 25 pounds of caterpillars. Assuming that the 25 pounds represented live weight, and given that this individual prefers to process his caterpillars in the fine sand of his backyard in Bishop, mathematical extrapolation indicates he removed roughly 100 caterpillars from each trench at each collection time. This is the same individual who stated that it took roughly ten minutes to clean each of the old trenches when he arrived at the site (about one hour of work total).

In 1963, Dick Warren of the U. S. Forest Service observed three members of a family gathering *piagi* two miles northeast of Bald Mountain. The family was working 18 Jeffrey pines, collecting the caterpillars twice daily.

Table 1
NUTRITIONAL ANALYSIS^a
COLORADIA PANDORA LINDSEYI

Moisture	71.82%
Total Protein	11.78%
Fat (Ether extract)	10.94%
Ash	1.13%
Carbohydrates	4.33%
Calories/100 g.	163.
Calories/oz.	46.
Calories/Hour worked	1,840-2,753 ^b

^aNutritional data are based on 100-g. sample, roasted, washed, boiled with non-iodized salt, MICHELSON LABORATORIES, Los Angeles.

^bThese figures are based on estimated 10-hour day (4 to 6 hrs. collecting and 4 hrs. processing) and yields extrapolate from reports given in this paper (hand-collecting trial, 198 2,753 cal./hr.; two reports of trenching yielding 25 lbs./4 days for 1,840 cal./hr. and 250 lbs./wk. for 2,628 cal./hr. All are probably low).

Warren (1963) stated that "some trees produced over one hundred larvae" on the collections in which he participated. This is the approximate figure calculated for the Owens Valley collector. If that yield continued for roughly one week, the family would have collected over 250 pounds cooked or 100 pounds dry weight in caterpillars.

In addition, as previously noted, we also had the account published by Aldrich (1921) based on data from another forester, Guy Way, that Jake Garrison and his group collected and cured one and one-half tons of caterpillars in the 1920 season. This seems like a very high figure given the yields suggested in the two previous accounts. However, from an account given by Way and quoted by Miller and Hutchinson (1928), we learned that Mr. Garrison's camp was a large one, that he assigned certain families areas in which to harvest, and that the women not only cleaned the trenches of caterpillars but also picked them off tree trunks, while back in camp processing "was in full swing" (Miller and Hutchinson 1928: 160).² Given that the harvest could have lasted a maximum of three weeks, Mr. Garrison's groups would have to have worked 50 trees to have obtained the weight in cooked caterpillars and more than twice that to have obtained the dry weight. However, if this were a multi-family operation, that weight could quite easily have been obtained by five to seven families working 20 trees each.

But, could comparable yields be achieved by merely harvesting caterpillars from the ground and from tree trunks as was done in the 1981 season? Without doubt they could, at least up to a point. One person collecting caterpillars for the roughly four to six hours per day that the caterpillars are active could collect about 1,000 per day – the minimum yield of five trenched trees. Three harvesters could come close to the yield of the family observed by Warren (1963).

What, then, are the advantages of trenching and why did this method develop? The most obvious advantage of this method of collection is that it leaves most of the camp members free to process caterpillars and/or collect additional *piagi* by hand. The overall harvest period is at maximum three weeks long, and time is thus important. Processing (twice daily) takes a total of roughly four hours. The site must be cleaned and cleared, wood collected, the fire tended, the caterpillars sifted and stored, spread to dry, and so forth. The work is not particularly energy consuming but it is time consuming. It is doubtful that much could be done to reduce processing time without altering the social pattern of family-based collecting.

Caterpillars are ordinarily processed in small batches by family members. Increasing the batch size would require additional personnel – not an obvious saving. The produce of a small number of trees, collected twice each day may be about what a fairly small, family-based unit can handle at a regular pace. But, savings can be made in collecting time by taking proper advantage of the caterpillar's habits. *Piagi* descend the trees to pupate, they *will* collect in the trenches and, if the trenches are properly constructed, they *will* remain there. The human collectors are thus free to augment the catch with individuals picked up from the ground or to help with processing. The trenches, in effect, serve as additional collecting personnel.³

The other advantage of the trenching method of collection is more subtle, but perhaps no less important. Paiute linguistics provides the clue. Caterpillar trenches are called *odiabi*, from the stem *tia-*, "to cache." Caterpillars are a fragile commodity. Once collected, they must be kept from the heat and spared overcrowding or they will die. Dead caterpillars are not worth processing. Caterpillars in trenches are in the shade of the trees. Given that the trenches are circular, the

82%
78%
94%
13%
33%

753^b

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caterpillars will keep moving around the tree searching for an exit. They will also attempt to pupate immediately in the forest soil unless prevented from doing so. The cleaned side-walls and bottom of the trench prevent this. Trenches are thus also functioning as "caches" of living resources awaiting processing.

ANTIQUITY OF *PIAGI* EXPLOITATION

Little is known of the antiquity of collecting *piagi* by the Owens Valley and Mono Lake Paiute. Even less is known of the antiquity of collecting them by trenching trees. According to Forest Service survey data, there are over 4,000 trenches in the Inyo Jeffrey pine forests (Richard Weaver, personal communication 1985; Weaver and Basgall MS). Older sites visited in 1982 are known to date to before the turn of the century. However, trenches rather quickly fill with forest litter and become all but invisible after roughly 60 to 100 years.

The term *piagi* is also of interest, as it appears to be an old form in the northern Uto-Aztec languages for some type of larvae. It has cognates in the Numic languages, in Cahuilla (*piyaxat*, "worm with two horns" [Seiler and Hioki 1979]), in Tubatulabal (*pi?agin-t*, "grub worm" [Voegelin 1958]), and in Hopi (*pi?aki*, "corn worm" [Voegelin 1957]). It is tempting to suggest that the original referent for these cognates was *Coloradia pandora lindseyi*, and thus that *piagi* have been harvested for many centuries. But, it is equally likely that the referent was the white-lined sphinx moth larvae (*Hyles lineata*; see also Fenenga and Fisher 1978 for this identification of the Cahuilla referent). These larvae were much more widespread and also commonly collected by most northern Uto-Aztec groups.

Although few conclusions can be reached as to the antiquity of the use of *piagi* and the techniques presently employed to take and

process them, we have been able to offer better documentation of practices through contemporary observation. Perhaps additional work with the elders of Owens Valley, in addition to archaeological investigations (e.g., Weaver and Basgall n.d.), will provide more definitive conclusions in the future.

NOTES

1. Archaeologically, trenches are also known from south of Lookout Mountain, northeast of Mammoth Lakes, California (Richard Weaver, personal communication 1985). But contemporary gathering takes place considerably north of this locality.

2. Way's two accounts (Way 1920; Miller and Hutchinson 1928) are slightly at variance. In one (Way 1920), he stated that men collected the caterpillars from the trenches and women transported them to the processing site. After all were transported, processing took place. But Way was also quoted by Miller and Hutchinson (1928: 159-160) as saying that the women did most of the collecting, carrying burden baskets filled with larvae to camp where processing "was in full swing."

3. Although we lack data on time required to clean caterpillars from trenches, we suggest that it is roughly half to one-quarter that required to pick up caterpillars by hand from the ground and/or off trees.

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Aboriginal Exploitation of Pandora Moth Larvae in East-Central California

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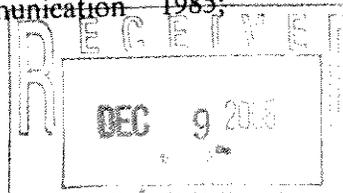
INSECTS were food resources throughout most of aboriginal California and the Great Basin (Kroeber 1925; Essig 1934; Barrett 1936; Steward 1938), but they seldom attract much attention from anthropologists and their role in these economies is generally assumed to have been secondary or ephemeral in character. It is virtually certain that insects never ranked with such staples as artiodactyls, acorns, or pine nuts; however, in certain contexts they may have contributed significantly to the native diet. Before relegating such resources to some ancillary status, it is necessary to evaluate fully the nature of the overall economy and its various situational constraints. This paper examines one insect, the Pandora moth (*Coloradia pandora lindseyi* Barnes and Benjamin), and its role in the native subsistence systems of east-central California.

Exploitation of Pandora moth larvae by the Mono Lake and Owens Valley Paiute has been the focus of varied attention in the literature for over seven decades. By and large, however, these accounts were not based on firsthand observation, and thus there has developed a corpus of misleading, often conflicting, information. The first part of this paper presents a critical evaluation of these discrepancies using both published and unpublished ethnographic, entomological, and archaeological data. Subsequent sections assess the importance of this resource relative to both short- and long-term regional subsistence strategies.

BACKGROUND

First identified in 1863 from a single specimen collected in Colorado (Chamberlin 1922:69), a number of distinct subspecies of the Pandora moth are now known to be distributed throughout montane regions of the western United States (Carolin and Knopf 1968:1; Carolin 1971). The subspecies *lindseyi* is endemic to the West Coast, with a range extending from the Cascade Range of Oregon south into Mexico (Barnes and Benjamin 1926; Ferguson 1971:92-94). Within the study area (Fig. 1), the principal host tree is Jeffrey pine (*Pinus jeffreyi*), although in mixed stands lodgepole pine (*P. murrayana*) may also be attacked (Keen 1928, 1952:83; Carolin and Knopf 1968:1, 7).¹

The life cycle of the Pandora moth generally lasts two years, with major infestations occurring roughly every 20-30 years. These intensive episodes usually span a period of 4-8 years (2-4 generations) before yielding to natural control factors (Keen 1952:83; Carolin and Knopf 1968:1, 7). Although some early entomological literature suggests that tree mortality occurs as a direct result of defoliation during major infestations (e.g., Patterson 1929; Wygat 1941), more recent evidence indicates that such occurrences are atypical and rare. Deaths, if any, are normally attributable to secondary attacks by other pests (B. Roettinger, personal communication 1980; M. Wagner, personal communication 1985;



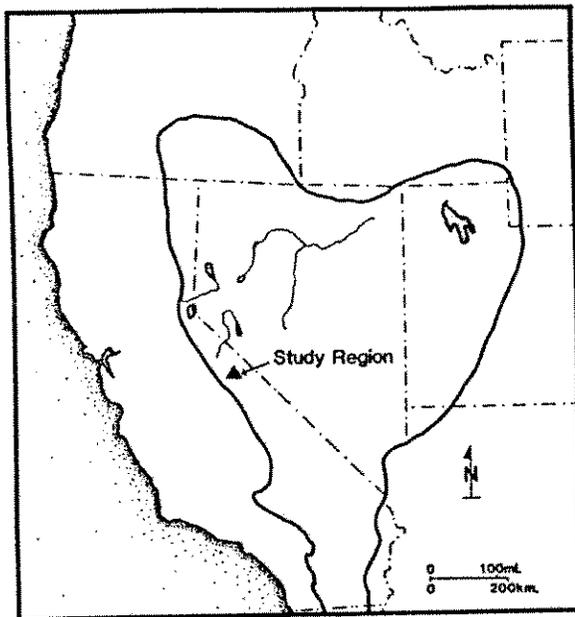


Fig. 1. Location of the study region within the Great Basin.

Wagner and Mathiasen n.d.).

The "normal" life cycle of the Pandora moth begins with emergence of adults from their pupal cases in July, mating taking place shortly thereafter. The egg clusters, which are deposited on the bark or needles of host trees, undergrowth, or ground litter, hatch in about 40 days. Upon emergence, the caterpillars ascend the trees and feed on the needles (except for the terminal buds) until the onset of winter. They hibernate in the needle clusters, and with the beginning of spring conditions resume feeding until the last week in June or first week in July. At this time they descend from the trees to pupate in the loose, volcanically derived soils (Aldrich 1912, 1921; Carolin and Knopf 1968: 4-5; Miller and Wagner 1984; B. Roettgering, personal communication 1980). It is during this brief period that the larvae, referred to



Fig. 2. Photograph of *piagi* collection trench near Indiana Summit, Mono County, California.



Fig. 3. Photograph of *piagi* collection trench near Indiana Summit, Mono County, California, during its use in 1963. (Courtesy R. Warren).

as *piagi*, were harvested by both the Mono Lake and Owens Valley Paiute (Aldrich 1912; Way 1920a, 1920b).²

To facilitate subsequent discussion, the following is a summary of the collection process based strictly on firsthand observations made between 1920 and 1982 (Way 1920a, 1920b; Miller and Hutchinson 1928; R. Warren 1963, personal communication 1985; Walter and Fowler 1982; Fowler and Walter 1985). The observations recorded by Guy Way (Way 1920a, 1920b) are the earliest known first-hand narratives of the process

and constitute an invaluable source of comparative information.

When the larvae descended from the host trees, groups of harvesters would excavate trenches [see Figs. 2 and 3] around the bases of a number of pines or, alternatively, clean out a number of previously constructed trenches. The descending caterpillars, after becoming trapped in these depressions, were collected in baskets, mixed with heated soil, and left to cook for 30 minutes to an hour. Afterward, the processed larvae were separated from the soil by winnowing and laid out to air dry

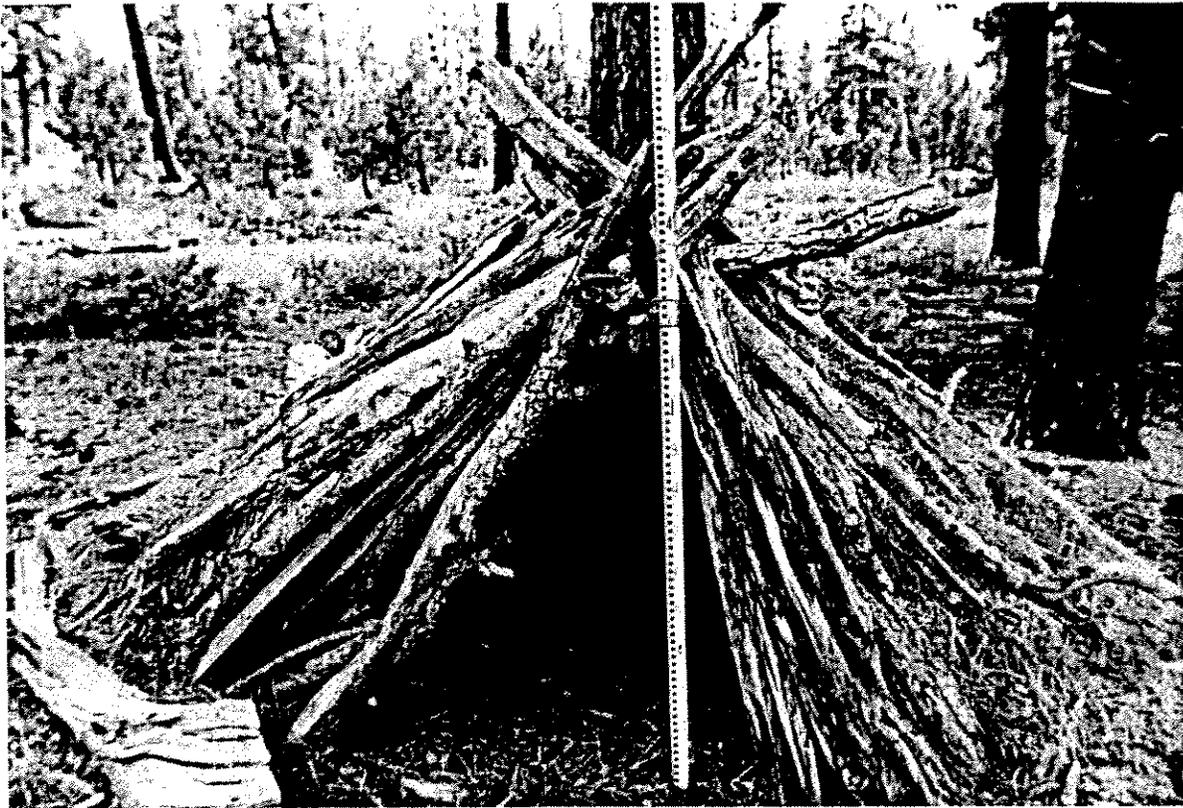


Fig. 4. *Piagi* storage structure at CA-MNO-799 near Indiana Summit, Mono County, California.

in the shade for a period of at least two days. In former times, the *piagi* were subsequently stored in nearby bark-covered, wood-framed shelters [see Figs. 4 and 5] for future use.

Discrepancies between these first-hand accounts and more widely circulated descriptions (Aldrich 1912; Keen 1928; Essig 1931, 1934:185; Steward 1933:256; Carolin and Knopf 1968:7) are addressed individually as appropriate.

NATURE OF THE RECORD

The foregoing description suggests that three kinds of archaeological manifestations might be expected to result from the process of *piagi* exploitation: collection trenches, used to entrap or amass descending caterpil-

lars; hearths or cooking areas, used to prepare the larvae for storage; and, at some locations, structures within which the dried insects were stored. Other associated features or artifacts probably would be scarce since procurement localities were used sporadically, they were occupied for only a short duration, and any attendant activities would have offered little opportunity or reason for the accumulation of debris.

Over 60 percent of the Jeffrey pine and mixed Jeffrey-lodgepole pine forested areas in the Long Valley-Mono Basin region had been subjected to intensive archaeological surveys as of January 1985 (Fig. 6). These efforts have documented 28 separate *piagi* collection localities containing nearly 4,000 recognizable trenches and seven storage



Fig. 5. Ceiling detail of *piagi* storage structure shown in Figure 4.

structures (Fig. 7, Table 1).³ Two sites, CA-MNO-799 (Basgall 1984) and CA-MNO-1982 (Mone 1986), were intensively examined and provide the basis for much of the following discussion.

Collection Trenches

Although impressive, the number of reported trenches almost certainly is an under-representation of the actual figure because of differential identification and the vagaries of preservation. First of all, the figures were extracted from existing site survey records, most of which indicate the number of rings at a given site in relative terms (e.g., in excess of "x" trenches). Additionally, the ephemeral nature of collection trenches leaves them prone to obliteration

through such processes as post-construction tree growth, erosion and collapse, and infilling by soil and duff.

Descriptions provided by Way (1920a, 1920b), Miller and Hutchinson (1928), R. Warren (1963, personal communication 1985), Walter and Fowler (1982), and Fowler and Walter (1985) show general agreement in the fact that trenches were typically from 10-16 in. (ca. 25-41 cm.) deep and approximately 24 in. (ca. 61 cm.) wide. Archaeological data from CA-MNO-799 (Basgall 1984: Figs. 4-7) and CA-MNO-1982 (Mone 1986: Table 2) are in accordance with these ethnographic dimensions, slight discrepancies being attributable to either methodological variation (in the measurement process) or increased disturbance to the older features.

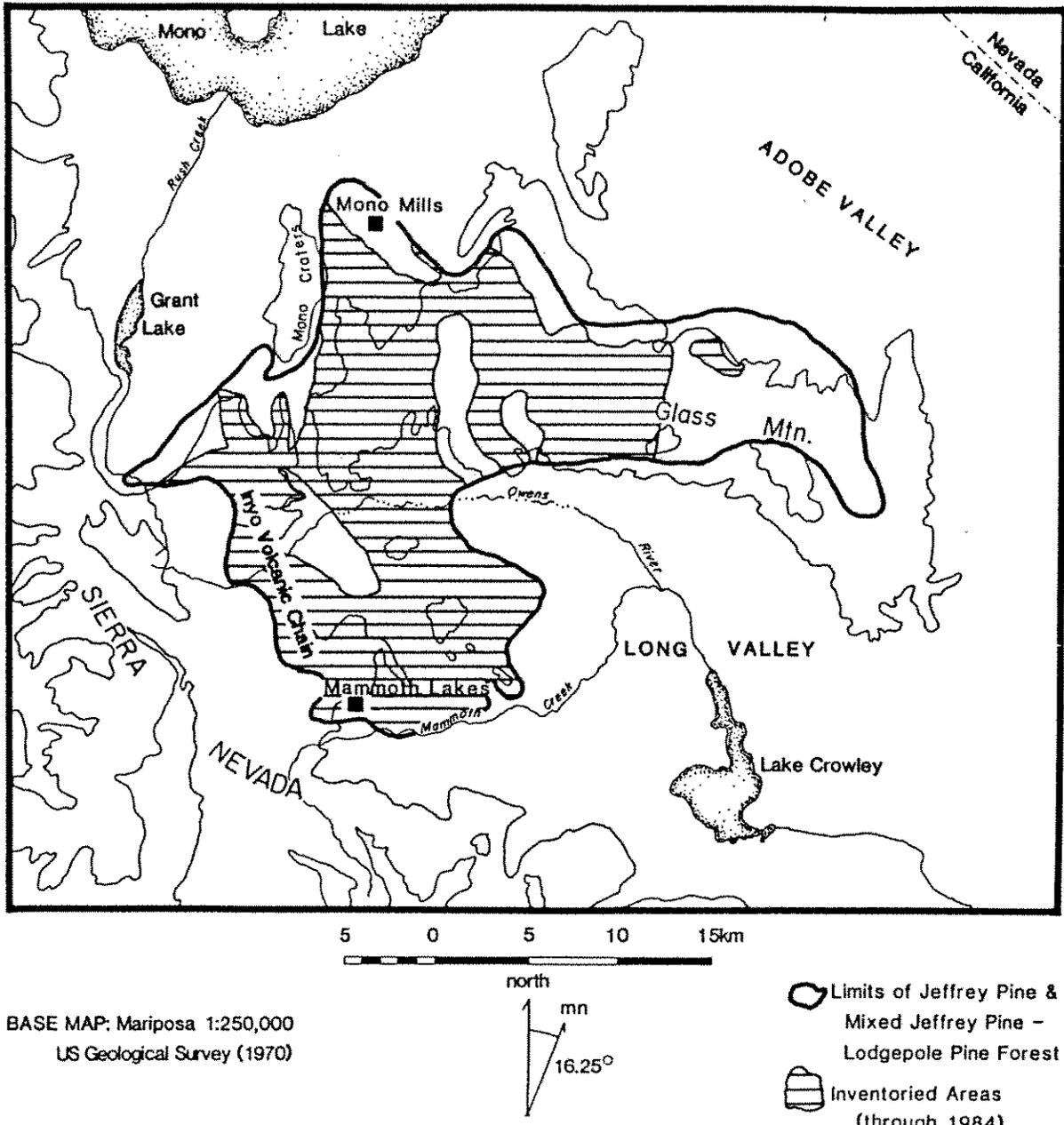


Fig. 6. Map showing the surveyed portion of the Jeffrey pine and mixed Jeffrey-Lodgepole pine forested areas of the Long Valley-Mono Basin region.

It is unlikely that such variability is culturally or technologically meaningful.

Differing descriptions of outer trench wall configuration probably relate to the same problem. Whereas Way (Miller and

Hutchinson 1928:159) noted that these were excavated with sidewalls as nearly vertical as possible, Davis (1965:32) indicated that the "trench walls" were undercut. Since other accounts attest to the fact that inner

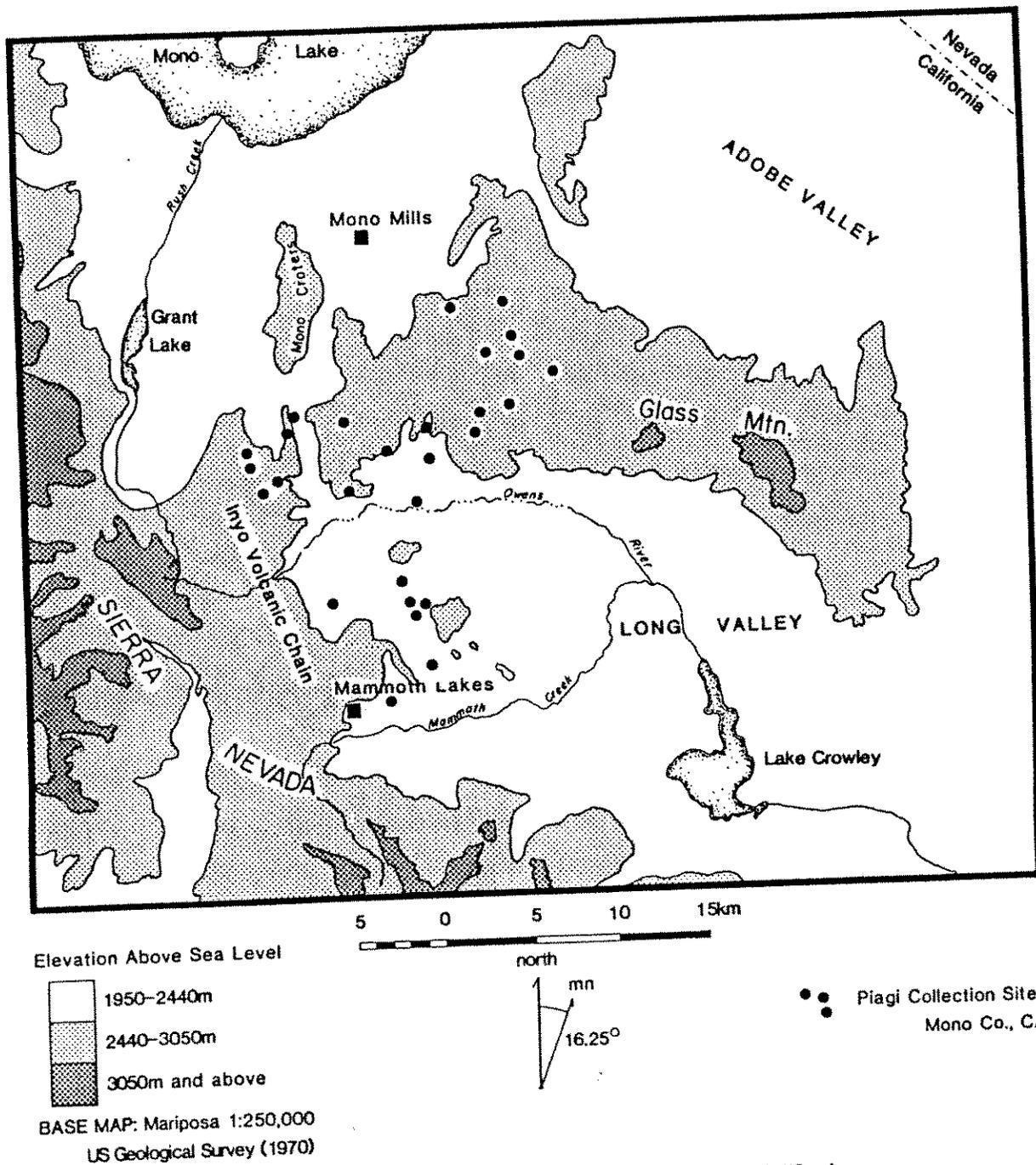


Fig. 7. Distribution of known *piagi* collection sites, Mono County, California.

walls sloped downward from the base of the trees (e.g., R. Warren, personal communication 1985; Fig. 3), it is assumed that Davis

was referring to the outer walls. Although it is unclear from Davis' description whether she actually observed this, other details in

Table 1
 ATTRIBUTES OF KNOWN *PLAGI* COLLECTION LOCALITIES, MONO COUNTY, CALIFORNIA
 (Based on Existing Site Records)

Site Number	Number of Trenches	Storage Structures	Other Associations
CA-MNO-462		2	
CA-MNO-466	114 +		1 obsidian flake
CA-MNO-544	600 +		obsidian flakes
CA-MNO-664	27		26 obsidian flakes
CA-MNO-763	55 +		
CA-MNO-764	318 +		
CA-MNO-780	60 +		
CA-MNO-781	3		
CA-MNO-782	1		rock shelter
CA-MNO-799	1,400 +	3	obsidian flakes, hearth feature
CA-MNO-832	13		obsidian flakes
CA-MNO-859	111 +		obsidian flakes
CA-MNO-862	35 +		obsidian flakes
CA-MNO-864	20 +		1 obsidian flake
CA-MNO-865	8		
CA-MNO-868	40 +		6 obsidian flakes
CA-MNO-1703	41		
CA-MNO-1704	60 +		
CA-MNO-1707	50 +		
CA-MNO-1708	250 +		
CA-MNO-1711	222 +		16 obsidian flakes
CA-MNO-1982	55 +		obsidian flakes
CA-MNO-2031	250	1	16 obsidian flakes, 1 metate
CA-MNO-2035	30	1	1 obsidian flake, historic debris
CA-MNO-2036	100		2 obsidian flakes
CA-MNO-2064	64		obsidian flakes
CA-MNO-2065	42 +		obsidian flakes
CA-MNO-2139	8		obsidian flakes
Totals			
28 sites	3,977 +	7	

her report suggest that her information was from a secondary source. Nonetheless, excavation profiles from a number of trenches at CA-MNO-799--the same locality discussed by Davis (1965)--show some tendency for the peripheral trench wall to be undercut (Basgall 1984:Fig. 4). Thus, it seems likely that these differences relate to both individual preference and the relative stability of soils at a given locale.

Roasting Hearths

The representation of roasting hearths at archaeological localities is limited, probably as a result of uneven recording and poor preservation conditions. Only one somewhat problematic feature of this sort, located at CA-MNO-799 (Basgall 1984), has been reported to date. This feature was approximately 4 m. (13 ft.) by 6 m. (19.7 ft.) in

extent and contained varying quantities of charcoal and ash, interspersed by various kinds of historic trash (e.g., cans and broken glass). Charcoal concentrations were densest toward the center of the feature; peripheral areas contained only scattered carbon and wisps of ash (Basgall 1984:25-28). Because no direct evidence of *piagi* processing (e.g., burnt larvae) was found in the burned area, its relationship to such activities can be inferred only through its loose association with nearby collection trenches and a storage structure. The feature configuration, however, is consistent with ethnographic data, which imply that roasting hearths would leave little more than a slight depression and charcoal-laden soil. Both attributes would likely disappear given the highly acidic and disturbed soils characteristic of the region (Weaver and Hall 1984:6-20). Duff accumulation and forest fires subsequent to aboriginal use would further obscure surface manifestations of hearth features.

Storage Structures

Differential identification and preservation do not, however, appear to offer a reasonable explanation for the distribution of known storage structures. Only seven intact or collapsed structures have been located to date, all in territory traditionally attributed to the Mono Lake Paiute. Given that survey coverage and historic (Euro-American) land-use patterns have been comparable north and south of Glass Mountain Ridge, there is some reason to believe that the spatial profile reflects differences in the storage practices of Mono Lake and Owens Valley groups. Such a pattern is not wholly unexpected in light of the differential distances between collection localities and core settlement areas of the respective populations. Further, there may be significant differences in how *piagi* articulated in the subsistence systems

of the Mono Lake and Owens Valley Paiute. These issues are explored more fully below.

Unlike house structures reported from east-central California (Bettinger 1975; Ritter 1980), *piagi* storage facilities are significantly smaller and neither conical nor free-standing in form. Although it has been suggested in some accounts (e.g., Essig 1931) that these structures served as drying (rather than storage) facilities, their small size would offer little area for spreading out larvae and first-hand testimony clearly rejects such a function. There is some formal variability between the known examples, but the structure recorded at CA-MNO-799 by Basgall (1984:28) provides a representative case.

Set against a medium-sized, still-living Jeffrey pine, the structure was framed using logs and branches, with bark slabs serving as the outer cover. A large central beam was butted against the base of the tree and supported on the opposite end with an A-frame. The support consisted of two branches fastened together with baling wire. Additional branches were then placed on the basic superstructure giving the feature an ovate outline. The final construction phase entailed placement of bark slabs over the primary and secondary framing, forming a relatively weatherproof storage facility (Figs. 4 and 5).

The structure at CA-MNO-799 measures approximately 2 m. (6.6 ft.) in length, and roughly 1.2 m. (3.9 ft.) in width. The door height is 1.1 m. (3.6 ft.) and the maximum height of the structure is about 1.7 m. (5.6 ft.). Both the use of historic materials and the calculated ages of nearby collection trenches (Mone 1986) argue that this feature, and probably the six other known structures as well, is less than 100 years old.

The great number of *piagi* collection localities would seem to suggest that exploi-

tation of the larvae was--consistent with indications from historic documents--an established component of regional subsistence strategies during the protohistoric and historic periods. Prior to assessing the importance of the resource system or its possible antiquity, however, an additional issue relative to harvesting practices--the use of smudge fires--is considered.

Smudge Fires

Perhaps the most widely held misconception regarding aboriginal *piagi* procurement involves the use of smudge fires. According to some reports (e.g., Aldrich 1912), smoke from these fires, which were built in the bottom of collection trenches, helped to drive the caterpillars down from the canopy. Essig (1931) provided a more elaborate deviation from the first-hand accounts in asserting that smudge fires, collection trees, and the processing area were encircled by a larger trench that served to both entrap the larvae and control the spread of fire. Again, however, none of the first-hand accounts (Way 1920a, 1920b; Miller and Hutchinson 1928; R. Warren 1963, personal communication 1985; Walter and Fowler 1982; Fowler and Walter 1985) noted the use of smudge fires. Indeed, when queried about this topic, modern collectors consistently indicated that smoke would be of no use to the process (Walter and Fowler 1982:3; Fowler and Walter 1985:159). Archaeological evidence for this practice is, at best, inconclusive. It seems, therefore, that systematic use of smudge fires is unlikely, and the purported practice probably derives from an erroneous interpretation of the roasting facilities.

Circulation of this misconception appears to have resulted from two interrelated events. The first of these involves Aldrich's (1912) initial description of *piagi* collection,

which was obtained from a clerk at a Mono Lake store. Later, Aldrich apparently became aware of the fact that his information on smudge fires was in error, and published a correction (Aldrich 1921) based on information supplied by Way (1920a, 1920b). Unfortunately, Aldrich's later paper received little attention and the error was perpetuated. In part, this probably is attributable to the fact that he failed to indicate what the "serious mistakes" (Aldrich 1921:35) in the earlier report were. In any event, the reported use of smudge fires was given wide circulation in the entomological literature (e.g., Essig 1929:671, 1931:35-44, 1934:185; Bodenheimer 1951:291; Keen 1952:85; Carolin and Knopf 1968:7; Furniss and Carolin 1977:195).

A similar proliferation of erroneous second-hand information apparently accounts for references in the anthropological literature to the use of smudge fires. In his ethnography of the Owens Valley Paiute, Steward (1933:256) appears to have relied on Aldrich's articles for all aspects of the *piagi* collection process except those relating to smudge fires. For the latter information, possibly in an effort to check the discrepancies in Aldrich's reports, Steward (1933:234) relied on an informant who elsewhere he noted was not particularly well informed. Therefore, it appears that readily available ethnological and entomological studies paralleled one another and mutually propagated the error.

CATERPILLARS IN THE SUBSISTENCE-SETTLEMENT SYSTEM

Based on even a cursory review of the ethnographic literature, it seems apparent that both the Mono Lake and Owens Valley Paiute regarded *piagi* as a highly prized foodstuff. Eldredge (1923) provided a particularly graphic illustration of this fact in

recounting how several Mono Lake residents left employment to collect caterpillars in 1911.⁴ However, just because a particular resource is exploited--even one that is valued--does not mean that it was a focal component of the broader subsistence system. Other factors, including the predictability in timing, distribution, and productivity of the resource, conflicts between these factors and the availability of other (perhaps more reliable and productive) resources, and the inherent storability of a resource must be considered when assessing its actual significance (Jochim 1981; Smith 1983; Basgall 1984:3-7, n.d.). There are really two parts to this problem. The first is to determine whether *piagi* use would be energy efficient (how the return rate compares to that of other potential resources) and under what situations its use would be expectable. The second is whether the resource constituted a significant component of the native economic system and had a major influence on broader subsistence-settlement strategies. These may or may not have convergent solutions.

A number of recent attempts have been made to evaluate cost/benefit data for various resources commonly exploited by aboriginal Great Basin populations (e.g., Bettinger and Baumhoff 1983; Simms 1984, 1985). In contrasting the acquisition costs and nutritional data provided by Simms (1985:120-121, Tables 2-3) to those available for Pandora moth larvae (Fowler and Walter 1985:162, Table 1), it is apparent that *piagi* ranks higher than most vegetal resources included in Simms' study. With an estimated return rate of between 1,840-2,753 calories per hour (cal./hr.), caterpillars are surpassed only by cattail pollen (2,750-9,380 cal./hr.). Foods such as pine nuts (collected when the cones were dry, 841-1,408 cal./hr.), ricegrass (301-392 cal./hr.), and wild rye (921-1,238 cal./hr.) yielded lower return rates in Simms'

experiments. Return rates reported by Simms (1985:122, Table 4) for selected Great Basin faunal resources are consistently higher than those derived for moth larvae. Finally, it is worth comparing the nutritional composition of these same resources. Data provided by Fowler and Walter (1985:162, Table 1) suggest that *piagi* are comparable to many plant resources in protein content, but have a substantially greater fat component. Notwithstanding certain questions regarding the reliability of Simms' (1984, 1985) experimental data--which were obtained during very short periods by an inexperienced collector--the collective information suggests that Pandora moth larvae constitute an amply efficient resource. Indeed, if these rankings are even roughly correct, *piagi* would have been fully competitive with virtually all vegetal resources from the standpoint of energy.

A remaining consideration is to evaluate the more inclusive role of *piagi* within east-central California subsistence-settlement systems. Some insight is provided by contrasts between the roles of the so-called "armyworm" among the Pomo of west-central California and the Bogong moth among certain aboriginal groups in the highlands of southeastern Australia (Barrett 1936; Flood 1976, 1980; Swezey 1978; Gould 1980; Basgall 1984). In both instances the insect was, following Barrett (1952:108), considered "highly esteemed." Unlike the Bogong moth, however, the "armyworm" was unpredictable in terms of its periodicity, distribution, and abundance, and it could not be stored for any length of time. Further, when it was available, scheduling often conflicted with the harvest of other, more productive, foodstuffs. As a result, the "armyworm," although considered desirable, never became an important dietary component nor had a strong influence on broader Pomoan subsis-

tence-settlement strategies. A similar perspective can be employed in assessing the overall significance of *piagi* within eastern Sierran cultural systems.

As noted previously, major outbreaks of the Pandora moth, lasting up to eight years, are known to occur at 20-30-year intervals within any given subset of its range (Keen 1952:83; Carolin and Knopf 1968:1). At first glance, such apparently wide periodicity would seem to place *piagi* in the category of a "delicacy," harvested when available but never assuming the status of a pivotal dietary component. However, closer examination of the ethnographic and entomological literature suggests this was not the case.

The earliest recorded indication that *piagi* was, in fact, both a predictable and reliable resource comes from Way (Miller and Hutchinson 1928:160), who reported that the leader of the collecting party he accompanied (which harvested about 1.5 tons of larvae) had gathered caterpillars 35 times in his lifetime. Such a frequency requires that significant quantities of larvae be available during stretches *between* major infestations. Additional support for such an inference is provided by recent entomological studies. These reveal that hatching diapause for the Pandora moth includes annual emergences (as opposed to biennial ones) of roughly equal numbers of females and males for at least five years beyond the typically cited cycle (Carolin 1971:23). Further, it is now known that forested areas of Mono County contain a permanent--if low density--population of these insects (B. Roettgering, personal communication 1980; M. Wagner, personal communication 1985). It seems apparent, therefore, that *piagi* were more predictable in terms of availability than originally was thought.

Despite the apparent availability of some larvae on an annual basis, both historic and

contemporary data, consistently indicate that *piagi* were harvested only every other year. Details provided by Way's consultant suggest that this pattern can be traced back to at least the early 1800s (Miller and Hutchinson 1928:160). This biennial gathering pattern was probably a result of the fact that alternate, off-year, collections were less productive (see Carolin 1971). Decreased abundance during portions of this cycle should not, however, be taken to mean that off-year collections were never undertaken and that biennial harvesting was always the norm. Energy data reviewed above clearly indicate that larvae would have been taken and lower yields would still have been particularly important, especially in years when other resources were scarce. Further, off-years with poor harvests could have been supplemented to some extent by yields obtained during alternate (good) years since *piagi* would preserve for at least a year under traditional conditions (Walter and Fowler 1982:5; Fowler and Walter 1985:161-162). Inasmuch as the timing of caterpillar availability did not conflict with the scheduling of other important subsistence resources (Steward 1933; Bettinger 1982), they were storable, and collection territories were owned by particular family groups, at least historically (Walter and Fowler 1982:5; Fowler and Walter 1985:159), *piagi* appear to meet the criteria of a significant dietary component.

TEMPORAL DIMENSIONS OF *PIAGI* USE

As noted above, other than the collection trenches, procurement localities contain few archaeological remains. Even when present, such remains are limited to a few obsidian flakes, charcoal smearing from the roasting facilities, and the odd storage structures. While these indicators might, in some

instances, provide limited chronological data, none can clearly be linked to actual trench use. In the case of flaked-stone debitage, any direct association is suspect owing to the fact that (1) the region was a node in an extensive trans-Sierran obsidian exchange network (Basgall 1983; Hall 1983, 1984; Bouey and Basgall 1984); and (2) the forested areas under consideration were and continue to be prime habitat for artiodactyls. Given these considerations, sparse flaked-stone scatters may just as likely reflect exchange-related obsidian production or retooling and butchering activities. Therefore, considerations of age, with respect to both individual collection localities and to the industry in the region as a whole, are best assessed through indirect means.

The upper age limit of Jeffrey pine in the eastern Sierra is roughly 500 years (Jenkinson MS:16). Historic accounts of *piagi* collection indicate that trenches were constructed only around trees over 18 in. in diameter at breast height (Miller and Hutchinson 1928: 159; note that "breast height" is defined by silvical convention as a point 4.5 ft. above ground surface), or about 150 years in age.⁵ During the major Pandora moth outbreak of 1978-1981 in the study area, trees of lesser size/age had few, if any, caterpillars. It would appear, then, that apparent ethnographic selectivity could relate to differential return rates for trees of various sizes. On the basis of these data, the maximum date reasonably expectable in an exposed archaeological context would be on the order of about 300 years for a trench associated with a living tree. Perhaps another 100 years could be added to this general chronology by using rings from trees cut prior to the turn of the century (e.g., during the operation of Mono Mills between 1880 and 1914 [see Maule 1938:44; Jackson

1985]). However, data from CA-MNO-799 and CA-MNO-1982 (Mone 1986:Table 2) suggest that extant trenches, at least at these locations, are substantially younger than this maximum potential age.

Obviously, in each of these instances two assumptions are operative. The first of these involves the premise that collection techniques have remained consistent since their inception. T. Balint (personal communication 1979) has observed that at least some modern harvesters gather the larvae by hand without using collection trenches. This approach, though probably employed in the past as well, would compromise or restrict the overall caterpillar yield. It seems likely that more casual procurement is a result of changing dietary adaptations--the role of *piagi* shifting from that of a major subsistence resource toward that of a "delicacy," important more for reasons of tradition. There may well be an energy rationale behind this change, but vagaries and complexities of the acculturation process preclude making such a simple attribution.

The second assumption in this chronological model concerns when in the tree's growth given trenches actually were constructed (i.e., at or after reaching ca. 150 years of age). During his observation of collection activities, R. Warren (1963, personal communication 1985) noted that the inner and outer walls of newly constructed trenches were roughly one and three feet, respectively, from the bases of the trees. Undoubtedly, the subsurface extent of the tree trunk and root systems were a consideration with respect to these distances. If it is assumed that the spatial relationship between the inner trench wall and the tree trunk has been consistent, a relative, albeit crude, compensatory age adjustment can be made when assessing individual *piagi* rings. Relying on the growth rate formula outlined

above, a given Jeffrey pine can be expected to increase roughly one inch in diameter for every eight years of life. Therefore, if a given trench never was reused after initial construction, it probably would be obliterated by increasing tree girth and associated soil uplift within approximately 200-300 years. Hence, progressive obscuration (or lack thereof) should allow for adjustment to the maximum age estimates for individual trenches. In light of preservation constraints, recently deposited volcanic ejecta (see below), and the upper age limit of Jeffrey pine, it seems unlikely that trenches older than 500 years are still in existence. As a result, suggestions regarding the greater time depth for this subsistence practice are necessarily reliant on inferences drawn from other facets of regional subsistence-settlement trends.

Current research in east-central California suggests that between roughly 600 and 1,300 B.P. there were major changes in regional subsistence and settlement patterns, affecting both the breadth of the dietary components and the intensity with which certain resources were exploited (Bettinger 1977; Bettinger and Baumhoff 1982; Weaver 1985; Basgall et al. 1986). This shift saw more regular use of high-cost resources (particularly vegetal products), and, apparently, the emergence of more sophisticated logistical organization. Energy data available for *piagi*, apparently superior to those of numerous plant resources (Simms 1984, 1985), are consistent with the notion that regular caterpillar exploitation might predate the more general subsistence intensification characteristic of the late prehistoric period. In being storable, caterpillars provide an equivalent to many seed resources, but have the added advantage of a high fat content. This latter may have been especially important during winter months, when the avail-

ability of animal-derived body fats is at a minimum (Speth and Spielman 1983). Although it seems probable that the time depth of *piagi* use is substantial, its role almost certainly became more significant with the general expansion of the subsistence base sometime after 1,300 B.P. That caterpillars attained a more focal position during the later period is likely, perhaps being more crucial to Mono Lake groups due to greater resource shortages in that region. This could partially account for the concentration of storage structures in the more northerly portions of the study area, reflecting an emphasis on logistical organization and a concern for more extensive harvesting. Such a conclusion is also supported by the fact that, in addition to all of the known storage structures, 75 percent of the known collection sites and 89 percent of all known collection trenches are located north of Glass Mountain Ridge within traditional Mono Lake Paiute territory.

Notwithstanding these general expectations regarding the trajectory of *piagi* use, the subsistence potential of the region may have been affected by a sequence of late Holocene volcanic events. Around 1,200 B.P., and again between 600 and 550 B.P., significant eruptions occurred in both the Inyo Craters and Mono Craters. These events blanketed the Long Valley-Mono Basin region with pumiceous deposits of varying depths. There is also some evidence for another local eruption around 800 B.P. (Hall 1983, 1984; Weaver and Hall 1984; Miller 1985; K. Sieh, personal communication 1985). Such events would have had a major effect on portions of the Pandora moth's habitat, although it is unlikely that the entire Jeffrey pine association would have been equally impacted. Without attempting to quantify the exact effects of such disturbances, it is safe to surmise that repeated

eruptions would have reduced the productivity and availability of caterpillars in the area. Further, preexisting archaeological indicators of larvae collection, if extant, would have been buried.

SUMMARY

Using a variety of historic and archaeological data, it has been shown that both the anthropological and entomological literature have propagated a number of errors regarding the techniques employed in *piagi* procurement by the Mono Lake and Owens Valley Paiute. It has been argued that the resource was efficient from an energy standpoint, and its predictability, abundance, and storability contributed to its key role in regional subsistence-settlement systems. Although extant archaeological indicators probably do not predate 500 B.P., indirect evidence suggests that caterpillar exploitation has considerable antiquity in the area. It is probable, however, that the resource attained greater importance in the later prehistoric period when regional subsistence adaptations generally intensified.

NOTES

1. In other areas of the Desert West, the principal host trees variously include ponderosa pine (*Pinus ponderosa*), lodgepole pine (*P. murrayana*), sugar pine (*P. lambertiana*), and Coulter pine (*P. coulteri*) (Carolin and Knopf 1968).

2. Generally, the term "*piagi*" refers to any caterpillar or worm. Its application to a specific larva (and whether it was used as a foodstuff) is dependent on the particular groups, subgroups, or geographic location involved (Steward 1934:436, 436 fn.; C. S. Fowler, personal communication 1985).

3. Reports on file at the Inyo National Forest and the Eastern Information Center of the California Archaeological Inventory also note the existence of seven additional *piagi* collection locales, for which archaeological site records have not been completed. These contain a total

of 26 trenches (one locus also has a single obsidian flake).

4. Another incident suggestive of the importance of *piagi* is also mentioned by Way (Miller and Hutchinson 1928:160) who reported that in about 1850 *piagi* were also plentiful on the western slope of the Sierra Nevada and that the Mono Lake Paiute crossed the crest to collect caterpillars within the territory of another tribe (Western Mono?). Certainly the western slope of the Sierra is within the habitat range of *C. pandora* and, in fact, Brewer (Farquhar 1966:540) described what likely were collection trenches in the Vermillion Valley area of Fresno County in the early 1860s. Further, inter-group relations between eastern Sierran and Western Mono groups are known to have long existed. However, while it is possible that such events did occur, no other data presently known to us support a conclusion that such excursions took place regularly or even at all.

5. Without increment borings, the age of an individual tree can be estimated using the following: Jeffrey pine generally requires about 10 years to reach breast height after germination; thereafter a tree adds about eight annual growth rings for each 1 in. increase in diameter at breast height (W. Chandler, personal communication 1982).

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Letter 051

COMMENTS ON THE RDPEIR MAMMOTH LAKES, CA OCTOBER 2005

Comments from Nancy Peterson Walter, PhD
PO Box 2383
Mammoth Lakes, CA

30 Nov 2005

I am very impressed with the Cultural Resources section. The inclusion of the various state and federal laws is very important. It is also important to refer to cultural resources since it includes all of areas that are covered by law: prehistorical, historical, and paleontological.

Table 2.3 is well done although there are still a few minor details I would like to see incorporated into the document. The comments about little mitigation measures referring to the possibility of below ground resources forgets to include mention that below ground is just that. How can you rule out the possibility of something being below if you have never seen below? Granted the probability is low — but it is still there!

On page 2-47: under mitigation measures it still refers only to historical resources when it should say cultural resources.

Throughout the RDPEIR there is constant reference to the Town Archives. As a town, Mammoth Lakes is not very old. There is a great deal of historical data in the vaults of our County seat in Bridgeport. The documents are easy to work with, very accessible and I have used them often for my own research as well as to check things for Ginny Smith.

Throughout Table 2.3 and the section dealing with Cultural Resources (4-) there is mention of the public needing to be educated about Cultural Resources. This is very true but has to be well done or like much of the Mammoth Mine area it will disappear as people disregard the laws. I have often found throughout the Eastern Sierra that a great deal of "pot hunting" takes place. I have had surgery at Mammoth Hospital with one of the doctors telling me about his latest "find" as he was backpacking as I went under— they told me later I drifted off saying that picking up artifacts was illegal!

On page 4-337 I would correct the statement to say ALL THE EASTERN SIERRA.

On page 4-338 many of the Paiute that lived in the Long Valley were Mono Lake Paiute.

There are still a few spelling errors. Page 4-338 paigi is spelled wrong – the text has paigt Part of this confusion is that the word does not exist in our language. The linguists say that the i at the end of the word is a barred (i). The mention of piagi Page 4-343 has the same problem. For your purposes, you might just want to leave it piagi.

There are also misspellings on 4-339 Miwok is spelled Miwot and on 4-342 creek is misspelled

creed..

The people who inhabited the Eastern Sierra often chose lovely places to live and camp, just as we do. They put their camps in places like Doe Ridge, Mammoth Creek, Hot Creek, and all the nice places around our community. They liked to camp in the coolness of the trees; taking the obsidian blanks they had gathered and reducing them to projectile points; taking the basketry materials they had collected and preparing it for making their baskets when they moved to warmer areas in the winter. Bluffs were often used as sacred areas. The medicine people went there and today all you see are ceremonial objects. These shamans regularly went to the high areas of the White mountains, Glass mountains, and the passes of the high Sierra as well as the Bishop Tuff area.. Obsidian is everywhere and it was used for many things. The resources of this area are rich with flora and fauna and are often still collected. For over thirty years John and I have taken elders into the forests to collect traditional foods. A few years ago the Natural History Museum of Los Angeles County needed to replace some Great Basin materials for a display so a Mono Lake Paiute and I took her out and harvested medicinal plants, and some foods – all within a few miles of downtown Mammoth Lakes. Just because you don't see what is there does not mean it was never there.

Letter 052

TOWN OF MAMMOTH LAKES PLANNING COMMISSION
Special Adjourned Meeting
Wednesday, November 30, 2005 – 9:00 a.m.
Council Chambers, Suite Z
Minaret Village Shopping Center

MINUTES

I. CALL TO ORDER

The Special Adjourned Meeting was called to order at 9:07 a.m.

II. ROLL CALL

Present were Commissioners Rhonda Duggan, David Harvey, Elizabeth Tenney and Vice Chair Roy Saari. Chair Neil McCarroll had an excused absence due to being out on vacation. Also present were Mark Wardlaw, Community Development Director; Bill Taylor, Deputy Director of Community Development; Sonja Porter, Senior Planner; and Tina Bohannon, Administrative Coordinator.

III. REPORTS FROM THE COMMISSION

Commissioner Tenney commented on the following: a local's mode of transportation; new sewer line being installed from Reno to Mt. Rose – could cause increased development; traffic jams in Bend, Oregon due to lack of transit system; Level of Service "D" is troubling for our community.

Vice Chair Saari complimented the Town Recreation staff for the light posts and banners along Old Mammoth Road and Main Street.

IV. COMMENTS FROM THE PUBLIC

John Hooper spoke on the topic of affordable housing in Mammoth Lakes. He suggested an alternative solution to the affordable housing mitigation fee (DIF) by allowing larger new single family homes to be designed with a caretaker accessory unit. He suggested creating this as an incentive to the property owner or developer. He said it could add more living units for locals. He said the issue of increased density would not be an issue as most of the larger second homes are vacant most of the year.

The Commission expressed interest in further discussion of this concept.

Jo Bacon commented on the Use Permit for a Verizon cellular tower approved by the Commission on November 9, 2005. She said the tower was to be placed on a prominent ridge and would be very visible. She suggested asking Verizon to consider using a tower that utilizes the artificial tree antennas. She also questioned whether it was consistent with the General Plan.

V. BUSINESS MATTERS

1. General Plan Amendment Application 2003-01 Draft General Plan Update for the Town of Mammoth Lakes and the Draft Program Environmental Impact Report – Receive public testimony (No action will be taken).

Vice Chair Saari provided introductory comments prior to the public comment period.

Paul Payne inquired about an executive summary comparing the existing General Plan with the new draft document.

Senior Planner Sonja Porter directed Mr. Payne to the Draft PEIR, Chapter 3.

Jo Bacon commented on the following: she recommended that the Commission address one or two topics per meeting during their deliberations.

- Commercial, retail and industrial: She expressed concern that the amount planned for build-out may not be sufficient to sustain the needs of the number of persons who will occupy all the new units proposed. She said we don't have a financial analysis that illustrates how hot beds will result in a viable economy. She said we run the risk of overbuilding units without enough commercial, retail and industrial to provide needed services. She said the proposed designations are not always conducive to services that are needed. She gave an example of the need for a second grocery store but with no place to put it. She said a mixed use commercial designation probably would not provide enough square footage for a large scale market.
- Recreation – town is lacking in recreational facilities for all the visitors. Parks and Recreation Element not being updated until 2006; it needs to be included in the Update. Supports identification of sensitive lands; should continue and expand the Special Conservation Overlay; should identify access points to wilderness corridors; should identify biological resources; recommends setting up separate designation in Land Use for parklands because they

are different than open space; don't use IP designation for Mammoth Creek Park; the Bell-shaped parcel should be placed into new parkland designation; use DIF to purchase more land along Mammoth Creek corridor.

Thom Heller commented on the following: as member of GPAG, he spoke about the committee's views on workforce housing – members had mixed views; interest by some members but not consensus to build new units, rehab older units, any new units should be built throughout town; most members felt there should not be a large amount of workforce housing between college and MCWD.

George Sandvig, owner of unit at Mammoth Creek condos, spoke favorably about the Update to General Plan. Felt the Plan is good as long as the spirit of the Plan prevails; need to adopt the Plan in a timely fashion in order to face challenge of many development projects; spoke of proposed project at corner of Old Mammoth Road and Minaret Road; very concerned that large development with potential for hotel, restaurant and excessive height will be in direct conflict with existing residential neighborhood; requests that Commission consider the character and density of neighborhood prior to project approval and to strongly support the policies in the Environmental Sustainability chapter.

Director Wardlaw encouraged those in attendance to participate in the public process by voicing their concerns, comments and ideas to the Planning Commission. He said there are several more opportunities to address the Commission – this evening at 6:00 p.m. and two sessions on December 14, 2005.

VI. DIRECTOR'S REPORT

1. Director's Department Report

Director Wardlaw spoke of an application by Mammoth Hillside which is currently under staff review. He announced that the applicant did not meet submittal requirements necessary to move forward with the public hearing in December, 2005. He said the project would require further ADP review.

Director Wardlaw also spoke about a new Code Compliance Master Log that will give staff the ability to track Conditions of Approval and Mitigation Measures for approved projects. He said this should provide a more responsive approach for staff. He said work has begun on the Log and should take several weeks to complete.

VII. ADJOURNMENT

The Special Adjourned Meeting ended at 9:50 a.m. and adjourned to a Special Adjourned Meeting at 6:00 p.m. in Suite Z for the purpose of receiving public testimony on General Plan Amendment Application 2003-01 Draft General Plan Update for the Town of Mammoth Lakes and the Draft Program Environmental Impact Report.

Respectfully submitted,

Mark Wardlaw
Community Development Director

Tina Bohannon
Administrative Coordinator

Letter 053

TOWN OF MAMMOTH LAKES PLANNING COMMISSION
Special Adjourned Meeting
Wednesday, November 30, 2005 -6:00 p.m.
Council Chambers, Suite Z
Minaret Village Shopping Center

MINUTES

I. CALL TO ORDER

The Special Adjourned Meeting was called to order at 6:05 p.m.

II. ROLL CALL

Present were Commissioners Rhonda Duggan, David Harvey, Elizabeth Tenney and Vice Chair Roy Saari. Chair Neil McCarroll had an excused absence due to being on vacation. Also present were Mark Wardlaw, Community Development Director; Bill Taylor, Deputy Director of Community Development; Sonja Porter, Senior Planner; and Greta Boyer, Administrative Assistant.

III. REPORTS FROM THE COMMISSION

None.

IV. COMMENTS FROM THE PUBLIC

None.

V. BUSINESS MATTERS

1. General Plan Amendment Application 2003-01 Draft General Plan Update for the Town of Mammoth Lakes and the Draft Program Environmental Impact Report – Receive public testimony (No action will be taken).

Vice Chair Saari stated the purpose of the evening meeting was for the purpose of taking public testimony, with no action to be taken, and that the Commission will listen, may ask clarification questions, but will not discuss nor debate comments received or questions asked. Vice Chair Saari requested that speakers keep comments to three minutes with a five minute maximum. Individuals with multiple issues may consider bringing some issues forward now and others at the next meetings on December 14th. Vice Chair Saari also emphasized that there were two mechanisms

for submitting input, oral and written, both of which are equally valid. The following individuals spoke to the Commission:

1. Brigitte Berman stated that she retired to Mammoth in 1986. Ms. Berman's comments were received by the Commission as follows: (a) The Village facility is okay but the Starbucks box is not pretty. The affordable housing looks awful—it is too dense; a professional would not want to live in them and these are not what was discussed in public meetings (dots) where the community stated how they wanted Mammoth to be developed. We must improve our style, not build boxes because they are not incentives for visitors to come here. We need to develop Destination Resort standards and building codes for major streets. (b) Mammoth Mountain Ski Area (MMSA) should be in the Environmental Impact Report (EIR) because it wants to connect into the sewage system. There is not enough communication between the Town and MMSA. Where are the extra people going to go? MMSA may put limits on the number of people on the mountain at one time-- where will the rest of the people go? (c) Back country – documents state that there is no impact; this is not so, the EIR is not sufficient on this topic. The Lakes Basin is full, look at the last fishing tournament. Where are people going to go? Is there communication with the Forest Service? Ms. Berman stated that she can see day passes and other restrictions in the future that should be worked out with FS, even with National Parks, now. What are the impacts on Yosemite? (d) Deer mitigation states no significant impact-- there is a tremendous impact. Deer will continue to be on the golf course, in Snowcreek, Old Mammoth Road, Valentine Reserve, etc. There should be open spaces, speed limits, some mitigation to keep deer safe. There should not be gated communities so that we can manage deer. The EIR is not sufficient on seismic impacts; (e) Sherwin Road should be paved and plowed for better access. Seismic and volcanic dangers, with fire being the biggest hazard. People should be aware. Oregon has big signs telling people where to go in emergency. The Town needs another escape route through Sherwin when Snowcreek further develops. We should also advise people that we have an active volcano. Ms. Berman's written comments were received.
2. Nancy Petersen Walter, PhD in Anthropology. (a) Mrs. Walters stated she has spent a lot of time looking at and reviewing EIRs and is impressed with Cultural Resources section and that the inclusion of State and Federal laws are important. (b) Table 2.3 is well done, but a few minor details need to be incorporated. Mrs. Walter recommended improving upon the wording "startled" as it relates to what is below ground, because a person will not know what is below ground until construction starts. (c) The new revised report references Town archives. Town not very old and a great deal of information is contained in the vaults of Mono County in Bridgeport, with the

documents being easily accessible. (d) Table 2.3 and the section dealing with Cultural Resources, references public education. This is true and should be well done or much could disappear. Pot hunting throughout the Eastern Sierra is a pet peeve--people are not afraid of prosecution. People need to be informed that this activity is illegal. The Paiutes referenced in document are Mono Lake Paiutes and some wintered in various places such as Round Valley, the back side of Mono Lakes and Hot Creek. (e) There are a few spelling errors. Finally, those who inhabit the Eastern Sierra chose places to live and camp and sit under trees to make projectile points. The same places attractive to residents and visitors today, are only a few miles from downtown Mammoth.

3. Doug Jung, Petroleum Engineer, Geologist, MBA from USC. Mr. Jung spoke to the Town's water supply. Mammoth Community Water District (MCWD) indicates only minimal surplus water supply is available, approximately 31 acre feet, which is not much of a cushion. A 5 to 6 year drought period is not included in the EIR. History shows that precipitation is highly variable. The EIR mentions an unnamed expert, who is it, what are the individual's qualifications? The EIR mentions new methodology for calculating supply and demand but nothing states how it is calculated. CWS is not defined in EIR. Mr. Jung's calculations show shortage in any dry period and recommends development of a safe water supply as soon as possible to provide a 100 percent excess of supply and demand. Don't permit connections that exceed the safe water supply. What is MCWD cushion—it was never defined at the MCWD meeting. Mr. Jung recommended that the Council not count on additional supply from line repair, dry creek, irrigation cutbacks or anything other than surface and new ground water supply.
4. Pat Eckert stated that she has been a member of the water board and water concerns are her main issue. Ms. Eckert stated that she has attended most water board meetings and read many, many documents and has much information regarding water loss. A lot of attention must be paid to water supply compared to demand. Ms. Eckert has been following water losses monthly since 1998 and this October is higher than last year. The Commission must be aware of a lot of information to be knowledgeable in all areas. Charts from 1992 to 1994 show that the wells have dropped. Water loss is also higher than last year. Who is on the Town staff is monitoring water? Who is knowledgeable historically as well as currently? Commissioner Tenney requested information regarding the relationship between TOML and MCWD. Deputy Director Bill Taylor stated that the Town is required to consult with MCWD and then provide water analysis. In the end, the MCWD has the ultimate control because if they do not have water, they will not connect.

5. John Cunningham, in his 50th year in Mammoth, expressed the following concerns and comments regarding the EIR and the General Plan Update (GPU). Where are we now and where are we going? Business is good in Mammoth, but how do we sustain a good business community? We will be completely build out in five years, but the GPU does not address what will happen in that event in a 20 year plan. The GPU should not incentivize development but must set high standards, reduce density, require landscaping, large setbacks, and adequate snow storage. The public workshops make it clear what the community wants. We must build a beautiful community in order to attract residents and visitors. Does the GPU implement the Town's Vision Statement and vision of the community? Mr. Cunningham does not think so. The GPU is not in alignment with the Vision Statement. (a) The documents are thick and there is not sufficient time for the public to read thoroughly. Although the GPAG and PC have worked hard, the Town Council is trying to ram the document through. (b) The EIR is good, much improved over previous. (c) Comments contained in the Executive Summary are not mitigated. Mr. Cunningham stated that he would leave his written comments. (d) Significant but not mitigated impacts are buried. Light, air, pollution, animal habitat, emergency, etc. state that policies are place but are not discussed. Fire, traffic noise, impacts on schools, libraries, hospitals, water shortage, Benton Crossing landfill concerns are not mentioned at all, together with the impact on recreation facilities and forest service land, level of service D exceeded with mitigation not funded, and the shortage of parking. (e) The GPU comments are more global. The town is congested on holidays and weekends. Can we get 20,000 more visitors to come here regularly? We need a marketing study. Regarding population, the current GP, page 11, maximum PAOT is 48,000. The new EIR interprets this to mean 61,376. No where in the GP does it mention any other number than 48,000. The EIR states a reduction from the old plan; this is not true. (f) Density transfers and density bonuses are good for developers but not the community with increased building heights and densities. Only state mandated bonus density should be granted. (g) The traffic analysis is inappropriate, as it does not acknowledge current problems such as snow storms. (h) The water supply is uncertain, and water is a big issue. (i) The GPU recommends open space and parks be rezoned to allow development which is inconsistent with the Town's Vision Statement. (j) The Quimby Act for parks are not being met. (k) The GPU has no limitation on building height. Building heights should be limited to 35/55.
6. Jo Bacon commended the Planning Commission for all their hard work on the Vision Statement, policies and implementation measures. (a) The Alternatives section provides no quantitative analysis. The other alternatives are supposed to be descriptive enough to allow us to determined the distinct aesthetic impacts of each alternative. (b)

Although the EIR states that the impacts will be mainly around the resort nodes (which are highly visual areas) there is no discussion on the impacts of taller buildings and requested that the cumulative effects be analyzed. There is also no analysis of the cumulative effects of light and glare. (c) Regarding population and employment, the impact of fractional ownership is not analyzed in the EIR, these units have higher occupancy than traditional units. There is no definition of fractional in the EIR. (d) Table 4.9.4 points out density of remaining development in town, less space with more asphalt; multi-unit transit at 16 units an acre and remaining development projected at 33 units an acre. (e) Single family transient category is not defined in category.

7. Marshall Minobe, a member of the General Plan Advisory Group, stated that none of the alternative are cohesive in the GPU. Town staff made the alternatives by simply grouping related policies according to category and this grouping had nothing to do with a cohesive plan. Mr. Minobe stated that he had requested staff to put together a presentation on how the plan might be cohesive and how trade offs could have occurred to preserve the small town feel while also supporting development. None of his requests have been met. Mr. Minobe addressed the public stating that whether you are for development or not, the elements of the GPU should be reviewed to ensure that the controls protect the community. Mr. Minobe stated that the EIR is an informational document only and can be adopted and Council can override significant impacts. The EIR does not protect the community, and the burden is on the community to be vigilant to assure that their interest(s) are acknowledged. Mr. Minobe stated that the GPU suffered from a flawed process from day one. Outreach did not reach a broad classification of community and results were not cross checked. Mr. Minobe stated that the document does not show the true statement of the community and lacks accountability. GPAG has spent a lot of time on a project that could have been better. Mr. Minobe encouraged the community to speak now.
8. Julie Yost a 30 year owner and a 10 year permanent resident thanked the Planning Commission for their hard work, especially Mr. Saari with his article in the Real Estate Times encouraging comment on the GPU and EIR. Mrs. Yost stated that she will submit written comments. Mrs. Yost also stated that while development is inevitable, it is how it is done that is important. The community should look for smart, well planned and unhurried development not just development oriented toward Town revenue sources. Town revenue concerns have worked their way into the heart of the GPU and also the EIR. Everything appears to be oriented toward revenue sources. (1) Policy issue number 4, don't change the meaning of institutional public. Don't allow rezoning or redefinition. Don't put work force housing in South Gateway. Additionally, there is a need for a decent size grocery, not a chain, but with sufficient parking as residents will not ride the bus to

grocery shop. (b) Policy issue 10, define open space as open space not buildings – keep the bell shaped parcel as Open Space with perhaps a bike path, wooden plank walkway, an area for people who are not able to go into the mountains to also have a mountain experience. Don't put big buildings in it. (c) Policy issue 6, growth rate, think about controlling the rate of growth with infrastructure to go along with it. Needs to be spelled out. State mandates that you can't build unless you have water (d) Policy issue 10, transient rentals in single family residential could affect the character of town – keep single family residential areas as they are, don't change zoning to raise more money. It does not make sense to put multi-family workforce housing in with single family. Mrs. Yost stated that she is assuming that this will not happen, but should not be left open within the GPU and EIR, Mrs. Yost expressed her feeling against density transfers and her belief that they should not be a commodity. (e) Policy issue 1, don't overbuild condominiums, doing so could make our community too dense and cause traffic gridlock. Mrs. Yost stated that a service level D is bad. Mrs. Yost clarified that college housing was appropriate but any additional workforce housing is a violation.

9. Ken Cline, a new resident to Mammoth Lakes, expressed concern about the shift in emphasis toward maximum density development. Parks, creeks, viewscapes, etc. are important for a well managed community. Concessions to developers will undermine a sensitive community. Mr. Cline urged prudence and restraint.
10. Evanne Jardine, a 13 year resident and a longer visitor, expressed her selfish plea for people who live here. (a) We need a market if 20,000 more people are anticipated. There is currently no plan for space for another market (b) In town, where people live and where there are children, we don't have but one park. Some space must be dedicated to parks—a park in Sierra Valley Sites perhaps. (c) Water quality is now no better than Santa Barbara's water. Water is a real issue for quality as well as quantity and should be addressed more. (d) Traffic and making left hand turns is difficult of any weekend. There is not a lot of accommodations for traffic issues. (e) Access to resources is difficult; the Village is not that accessible. We need to think about accessibility for residents to avail themselves of amenities in town as well as the visitors. (f) Roofs coming over treetops, how many more will violate height limit?
11. Wilma Wheeler, Sierra Club, wondered how the projected population wonders will affect public land and parks, how the increased density of town will affect quality of life of those who live here. Additionally, commercial development at Mammoth Creek Park is a very big concern and we cannot afford to give up park space. Mrs. Wheeler will submit further comments. Mrs. Wheeler provided a white paper for public lands to the Commission.

12. Dan Dawson, SNARL, asked how have we come to this point stating he has attended workshops leading up to the formation and provided input to consultants, staff, Planning Commission, and Town Council. The GPU and EIR that analyzes runs contrary to the bulk of input provided by the populous. Section 7 lays out other alternatives and then rejects those in favor of preferred alternative. Mr. Dawson urged the Commission to give strong consideration to the reduced development alternative rather than the alternative driven by town revenue needs. The EIR supports that argument; the reduced development alternative (maximum population of 51,000) is the environmentally superior alternative but is rejected because of economic interests. Urges Commission to recommend to Town Council a different alternative.
13. Heather Johnson stated her concerns are with over development so that people will not want to come to Mammoth Lakes. Ms. Johnson further encouraged open space, the protection of the Mammoth Creek corridor as sacrosanct, remembering that this is a recreational community where walking through the forest and enjoying the aesthetic value of the community is also important to those of us who live here. It is the Planning Commission's duty to protect open space and sensitive areas. The Town should buy lands along Mammoth Creek and expand the OSSC overlay. Additionally, building heights should be no higher than trees--money is not more important than the integrity of the area. Ms. Johnson thanked the Commission for all their time and service.
14. Stan Heller stated his biggest concern is at build-out and the number of people going out to do something--what are 60,000 people doing to do for shopping, recreation? The town should pay more attention to sales tax income. A visitor's experience should be pleasant and they must have access to shopping, getting around--it doesn't matter how beautiful thing are. (2) The town is currently marketed by the resort—Intrawest and MMSA. Other resorts have true reservations that represents the entire town. If we build all, marketed by Intrawest-Starwood Mammoth, how will the rest of the town's businesses survive?
15. Wendy Sugimura speaking on behalf of Andrea Lawrence and ALIMAR. Ms. Sugimura stated that they have been listening to what is being said, that people lack confidence in the process in that the documents do not reflect what people have expressed. People are confused by the complicated documents and constantly changing numbers. ALIMAR wants to have a better process that builds transparency. Wendy Sugimura suggested a different process using charettes, a professional planner and trained facilitator in order to build community consensus.
16. John Walter presented a partial list of concerns from the Advocates. Mr. Walter stated that longer descriptions will be submitted when their

comments are submitted. (a) The Advocates biggest worry is lack of balance or emphasis. The project alternative of 10,000 additional people at one time (from today) was thrown out because it did not meet the town objectives of resort development for affordable housing. Nowhere has anybody quantified how much is required. (b) How much development and how fast? If they don't come, we've invested a lot in infrastructure and we won't have the money to pay for it. If we proceed too fast with too much, we could overshoot or create a bad experience. The Advocates recommend that the Town go slower and amend the General Plan as necessary. Building too much could make for a bad experience with no return visits. If we build less they will have to come during the week. Building more does not fill mid-weeks. The EIR should fit general plan, they should work together. The EIR should not be certified and General Plan made to fit to EIR.

VI. DIRECTOR'S REPORT

1. Director's Department Report

None.

VII. ADJOURNMENT

The Special Adjourned Meeting ended at 7:40 p.m. and adjourned to the next regular meeting of December 14, 2005, at 9:00 a.m. in Suite Z.

Respectfully submitted,

Mark Wardlaw
Community Development Director

Greta J. Boyer
Administrative Assistant

Letter 054

TOWN OF MAMMOTH LAKES PLANNING COMMISSION
Regular Meeting
Wednesday, December 14, 2005 - 9:00 a.m.
Council Chambers, Suite Z
Minaret Village Shopping Center

MINUTES

I. CALL TO ORDER

The meeting was called to order at 9:05 a.m.

II. ROLL CALL

Present were Commissioners Rhonda Duggan, David Harvey, Elizabeth Tenney, Vice Chair Roy Saari, and Chair Neil McCarroll. Also present were Mark Wardlaw, Community Development Director; Bill Taylor, Deputy Community Development Director; Craig Olson, Senior Planner; and Sonja Porter, Senior Planner.

III. REPORTS FROM THE COMMISSION

Commissioner Tenney (1) displayed a copy of the High Sierra telephone book stating how proud she was of the cover and how we should think about our amenities as we go through the general plan—that is why we are here; (2) stated that she had viewed a cell tower tree which should be reconsider for Mammoth use; (3) asked about completion of a report on the peer resort. Tourism and Recreation Director Danna Stroud stated that she and Deputy Town Manager Karen Johnston are working on the report, the last communication has just been received, will be incorporated into the report, and should be available by the first of the year; and (4) Will talk to Ruth Harrell at the Village regarding a more coordinated effort with music could make the Village experience more pleasant.

Commissioner McCarroll stated that he has had conversations with Marshall Minobe regarding becoming a wired community, has read an article on a town that started wireless community for purposes of coordination between town departments that also had dividends for the community. Mr. McCarroll stated that he has spoken with Tony Barrett who will further research the project.

IV. COMMENTS FROM THE PUBLIC

Senior Planner Craig Olson reported to the Commission that he has been in contact with Tim Sanford regarding the Fairway Road access gate. Mr. Sanford has informed the Town that there will be a provision in the easement documents between the owners and Chadmar for a four foot easement for pedestrian access. When staff has received a copy, the gates will be activated. Commissioner Saari stated that in the winter time, when the roads are plowed, the access will be inaccessible and should be maintained. In his opinion "pedestrian access should be

provided” means access and snow removal. Mr. Olson stated that there is no provision in the document for snow removal. Deputy Director Bill Taylor stated that staff will follow up with Mr. Sanford for clarification.

John Wentworth, a resident of Mammoth Lakes for 5 years, who resides at 42 Davison Road, #2, read a prepared statement regarding the vehicle gate on Ranch Road and supporting the Sherwin access, which was presented to staff and included 30 signatures. Commissioner Tenney requested that the Commission receive copies.

Marshall Minobe, a member of the General Plan Advisory Group, stated that it is important to look at the Sherwins access as a proactive situation and anticipate future. Access to the Sherwins needs a plan—a gate and vacation of land is not enough. Staff should have taken time to determine how access would affect the community.

V. APPROVAL OF MINUTES

1. Minutes of September 28, 2005

Action: It was moved by Commissioner Tenney, seconded by Vice Chair Saari, and carried by a 4-0-1 vote, with Commissioner Duggan abstaining, to approve the Minutes of September 28, 2005, with the following corrections: (1) page 2, during Gordon Shaw’s statement, include: Gordon Shaw stated that levels of service were calculated with no snow on the roads, and (2) page 3, last paragraph, include in Heather Johnson’s statement that she stated she would be willing to donate her own contiguous property to the Town if Mr. Kenney sells his property to the Town..

2. Minutes of October 12, 2005

Action: It was moved by Commissioner Tenney, seconded by Vice Chair Saari, and carried by a 4-0-1 vote, with Commissioner Duggan abstaining, to approve the Minutes of October 12, 2005, with the following correction: The statement on page 3 attributed to Chair McCarroll should read Vice Chair Saari.

3. Minutes of November 30, 2005 - 9:00 a.m. and 6:00 p.m.

Action: It was moved by Vice Chair Saari, seconded by Commissioner Tenney, and carried by a 4-0-1 vote, with Commissioner Harvey abstaining, to approve the Minutes of November 30, 2005, 9:00 a.m. meeting, with the following correction: Page 1, item 3, should be amended to note that the sewer line to Mt. Rose should reflect that it is going to the ski area.

Action: It was moved by Vice Chair Saari, seconded by Commissioner Tenney, and carried by a 4-0-1 vote, with the Chair McCarroll abstaining, to approve the Minutes of November 30, 2005, 6 p.m. meeting, with the following corrections: (1) page 3, item 3, in the comment from Doug Jung, the reference to Dry Creek should be capitalized; (2) page 6, item 10, Evanne Jardine’s statement including “selfish plea for people who live here” should be in quotes; (3) Item 12, Dan

Dawson statement includes a reference to populous, the correct spelling is the populace.

VI. CONSENT AGENDA

None.

VII. PUBLIC HEARINGS

1. **Tentative Tract Map 36-235 and Use Permit Application 2005-09** – Request to construct a 193 Unit Condominium Hotel, understructure parking hearing, or 259 vehicles with full-time valet parking services, spa, pool and patio facilities, meeting facilities, restaurant/bar, and associated landscape improvements on five parcels of land consisting of seven acres. Applicant: Mammoth Hillside, LLC. Location: Canyon Boulevard, north of Lake Mary Road. APNs: 33-020-10, -11, -21, -33 and 31-110-27. Zoning/General Plan: The property is designated Plaza Resort (PR) as Specific Plan (SP) with an Activity Node Overlay by the General Plan. Staff contact: Craig Olson, Senior Planner – x269. **STAFF IS RECOMMENDING A CONTINUANCE TO A DATE TO BE DETERMINED. A STAFF REPORT HAS NOT BEEN INCLUDED AT THIS TIME. NO ACTION WILL BE TAKEN.**

Chair McCarroll open the public hearing at 9:31 a.m. Rhona Hunter, representing Meridian Partners, stated that no Planning Commission date has been set to review this item. Ms. Hunter stated that the applicants feel they have gone above and beyond incorporating staff and ADP comments. Ms. Hunter stated that delays impact them and continued delays may cause them to lose an additional opportunity to work with another 5 star operators.

Vice Chair Saari stated that the January 11 special meeting is full but felt the item should be continued to a date certain. Mr. Wardlaw advised the Commission that staff continues to work diligently to accommodate the applicants and felt it a good strategy to hold an introductory hearing, with no action taken and with subsequent review by ADP. Mr. Wardlaw also stated that this project is significant and that the plans have been modified from the first ADP review. Mr. Wardlaw further stated that ADP comments should be received in order for staff to make an informed recommendation to the Commission. It was the Consensus of the Commission that this item be continued to Thursday, January 12, 2006, at 3:00 p.m., the only item on the agenda.

Taken out of order: Upon reconvening at 1:10 p.m., Chair McCarroll stated that he was uncomfortable with the earlier tenor of item 1; that the Commission did not wish to hear the item until staff was ready to bring it to the Commission. Community Development Director Mark Wardlaw stated that staff has had extensive meetings and negotiations with the applicant, but will place the item on the agenda for January 12, 2006, as a non-action item.

2. General Plan Amendment Application 2003-01 Draft General Plan Update for the Town of Mammoth Lakes and the Draft Program Environmental Impact Report. Receive public testimony. No action will be taken.

Chair McCarroll opened the meeting for general public testimony:

Gordon Alper distributed written comments to the Commission and staff. Mr. Alper stated that the General Plan is the single most critical document to determine livability of the community and that he is disappointed in the draft general plan as presented. The document is different than previously reviewed and has not included information for the document to be complete. Mr. Alper recommended forwarding the updated general plan, without a recommendation, and let the Council make the decisions. The General Plan Update fails to adhere to the guiding principles of the Town's Vision Statement. Projects being built are too dense. The proposed build-out does not deliver an acceptable transportation level. South Gateway is not reflected in build-out numbers. IP zoning specifically to include housing is contrary to the Vision Statement. Population, density, assumptions, and logic for 60,700 does not match today's data. Additionally, we must understand what people will be doing before we invite them to Mammoth. The mountain only has 30% more capacity therefore this should be our limit. The general plan update falls short by not considering it as part of the plan. Why isn't the Main Lodge development part of the plan—this should be added to the general plan for the document to be meaningful. How will fractional ownership in single family residential areas affect neighborhoods, what are the hospital and college plans for 20 years, etc.? The proposed general plan is a good effort but falls short of meeting the community needs. We are approving development but we are not taking care of ourselves. What about park acquisition? We should identify, zone and acquire land for parks. Our priorities need to take precedent over developer priorities.

Jo Bacon stated that the EIR provides no cushion in water supply and demand; there is no mention of potential loss of surface water because of the Mammoth Creek EIR; and including Dry Creek in the supply is against water code. Ms. Bacon stated her concern about Chapter 7 and how new development could use only a small amount of water. This section requires more study and a more detailed comparison. The transportation study has serious flaws it does not deal with pedestrian crossings and only deals with the LOS of intersections not entire streets. Ms. Bacon recommended less population versus widening streets to solve LOS D. There is no data to analyze increased traffic. What will Sierra Park and Meridian Boulevard look like? Work force housing for South Gateway is not included in the data and should be included. Ms. Bacon stated that there is conflict between document pages that speak to the housing element but in other places statements that say we are not changing the element. Ms. Bacon reiterated Thom Heller's comment of November 30th wherein he stated that workforce housing should be distributed throughout the community, with emphasis on refurbishing existing stock. Finally, an alternative outlined in chapter, states that the reduced development alternative would result in a lack of workforce housing but has no supporting data.

Jesse Langley, representing Cardinal Real Estate Investments, stated that they are currently in escrow on property at Minaret and Old Mammoth Road. Mr. Langley provided a document to the Commission asking that the Commission not change the current zoning. Current zoning permits 36 hotel rooms per acre and the proposed density of the General Plan would limit them to 20 rooms per acre. Jesse Langley stated that a hotel such as the one they are proposing supports numerous other goals of the general plan. Hotel design would decrease lot coverage and increase public space above and beyond the requirements of current zoning.

Dan Dawson stated he has served as a Mono County Planning Commissioner for six years as well as three years on the Technical Advisory Commission during the 1987 general plan process. Mr. Dawson stated that a general plan should reflect the will of the people and that the interpretation of the people is not included. Mr. Dawson also felt that those who attend workshops should carry the weight on how things shape up as they have participated and that this is the public process that should be followed. Mr. Dawson stated that he does not like the draft general plan but does support the reduced development alternative, which would mean less revenue to the Town. Mr. Dawson does not support an ice rink, police department, or a big government center. Workforce housing is inconsistent with the original intent of the South Gateway acquisition and Mr. Dawson opposes the sale of 25 acres to Mammoth Lakes Housing. Regarding heights, Mr. Dawson supports maintaining existing height limits. The urban growth boundary does not accurately reflect the policy as adopted. If we can contain boundaries, we can retain the small community flavor and not impact the surrounding areas. The public facilities section is vague and needs to be tightened up. A government center outside the urban growth boundary violates the proposed general plan. Traffic level D is unacceptable and recommends a change to level C.

Policy issue 1: Does the Draft General Plan modify the intent of the current Urban Growth Boundary policy:

Public Testimony. (1) John Walter (a) automatic inclusion of Forest Service exchanged land, i.e., the Mill City Tract, would be a clear violation of the urban growth boundary and recommended that it not be included in the proposed general plan but amend the general plan at a later date if necessary. (b) Allowing public facilities out of the urban growth boundary, i.e., performing arts, administrative offices, public parking lots is also a violation of the urban growth boundary. Toilets and recreation supporting facilities are acceptable; however, the current language allows for too much discretion. (2) Gordon Alper stated that he authored the urban growth boundary accepted by the Town Council and only Council should make changes. Additionally, if the proposed general plan is adopted, we are abandoning the urban growth policy previously accepted by the Town Council. Rezoning South Gateway from SP to IP to allow single family residences was not the intent of policy. The UGB restricted development to the already urbanized portions of the community, Mr. Alper noted his disappointed to find the work of the GPAG ignored and abandoned at this late date. South Gateway was not discussed during GPAG in spite of requests for information. (Deputy Director Bill Taylor clarified that the proposed housing in the South Gateway district has been included in all drafts of the

General Plan). Chair McCarroll opened the meeting to general public comments. (3) Dan Dawson, referencing the Madden property, not contiguous but within the urban growth boundary, stated that there is a move to make the property contiguous to the town adjacent to the ski bridge. This would require a land trade and would be an acceptable amendment to the UGB and require a general plan adjustment.

Commission comments: Commissioner Tenney stated that the South Gateway property is prime real estate with a southern exposure, bike path, etc. and should be park acreage. Mrs. Tenney believes in living where you work and is troubled that there is consideration for a subdivision on the South Gateway property. Mrs. Tenney supports housing along the transit corridors and student/employee housing on the college campus. Additionally, more industrial land is needed and is not sure that is the highest and best use of that land is industrial as there is space at the Airport and Sierra Business Park. Mrs. Tenney questioned if there is a method by which incentives may be offered to reorganize the industrial area so some uses could be placed in another spot. Mrs. Tenney stated her support of the urban growth boundary. Commissioner Saari expressed his support of the urban growth policy, believes we need to remain flexible, and that park lands should be identified now, perhaps South Gateway should be identified as a park. Commissioner Harvey noted that restriction of South Gateway to college housing only has challenges as most family have two income earners and it would be difficult to draw the line. Mr. Harvey also stated that parks could come from development and a source of revenue is needed to purchase and develop them, the bell-shaped parcel requires a great deal of consideration. Mr. Harvey stated that market forces will drive the amount of development. Downzoning just to achieve a reduced population may not be the answer; this requires strong consideration and Commission discussion to fully understand the consequences. Commissioner Duggan expressed her appreciation of the public's comments. Mrs. Duggan stated that the urban growth boundary definition requires clarification as a broad interpretation may be beneficial to the community but may also be detrimental in the future. Mrs. Duggan stated that she will not reject the proposed general plan, but will continue to do her job. Regarding the housing definition, Mrs. Duggan stated that it may not be strong enough and also believes that we must develop workforce housing that fits the vision of the community. With regard to Mammoth Lakes Housing and the college, Mrs. Duggan previously understood that Mammoth Lakes Housing would develop the college's student housing. Parks, whether active and passive, are not clearly defined but believes the community to be looking for passive parks. Mrs. Duggan supports the urban growth boundary and also supports an in-depth review of future projects. Commissioner McCarroll stated he supports the urban growth boundary but also supports tightening language to make sure the town is unable to sell off land and build outside the urban growth boundary. Mr. McCarroll also supports tightening language in the implementation measures and land exchange language so that land exchanges with the forest service would be limited to existing uses only. Mr. McCarroll noted that hotel uses are not addressed in the general plan update. The existing general plan calls out for hotel and the best way to address the general plan update is to insert the language back into the RMF2 zone.

Policy Issue 2: Should the build-out capacity of the Draft General Plan be reduced? Separate population from land use?

Public Comments: (1) John Walter stated the general plan update cannot be decoupled from Mammoth Mountain Ski Area capacity. What is the right number? The Advocates of Mammoth have no idea. But once a number is placed on paper, it almost becomes a right. It is harder to reduce a number than to let it develop naturally. If Mammoth becomes too crowded, visitors will not come. If we achieve the objective and bring in double visitors, it is also bad if visitors don't come because we could have empty buildings and low TOT. Regarding bonus density transfer policies, densities transfers can promote growth. The optimum resort development would be the reduced alternative. Regarding affordable housing, the Advocates strongly support affordable housing but expressed concern that building anywhere and at any cost will require less affordable housing. In addition the reduced development alternative would require less affordable housing, which was not factored into the analysis. Mr. Walter recommended that the pie chart be placed in the EIR. (2) *Dan Dawson* stated strong support for the reduced alternative. Mr. Dawson also stated that the vision statement has conflicting principles to the general plan. Mr. Dawson disagreed with Commissioner Harvey that the market can control us. Clean air, clean water, and no congestion are environmentally superior alternatives that cannot be discarded for economic interests. How else can we achieve a community that is livable for all of us? He stated that the population is the crux of the General Plan and existing peak holiday weekends are already bordering on unlivable. Development is not a right is a privilege.

Commission comments: Commissioner Duggan stated that the population number is arbitrary. Mrs. Duggan recommended that Lynn Carpenter from Mammoth Mountain Ski Area present the Mountain's marketing plan for the Commission and community benefit. Mrs. Duggan stated that we should be explicit with density transfers so that we don't have issues later. Mrs. Duggan stated that she does not agree that a reduction in population reduces the need for affordable housing. Workforce housing includes our peers as well as doctors, nurses, teachers, etc. Additionally, everything cannot be tied to TOT. Commissioner Harvey stated that he does not agree with tying all PAOT to the ski area because cross-country, snowmobiling, etc. are not directly associated with the ski area. Mammoth Lakes is in competition with all other resort areas and Mr. Harvey finds it interesting that we still have the level of interest in light of our development impact fees, affordable housing mitigation and amazed that developers are willing to pay the price. Mr. Harvey felt that density transfers should be controlled very carefully since we don't fully understand them and don't know what can happen in the future. Regarding affordable housing, affordable housing is not what it was five years ago--five years ago we were addressing service and industry workers who needed assistance to live here. Today everyone who works in Mammoth requires assistance unless they own a home. Mr. Harvey stated that the PAOT number is not relevant at this time and that the market will continue to drive development or lack of it in the future. Mr. Harvey is not hung up on a build-out number nor trying to reduce it by utilizing different properties. Commissioner Saari stated that he has reread Section 7 and though it sounds like a good alternative he agrees with Dan's and John's comments and how hard it would be to come off of 60,000 number. We should continue to

learn more about density bonuses, don't give them away, but is currently not in favor of downzoning. Commissioner Tenney stated that there is not enough information in Section 7.6 regarding the impacts of "reduced alternative critical mass..." for conclusions at this time. Commissioner McCarroll stated that we must look at each problem such as sustainability, smart growth, etc., but doesn't believe that growth control is good. Mr. McCarroll believes that growth control and downzoning leads to an elitist community. Mr. McCarroll believes we want Mammoth to change the way the Mountain changed the way they moved people. Additionally, Mr. McCarroll stated that there are many things we can do to make Mammoth special, bit by bit, project by project. Mr. McCarroll noted that mobility plans are critical to maintain projects as part of that approved according to smart growth principles. The Town's affordable housing mitigation and development impact fees are the highest in the nation. We are not a developer friendly community because it is hard to get through the process because our zoning is amongst the toughest in the nation which is an indication of our community changing itself for the better. All communities visited on the peer resort tour have a transfer of development rights which is different than harvesting development rights. Commissioner Duggan stated her appreciation of the Advocates general plan table and its specific recommendations but stated that she would not use the table as a goal to reduce the PAOT, but would use it as a discussion item to do the right thing and utilize it to identify which pieces of property are too valuable to develop. Commissioner McCarroll stated that the PAOT is not a scientific number, but is useful for generating discussion. The general plan should not be based plan on PAOT.

The Commission broke for lunch at 12:30 and reconvened at 1:10 p.m.

Regarding Policy Issue 2, Commissioner Tenney questioned the Town's ability to ask the applicant how they would support our community. Staff will research our peer resorts.

Policy Issue 3: Should the Bell-Shaped Parcel, Mammoth Creek Park, East Gateway, and a portion of the South Gateway properties be designated as "Open Space?"

Deputy Director Bill Taylor stated that housing is only proposed on that portion of South Gateway owned by Mammoth Unified School District, Mono County, Kern Community, and the Foundation. Regarding population, Mammoth Creek Park, East Gateway and portions of South Gateway do not affect the population numbers but making the bell shaped parcel open space could reduce development by 450 PAOT. Community Development Director Mark Wardlaw stated that the Commission may recommend different language for different sites.

Public Comments:

(1) *John Walter* stated that Mammoth Creek Park should be open space with passive recreation. A line should be drawn between multi-purpose facilities with parking versus a true park like facility. East Gateway should be designated as a park now. Mammoth Community Water District has provided no analysis of further need for industrial park. Staff should review viewshed impacts. Mr. Walter stated that under this general plan, if we proceed as we are now, we will reach build-out in

about 10 years. Property between Mammoth Community Water District and Foundation should be set it aside now for a park. (2) *Jo Bacon* stated that she receives comments that people see the East Gateway parcel as open space. We should maintain it as open space and protect the Mammoth Mountain RV Park, the only year-round camping facility . Maintain open space by the South Gateway skate park. Also save the view corridor to the Sherwins, this should be an open view not a view between buildings.

Commission comments: Commissioner *Saari* opened discussion on conservation easements for the bell-shaped parcel. Mr. Saari also stated that he did not believe that the actual parcel to be transferred to Mammoth Lakes Housing within the South Gateway parcel has been clearly defined, but is owned by the Foundation. We must weigh all values in order to achieve a balanced community and maintain open space, housing, industrial, and commercial. Commissioner *McCarroll* stated his general concern that as much flexibility as possible be given in order to affect the best possible outcome. Additionally, designating open space may preclude us from something better. Neil stated that he did not agree with the concept of designating OS for the bell-shaped parcel.. Putting a portion of the bell-shaped parcel into a conservation easement and developing the rest, could bring the Town money. Mr. Saari favors the existing zoning. The east portion of South Gateway could be OS, but the IP designation allows the town more flexibility. State Highway 203 and RV Park also known as the North Gateway should be IP in order to allow flexibility. South Gateway should be in the IP designation in order to give the community as much flexibility as possible to deal with the future. Mr. McCarroll stated that he would not necessarily be in favor of workforce housing without seeing a project. The Planning Commission needs to be tough on a project by project basis. Mammoth Creek Park language should be toughened as to what is allowed on the property. Commissioner *Harvey* agreed with Commissioner *McCarroll's* comments. Commissioner *Saari* stated that he also agrees with Commissioner *McCarroll* and that flexibility is necessary. Commissioner *Tenney* stated her agreement with the need to be flexible, but we also cannot miss opportunities. Mrs. Tenney stated that North Gateway sets the mood, should be left as OS and a buffer for the industrial park and 203; East Gateway should be set aside as park. Mrs. Tenney stated that she is not in favor making the west side of Mammoth Community Water District industrial. Mrs. Tenney stated that she is troubled by Mammoth Creek Park and an IP designation. With regard to the bell shaped parcel, a large portion of the open space could be boardwalks and leveraged as an asset of the town to realize some preservation and benefit; same thing with Mammoth Creek Park. Staff will draft language. Commissioner *Duggan* stated that she does not want to see the bell shaped parcel for condominiums, favors leaving as designated but more definitive, incorporating policies more so not so generalized. Mrs. Duggan believes the transportation element key to be the key to success.

VIII. BUSINESS MATTERS

1. Fiscal Year Annual Planning Activities Report 2004-2005. Staff contact: Craig Olson, x269.

Deputy Community Development Director Bill Taylor stated that comments or suggestions for changes should be forwarded to Craig Olson as soon as possible so the document may be forwarded to the Town Council and the State.

IX. DIRECTOR'S REPORT

1. Director's Department Report

Community Development Director Mark Wardlaw advised the Commission that members of the Town Council and Planning Commission toured five projects and discussed concerns about some of the details. He will be writing a paper to the Town Council to request direction as to whether or not the Planning Commission and Town staff should spend time scoping out issues, which would require a reallocation of resources and affect the current work program. Vice Chair Saari requested a written summary.

X. ADJOURNMENT

The meeting ended at 2:25 p.m. and adjourned to a Special Adjourned Meeting of December 14, 2005, at 6:00 p.m. in the Council Chambers to hold a public hearing to take public testimony on General Plan Amendment Application 2003-01 Draft General Plan Update for the Town of Mammoth Lakes and the Draft Program Environmental Impact Report.

Respectfully submitted,

Mark Wardlaw
Community Development Director

Greta J. Boyer
Administrative Assistant

Letter 055

TOWN OF MAMMOTH LAKES PLANNING COMMISSION
Special Adjourned Meeting
Wednesday, December 14, 2005 – 6:00 p.m.
Council Chambers, Suite Z
Minaret Village Shopping Center

MINUTES

I. CALL TO ORDER

The meeting was called to order at 6:10 p.m.

II. ROLL CALL

Present were Commissioners Rhonda Duggan, David Harvey, Elizabeth Tenney, Vice Chair Roy Saari and Chair Neil McCarroll. Also present were Mark Wardlaw, Community Development Director; Bill Taylor, Deputy Community Development Director; and Sonja Porter, Senior Planner.

III. COMMENTS FROM THE PUBLIC

None.

IV. PUBLIC HEARINGS

1. **General Plan Amendment Application 2003-01 Draft General Plan Update for the Town of Mammoth Lakes and the Draft Program Environmental Impact Report.** Receive public testimony. No action will be taken.

Chair McCarroll stated that the purpose of today's meetings is to take public testimony, with all discussions being preliminary in nature. There will be no definitive discussion until all public comments on Draft EIR are responded to by staff. On January 9, 10, and 11, 2006, the Planning Commission will begin to definitively discuss policy issues as well as each issue of the general plan.

The public hearing at was opened at 6:13 p.m.

Pastor Justin Everson stated his appreciation of the hard work the Planning Commission has put into general plan process. Pastor Everson also stated he has spoken with David Wilbrecht regarding non-profits in general, faith based or not, concerning the loss of a community center, little green church, and the pricing of land not allowing for places to be available for meetings. Pastor Everson encouraged establishment of a

plan providing for non-profits in particular. Also in the existing general plan, churches are acknowledged as an integral part of community; the proposed general plan deletes any mention of churches. Pastor Everson asked for consideration of churches and non-profits in the proposed general plan. Deputy Director Bill Taylor stated that additional language is provided in IP zone to allow places of public assembly, including churches. Commissioner Saari stated his concern about addressing this issue and requested additional information to assist him in making a rational conclusion.

Andrea Clark, Executive Director for Mammoth Lakes Housing (MLH), stated that workforce housing is necessary for a viable, sustainable community. Current town policy is to house 80 percent of the workforce within the urban growth boundary; at a later date, MLH may choose to assist in housing the remaining 20 percent outside of the community. In order to address the changing needs of the community, MLH requires as much flexibility as possible within all land use designations of the general plan, except the Open Space and Forest Service designations. Housing would be provided through both new and refurbished units. Ms. Clark stated that the proposed residential reduction in maximum density will constrain the ability of MLH in continuing to house 80 percent of our workforce within the community; the residential zone should allow for something other than state density bonuses, also MLH requests additional flexibility in how bonuses are applied; it would be also be appropriate to have higher densities in the C1 and C2 zones; and the transit core allows up to 20 units per acre and up to double density for projects with additional community benefit--workforce meets that need. Mrs. Clark also stated that MLH believes that work force housing should be allowed in the IP designation. The current proposed draft recommends housing only in the South Gateway portion of IP, which may not be the appropriate location. Proposed draft should allow for housing in an entire IP designation so that housing can be placed where appropriate. Workforce housing should also be allowed in industrial zones with implementing measures. MLH believes that housing for the workforce is a health and safety issue, yet there is no mention of housing in Community Health and Safety section of the proposed general plan. Ms. Clark requested a reference to work force housing in the Community Health and Safety section and stated that density transfers should be maintained as an option.

David Dahl, a partner in the Sierra Nevada Inn, requested C2 density modifications, as greater density should be in the commercial zone rather than the residential areas. Mr. Dahl stated that if the Town makes it too difficult to redevelop existing properties, existing properties will not be redeveloped. Mr. Dahl asked that the Planning Commission carefully consider the modification to the C2 zoning.

John Walter representing the Advocates for Mammoth stated that the proposed general plan does not consider the impacts on public lands and the effect if we double population. Our visitors come here for the natural environment, yet the proposed general plan does not analyze the effect on the wilderness, trailheads, Lakes Basin, etc. Secondly, the Town and Mammoth Mountain Ski Area (MMSA) are not talking to each other. The fact that MMSA is looking at redevelopment has not been a secret, yet they lack mention in the proposed general plan. MMSA is the biggest employer, provider of amenities and transit provider and their actions need to be incorporated into the document. Mr. Walter pointed out that there is no analysis of schools, little of hospitals, fire departments, etc. that the Town does not have responsibility to provide mitigations, although CEQA indicates that the Town must analyze. Mr. Walter stated that the EIR has many good things, but also some glaring deficiencies. If existing policies are not adequate to mitigate we should strengthen them or mitigate them by adopting a project with a smaller PAOT. The attorney for the Advocates feels the EIR has shortcomings in the water and air quality areas. The document emphasizes resort density to get amenities, the Vision Statement is about quality of life, and there is no mention of economic diversification or maintaining a village in the trees. A Conservation Element is required but is not included. Mr. Walter stated that the staff should consider Alamar's proposal to sit down and go through process one more time--put another year into it; it is worth doing right. Mr. Walter requested withdrawal of the EIR to bring the document up to speed and circulate for comment.

Mary K. Prentice, a resident of Mammoth Lakes, read a letter and provided a copy to staff for entry into the record.

Marshall Minobe, a member of GPAG, stated that he supports a community based approach and the policy papers do not answer basic question of what the setback to workforce housing goal might be. The policy papers do not attack the interrelatedness of the general plan elements. Mr. Minobe stated that we have not been as informed as we should have been and requested that he be shown the plan's cohesiveness

Wilma Wheeler, Chair of Range of Light, Sierra Club, submitted written comments, concerning the impact on surrounding Forest Service lands and other public lands. Mrs. Wheeler stated that the increase in visitors will have great impact on areas like the Lakes Basin with overcrowding and over use. Mrs. Wheeler also stated that we must also consider water uses. Additionally, the redevelopment that Mammoth Mountain Ski Area is proposing is not considered in general plan and should be because it impacts the town and surrounding lands. Mrs. Wheeler also submitted written comments on behalf of her and her husband.

Policy Issue 4: Is workforce housing an appropriate use in the South Gateway Master Plan area (serving student, faculty, and general community)? Deputy Director Bill Taylor advised the Commission that the IP designation identified for workforce housing is for the South Gateway area, totaling approximately 80 acres and approximately 360 units, mostly student housing, uses accessory to the college, or available for workforce housing.

Public Testimony: *Jo Bacon* stated that college enrollment is declining and recommended that reservation of housing units without turning them over to another purpose. *John Walter* stated that land should be set aside for faculty, dorms, etc., and to limit to auxiliary uses supported by institutions and community facilities such as a performing arts center. More housing will result in urban sprawl. Mammoth Lakes Housing should be encouraged to fix up the older units. *Mary Prentice* stated that the property is exquisite, with unequalled views, perfect for performing arts, conference center, amphitheatre--workforce housing would considered urban sprawl. Mrs. Prentice encouraged redoing some of the older units in town keep the college area a beautiful spot for community/educational arts center. *Marshall Minobe* reinforced his point about how the policy papers do not do a good job satisfying and informing as he is unable to determine the types of impacts without sufficient analysis.

Commission Comments: Commissioner *Tenney* stated that her preference is leaning toward housing on the college campus for faculty and students. The area between the college and the water district parcel should be dedicate to OS, could be park land. Vice Chair *Saari* stated that the zoning language should be both flexible and integrated and is opposed to a 10 or 25 acre parcel being segregated from the college parcel. There should be flexibility for affordable housing on the South Gateway, just not a segregated parcel. Chair *McCarroll* stated his agreement with Vice Chair Saari regarding the need for flexibility of workforce housing in the IP zone. Mr. McCarroll also asked for additional research of the appropriateness of applications considering representations made to the Forest Service when the property was acquired. Mr. McCarroll stated that he cannot comment specifically until he sees a project application and would favor a master or specific plan for this area. Commissioner *Harvey* stated that there are many different mitigation solutions available in the affordable housing area that we did not have three and four years ago—the idea of utilizing older stock in town and excluding workforce housing from the South Gateway parcel may not allow us to meet needs. He said that we require flexibility and, is therefore, leaning in the direction of housing in South Gateway area. Commissioner *Duggan* stated that the original master plan of the Foundation at build-out included residences for staff and students and a large component for the arts. Mrs. Duggan encouraged caution so as not to impact previous commitments; workforce for this segment should be of the highest standard and quality, should be

well defined, overall in favor, but the language should be tightened. Vice Chair *Saari* stated that he has had no input from staff excluding the arts. Commissioner *Tenney* stated that she would consider housing in the IP zone subject to further specificity and adopted changes to the zoning. In response to Marshall Minobe comments regarding the housing element, Mr. Taylor stated that the Housing Element has been incorporated into the proposed general plan and does meet the requirements of State. E. L. Smoogen commented that housing should be regulated and asked that a definition of student be added so the community is aware for whom they are subsidizing housing.

Policy Number 5: Should the Draft General Plan establish controls to regulate the rate of development in the community?

Public testimony: *John Walter* stated that we are currently growing at the rate of 700 units per year and anticipates that it will higher in the future. We should put in place a slow down mechanism that will work; don't give density bonuses, don't make it easier for the developer. The best way to slow down is to take out things that add development, like density bonuses and incentives and add them later if there is not enough development. *Marshall Minobe* stated that in the past 5 years the growth rate has caused stresses in the community and recommended a study of other communities that have added growth control measures. What is the growth rate that will stabilize our community and help alleviate some of the stresses that have occurred?

Commission comments: Commissioner *Harvey* stated that market forces will dictate how fast and how long we will grow. Real estate development is cyclical, all triggered by different things that are hard to analyze. Our past eight years of good development and growth are not normal, considering that we have one of the toughest resort towns in America within which to develop. In light of our affordable housing mitigation and development impact fees, a developer must prove to his investment institution that there is a market and viability to building in our area. Commissioner *Harvey* stated that he is not in favor of permit cap as it does not solve the problem, but could compound it. Commissioner *Harvey* stated that we need common sense approaches. Chair *McCarroll* stated that he is leery of caps and believes that option 1 is way to deal with this issue. Commissioner *Saari* stated his concern is that the product being built is condominium hotels. Commissioner *Tenney* stated that this is her largest issue, and her fear that we are not getting the best possible outcome because we are not meeting the vision. Mrs. *Tenney* stated that the peer resort tour was an eye opener. Mrs. *Tenney* feels that development is coming too fast. Mrs. *Tenney* noted that Missoula has adopted a lighting ordinance based on ours; unfortunately, we have not been able to enforce the lighting ordinance except on a complaint basis. Mrs. *Tenney* also expressed her concern about how we take it slower to make sure it turns out okay. Our town can be fabulous and must be the

best we can make it. How do we assure we do it better than anybody else? A quick pace does not allow the Planning Commission to do their due diligence. Mrs. Tenney stated that she did not believe caps was the answer. The staff and Commission must take the time necessary to do their job correctly. Commissioner *Duggan* stated that Aspen had limited their permits; she was shocked at the small number of permits that they did issue, and limiting them did not solve the problems.

Further public testimony: *John Walter* questioned that if caps were not the answer, then what will happen in two years when we are not meeting the water needs. The Commission should determine some mechanism to slow development if monitoring programs say slow down. *Dieter Fiebigger* questioned when and how we apply the brakes. In the 70s and 80s it took many years to institute a water moratorium, now we're down to three years, can we use this as a thermometer? After two years of drought, can we use this as a measurement?

Policy Issue 6: Should the Draft General Plan set an objective of achieving LOS C or better, or should the Draft General Plan increase the Level of Service (LOS) standard for traffic performance from LOS C or better?

Senior Planner Sonja Porter stated that LOS D has been the Town's policy since 1997. If the policy changes, roads would have to be widened, sidewalks removed, and the visual character of the town could be impacted.

Public testimony: *John Walter* representing the Advocates for Mammoth stated a problem with Level D because if we accept a Level D we are setting ourselves up for failure when we have snow storms--we need to set a higher goal. Once again, Mr. Walter stated that the reduced development alternative would make it easier. *Marshall Minobe* stated that the Town has spent a lot of money on traffic modeling, yet we don't continue to use it as a tool to address different alternatives. Mr. Minobe proposed that the traffic model be used for more modeling to support planning activities.

Commission comments: Vice Chair *Saari* stated that traffic is a big concern. Moving from a LOS D to C could cause additional problems; our real goal should be to reduce from level D. Reducing to a Level C has great consequences that as a Commissioner he would not recommend. Chair *McCarroll* stated that Level D is consistent with sidewalks, etc., making a more attractive community. Mr. McCarroll recommended that we develop solutions that recognize who we are, what we are, and strive to get our residents and visitors out of cars. We must continue to emphasize getting people out of cars by building strategic parking facilities--thus shrinking Main Street to make it more pedestrian oriented could improve our community. Commissioner *Harvey* stated that our goal should be to be better than Level D. Mr. Harvey noted that his dream walk would be from Mammoth Creek Park to the Village on sidewalks. Mr.

Harvey stated that making larger roads and intersections will not solve our problems and believes that we can have a Lionshead-type transportation in Mammoth. Transportation this summer was nice with the trolley; moving to a Level C as a standard defeats what we have been working toward the last several years. Commissioner *Duggan* stated that a slower pace makes for a better community feel. Mrs. Duggan stated that she cannot approve of making roads bigger to improve traffic flow. Anything we can do to improve traffic flow is not tied to widening our roads but is tied to other issues that should be addressed. Our policy of Level D with a goal to improve is appropriate. Commissioner *Tenney* stated that our goal to leave cars at the lodging is based on our ability to provide adequate transportation. Mammoth Mountain Ski Area has limited its parking and must provide fun, reliable, and frequent transportation. Additionally, Mrs. Tenney felt that striving to achieve better than Level D should be our goal as a community but that it does not have to be our standard.

Commissioner *McCarroll* stated that we are much larger than our peer resorts and because of our size we have issues they don't have; transportation is an issue that we are facing. Mr. McCarroll noted that the traffic through North Village is a problem and is going to continue to be a problem but there are solutions. Mr. McCarroll's concern is the level of traffic now. Commissioner Duggan stated the need to address other options. Senior Planner Sonja Porter noted that the Town does have a traffic model working in conjunction with our GIS that is used on a regular basis. John Walter stated that we must consider the total traffic and must work with Mammoth Mountain Ski Area more. Dieter Fiebigger stated that last January he spoke to the Commission about parking, how to get people out of their cars, and his suggestion at that time was to consider a huge parking structure as you come in to town that connects with a bus system that brings our visitors into town.

V. REPORT

1. Director's Department Report

Director Mark Wardlaw recommended that the Commission adjourn to Tuesday, December 20, 2005, at 6:00 p.m. to continue with Policy Issues 7-16.

Thereafter, January 9, 2006, meeting has been rescheduled to 6:00 p.m., January 10, 2006, remains at 9:00 a.m. and January 11, 2006, remains at 9 a.m.

VI. ADJOURNMENT

The meeting ended at 9:00 a.m. and adjourned to a Special Adjourned Meeting of Tuesday, December 20, 2005, at 9:00 a.m. in the Council

Chambers to hold a public hearing to take public testimony on General Plan Amendment Application 2003-01 Draft General Plan Update for the Town of Mammoth Lakes and the Draft Program Environmental Impact Report.

Respectfully submitted,

Mark Wardlaw
Community Development Director

Greta J. Boyer
Administrative Assistant