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IMPACT ANALYSIS ■ WATER RESOURCES POLICY & MANAGEMENT ■ LAND & WATER USE ■ PROJECT PLANNING

Draft

ENVIRONMENTAL IMPACT REPORT

for the

NORTH ARBOGA STUDY AREA (NASA)

Master Environmental Assessment
and Constraints Analysis

County of Yuba

SCH # 92012045

Prepared for:

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Table of Contents (continued)

Appendices

List of Tables

Table of Contents (continued)

List of Figures

EXECUTIVE SUMMARY

This Environmental Impact Report has been prepared in accordance with the California Environmental Quality Act for the County of Yuba by Research Associates to address the potential impacts of development within the North Arboga Study Area (NASA) in southern Yuba County. The project includes up to 12 development projects and additional properties encompassing a total of 1,300± acres. Development will include up to 2,500 low and medium density single-family residential units, 205 acres of industrial use, and 10 to 20 acres of commercial uses.

This summary provides an overview of proposed actions and potential impacts. Legal requirements, environmental conditions, predicted impacts, and mitigation measures are discussed in detail in corresponding sections of the main text. Measures identified to reduce or eliminate potential impacts are presented sequentially in this summary.

Environmental issues identified by the County and other agencies in review of the project are summarized as follows:

- General Plan, zoning, and land use issues, including land use designations and patterns sensitive to environmental and administrative constraints, and long term planning strategies for County growth and development goals;
- Effects on overall County service levels and public services generally, including sheriff, fire, schools, water and sewer, stormwater drainage, solid waste, electricity, and parks and recreation;
- Project traffic generation and impacts on area road capacities, and on affected county roads and Highway 70;
- Air quality impacts related to vehicular emissions from project generated traffic;
- Exposure of new residents to noise in areas adjacent to Highway 70, the railroad tracks, and the airport;
- Geologic hazards and soils constraints;
- Impacts to biological resources, including potential for damage to wetlands, and potential for sensitive habitat and/or rare and endangered plant or animal species;
- Potential for historical and/or archaeological resources to exist within project lands.

These concerns and other issues are addressed to meet CEQA requirements, and provide full disclosure to County and agency decision-makers. As an integral part of each of the analyses, measures have been identified which must be implemented to reduce or eliminate adverse environmental effects. If measures are not adopted as required conditions of approval, the County must make formal findings recognizing that the project will pose significant adverse environmental impacts that have not been mitigated, and citing specific overriding considerations for failing to mitigate impacts.

The alternatives analysis includes a range of options which could be feasibly implemented. Alternatives selected for analysis include:

1. **Increased Density, Residential Development:** An average of four to six (4 to 6) units per acre, including residential development of most of the industrially zoned (M-1) property within the study area.

2. **Reduced Density, Residential Development:** An average of two (2) units per acre, including residential development and retaining all industrially zoned property within the study area.

3. **Mixed Density Residential Development:** A range of residential development including both single and multiple family housing and residential development of a portion of the industrially zoned (M-1) property within the study area.

4. **Alternative Location to Encourage Residential Development:** The County could determine that other areas are more suitable for the urban levels of development proposed.

5. **No Project:** The County can decide to reject all requests for General Plan amendments and rezoning, and allow development to proceed under existing land use designations and permitted densities.

Each alternative is briefly described and an explanation of relative advantage or disadvantage is presented. A conclusion regarding the environmentally superior development alternative is made as required by CEQA.

It is emphasized that, as for the proposed project, any alternative project design could still be subject to inclusion of mitigation measures as identified herein to be adopted as conditions of project approval.

In conclusion, findings of this analysis indicate that if all required mitigation measures are adopted and implemented as conditions of approval, the project can be developed without creating site specific adverse impacts on the environment. The project will contribute to significant cumulative impacts related to regional air quality, Statewide loss of agricultural land, and increasing demands on public services.

The following section summarizes the impacts and required mitigations for each of the topical analyses presented in the text.

GENERAL PLAN, ZONING, & LAND USE

Land Use Conflicts and the Enterprise Zone

The M-1 property lies adjacent to the existing Airport Industrial Park property, and provides an important buffer to residential development along its south margin. Preservation of the northern portion in an industrial zone (M-1 or M-3) will also serve to maintain the integrity of the central region of the Enterprise Zone. The airport property and M-1 zoned land within NASA constitute the only lands in the County served by regional air, rail, and highway transportation facilities, features which are usually considered to be essential for attracting industrial and commercial uses. Encroaching large-scale residential development would limit the types of industry that could be attracted, and could jeopardize the future success of this important economic development zone within the County.

Mitigation 1: The M-1 zoned land north of Buttercup Lane and McGowan Road must be maintained for industrial use. It may be desirable to rezone it to M-3, Light Industrial, to provide a more transitional land use between the airport zone and surrounding residential land uses.

Mitigation 2: That portion of the RRE zoned property that lies south of McGowen Parkway, east of Arboga Road, and west of the Western Pacific Railroad tracks should be maintained in its present zoning, permitting only low-density residential development in conformance with the airport zone restrictions.

Conflicts with Agricultural Uses

Potential conflicts of new development for the existing rural residential and agricultural landowners include harassment of livestock by pets, and complaints leading to curtailment of normal farming practices. In addition, the County should require that pets be restricted to fenced yards,

or tethered within the limits of the owners property, and controlled on a leash when off the owners property. Protection of local farm operations should be confirmed by requiring a deed clause informing home buyers of the County's intent not to place restrictions on normal farm operations.

Mitigation 3: A solid fence a minimum of six feet in height shall be constructed for all lots with property bordering active agricultural uses.

Mitigation 4: The County will require that pets be restricted to fenced yards, or tethered within the limits of the owner's property, and controlled on a leash when off the owner's property.

Loss of Agricultural Land

Soils on site are identified as class III, non-prime soils, but suitable for agricultural use. The California Department of Conservation has classified this area as "Farmland of Statewide Importance" on its 1988 draft farmland map. The loss of 600 ± acres of non-prime farmland (remaining vacant area within NASA) may not be individually significant, but when considered as a part of the total agricultural land lost to urban encroachment in California every year, the combined effect is significant. Following recommendations of the Department of Conservation, the County should recognize that the loss of agricultural land is a significant impact, and adopt a Statement of Overriding Consideration if urban development is to be permitted within the study area.

Mitigation 5: The County will require inclusion of an informational deed clause notifying residents of the presence of nearby agricultural activities and of the County's intent to allow and protect those activities.

Airport Safety Zones and Public Safety

Portions of the three airport zones do cover a segment of the northern properties, and development of these lands will conflict with safety zone restrictions. Lighting, electrical interference, and potentially hazardous uses could be created by development that might interfere with airport traffic. Housing development would create a land use that would expose significant numbers of people to safety hazards. For these reasons it is concluded that the subject properties must be limited to agricultural and/or limited industrial development, and low density residential development.

Mitigation 6: No development will be permitted within the "*Clear Zone*" (Zone 1). Development within the "*Approach - Departure Zone*" (Zone 2) shall be limited to residential uses which adhere to the RRE zoning standards, and to all Zone 3 standards. Development within the "*Overflight Zone*" (Zone 3) may include residential and industrial development that does not require or utilize any steady or flashing light that could be confused with an FAA navigational signal, generate smoke, attract large numbers of birds, or otherwise create interference detrimental to the safe operation of aircraft or airport instrumentation. Installations involving hazardous materials such as above ground oil tank farms or other chemical storage are also excluded from this zone.

High Voltage Power Lines

The presence of high voltage electrical power lines overlying the eastern study area raises concerns about the possible adverse health effects of electromagnetic radiation new residents. Safety concerns are also raised by potential interference with, and accidents involving, the existing PG&E lines within the NASA boundaries.

Mitigation 7: A minimum lot-line setback of 100 feet from right-of-way is required for development of human-occupied structures beside the high-voltage powerline easement.

Mitigation 8: Individual owners must coordinate with PG&E prior to beginning construction to identify construction safety measures. A record of consultation with the utility shall be placed on record with the Department of Planning and Building prior to issuance of building permits.

Odor

Two sources of odor may present substantial land use conflicts, including the existing OPUD sewage treatment plant, and nearby farming operations.

Mitigation 9: A minimum lot-line setback of 200 feet from the OPUD ponds shall be established for residential structures, and a solid fence shall be constructed to provide odor, sight, and noise control from the sewage treatment plant. The setback area may be occupied by uses such as parks, but not including schools.

Mitigation 10: The County will require inclusion of an informational deed clause notifying residents of the presence of the nearby sewage plant and of the County's intent to protect the existing land use.

PUBLIC SERVICES

Schools

District schools are operating at or near capacity at present, and any increase in the student population will require the addition of new classrooms and land for campus expansion. Development within NASA will impact district schools under present conditions.

Mitigation 11: The owner shall pay the Marysville Joint Unified School District fees adopted under Government Code Section 53080 at time of issuance of building permits.

Mitigation 12: The owner / applicant shall annex into the existing, or support the formation of, a school district sponsored Mell-Roos Community Facilities District (CFD) prior to recordation of the Final Map; provided the school district allows the annexation or causes the formation of a new CFD within 24 months of the date the Tentative Map is approved; and provided further that the applicant's obligation under the CFD plus the fees paid under Government Code Section 53080 is limited to mitigating the impacts to school facilities directly resulting from the project.

Mitigation 13: The owner shall reserve for sale to the Marysville Joint Unified School District (MJUSD) parcels of land identified by the district as potential school sites which lie within the owner's property. The reservation and acquisition of said properties shall be in conformance with provisions of the Subdivision Map Act.

Mitigation 14: The above conditions pertaining to school facilities shall be waived by the County if the applicant and the Marysville Joint Unified School District reach agreement to mitigate the impacts on the school facilities caused by the project and jointly request in writing that one or more of these conditions be waived.

Parks, Recreation, and Open Space

OPUD provides community park facilities within district boundaries. The County General Plan and Subdivision Ordinance requires park land dedication to the County of five (5) acres per 1000 population. Assuming a total of 2,500 homes, approximately 36.25 acres of park land will be required within the study area.

Mitigation 18: The owner shall annex into or support the formation of a Landscape and Lighting District prior to recordation of the Final Map. The District shall provide for the acquisition of parkland and park improvements including the installation of landscaping and park equipment, bike paths, sidewalks, irrigation, and lighting as well as maintenance of parks and the landscaped recreation/ floodway corridors along arterial and collector streets.

Mitigation 19: The owner shall submit to the Planning and Building Services and Public Works departments a residential street tree plan for review and approval prior to map recordation. Said plan shall be in accordance with the Yuba County Ordinance Code Section 12.82.40(10). Said street trees shall be planted prior to the issuance of the Certificate of Building Occupancy.

Water supply

Water systems must be checked to ensure that they meet the fire flow requirements for specific land uses. A second requirement is that the entire study area must be integrated into the OPUD water service system. Connection must be made to link water lines with the existing system in addition to the new wells and lines required. The number of water production facilities needed will depend upon actual yield for individual wells, and timing of build-out.

Mitigation 20: Prior to building permit approval, the Fire Flow Requirements of the Uniform Fire Code must be met for individual land use proposals. The Linda Fire Protection District Fire Marshal shall certify the adequacy of fire flows prior to issuance of any building permits within the North Arboga Study Area boundaries. Issuance of building permits for projects within OPUD is expressly conditioned upon full participation in the District for the construction and installation of required water lines, wells and treatment facilities, and any supporting equipment required.

Mitigation 21: Water service systems for individual projects must be designed to be fully integrated into the OPUD water service system to provide looped water systems. Connection must be made to link water lines with the existing system in addition to the new wells and lines required. Final water system design will be subject to review and approval of OPUD, in consultation with the County Public Works Director.

Mitigation 24: All lands not presently in Reclamation District No. 784 must be annexed to the district during the development process and prior to recording of final maps.

Mitigation 25: All development within areas subject to flooding shall provide for flood proofing of all structures pursuant to FEMA and County requirements, subject to review and approval of the Public Works Director.

Mitigation 26: Approval must be obtained from the State of California to abandon flood inundation easements, or, to obtain approval of development plans in areas where the State has inundation and flowage easement rights under the Sacramento and San Joaquin Drainage District.

Mitigation 27: The owner shall submit to the Public Works Department for review and approval drainage plans and calculations which are prepared by a registered engineer for the proposed project to determine the quantity of increased drainage runoff. Projects that will increase downstream drainage flow will not be approved by the County until adequate drainage facilities are completed. Initially, projects may be approved that incorporate on-site detention or retention ponds that will prevent any increase in downstream storm water runoff. Owner shall construct the drainage facilities in conformance with the plans approved by the Public Works Department.

Mitigation 28: Detention basin and drainage corridor areas shall be landscaped to meet with approval of the County of Yuba. Landscaping shall consist of grass or other ground cover approved by the Public Works Department and Planning and Building Services Department.

Mitigation 29: Subdivision design shall include provision of for an on-site detention facility. Lot design shall include a provision for prevention of off-site ponding of surface water runoff on adjacent lands. Plans for the detention facility and lot design shall be prepared by a registered engineer and submitted to the Yuba County Department of Public Works for review and approval.

TRAFFIC & CIRCULATION

The amount of vehicular traffic which might be generated by the NASA study area, as well as by other background development, has been estimated and assigned to the area circulation system. Resulting traffic operations have been quantified, and measures to mitigate identified impacts to a level of insignificance are identified.

Development of the residential and industrial uses in the North Arboga Study area would generate gross totals of 34,533 daily trips with 3,996 trips occurring during the evening peak hour. The McGowan Plaza Commercial Center, when fully developed, is expected to generate gross totals of 4,595 daily trips with 505 trips occurring during the evening peak hour.

However, many of the study area trips represent opposite ends of trips which will originate and terminate within the project area boundary. Review of traffic projections made by the model suggest that about 54% of the gross area trips would leave the study area. When the Arboga area is fully developed about 35% of the commercial trips and 30% of the industrial trips will be internal to the project area. After accounting for the internal and "pass-by" trips, the total new external trip generation for the project area would be 21,111 new daily trips, with 2,476 new trips occurring during the PM peak hour.

The McGowan Parkway intersections on the State Route 70 interchange are a particular concern. If the interchanges are not modified to provide additional travel lanes, projected traffic volumes would meet warrants for signalization on a two lane road. However, it is not feasible to signalize these intersections without modifying the interchanges to add left turn lanes.

The effect of this future development on area streets, highways and intersections will be significant. Most of the area streets which are included in the Yuba County Circulation Plan will carry volumes which will warrant widening the roads to four lanes.

Under the cumulative forecast, signalization will be required at the intersections of most major south Yuba County roads. Assuming that typical intersection geometrics are installed, each intersection can be made to function at LOS "C" or better. This analysis accounts for two new interchanges on SR 70 which will need to be constructed and assumes that the McGowan Parkway Interchange on SR 70 will need to be reconstructed.

benefit for reimbursement as subsequent development occurs. The preferred mechanism should be determined by the Planning Director in consultation with the Public Works Director.

Implementation Schedule: This improvement would not be needed until a significant portion of the NASA area west of the railroad is built. In fact, if McGowan Parkway is extended west through the Centex Subdivision (Project 13), the "Existing plus NASA area" daily traffic volume would be reduced to a level where a four lane road is not needed. Without the McGowan Parkway extension, the roadway would need to be widened when 80% of NASA west of the railroad is built.

Impact: Development of NASA's industrial area will increase traffic on Arboga Road north of McGowan Parkway.

Mitigation 32: Arboga Road must be widened north of McGowan Parkway to provide a four-lane section. The roadway must be widened to its ultimate four-lane section with shoulders and must extend from McGowan Parkway in the south to the limits of the industrial area in the north. This widening will be approximately 2,700 feet long. (Estimated cost = approximately $405,000, depending upon the access layout of the industrial area onto Arboga Road.)

Implementation Schedule: This improvement would not be required until traffic on Arboga Road reaches 12,000 ADT. This threshold would not be reached until about 85% of the NASA area is built out.

Impact: The development of the project will result in traffic volumes at the McGowan Parkway / Arboga Road intersection which meet warrants for signalization.

Mitigation 33: The intersection of McGowan Parkway and Arboga Road must be reconstructed and signalized. In conjunction with the Arboga Road reconstruction noted above, the McGowan Parkway intersection should be reconstructed to provide the following configuration:

Northbound:	1 Through lane and 1 Through Plus Right Turn lane;
Southbound:	2 Through lanes and 1 Left Turn lane;
Westbound:	1 Left Turn Lane and Right Turn lane

(Estimated traffic signal cost = about $125,000.)

Implementation Schedule: Install when warrants are met. This threshold is likely to be met when about 90% of the NASA is built out.

Impact: The development of the NASA project area will increase traffic volume on McGowan Parkway west of the SR 70 interchange, increasing overall delay and congestion.

Mitigation 34: McGowan Parkway must be widened to a four-lane section from Olivehurst Drive to SR 70. (Estimated cost = about $1,400,000.)

Implementation Schedule: This improvement should be triggered by 12,000 ADT on McGowan Parkway. This threshold would likely be reached when about 50% of the NASA project is built out.

Impact: Development of the NASA area will contribute to the need to signalize the intersections on the State Route 70/McGowan Parkway Boulevard interchange.

Mitigation 35: The McGowan Parkway/State Route Highway 70 interchange must be reconstructed as build out approaches.

Implementation Schedule: This mitigation would not be needed until the area is nearly built out, and may best be implemented as a cumulative mitigation.

Improvements needed under cumulative conditions.

Impact. The cumulative development anticipated in the south Yuba County area will significantly increase traffic volumes on study area streets and intersections. It is difficult to unilaterally develop an area wide improvement program when the major potentially participating developments are on different schedules. Therefore, the recommended mitigation would be for the NASA area owners to agree to facilitate and participate in the establishment of a mechanism to finance identified circulation system improvements.

Mitigation 36: A two part strategy should be implemented to mitigate regional impacts:

36A. A Public Facilities program, Area of Benefit or similar financing strategy should be established for the south Yuba County area, including, at a minimum the circulation system improvement indicated in Table 10. As indicated, these facilities are regional in nature, and either involve construction of roadways already included in the Yuba County Circulation Element or roadways which should be added.

36B. Programs and strategies to reduce trip generation and dependence on the single occupant automobile must be developed. Yuba County must provide a policy basis and Transportation Systems Management (TSM) ordinance which

requires employers to implement such programs and requires that new development include provisions for alternative transportation modes. As a part of this effort, the NASA owners must incorporate bicycle and pedestrian facilities into the project plan. In addition, the plan should include facilities, such as bus turn outs and Park & Ride Lots, which will facilitate future transit service and car pooling.

Impact. Cumulative Development in the South Yuba County area will contribute to the need for regional circulation improvements, including:

1. Third Bridge Crossing;
2. SR 70 Marysville Bypass; and
3. Widening of SR 70 to Freeway standards.

Regional circulation improvements are being considered by Caltrans and Yuba County, although each is at a different planning stage. At this point in time, the Marysville Bypass exists only as a designated corridor around the community, with much work remaining before an alignment may be selected. Currently Caltrans is planning both SR 70 widening and the Third Bridge over the Feather River, but each project is many years from completion.

According to Caltrans, a key element in the eventual implementation of these improvements will be local (ie., Yuba County) participation in the cost of right-of-way and construction. Caltrans has indicated that without local participation, none of these improvements will be constructed. Various funding sources are being considered, including a local sales tax, a County-wide Circulation Fee and Impact fees. County-wide Circulation Fee and Impact Fees has recently been identified for Yuba County.

Mitigation 37: When implemented by Yuba County, the NASA area should participate in the local funding program to mitigate the MEA's cumulative impacts. (Estimated cost = about $1,500 per residence.)

AIR QUALITY

Based upon the comparison of project vehicle emissions to significance threshold levels, it is concluded that the project will produce significant adverse air quality impacts which are unavoidable and cannot be completely mitigated. This conclusion is further supported by the additional impacts calculated from primary stationary sources. The mitigation measures identified by the Feather River Air Quality Management District to reduce emissions should be implemented to the extent feasible.

In addition, the County should acknowledge the unavoidable impacts of area development on air quality, and prepare a Statement of Overriding Consideration under section 15093 of CEQA if development is to be subsequently approved. Based upon Sacramento Metropolitan Air Quality Management District threshold guidelines, auto emissions from buildout of the north Arboga area will contribute to significant adverse air quality impacts within the basin, and special mitigation should be required. As for all projects in the region, the project will contribute to cumulative air quality impacts on a cumulative basis as well.

Provision of bike lanes and sidewalks are standard conditions of Tentative Map approval for all new projects and are therefore not identified herein. Mixed land use is an existing feature within NASA, and is identified as a recommended mitigation in the discussion of Land Use impacts.

Mitigation 38: Industrial and commercial development with more than 25 employees will be required to prepare and implement a trip reduction and ridesharing program including coordination of carpools, and establishment of some form of flex-time work hours including staggered work schedules and compressed work weeks (ie., 4 days @ 10 hours).

Mitigation 39: An appropriate site near the McGowen / Highway 70 interchange should be identified by Department of Planning and HATA staff for development of a park-and-ride lot. A per-unit based fee can be assessed for all new development to cover the costs of development of the lot.

Mitigation 40: The County will require preservation of the abandoned railroad corridor that forms the southwestern NASA boundary and extends through the Plumas Lake Specific Plan area as a potential long term light-rail route to link with the Sacramento rapid transit system, or alternatively, as a future roadway or bicycle route within the south County area.

Highway Noise

Mitigation 44: For all residential development, a 100-foot lot-line setback is required from the edge of pavement of Highway 70, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the Public Works Director in consultation with the California Department of Transportation.

Mitigation 45: Window or through-the-wall ventilation or air-conditioning units shall not be permitted for units along the highway or railroad corridors.

Mitigation 46: Exterior walls facing the highway or railroad tracks shall be wood frame structure with enhanced insulation in cavities. Wood or stucco finish should be applied over wood or gypsum sheathing. Gypsum wall board 0.5 inch thick, attached with resilient channels, shall be used on interior wall faces and ceilings, or equivalent method to meet STC requirements.

Mitigation 47: Double-pane windows with a minimum Sound Transmission Control (STC) rating of 34 shall be used on all wall sides facing towards the highway or railroad tracks. Windows on these sides should comprise less than 25 percent of the wall area. Sliding glass doors and other doors facing towards the highway should have a minimum STC rating of 34.

Railroad Noise

Mitigation 48: For all residential development, a 100-foot lot-line setback is required from the edge of the railroad tracks, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the Public Works Director.

Yuba County Airport

Mitigation 49: New single-family residences and school classrooms will be allowed in areas having airport caused noise between the 65 to 75 db (Community Noise Equivalent Level: CNEL) provided the following criteria are met:

a) The proposed structure is constructed in such a manner so that the interior noise level does not exceed 45 db(CNEL).

b) Avigation noise easements are secured prior to issuance of building permits and as a condition of subdivision or other discretionary permit approval.

GEOLOGY & SOILS

Potential geologic hazards that could pose a significant problem within the study area include earthquake activity (ground shaking), flooding, and expansive soil. Supporting evidence is given with respect to each of these potential geologic hazards.

Seismic Safety

Mitigation 55: All structures built as part of this project should be designed with frames bolted to foundations. In addition, potential home buyers should be informed through an informational deed clause of the seismic risk associated with the Sierra foothills region.

Expansive Soil

Mitigation 56: The Subdivision Map Act of the Business and Professional Code (section 11010) requires that soil conditions on all tract developments of five lots or more be studied by a registered civil engineer. The engineering study should include laboratory tests for soil expansion.

Erosion Control

Mitigation 57: Owner shall submit to the Public Works Department for review and approval an erosion and sediment control plan. Subject to approval by the Public Works Department, oil and grit separator, sediment traps, evaporation basins, slow restriction devices and/or other methods to reduce the volume of grease and oil pollutants caused from street surface runoff shall be installed in the storm drain system. Owner shall also submit storm drainage plans to the Public Works Department for review and approval.

BIOLOGICAL RESOURCES

There are very few biological constraints on the development of the Nasa, particularly due to the long-term residential/agricultural use of the project site. Two areas need to be addressed, however, when considering further development of the site:

1) **Wetlands:** The presence of extant vernal pools on site and the possibility of other wetlands masked by agricultural activities indicates a need for a wetlands delineation of individual properties as development is proposed. Delineation studies will also determine whether the Army Corps of Engineers has jurisdiction over the irrigation canals/ditches in the area.

CULTURAL RESOURCES

Project construction will require the excavation and grading of a substantial surface area. Although lands within NASA are not particularly sensitive, it is possible that subsurface prehistoric and/or historic materials may be disturbed as a result of grading activities.

Mitigation 64: Should any prehistoric or historic artifacts be exposed during excavation and construction operations, work shall cease immediately and the Department of Planning and Building shall be notified. A qualified archaeologist shall be consulted to determine whether any such materials are significant prior to resuming ground breaking construction activities. Standardized procedures for evaluating accidental finds and discovery of human remains shall be followed as prescribed in Appendix K of the California Environmental Quality Act.

INTRODUCTION

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PROJECT DESCRIPTION

INTRODUCTION

This Environmental Impact Report has been prepared for the County of Yuba by Research Associates to address the environmental constraints and potential impacts of urban development within the North Arboga Study Area (NASA). The report is intended to satisfy requirements of the California Environmental Quality Act (CEQA), and to provide County decision makers with adequate information to use as a basis for decisions regarding pending and future development plans.

The report is intended to provide a master environmental assessment to be used as a basis for evaluating specific development proposals within the NASA area. Current proposals are reviewed for sensitivity to the identified constraints, and implementation of mitigation strategies identified within this report. It is the County's intention that CEQA review for project's which conform to these criteria will be completed through this EIR process. Project's that conflict with identified constraints and/or fail to implement mitigation measures may be required to undergo separate review through preparation of a supplemental or subsequent Environmental Impact Report.

Section 15121 of the 1986 CEQA Law and Guidelines defines the role of an EIR in the decision making process and is cited here to clarify the purpose and intent of this document.

> *15121*
> *(a) An 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. The public agency shall consider the information in the EIR along with other information which may be presented to the agency.*
>
> *(b) While the information in the EIR does not control the agency's ultimate discretion on the project, the agency must respond to each significant effect identified in the EIR by making findings under Section 15091 and if necessary by making a statement of overriding consideration under Section 15093.*
>
> *(c) The information in an EIR may constitute substantial evidence in the record to support the agency's action on the project if its decision is later challenged in court.*

An EIR, therefore, does not directly control decisions regarding a proposal. It is intended to ensure that land use and community planning decisions are based upon a solid body of information, and a clear understanding of potential environmental effects of the project. If a project is to be approved which will adversely impact the environment, decision-makers must explicitly define the overriding considerations in a formal statement of findings to inform the public of their reasoning.

As described in detail in the Project Description which follows, the study area includes 1,300± acres located in the southwestern region of Yuba County approximately five miles south of the City of Marysville. The area is bound by the Northern Railroad tracks on the west, Plumas-Arboga Road on the south, State Highway 70 on the east, and Helveta Road, Clark Slough, and 11th Avenue on the north. Three different property owners have title to undeveloped lands in the project area for which eight separate subdivision maps are proposed.

The "project" in this case involves analysis of the entire study area, and review of eight proposed developments. Existing County land use designations include a mixture of industrial (M-1) and residential (RRE, R-1, and R-2) designations. Surrounding uses include the County airport, a chemical manufacturing plant, the railroad and State highway corridors, and mixed agricultural and residential uses.

The North Arboga area is related to other rapid growth planning areas, particularly the Plumas Lake Specific Plan area bordering the study area to the south, and Wheeler Ranch which borders the southwest margin. Several environmental and related land use planning issues have been identified by the County for in-depth analysis in this Environmental Impact Report. These are summarized as follows:

- General Plan, zoning, and land use issues, including land use designations and patterns which are sensitive to environmental and administrative constraints, and long term planning strategies for County growth and development goals;

- Effects on overall County service levels and public services generally, including sheriff, fire, schools, water and sewer, stormwater drainage, solid waste, electricity, and parks and recreation;

- Project traffic generation and impacts on area road capacities, and impacts on affected county roads and Highway 70;

- Air quality impacts related to vehicular emissions from project generated traffic;

- Exposure of new residents to noise in development areas adjacent to Highway 70, the railroad tracks, and the airport;

- Geologic hazards and soils constraints throughout the plan area;

- Impacts to biological resources, including potential for damage to wetlands, and potential for sensitive habitat and/or rare and endangered plant or animal species;

- Potential for historical and/or archaeological resources to exist within project lands.

These concerns and other issues are addressed to meet CEQA requirements, and provide full disclosure to agency and County decision-makers. As an integral part of each of the analyses, measures have been identified which can be implemented to reduce or eliminate adverse environmental effects. Long and short term impacts, unavoidable effects, growth inducing impacts, and cumulative impacts are also described.

Report Preparation

In addition to the CEQA Law and Guidelines, County planning documents were utilized in preparing this report, including the zoning ordinance and elements of the General Plan. Information utilized from these documents is summarized in this report and referenced in the text. Copies are available in the Planning Department for more detailed review.

Technical analyses prepared specifically for this project are summarized in the text and presented in full in the attached appendices. These include:

- a traffic engineering analysis prepared by KD Anderson & Associates;

- an engineering analysis of flood conditions and drainage requirements prepared by M-H-M, Inc.;

- an engineering analysis regarding provision of water and sanitary sewer services prepared by Laughlin & Co;

- an analysis of geologic conditions and hazards prepared by Richard L. Ford (California Registered Geologist #4489);

- an assessment of biological sensitivity and constraints prepared by Dr. Kenneth D. Whitney;

- an computer modelling analysis of expected emissions and air quality impacts by Research Associates;

- an economic modelling analysis of fiscal and economic conditions resulting from land development prepared by Regional and Economic Sciences.

As identified in the Table of Contents, primary topics are considered individually, followed by the more integrative analyses required under CEQA. Each section includes a description of the existing environmental setting and constraints to development, followed by analysis of potential development impacts. Mitigation measures listed are those which must be implemented to reduce impacts below a level of significance. A summary of all recommended measures, and evaluation of the twelve individual parcels proposed for development, is presented at the end of the report. Appendices include a list of persons consulted, references, agency responses, and technical reports.

Research Associates certifies that this document represents our objective, professional analysis of the project. We also hereby certify that no member of our staff has any personal, financial, or other interest in the subject project.

PROJECT DESCRIPTION

Yuba County has determined that an Environmental Impact Report will be prepared for the North Arboga Study Area (NASA) to develop a master environmental assessment and constraints analysis, and formulation of mitigation requirements for proposed and future development. The report is intended to provide a master environmental assessment to be used as a basis for evaluating specific development proposals within the NASA area. Proposals will be reviewed for sensitivity to the identified constraints, and implementation of mitigation strategies identified within this report.

The study area includes 1,300± acres located in the southwestern region of Yuba County approximately five miles south of the City of Marysville. The area is bound by the Sacramento Northern Railroad tracks on the west, Plumas-Arboga Road on the south, State Highway 70 on the east, and Helveta Road, Clark Slough, and 11th Avenue on the north. (See figures 1 and 2).

Land Use & Environmental Setting

Current land uses include a mixture of agriculture, residential development, and industrial operations. Predominant zoning classes include industrial (M-1) and residential (RRE, R-1, and R-2) designations. Existing uses within and surrounding the study area include:

- the County airport north of the area, including the Airport Enterprise Zone;
- active railroad lines which run north and south through the center, and along the northwestern margin of the study area;
- State Highway 70, which forms the eastern boundary to project lands;
- a high-voltage powerline corridor parallel to Highway 70;
- mixed agricultural uses including grazing land and grain crops;
- the existing sewage treatment plant operated by the Olivehust Public Utility District (OPUD);

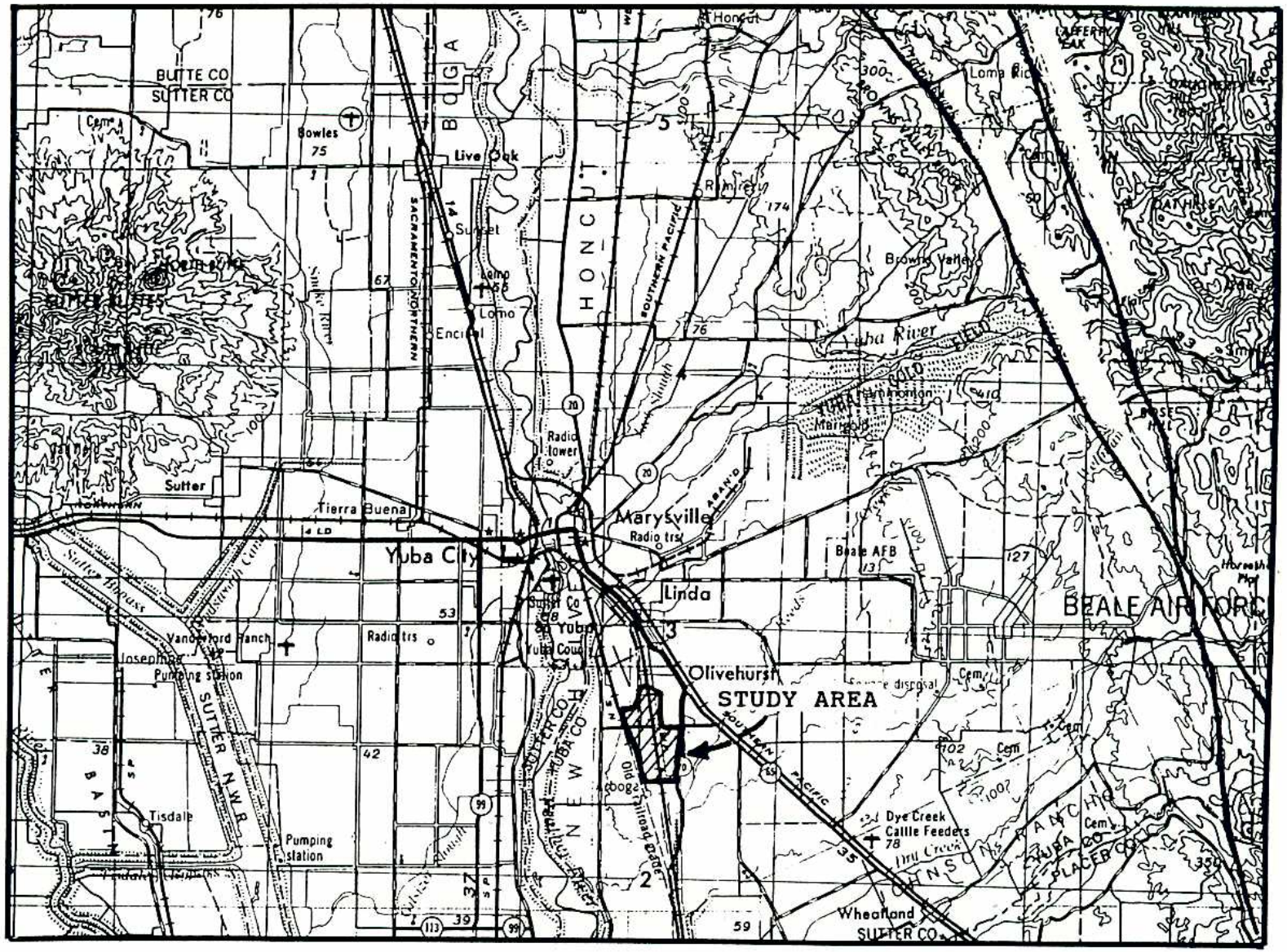
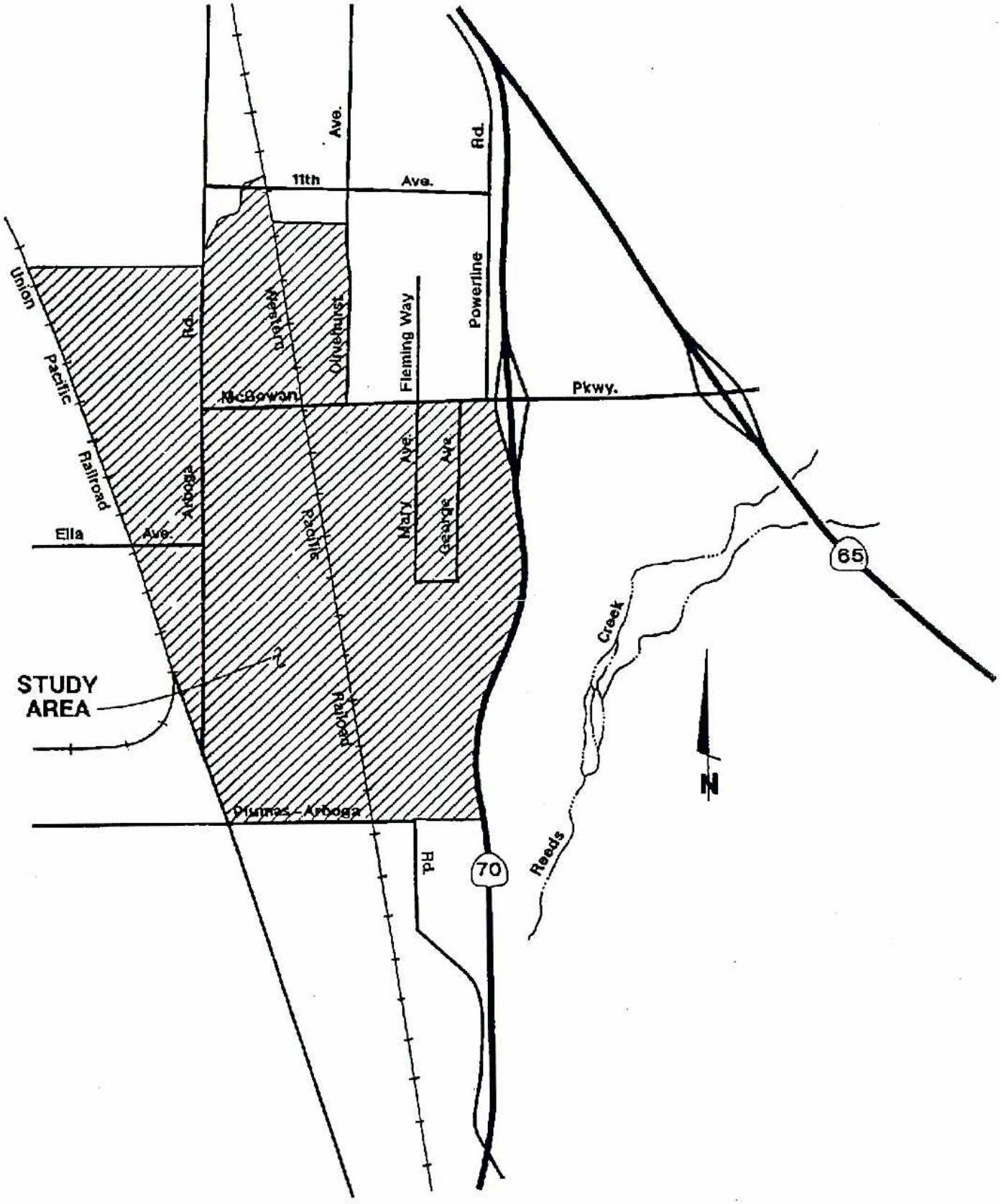


Figure 1. General location map for the North Arboga Study Area, Yuba County, California (1 inch = approx. 4.5 mi).



VICINITY MAP

Figure 2

Source: kdAnderson Traffic Engineers

- mixed residential uses ranging from older low-income multi-family and single-family housing, to new middle-income single-family tract homes, and a variety of small farm houses;

- limited neighborhood commercial uses, including a convenience store and gas station on McGowen Parkway at the State Highway 70 interchange, an auto parts store, and two family-owned markets;

- other large special study planning areas, particularly the Plumas Lake Specific Plan (which now encompasses the former Wheeler Ranch project) totalling approximately 13,000± dwelling units;

- several agricultural/industrial plants located approximately 0.75 mile west of the study area;

The entire NASA area has been subjected to intense human activity and ground disturbance. Biological sensitivity is generally low, although some vernal pools and drainages are found within the area. Other than residential landscaping, very few trees exist. Portions of the grazing lands and fallow lands may contain small vernal pools which may qualify as wetlands under the jurisdiction of the U.S. Army Corps of Engineers. Limited riparian vegetation has become established along roadside drainage ditches. Rice land also provides habitat for waterfowl, and grazing land provides forage for raptors.

Area development would be served by the Yuba County agencies, local special districts, and private utilities. Law enforcement would be provided by the Yuba County Sheriff's department. Responsibility for fire protection is split between the Linda Fire Protection District and the Olivehust Public Utility District. OPUD is also responsible for water, sewer, parks, and lighting services. Reclamation District 784 is responsible for storm drainage and flood control for most of the property. NASA lies within the boundaries of the Marysville Joint Unified School District. Public transportation is provided by the Hub Area Transit Agency. Solid waste collection is the responsibility of the Yuba-Sutter Disposal company. Pacific Gas and Electric Company provides energy utilities.

Three different property owners have title to lands proposed for development as 8 separate subdivisions within the project area. Preliminary development proposals in NASA are summarized in Table 1 and Figure 3 below.

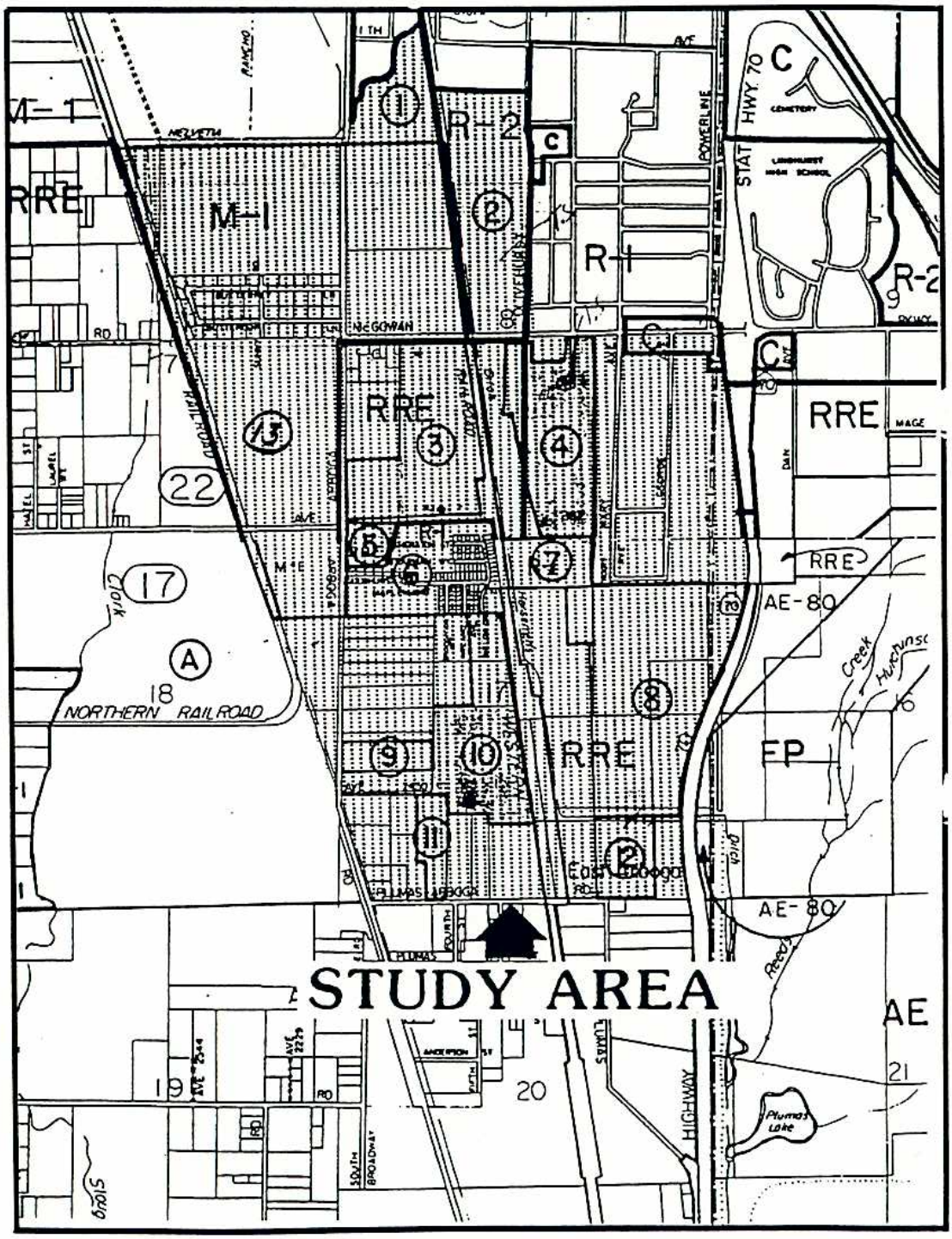
Table 1

Existing Developments & Proposals Within the North Arboga Study Area

Project #*	# of lots	Developer
1	NA - project deleted from NASA Study	
2	274 ±	Approved Tentative Map*
3	350 ±	Ron Ward Construction
4	217 ±	Approved Final Map*
5	47 ±	Withdrawn*
6	184 ±	Approved Tentative Map*
7	106 ±	Jon Quitiquit Investments
8	418 ±	Jon Quitiquit Investments
9	47 ±	Jon Quitiquit Investments
10	217 ±	Ron Ward Construction
11	60 ±	Jon Quitiquit Investments
12	92 ±	Jon Quitiquit Investments
13	536 ±	Centex Homes / Fred Draper
Total:	2548 ±	

See Figure 3 for location within study area.
(Source: Yuba County Department of Planning and Building Services, 1991)
*Included for purposes of cumulative impact analysis.

Figure 3 Detailed index and zoning map of the North Arboga Study Area (1 inch = approx. 2400 ft).



Use of this Report and Required Approvals

The "project" in this case does not involve specific land development plans, but rather a land use scenario in which existing land use designations are changed to allow a variety of residential, commercial, and industrial development on lands surrounding the Arboga area. Existing County land use designations include a mixture of industrial (M-1) and residential (RRE, R-1, and R-2) classifications.

For the eight proposals identified above, development entitlements are to be granted at this time, including revision of General Plan and zoning land use designations, and approval of tentative subdivision maps. Individual development proposals are evaluated utilizing the information and mitigation requirements identified in this report in the section entitled *Summary Evaluation of Individual Projects*.

Multiple discretionary actions are required before construction could begin on any of the development proposals (Table 1) within the North Arboga Study Area. This EIR document, together with a project specific Initial Study to evaluate adoption and implementation of the mitigation requirements identified herein, will be used as a basis for project review by each of the reviewing agencies.

Individual applicants will be required to obtain a range of approvals and entitlements preliminary to gaining approval of Tentative Subdivision Maps and Tentative Parcel Maps, which will include the following:

- County approval of a Mitigation Implementation Plan prior to final approval of specific projects in every case;
- a General Plan Amendment(s) to establish consistent land use designations;
- rezoning consistent with the General Plan and development proposals;
- annexation(s) to integrate lands within service agency boundaries for water, sewer, drainage, and fire protection, and in some cases, detachments from existing service boundaries as a part of annexation;
- formal abandonment of flood inundation easement rights owned by the State of California;

- Approval of wetlands delineation studies and wetlands mitigation plans by the U.S. Army Corps of Engineers;

- approval of aviation noise easements for properties within designated airport noise zones;

- others as required to meet Federal, State, and local legal requirements.

Additional approvals may be required as conditions of approval for Final Maps and/or issuance of building permits, including:

- Final Improvement Plans;

- grading and erosion control plans;

- final design of storm drainage systems to meet standards imposed under the County's National Pollution Discharge Elimination System permit (NPDES);

- approval and implementation of specific funding mechanisms, special district formation, and/or payment of impact fees;

- others as required to meet Federal, State, and local legal requirements.

Developers must also obtain demolition permits from the County Building Department prior to removal of existing structures. The Yuba County Health Department must issue certification of abandonment of any wells, septic tank(s), and irrigation systems on the property.

All required development and impact fees must be paid to the appropriate agencies by the developers. Additional requirements may have to be met to satisfy State and Federal Regulations, and to meet County regulations regarding mitigation compliance, and other legal standards, and are not excluded by inadvertent omission from this listing.

APPENDIX 1

PERSONS & ORGANIZATIONS CONTACTED

&

EIR Preparation Team

PERSONS & ORGANIZATIONS CONTACTED

Yuba County

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James P. Manning, Deputy Director

Karri L. Campbell, Associate Planner

Pete Calarco, Associate Planner

John E. Wright, Director of Public Works

United States Department of the Interior, Fish and Wildlife Service

Wayne S. White, Field Supervisor

State of California, Governor's Office of Planning and Research

David C. Nunenkamp, Deputy Director, Permit Assistance

State of California, Department of Transportation, District 3

Robert M. O'Loughlin, Chief, Planning Branch C

State of California, Department of Conservation

Stephen E. Oliva, Environmental Program Coordinator

State of California, California Integrated Waste Management Board

Lorraine Van Kekerix, Senior Waste Management Specialist, Waste Generation Analysis and Environmental Assessment Branch

State of California, Department of Fish and Game

James D. Messersmith, Regional Manager

State of California, Department of Food and Agriculture

Shelley Mountjoy, Environmental Reviewer, Agricultural Resources Branch

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HUB Area Transit Authority

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Pacific Gas & Electric

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M-H-M, Inc. Civil Engineers

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Kenneth D. Whitney, Ph.D., Consulting Biologist

Jon S. Ebeling, Ph.D., and Frederica Shockley, Ph.D., Regional and Economic Sciences

APPENDIX 2

REFERENCES

REFERENCES

Airport Land Use Commission, *Airport Land Use Commission Policy Plan*, Sacramento, California, December 1988.

California Council of Civil Engineers and Land Surveyors, *Subdivision Map Act*, as amended January 1, 1990, Sacramento, 1988

California Department of Conservation; *Erosion & Sediment Control Handbook*, Resources Agency, State of California, May 1981

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Remy, Michael H., Tina A. Thomas, Sharon E. Duggan, and James G. Moose, *Guide to the California Environmental Quality Act (CEQA)*; 1991 Edition, Solano Press, Berkeley, California.

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Shaeffer, Wright, Taggert, and Wright; *Urban Storm Drainage Management*, Marcel Dekker, Inc., New York, 1982.

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United States Environmental Protection Agency, *America's Wetlands, Our Vital Link Between Land and Water*, Washington, D.C., February 1988.

United States Department of Housing and Urban Development, Office of Policy Development and Research, *Noise Assessment Guidelines*; U.S. Government Printing Office, Washington, D.C., 1984.

Yuba County General Plan

Land Use Element, Amended 7/1/86
Noise Element, Adopted 8/26/80
Open Space and Conservation Element, Adopted 12/73
Seismic Safety and Safety Elements, Adopted 8/26/80

Yuba County Zoning Ordinance, Title 12, Ordinance No. 1037, County of Yuba, Amended December 1989

Yuba County, California, *East Linda Specific Plan*, May 14, 1990.

Yuba County, *Final Environmental Impact Report for the East Linda Specific Plan*, February, 1990.

APPENDIX 3

AGENCY COMMENTS AND NOP RESPONSES

The County of Yuba

DEPARTMENT OF PUBLIC WORKS

JOHN E. WRIGHT, DIRECTOR

215 FIFTH STREET
MARYSVILLE, CALIFORNIA 95901

(916) 741-6421

February 3, 1992

Mr. Jeff Harvey
Research Associates
5813 Fernbrook Court
Carmichael, CA. 95608

SUBJECT: FLOOD INUNDATION EASEMENTS

Dear Mr. Harvey:

Per our telephone conversation of Friday, January 28th, I am forwarding a copy of a map showing the referenced easements in Yuba County. Please note that those easements west of State Highway 70 appear to be in the North Arboga Study Area and need to be addressed in the EIR.

Sincerely,

JOHN E. WRIGHT
DIRECTOR OF PUBLIC WORKS

JEW:deb
HARVEY
ENCL.
CC: Mr. Mike Smith, MHM Engineering, Inc.
Mr. Karri Campbell, Yuba County Planning Department

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Fish and Wildlife Enhancement
Sacramento Field Office
2800 Cottage Way, Room E-1803
Sacramento, California 95825-1846

In Reply Refer To:
PPN 1104

March 9, 1992

Mr. Karri Campbell
Yuba County Planning
938 14th Street
Marysville, CA 95901

Subject: Notice of Preparation of a Draft Environmental Impact Report; North Arboga Study Area, Sacramento River, Yuba County, California.

Dear Mr. Campbell:

The Fish and Wildlife Service (Service) recently received a copy of California Department of Fish and Game's comments concerning the North Arboga Study area. The Service was not solicited for comments on this Notice of Preparation, however, we support many of the comments provided to you by the California Department of Fish and Game. Additionally, the Service recommends that comments provided in Enclosures A and B are also taken into account. These comments are intended to assist you in your review of the proposal, and will not take the place of any formal comments that may be required under the provisions of the Fish and Wildlife Coordination Act.

Enclosures A and B provide general guidelines for identifying and mitigating project impacts to fish, wildlife, and their habitats. We encourage you to use these guidelines to develop a comprehensive environmental document that addresses these needs.

We appreciate the opportunity to comment on this proposal. If you have any questions regarding these comments, please contact Mark Littlefield at (916) 978-4613.

Sincerely,

for Wayne S. White
Field Supervisor

2 Enclosures

cc: RD (AFWE), FWS, Portland, OR
Dir., CDFG, Sacramento, CA
Reg. Mgr., CDFG, Reg. III, Yountville, CA
COE, Sacramento, CA

ENCLOSURE A

Endangered Species. The Service recommends that the applicant request from the Service a complete list of listed, proposed, and/or candidate species that may occur in the proposed project area. Information and maps concerning candidate species in California may be obtained from the California Natural Diversity Data Base, a program administered by the California Department of Fish and Game. Requests for information should be addressed to the Marketing Manager, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814. The marketing manager may be contacted by calling (916) 324-0562. You may request additional information from the Chief, California Department of Fish and Game, Non-Game Heritage Program, at (916) 324-8348.

Listed species are fully protected under the mandates of the Endangered Species Act (Act), as amended. Section 9 of the Act and its implementing regulations prohibit the "take" of a federally listed fish and wildlife species by any person, as defined by the Act. Take is defined by the Act "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such species. Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR § 17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures. If a Federal agency is involved with the permitting, funding, or carrying out of this project, initiation of formal consultation is required between that agency and the Service pursuant to Section 7 of the Act if it is determined that the proposed project may affect a federally listed species. Federal agencies must confer if they determine that the continued existence of a proposed species may be jeopardized by the project. Such consultation or conference could result in a biological opinion that addresses anticipated effects of the project to listed and proposed species. The biological opinion may authorize a limited level of incidental take for federally listed species.

If a Federal agency is not involved with the project, and federally listed species may be taken as part of the project, then an "incidental take" permit pursuant to Section 10(a) of the Act should be obtained. The Service may issue such a permit upon completion by the permit applicant of a satisfactory conservation plan for the listed species that may be affected by the project.

We recommend that appropriately timed surveys for the identified species be undertaken by qualified biologists. The results of these surveys should be published in the environmental impact report. Should these surveys determine that listed, proposed, or candidate species may be affected by the proposed project, the Service recommends that the project proponent, in consultation with this office and the California Department of Fish and Game, develop a plan that mitigates for the project's direct and indirect impacts to these species and compensates for project-related loss of habitat. The mitigation plan also should be included in the environmental impact report.

One of the benefits of considering candidate species as well as listed and proposed species early in the planning process is that by exploring alternatives, it may be possible to avoid conflicts that could develop, should a candidate species become listed before the project is complete. In addition, in instances where the Service addresses proposed projects under its Fish and Wildlife Coordination Act authority, we must also analyze the impacts on candidate species and make recommendations to mitigate any adverse effects.

ENCLOSURE B

The goal of the U.S. Fish and Wildlife Service is to conserve, protect and enhance fish, wildlife, and their habitats by timely and effective provision of fish and wildlife information and recommendations. To assist us in accomplishing this goal, we would like to see the items described below discussed in your environmental documents for the proposed project.

Project Description. The document should very clearly state the purposes of, and document the needs for, the proposed project so that the capabilities of the various alternatives to meet the purposes and needs can be readily determined.

A thorough description of all permanent and temporary facilities and work to be done as a part of the project should be included. The document should identify any new access roads or equipment staging areas which are needed, and any material source sites. Figures accurately depicting proposed project features in relation to natural features (such as streams, wetlands, and other habitat types) in the project area should be included.

Affected Environment. The document should show the location of, and describe, all vegetative cover types in the areas potentially affected by all project alternatives and associated activities. Tables with acreages of each cover type with and without the project for each alternative would also be appropriate. We recommend that all wetlands in the project area be delineated and described according to the classification system found in the Service's Classification of Wetlands and Deepwater Habitats of the United States (Cowardin 1979). The Service's National Wetland Inventory maps would be one starting point for this effort.

The document should present and analyze a full range of alternatives to the proposed project. At least one alternative should be designed to avoid all impacts to wetlands, including vernal pools and riparian areas. Similarly, within each alternative, measures to minimize or avoid impacts to wetlands should be included.

Lists of fish and wildlife species expected to occur in the project area should be in the document. The lists should also indicate for each species whether or not it is a resident or migrant, and the period(s) of the year it would be expected in the project area.

Environmental Consequences. The sections on impacts to fish and wildlife should discuss impacts from vegetation removal (both permanent and temporary), filling or degradation of wetlands, interruption of wildlife migration corridors, and disturbance from trucks and other machinery during construction. These sections should also analyze possible impacts to streams from construction of outfall structures, pipeline crossings, and filling. Impacts on water quality, including nutrient loading, toxics, biological oxygen demand, and temperature in receiving waters should also be discussed in detail along with the resultant effects on fish and aquatic invertebrates. Discussion of indirect impacts to fish, wildlife, and their habitats,

including impacts from growth induced by the proposed project, should also be addressed in the document. The impacts of each alternative should be discussed in sufficient detail to allow comparison between the alternatives.

The cumulative impacts of the project, when viewed in conjunction with other past, existing, and foreseeable projects, need to be addressed. Cumulative impacts to fish, wildlife, wetlands and other habitats, and water quality should be included.

Mitigation Planning. Under provisions of the Fish and Wildlife Coordination Act, the Service advises the U.S. Army Corps of Engineers on projects involving dredge and fill activities in "waters of the United States", of which wetlands and some riparian habitats are subcategories. Since portions of this proposal may ultimately require a Corps permit, the Service will subsequently be involved under the Coordination Act. Therefore, if you have not done so already, we suggest that you or your representative consult the Corps regarding onsite wetlands and related habitats that may fall under their jurisdiction, and include this information in the draft document. When reviewing Corps public notices, the Service generally does not object to projects meeting the following criteria:

1. They are ecologically sound;

2. The least environmentally damaging reasonable alternative is selected;

3. Every reasonable effort is made to avoid or minimize damage or loss of fish and wildlife resources and uses;

4. All important recommended means and measures have been adopted, with guaranteed implementation to satisfactorily compensate for unavoidable damage or loss consistent with the appropriate mitigation goal; and

5. For wetlands and shallow water habitats, the proposed activity is clearly water dependent and there is a demonstrated public need.

The Service may recommend the "no project" alternative for those projects which do not meet all of the above criteria, and where there is likely to be a significant fish and wildlife resource loss.

When projects impacting waterways or wetlands are deemed acceptable to the Service, we recommend full mitigation for any impacts to fish and wildlife. The Council of Environmental Quality regulations for implementing the National Environmental Policy Act define mitigation to include: 1) avoiding the impact; 2) minimizing the impact; 3) rectifying the impact; 4) reducing or eliminating the impact over time; and 5) compensating for impacts. The Service supports and adopts this definition of mitigation and considers the

specific elements to represent the desirable sequence of steps in the mitigation planning process. Accordingly, we maintain that the best way to mitigate for adverse biological impacts is to avoid them altogether.

The document should describe all measures proposed to avoid, minimize, or compensate for impacts to fish and wildlife and their habitats. The measures should be presented in as much detail as possible to allow us to evaluate their probable effectiveness.

Because of their very high value to migratory birds, and their ever-increasing scarcity in California, our mitigation goal for wetlands (including riparian, riverine, and vernal pool wetlands) is no net loss of in-kind habitat value or acreage (whichever is greater). Our mitigation goal generally for oak woodlands is also no net loss of in-kind value or acreage.

For unavoidable impacts, to determine the mitigation credits available for a given mitigation project, we evaluate what conditions would exist on the mitigation site in the future in the absence of the mitigation actions, and compare those conditions to the conditions we would expect to develop on the site with implementation of the mitigation plan.

Mitigation habitat should be equal to or exceed the quality of the habitat to be affected by the project. Baseline information would need to be gathered at the impact site to be able to quantify this goal in terms of plant species diversity, shrub and tree canopy cover, stems/acre, tree height, etc. The ultimate success of the project should be judged according to these same measurements at the mitigation site.

Criteria should be developed for assessing the progress of the project during its developmental stages as well. Assessment criteria should include rates of plant growth, plant health, and evidence of natural reproduction. Success criteria should be geared toward equaling or exceeding the quality of the highest quality habitat to be affected. In other words, the mitigation effort would be deemed a success in relation to this goal if the mitigation site met or exceeded habitat measurements at a "model" site (plant cover, density, species diversity, etc.).

The plan should present the proposed ground elevations at the mitigation site, along with elevations in the adjacent areas. A comparison of the soils of the proposed mitigation and adjacent areas should also be included in the plan, and a determination made as to the suitability of the soils to support habitats consistent with the mitigation goals.

Because wetland ecosystems are driven by suitable hydrological conditions, additional information must be developed on the predicted hydrology of the mitigation site. The plan should describe the depth of the water table, and the frequency, duration, areal extent, and depth of flooding which would occur on the site. The hydrologic information should include an analysis of extreme conditions (drought, flooding) as well as typical conditions.

The plan must include a time frame for implementing the mitigation in relation to the proposed project. We recommend that mitigation be initiated prior to the onset of construction. If there will be a substantial time lag between project construction and completion of the mitigation, a net loss of habitat values would result, and more mitigation would be required to offset this loss.

Generally, monitoring of the mitigation site should occur annually for at least the first five years, semi-annually for years 6 through 11, and every five years thereafter until the mitigation has met all success criteria. The monitoring period should begin again if success criteria are not met during the first five years. Some projects will require monitoring throughout the life of the project. Reports should be prepared after each monitoring session.

The plan should require the preparation of "as-built" plans. Such plans provide valuable information, especially if the mitigation effort fails. Similarly, a "time-zero" report should be mandated. This report would describe exactly what was done during the construction of the mitigation project, what problems were encountered, and what corrections or modifications to the plans were undertaken.

The plan should detail how the site is to be maintained during the mitigation establishment period, and how long the establishment period will be. It will also be important to note what entity will perform the maintenance activities, and what entity will ultimately own and manage the site. In addition, a mechanism to fund the maintenance and management of the site should be established and identified. A permanent easement should be placed on the property used for the mitigation that would preclude incompatible activities on the site in perpetuity.

Finally, in some cases, a performance bond may be required as part of the mitigation plan. The amount of the bond should be sufficient to cover the costs of designing and implementing an adequate mitigation plan (and purchasing land if needed) should the proposed plan not succeed.

Reference

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service, Washington, D.C. 103 pp.

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

DATE: Jan 21, 1992

TO: Reviewing Agency

RE: YUBA COUNTY's NOP for
NORTH ARBOGA STUDY AREA
SCH # 92012045

Attached for your comment is the YUBA COUNTY's Notice of Preparation of a draft Environmental Impact Report (EIR) for the NORTH ARBOGA STUDY AREA.

Responsible agencies must transmit their concerns and comments on the scope and content of the EIR, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of this notice. We encourage commenting agencies to respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

KARRI CAMPBELL
YUBA COUNTY
938 14TH STREET
MARYSVILLE, CA 95901

with a copy to the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the review process, call Russell Colliau at (916) 445-0613.

Sincerely,

David C. Nunenkamp
Deputy Director, Permit Assistance

Attachments

cc: Lead Agency

NOP Distribution List

S = sent by lead agency
X = sent by SCH

SCH# 92 2 0

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[ ] Jim Messersmith, Regional Manager
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Rancho Cordova, CA 95670
916/355-0922 (8-438)

[ ] B. Hunter, Regional Manager
Department of Fish and Game
P.O. Box 47
Yountville, CA 94599
707/944-5518

[ ] G. Nokes, Regional Manager
Department of Fish and Game
1234 East Shaw Avenue
Fresno, CA 93710
209/222-3761 (8-421)

[ ] Fred A. Worthley, Jr., Reg. Manager
Department of Fish and Game
330 Golden Shore, Suite 50
Long Beach, CA 90802
213/590-5113 (8-635)

Independent Commissions

[ ] John R. Nuffer
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814
916/654-3859

[ ] William A. Johnson
Native American Heritage Comm.
915 Capitol Mall, Room 288
Sacramento, CA 95814
916/653-4082

[ ] William Meyer
Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
415/703-1540 (8-597)

[ ] Betty Eubanks
State Lands Commission
1807 - 13th Street
Sacramento, CA 95814
916/322-2795

Business, Transportation, & Housing

[ ] Sandy Hesnard
Caltrans - Division of Aeronautics
P.O. Box 942874
Sacramento, CA 94274-0001
916/324-1831

[ ] Tom Micone
California Highway Patrol
Office of Special Projects
Planning and Analysis Division
2555 First Avenue
Sacramento, CA 95818
916/437-7222

[ ] Ron Helgason
Caltrans - Planning
P.O. Box 942874
Sacramento, CA 94274-0001
916/445-5570

Department of Transportation
District Contacts

[ ] Guy Luther
Caltrans, *District 1*
1656 Union Street
Eureka, CA 95501
707/445-6407

[ ] Michelle Gallagher
Caltrans, *District 2*
P.O. Box 494040
Redding, CA 96049-4040
916/225-3259 (8-442)

[ ] Jody Lonergan
Caltrans, *District 3*
703 B Street
Marysville, CA 95901
916/741-4277 (8-457)

[ ] Gary S. Adams
Caltrans, *District 4*
P.O. Box 7310
San Francisco, CA 94120
415/557-9162 (8-597)

[ ] Wayne Schnell
Caltrans, *District 5*
P.O. Box 8114
San Luis Obispo, CA 93403-8114
805/549-3683 (8-629)

[ ] Moses Pacheco
Caltrans, *District 6*
P.O. Box 12616
Fresno, CA 93778
209/276-5989 (8-422)

[ ] Gary McSweeney
Caltrans, *District 7*
120 South Spring Street
Los Angeles, CA 90012
213/620-2376 (8-640)

[ ] Harvey Sawyer
Caltrans, *District 8*
P.O. Box 231
San Bernardino, CA 92402
714/383-4808 (8-670)

[ ] Lisa Flores
Caltrans, *District 9*
500 South Main Street
Bishop, CA 93514
619/872-0203 (8-627)

[ ] Al Johnson
Caltrans, *District 10*
P.O. Box 2048
Stockton, CA 95201
209/948-7838 (8-423)

[ ] Mike Owen
Caltrans, *District 11*
P.O. Box 85406
2829 Juan Street
San Diego, CA 92186-5406
619/688-6750 (8-631)

[ ] Aileen Kennedy
Caltrans, *District 12*
2501 Pullman St
Santa Ana, CA 92705
714/724-2239 (8-655)

Food and Agriculture

[ ] Vashek Cervinka
Dept. of Food and Agriculture
1220 N Street
Sacramento, CA 95814
916/322-5227

Health & Welfare

[ ] Quy Tu
Dept. of Health
714 P Street, Room 692
Sacramento, CA 95814
916/323-6111

[ ] DHSTSCD: _____

State and Consumer Services

[ ] Robert Sleppy
Dept. of General Services
400 P Street, Suite 5100
Sacramento, CA 95814
916/324-0214

Environmental Affairs

[ ] Barbara Fry
Air Resources Board
1102 Q Street
Sacramento, CA 95814
916/322-8267

[ ] Steve Alt
Calif. Waste Management Board
8800 Cal Center Drive
Sacramento, CA 95826
916/322-4235

State Water Resources Control Board

[ ] Allan Patton
State Water Resources Control Board
Division of Clean Water Programs
P.O. Box 944212
Sacramento, CA 94244-2120
916/739-4265

[ ] Dave Beringer
State Water Resources Control Board
Delta Unit
P.O. Box 2000
Sacramento, CA 95812-2000
916/322-9870

[ ] Phil Zentner
State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95801
916/657-0912

[ ] Mike Falkenstein
State Water Resources Control Board
Division of Water Rights
908 P Street, 3rd Floor
Sacramento, CA 95814
916/657-1377 (8-437)

[ ] APCD/AQMD: _____

Regional Water Quality Control Board

[ ] NORTH COAST REGION (1)
1440 Guerneville Rd.
Santa Rosa, CA 95401
707/576-2220 (8-590)

[ ] SAN FRANCISCO BAY REGION (2)
2101 Webster, Suite 500
Oakland, CA 94612
415/464-1255 (8-561)

[ ] CENTRAL COAST REGION (3)
81 Higuera Street, Suite 200
San Luis Obispo, CA 93401-5414
805/549-3147 (8-629)

[ ] LOS ANGELES REGION (4)
1075 S. Broadway, Rm. 4027
Los Angeles, CA 90012
213/266-4460 (8-640)

[ ] CENTRAL VALLEY REGION (5)
3443 Routier Road, Suite A
Sacramento, CA 95827-3098
916/361-5600

- [ ] Fresno Branch Office
  3614 East Ashlan Avenue
  Fresno, CA 93726
  209/445-5116 (8-421)
- [ ] Redding Branch Office
  415 Knollcrest Drive
  Redding, CA 96002
  916/224-4845 (ATS 441)

[ ] LAHONTAN REGION (6)
2092 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150
916/544-3481

- [ ] Victorville Branch Office
  15428 Civic Drive, Suite 100
  Victorville, CA 92392-2359
  619/241-6583

[ ] COLORADO RIVER BASIN REGION (7)
73-271 Highway 111, Suite 21
Palm Desert, CA 92260
619/346-7491

[ ] SANTA ANA REGION (8)
2010 Iowa Avenue, Suite 100
Riverside, CA 92507
714/782-4130 (8-632)

[ ] SAN DIEGO REGION (9)
9771 Clairemont Mesa Blvd., Suite B
San Diego, CA 92124-1331
619/265-5114 (8-636)

[ ] OTHER: _____

[ ] OTHER: _____

Yuba 41

10/22/91

STATE OF CALIFORNIA--BUSINESS, TRANSPORT. .ON AND HOUSING AGENCY PETE WILSON, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3
P.O. BOX 942874-MS41
Sacramento, CA 94274-0001
TDD 916-741-4509
FAX 916-323-7669
916-327-3859

February 25, 1992

CYUB006
03-YUB-70 PM 4.3
North Arboga Study Area
NOP
SCH #92012045

Mr. Karri Campbell
Yuba County Planning
938 14th Street
Marysville, CA 95901

Dear Mr. Campbell:

Thank you for the opportunity to review and comment on the above referenced document.

COMMENTS:

A comprehensive traffic study that analyzes the impacts of developing this area over the next 20 years should be prepared. The analysis should include traffic generated by approved and proposed development in the surrounding area so that an adequate road network may be planned. All new roads and improvements should be identified, including improvements necessary for State Route 70. A funding mechanism should be developed to finance the needed improvements.

Caltrans would like to work with the County in developing a scope for the traffic study.

If you have any questions concerning these comments, please contact Lib Haraughty at (916) 741-4539.

Sincerely,

L. Haraughty
for ROBERT M. O'LOUGHLIN
Chief, Planning Branch C

cc: Russell Colliau, Office of Planning and Research

STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, Governor

DEPARTMENT OF CONSERVATION
DIVISION OF ADMINISTRATIVE SERVICES
DIVISION OF MINES AND GEOLOGY
DIVISION OF OIL AND GAS
DIVISION OF RECYCLING

1416 Ninth Street
SACRAMENTO, CA 95814
TDD (916) 324-2555
ATSS 454-2555

(916) 445-8733

February 21, 1992

Mr. Kerri L. Campbell
Department of Planning
County of Yuba
938 14th Street
Marysville, CA 95901

Dear Mr. Campbell:

Subject: Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the North Arboaga Study Area. SCH# 92012045

The Department of Conservation has reviewed the County of Yuba's Notice of Preparation for the project referenced above. Approximately 1,000 acres of land will be involved in the development of a comprehensive land use plan. The site is currently used for agriculture and urban uses. The Department is responsible for monitoring farmland conversion on a statewide basis and also administers the California Land Conservation (Williamson) Act. Since development of the Land Use plan could have environmental impacts on agricultural lands the Department offers the following comments.

The loss of prime agricultural land should be identified and treated as a significant environmental impact. The California Code of Regulations (Section 15000 et seq., Appendix G (y)) states that a project will normally have a significant effect on the environment if it will convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land. Since it appears that the Land Use plan will have such an effect, the Draft Environmental Impact Report (DEIR) should provide information on the number of acres of agricultural land to be developed, the potential agricultural value of the site, the impacts of farmland conversion, and possible mitigation actions. Specifically, we recommend that the DEIR contain the following information to ensure the adequate assessment of impacts in these areas.

o The agricultural character of the planning area, including:

- Types and relative yields of crops grown.

- Agricultural potential of the area's soils, as defined by the Department of Conservation's Important Farmland series map designations.

o Impacts related to soil erosion. The Department recommends that a soil erosion and sedimentation control plan be developed for the project by a Certified Professional Erosion and Sediment Control (CPESC) Specialist. The erosion and sedimentation control plan should outline specific strategies for long term control of soil erosion within the site. A directory of CPESC specialists is enclosed. In addition, the Department recommends that the following information be included regarding the project site:

- Soil types and inherent erodibilities (water and wind). A map of the project area, which shows potential as well as actual erosion, should be included in this discussion.
- Slopes and slope lengths, both before and after proposed grading.
- Vegetative cover, both before and after development.
- Wind speeds, as well as duration and distance of exposure in direction of prevailing winds.
- Predictions of the amount of water and wind induced soil erosion that will likely occur due to land disturbances that would result from development and use of the site.

o Farmland Conversion Impacts.

- The type, amount and location of farmland conversion that would result from implementation of the Land Use plan.
- The impacts on current and future agricultural operations.
- The cumulative and growth-inducing impacts of the plan.

o Mitigation measures and alternatives that would lessen farmland conversion impacts. A public agency must adopt a reporting or monitoring program for adopted project changes which mitigate or avoid significant efforts on the environment (AB 3180 - Chapter 1232, Statutes of 1988). Some of the possibilities are:

- Increasing densities or clustering residential units to allow a greater portion of proposed development sites to remain in agricultural production.
- Establishing buffers such as setbacks, berms, greenbelts and open space areas to separate farmland from urban uses. Many communities have considered 300

feet as a sufficient buffer for impacts such as pesticide spraying, noise and dust.

- Implementing right-to-farm ordinances to diminish nuisance impacts of urban uses on neighboring agricultural operations, and vice-versa.
- Adopting a farmland protection program that utilizes such land use planning tools as transfer of development rights, purchase of development rights or conservation easements, and farmland trusts.

The Department appreciates the opportunity to comment on the NOP. We hope that the farmland conversion impacts are given adequate consideration in the DEIR. If I can be of further assistance, please feel free to call me at (916) 445-8733.

Sincerely,

Stephen E. Oliva
Environmental Program Coordinator

Enclosure

cc: Kenneth E. Trott
Office of Land Conservation

Yuba County Resource Conservation District

STATE OF CALIFORNIA

Pete Wilson, Governor

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD
8800 Cal Center Drive
Sacramento, California 95826

February 25, 1992

Karri Campbell
Yuba County
938 14th Street
Marysville, CA 95901

Subject: Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the North Arboga Study Area, Yuba County

Dear Ms. Campbell:

California Integrated Waste Management Board (CIWMB) staff have completed their review of the subject document, dated January 21, 1992, and offer the following comments.

PROJECT DESCRIPTION

The study area includes 1,000 acres located in the southwestern region of Yuba County. Current land uses include a mixture of agriculture, residential development, and industrial operations.

GENERAL COMMENTS

In consideration of the California Environmental Quality Act (CEQA) Section 15205(c) CIWMB staff will focus comments on specific issues involving waste generation and disposal.

In order to help decision-makers 1) identify potential impacts from construction and demolition projects, 2) determine whether any such impacts are significant, and 3) ascertain whether significant impacts can be mitigated to a level of insignificance, CIWMB staff request that the Draft Environmental Impact Report (DEIR) include the following information:

A) Identification of the final disposal site(s) for the proposed project's anticipated waste generation.

B) Identification of the anticipated types and quantities of solid wastes to be generated upon implementation of the project (both during construction phases and at the project's completion). This should include identification of any additional sewage sludge generated which would require landfilling.

C) Identification of the potential impacts of these waste quantities on remaining landfill capacities in the jurisdiction.

D) Identification of the location(s) of landfilling and/or dumping of wastes which may have occurred within the area of the proposed project. If a waste disposal location is identified, the DEIR should include a detailed discussion of all mitigation measures to be implemented in order to prevent potential environmental impacts from the development of this area.

All Cities and Counties within the State are required to comply with the planning requirements of the Integrated Waste Management Act of 1989 (Act), and the planning guidelines of the California Integrated Waste Management Board. To meet those requirements each jurisdiction must establish a series of waste management programs to divert 25 percent of nonhazardous and household hazardous wastes from landfills by 1995 and 50 percent by the year 2000.

New residential and commercial developments increase the amount of waste being sent to landfills. To minimize this amount, and help your jurisdiction comply with the requirements of the Act, CIWMB staff suggest the DEIR discuss source reduction (any action which causes a net reduction in the generation of solid waste) and/or recycling programs which will be implemented as a part of the proposed project. These programs can include: buy-back recycling centers, curbside recyclable material and household hazardous waste collection, composting facilities, materials recovery facilities, etc.

Thank you for the opportunity to review and comment on the subject NOP. If you have any questions about these comments, please call Donnaye Palmer of my staff at (916) 255-2329.

Sincerely,

Lorraine Van Kekerix

Lorraine Van Kekerix, Sr. Waste Management Specialist
Waste Generation Analysis and Environmental Assessment Branch

cc: Russ Colliau
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

STATE OF CALIFORNIA—THE RESOURCES AGENC

PETE WILSON, *Governor*

DEPARTMENT OF FISH AND GAME
REGION 2
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CALIFORNIA 95670

(916) 355-7020

February 25, 1992

Mr. Karri Campbell
Yuba County Planning
938 14th Street
Marysville, California 95901

Dear Mr. Campbell:

The Department of Fish and Game (DFG) has reviewed the Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for the North Arboga Study Area.

The study area includes 1,000± acres located in the southwestern region of Yuba County approximately five miles south of the City of Marysville. The area is bound by the Northern Railroad tracks on the west, Plumas-Arboga Road on the south, State Highway 70 on the east, and Helveta Road, Clark Slough, and 11th Avenue on the north. Four different property owners have title to lands in the project area.

Significant resources in the project area include the Clark Lateral, other waterways, and wetlands. The wetlands may be providing habitat for the giant garter snake (Thamnophis couchi gigas). Much of the area is in rice production and is habitat for both summering and wintering waterfowl. The area is located within the American Basin of the Central Valley. The plan may be within the foraging area of the State-listed Swainson's hawk (Buteo swainsoni).

The DFG recommends that the following concerns be adequately addressed in the Draft EIR:

1. A site specific survey and literature survey be completed by a qualified biologist and botanist to identify the potential impacts on any rare, threatened, endangered species, or any species of special concern.

2. A survey be completed by a qualified biologist and a detailed map prepared which shows the location and quantity of stream courses and wetlands in the Plan Area. Wetlands include, but are not limited to, areas of standing water, flood plains, intermittent and perennial drainages, vernal pools, riparian wetland vegetation, and farm ditches. The watershed of drainages crossing this parcel must be shown.

The DFG recommends that stream corridors be incorporated into the plan area as aesthetic and biological resources. We suggest that the stream corridor be located across the street from a row of homes rather than behind the backyards.

3. To protect and maintain riparian wetland systems, the DFG recommends avoidance through the incorporation of 50-foot nondevelopment setback buffers above the banks of intermittent drainages and 100-foot nondevelopment setback buffers above the banks of all ponds or perennial water courses. These setbacks should extend beyond the recommended distances if necessary to protect all onsite riparian wetland habitat. There should be no development within the flood plain of any waterway.

4. Projects located adjacent to buffers should be required to include the following provisions:

   a. No fill shall be placed within buffers either during or after construction.

   b. Grading is prohibited within buffers.

   c. All vegetation within buffers shall be protected during construction.

   d. Covenants, codes, and restrictions shall be established that prohibit disposal of lawn clippings, oil, chemicals, or trash of any kind within setback buffers.

   e. Temporary fencing will be placed to protect the open space area during construction.

   f. Open fencing such as wire mesh, split rail, chain link, etc., may be required adjacent to the buffer areas to reduce improper disposal or storage of materials in the open space area.

5. The protection of native trees be made a goal of this plan. The valley oak (Quercus lobata), in particular, is rapidly disappearing in the Sacramento Valley. The specimens on the site should be protected from changes in grading and change in soil moisture regimes. A 10-foot buffer extending beyond the drip line should be established around all

specimen trees to be preserved on site. A fact sheet on how to care for native trees should be prepared for distribution to all residents.

6. Riparian zones should be surveyed for the giant garter snake (Thamnophis couchi gigas), a State-listed threatened species.

7. Mitigation plans which compensate for the loss of Swainson's hawk foraging habitat should be developed according to DFG guidelines (copy enclosed) and discussed in the Draft EIR.

8. Any activity resulting in loss of habitat, decreased reproductive success, or other negative effects on population levels of State-listed endangered or threatened species may be construed as "take" by the DFG. Take of a threatened or endangered species may be allowed after consultation with the DFG (Fish and Game Code 2081). This process would require a management plan entered into by the project proponent and the DFG that would require formalized mitigation to reduce the significance of the impact. Similar Federal Endangered Species Act sections (9 and 10a) apply for Federally-listed species.

9. The rice land in this project area is habitat for a variety of migratory waterfowl and other shorebirds. The loss of rice fields within the American Basin would be considered a significant adverse impact to waterfowl and other avian wetland species. State DFG policy requires no net loss of either wetland acreage or quality. Impacts to wetlands should be thoroughly discussed. We recommend a meeting with representatives from the U.S. Fish and Wildlife Service and the DFG to determine the appropriate mitigation.

10. For projects that are unable to avoid impacts to stream zone or wetland resources, such as sewer trunk establishment or flood control projects impacting riparian or wetland habitat, mitigation must be identified within the appropriate location in the Draft EIR. The Draft EIR should include identification and quantification of vegetation impacted. Complete revegetation plans must be included to assure no net loss of wetland acreage or values. Detailed monitoring plans should be discussed in the document to assure compliance and satisfactory results (see below).

11. Water quality and means of protecting it from urban pollutants should be discussed. The DFG does not recommend the combined use of wetlands for mitigation of lost wetlands and urban runoff.

In order to comply with Public Resources Code Section 21081.6, a detailed monitoring program must be developed for all required mitigation conditions. The monitoring program should include the following:

1. Specific criteria to measure effectiveness of mitigation.

2. Annual monitoring for a minimum of five years. Annual written reports submitted to the lead agency and the DFG.

3. Annual monitoring reports, each of which include corrective recommendations that shall be implemented in order to ensure that mitigation ~~efforts~~ are successful.

Pursuant to Public Resources Code Sections 21092 and 21092.2, the DFG requests written notification of proposed actions and pending decisions regarding this project. Written notifications should be directed to this office.

This project will have an impact to fish and/or wildlife habitat. Assessment of fees under Public Resources Code Section 21089 and as defined by Fish and Game Code Section 711.4 is necessary. Fees are payable by the project applicant upon filing of the Notice of Determination by the lead agency.

If we can be of further assistance, please contact Mr. Ron Bertram, Associate Wildlife Biologist or Ms. Patricia Perkins, Wildlife Management Supervisor, telephone (916) 355-7010.

Sincerely,

James D. Messersmith
Regional Manager

Enclosure

cc: U.S. Fish and Wildlife Service
Attention Wayne White
2800 Cottage Way
Sacramento, CA 95825-1846

Mr. Ron Bertram
Department of Fish and Game
Rancho Cordova, CA 95670

Ms. Patricia Perkins
Department of Fish and Game
Rancho Cordova, CA 95670

STATE OF CALIFORNIA

PETE WILSON, *Governor*

DEPARTMENT OF FOOD AND AGRICULTURE

1220 N Street
Sacramento, CA 95814

February 6, 1992

Karri Campbell
Yuba County
Department of Planning & Building Services
938 14th Street
Marysville, California 95901

Dear Ms. Campbell,

Thank you for the opportunity to comment on the forthcoming Draft Environmental Impact Report (DEIR) for the North Arboga Study Area (SCH# 92012045). Current land uses in the 1,000 acre study area include agriculture, residential and industrial.

The California Department of Food and Agriculture (CDFA) would appreciate a discussion of the following issues in the DEIR:

1. A complete description of the planning area. This should include current and planned land use designations, the number of acres in agricultural production, soil classifications and acreages, and cropping history.

2. Whether any land under a Williamson Act contract or in an Agricultural preserve is part of, or near to the planning area. How will development affect these designations?

3. The possible mitigation measures to ensure that agricultural land is not prematurely or unnecessarily converted to non-agricultural uses. These measures can include use of the Williamson Act, deed disclosures, a Right-to-Farm Ordinance, phased development, clustered development, transfer of development rights, and requiring infill development of vacant land prior to urban expansion.

4. The interface conflicts which can arise from adjacent agricultural and urban uses. Problems can arise due to noise, dust, chemical usage, trespassing, and traffic conflicts. Include any buffering measures (ie. buffers, setbacks, berms, fencing, etc.) proposed for the development.

5. Whether development of the area will create patterns of discontiguous growth. If so, is development necessary at this time?

6. Given the projected need for residential and urban development, what is the cumulative impact to agriculture from this and other projects in the region?

Since the above issues are not necessarily comprehensive, the lead agency should also request comments from concerned local agencies. These agencies can include the agricultural commissioner's office, the USDA Soil Conservation Service office, and the county Farm Bureau Federation office.

The CDFA supports the right of local agencies to develop and implement land-use policy in its area of influence. However, the CDFA also wants to assure that agricultural land is not prematurely and irreversibly lost due to development which is not accurately assessed for environmental impact.

Sincerely,

Shirley Wells for

Shelley Mountjoy
Environmental Reviewer
Agricultural Resources Branch
(916) 322-5227

cc: Russ Colliau, Office of Planning and Research
Yuba County Agricultural Commissioner
California Association of Resource Conservation Districts

FEATHER RIVER
AIR QUALITY MANAGEMENT DISTRICT

(Yuba and Sutter Counties)

463 Palora Ave., Yuba City, CA 95991 (916) 634-7659 (FAX 634-7660)

Date: January 22, 1992

To: Yuba County, Department of Planning and Building Services

From: Ken Corbin, Air Pollution Control Officer

Subject: North Arboga Study Area, Notice of Preparation of an Environmental Impact Report

The California Clean Air Act requires that all new sources of air pollutants be considered when reviewing a project. Sources other than traffic should be included in the EIR; such as, construction, residential heating and open burning, small utility engines, barbecuing, garden pesticides, etc.

HATA

HUB AREA TRANSIT AUTHORITY

Serving Marysville, Sutter County, Yuba City and Yuba County

February 4, 1992

Mr. Karri Campbell, Associate Planner
Yuba County Planning Department
938 14th Street
Marysville, CA 95901

Re: North Arboga Study Area EIR

Dear Karri:

Thank you for the opportunity to comment on the scope and content of the North Arboga Study Area EIR.

All of the proposed North Arboga Study Area is located outside of HATA's current urban service boundary with the exception of the small portion north of McGowan Parkway and east of the rail line which bisects the study area. Given the level of development being considered in the project area and its proximity to the current service area, the extension of transit service to this area would be required at some point. In addition, this project will generate a significant number of work trips to the greater Sacramento area, thereby impacting the capacity of HATA's commuter service.

HATA currently operates demand response service in the urban service area and daily commuter service between Marysville/Yuba City and downtown Sacramento. The nearest commuter stop to the project area is the Peach Tree Mall in Linda. Urban fixed route service will be provided to the Olivehurst area in 1993. Both the demand response and commuter service are currently operating at or near capacity. For this reason, the EIR should address the impact of this project on the availability of transit service to the project area residents including the need for additional capital equipment and facilities.

The EIR should evaluate the need and provision for additional urban fixed route service in the project area over what is now being developed in Olivehurst. In addition, the need and provision for additional commuter capacity including a possible park and ride at the intersection of Highway 70 and McGowan Parkway should also be evaluated in the EIR. The need for additional commuter capacity could be determined through an analysis of the projected employment market for future residents of the study area. This information could be used to develop a projected yield per unit of Sacramento/South Placer commuters. Applying a reasonable transit mode share to this figure would provide the expected commuter bus demand per unit from which the financial impact can then be determined.

The availability of adequate transit service will be an important feature of this project for both environmental and economic purposes. This applies to all of the potential large scale developments in Yuba County given the County's close proximity to Sacramento and South Placer.

I would be happy to discuss this project with you. Please give me a call if you have any questions.

Sincerely,

Keith E. Martin
Manager

KEM/ac

Pacific Gas and Electric Company

530 E Street
P.O. Box
Marysville, CA
916-742-

January 17, 1992

Karri L. Campbell, Assoc. Planner
County of Yuba
Dept. of Planning & Bldg. Services
938 - 14th Street
Marysville, California 95901

Dear Ms. Campbell:

North Arboga Study Area EIR

We have reviewed the Notice, Prep. of EIR, and have marked the study area map in red showing our various electric transmission tower lines and wood pole line. These are 60,000 and 115,000 volt lines and must be given the necessary consideration in this study. I have enclosed the marked-up map with this letter for your information.

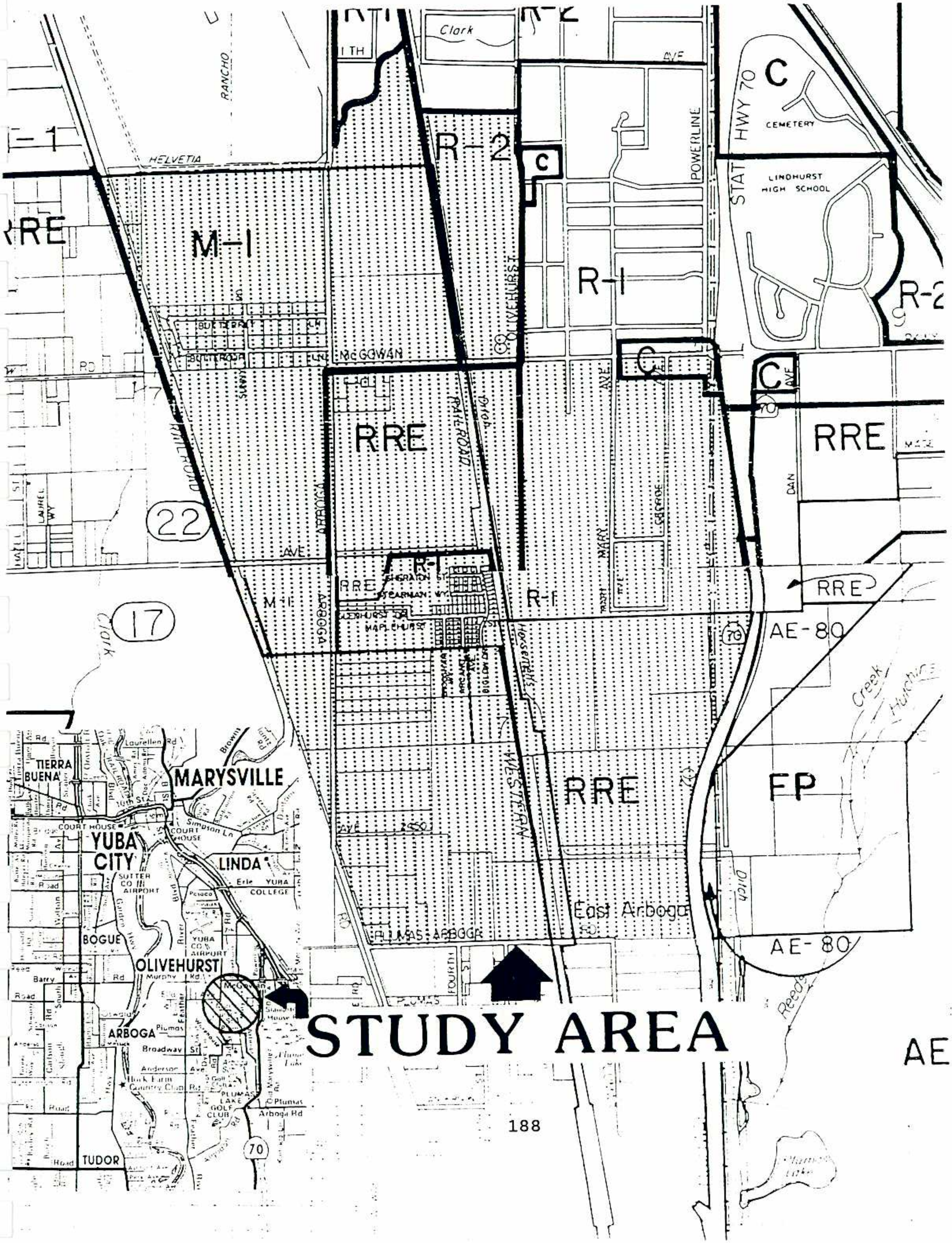
Otherwise, there is no negative environmental impact insofar as the project will affect our ability to provide utility service to the public.

If you have any questions regarding this matter, you may contact me at 634-6645.

Sincerely,

Hal Graham

Encl.


STUDY AREA
M-1
RRE
R-1
R-2
C
FP
AE-80
CEMETERY
LINDHURST HIGH SCHOOL
HWY 70
POWERLINE
OLIVEHURST
RAILROAD
McGOWAN
HELVETIA
PLUMAS ARBOGA
East Arboga
MARYSVILLE
YUBA CITY
LINDA
BOGUE
OLIVEHURST
ARBOGA
TUDOR
TIERRA BUENA

APPENDIX 4

ENGINEER'S REPORT: WATER & SEWER SERVICES

(Prepared for RESEARCH ASSOCIATES by
Laughlin & Co.)

LAUGHLIN & CO.
CIVIL ENGINEERS
1008 LIVE OAK BOULEVARD
YUBA CITY, CA 95991
(916) 671-1008
FAX (916) 6710822

April 16, 1992

Jeff Harvey
Research Associates
5813 Fernbrook Court
Carmichael, CA 95608

Re: North Arboga Study Area.

Dear Jeff:

Attached is our sewer and water evaluation for the North Arboga Study Area. The County of Sacramento Department of Public Works Standards were used in the sewer and water designs of each alternative. The Olivehurst Public Utilities District Engineer, Garry Laughlin, has indicated that these are acceptable standards for the design.

The tentative maps were used to determine the probable number of houses for the given projects. The land which does not have tentative maps,was given dwelling unit designations based on comparable properties in the area. The flow rates for sewage, which were used, are comparable to the flow rates which would be used for evaluation of industrial flows also.

The prices which were used for cost alternatives were based on a number of different sources. The sewer plant expansion costs are from a report prepared by CH2M Hill in September of 1989 for the OPUD Plant. The surface water costs are from a report prepared for OPUD by CH2M Hill in May of 1989. The unit costs for infrastructure were obtained from prices which we collected from contractors and job estimates for this area. We have included a contingency to cover unforseen problems which may

arise. This contingency is also intended to cover the engineering costs for the projects.

We hope that this information is what you need to prepare your report. Please realize that this is just the preliminary step in the evolution of the Study Area Plan. This report will need to be modified when it is determined what the final unit totals will be. If you need anything further or have any questions, please call.

Thank You,

for

Sean M. O'Neill

SMO/jm
Attachments
92-8173

GENERAL

This property falls within the Olivehurst Public Utilities District sphere of influence. They have expressed a willingness to serve the area with both sewer and water service. They will require the infrastructure to be provided by the developers. The developers will also have to pay capital improvement fees for mitigation of the burden they will place on the existing water and sewer facilities. Any money spent on capital improvements by the developers, such as wells, could be credited toward these fees. Olivehurst will maintain the facilities and provide service to the future customers.

SEWER

The District has recently completed a sewer expansion project that has raised their treatment capabilities to 1.8 M.G.D. The present flow is 1.0 M.G.D. A portion of this excess flow capacity will be absorbed by the proposed projects within the North Arboga area. The Kaufman and Broad project will require the treatment capability for 0.085 M.G.D. The Halcyon Corp. project will require 0.11 M.G.D. of treatment. The Kaufman and Broad project is under construction and the Halcyon project is soon to have plans submitted. These two projects would increase the daily flow to the Olivehurst treatment plant to 1.2 M.G.D. In addition to these two large developments there are also other small scattered developments within the Olivehurst District which are in construction phases.

There are also numerous other subdivisions proposed within the South Yuba County Area that will fall within the Olivehurst

District. Most of these are being studied within the Plumas Lake Specific Plan or the Erle Road Specific Plan. These plans will all recommend substantial upgrading and expansion of the existing facilities to accommodate them. There is a proposal by one of the large developers in the Plumas Lake Specific Plan to put in a new treatment plant in the South Area of the Plan. The North Area of the Plumas Lake Specific Plan will require a substantial expansion of the existing treatment plant or a new one will be required in this area. The Erle Road Specific Plan is also recommending installation of a new treatment plant. It is difficult to determine what will be required to serve the South County Area until these Specific Plans are further evolved.

The remaining 0.5 M.G.D. which is available at the existing plant capacity will allow the sewage flows from 1250 additional units to be served. These hookups will be allotted on a first come, first serve basis.

The next phase of expansion as set forth in the CH2M Hill "Wastewater Facilities Master Plan" of September 1989 recommends the next expansion to be to a capacity of 2.6 M.G.D. This additional 0.8 M.G.D. would serve another 2,000 homes. The estimated cost for the Phase II expansions is $ 2,030,000.00. This expansion will proceed as the need for it arises. Olivehurst has in the past and presently has an attitude conductive to growth.

The sewer infrastructure facilities for this plan area will be divided into eastern and western facilities. This is required by the physical constraints present. The dividing line for these

facilities will be the Western Pacific Railroad.

The property lying west of the railroad will need to be served by a new out-fall line to the existing sewer treatment plant. This may either be a pressurized line or a gravity line depending on what agreement can be reached between Olivehurst Public Utility District and the developers in the area. If pressurized, the line will need to be approximately 18" in diameter or the equivalent to serve the western portion of the North Arboga Study area. If it is a gravity line it will need to be approximately 24" in diameter or the equivalent.

The best route of travel for this line would be to begin at the same location as the existing out-fall line at the plant, then head north in the existing sewer easement approximately 1050 LF to the intersection with the existing utility line easement. It would then traverse to the west, approximately 325 feet to the intersection with the Union Pacific Railroad. It will then be necessary to bore beneath the railroad approximately 200 feet to the west side of the railroad tracks.

A major collection point which can then be located at the end of the line would be extended another 2000 LF to the west, to Arboga Road. The location of this major collection point will need to be negotiated between OPUD and the developers within the area. A collection point at the immediate west side of the railroad tracks would allow for less money to be required initially. The problem with this location is that it is not centrally located within the area. Another location for this central collection point would be within the powerline easement

at Arboga Road. This location is more centrally located for the area but would require an additional 2000 LF of line to be installed in the first phase of development. From this collection point trunk lines would extend north, west, and south to serve the area.

These alternatives will need to be examined further. The final decision will depend on the cost of the infrastructure and the phasing of the developments within the area. The attached chart shows the differences in costs between the alternatives.

The study area should be divided up into the different areas as shown on the attached map. The major infrastructure lines which will be required are shown on the map. These lines should be constructed to their ultimate size whenever the first developments within the area are built, but this is subject to negotiation with OPUD.

The area east of the Western Pacific Railroad tracks will also require a new out-fall line. The projects which are presently under construction or will be in the near future, namely the Kaufman and Broad project and the Halcyon project can discharge into the existing 24" diameter line located on Olivehurst Avenue, through the existing sewer to the plant. The 184 lot project proposed by Jon Quitiquit can also discharge into this line. The 418 lot and the 92 lot subdivisions proposed by Jon Quitiquit as well as the sporadically developed area around George and Mary would be collected by a new trunk line.

This new line should be a 12" diameter line. The line should begin at the point of collection at the sewer plant and

then extend to the east to a central collection point near the south end of Mary Avenue. From this location lines would extend to the north, south and east to collect the effluent from George Avenue, Mary Avenue and the new subdivisions. The size of these lines are shown on the attached diagram.

WATER

The water facilities within the area are also provided by OPUD. They consist of a series of wells and distribution lines throughout the District. OPUD has enough water to serve its existing residents with a substantial excess capacity. The problem with most of the water is the quality. This well water generally does not meet present State water quality standards.

However, even with the problem of quality, wells are still the best alternative for providing water to the area at this time. The number of wells which will be required will depend on the number type and location of units which are built.

OPUD has no definite standard of what consumptive use should be used. Their yearly average is 2.2 M.G.D. for approximately 2,800 residences. Their maximum daily peaking factor is 3.0 which translates to 6.6 M.G.D. of peak demand. This reduces to a peak demand rate of 1.64 gpm/residence, or 0.55 gpm per person.

Using an assumed rate of 0.6 gpm per person and a well requirement of 1,500 gpm per well would correlate to each well serving 2,500 people. At three people per residence this would require 1 well per 833 residences.

The last well Olivehurst constructed in this area cost $450,000. In addition there would probably be treatment required

which would cost approximately $1,000,000. These two costs would translate to $1,600 per unit in capital improvement costs.

The number of wells required will depend on the number of units which are built in the study area. An alternative to installing a high number of wells would be to have surface storage that would meet the above outlined requirements. These options must meet District approval to determine their requirements and their preferred alternative.

Based on testing which has been performed on existing wells within the area it has been found that as you travel closer to the river the quality of ground water is better. It has been proposed to buy land adjacent to the river, install wells and then pump the water back to Olivehurst. This would require extensive pumping, but would probably negate the need for expensive treatment. OPUD has expressed an openness to this idea.

A short term alternative that is presently being worked with between OPUD and the Developers is a compromise situation. OPUD is in the process of installing a treatment facility at two of their existing wells. They are wells #28 and #10. Neither of these wells are presently used full-time. The District has a proposal from Kennedy-Jenks Engineering to begin plans to install treatment facilities at well #28 to improve water quality. In addition the water from well #10 may be transported to this facility for treatment. OPUD is seeking money from the State, local water agencies and their own reserve account to fund this project. In addition they have approached several of the

developers within the area to help fund this project. They are offering to sell a portion of the available capacity in return for the Developers paying their money now instead of at the time of the building permit. This would not reduce the required money, but it may eliminate the need for a developer to install a well in their first phase of construction. OPUD has offered to sell up to 300 housing units of capacity.

The water service to this area will also require a substantial upgrading of the distribution system. It will require that the extension of the existing system south and west into the study area. A railroad bore will be required at McGowan road, the lines at well 28 will have to be extended south, the line in George Avenue will have to be extended south and a major distribution line in Arboga road and a major distribution line in Ella Avenue, will need to be installed. There will also need to be a major distribution line on the east side of the tracks and a major distribution line in the south and of the area extending east and west to complete the loop. Please see attached sketch for these requirements.

At some point in the future surface water will probably be used to serve the South Yuba County area. OPUD and the Yuba County Water Agency have an agreement that reserves 2,700 acre feet annually for OPUD. There are several collection points for this water. The alternative which was proposed in the "Feasibility and Planning Study; Water Supply and Treatment" prepared for OPUD in May 1989 recommends installing a treatment plant on the Feather River, Northwest of Olivehurst. A 250,000

gallon storage tank and a pump station capable of pumping 8.2 M.G.D. would be installed at this location. From this point a transmission line would be extended south and west to make numerous connections to the existing OPUD system. The terminus of this line is proposed to be 11th Street and Powerline Road. The estimated surface water system costs are shown on the attached table.

The other control that is present when designing the water system is fire flows. The Uniform Fire Code requirements for an area are dependent on the usages of the area; i.e. commercial, residential, industrial, etc. The systems will be checked to ensure they meet these requirements when it is determined what is being built. The minimum flows should be set by the requirements of the UFC. Olivehurst Fire Department will be the controlling agent in approving this aspect.

The study area should be included in the water distribution system for OPUD. At this time connection must be made to the existing system in addition to the new wells which will be required. The number of wells which will need to be constructed will depend on the capacity of the wells and the build out of the Plan area. The requirements set forth in this report can be used to determine this. Eventually surface water treatment should be constructed and connected to the OPUD system and other systems in the area.

The recommendations in this report are only preliminary. They will have to be updated and modified when the final totals and land uses are determined. It also must be considered that

the OPUD has control over water and sewer development. They have the option to place stricter conditions on the projects, impose fees, or allow for leniency and compromises. This report is intended to provide a "look" at the North Arboga Study Area.

Table A

SURFACE-WATER SYSTEM COSTS (1989 dollars)

Element	OPUD system (8.2 mgd)
Land	$ 50,000
Treatment/Pumping	$ 7,577,000
Transmission	$ 1,350,000
Storage	$ 125,000
Distribution Pumping	$ 685,000
Distribution	$ 568,400
Subtotal Construction Costs	$10,355,000
Contingency (15%)	$ 1,553,000
Subtotal	$11,908,000
Engineering, Legal & Administration (25%)	$ 2,977,000
Total Capital Costs	$14,886,000
Total O&M Costs/Per Year	$ 533,000[a]
Present Worth Costs O&M	$ 6,111,000
Total Present Worth	$20,997,000
Cost per MG Delivered	$ 1,045
Cost per Capita/Month[b]	$ 13.38
Cost per Connected Customer/Month[c]	$ 40.14

[a] Includes cost of Yuba County Water Agency water ($30,800/year).

[b] At estimated year 2000 OPUD population (12,700); assumes 20-year finance period at 8 percent interest.

[c] Assumes three people per connection.

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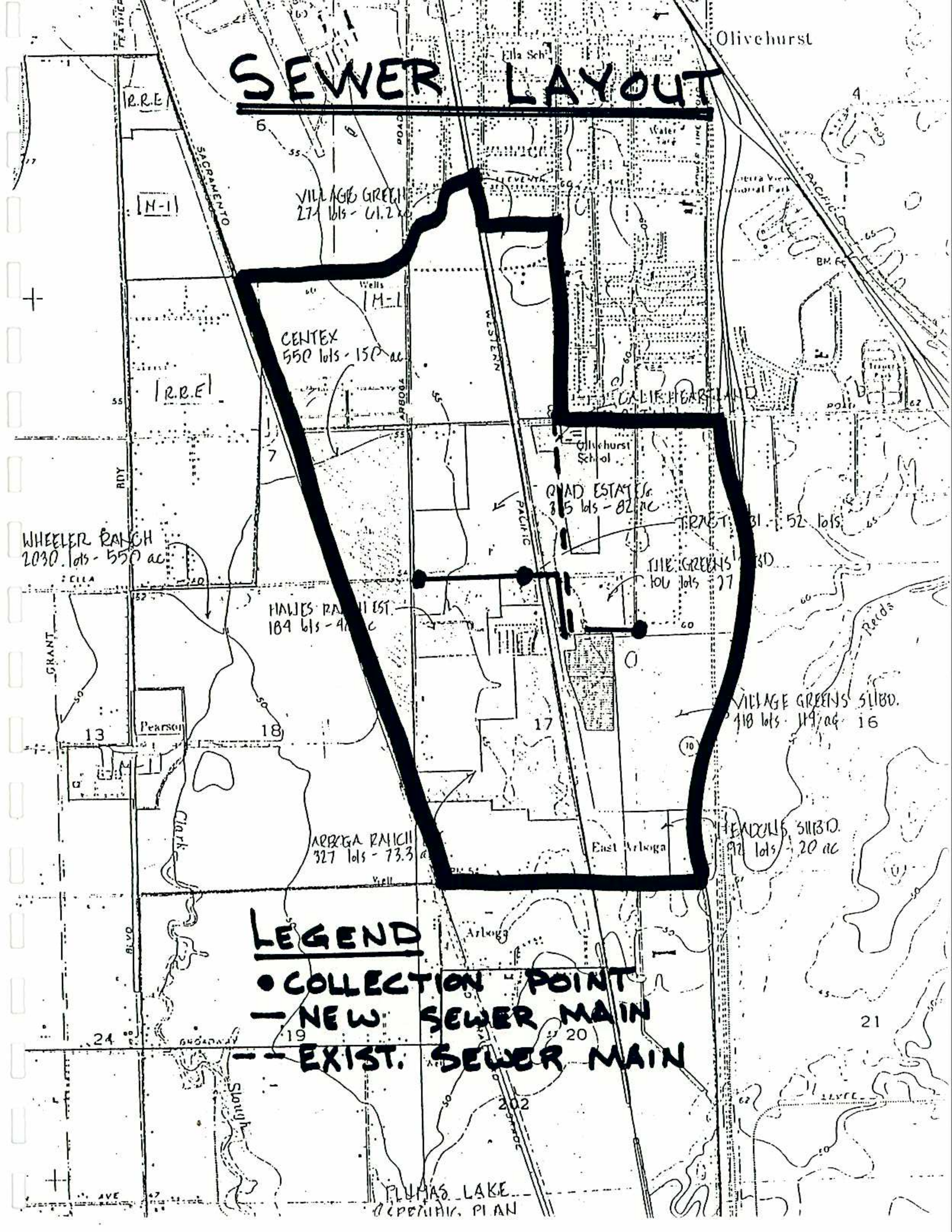
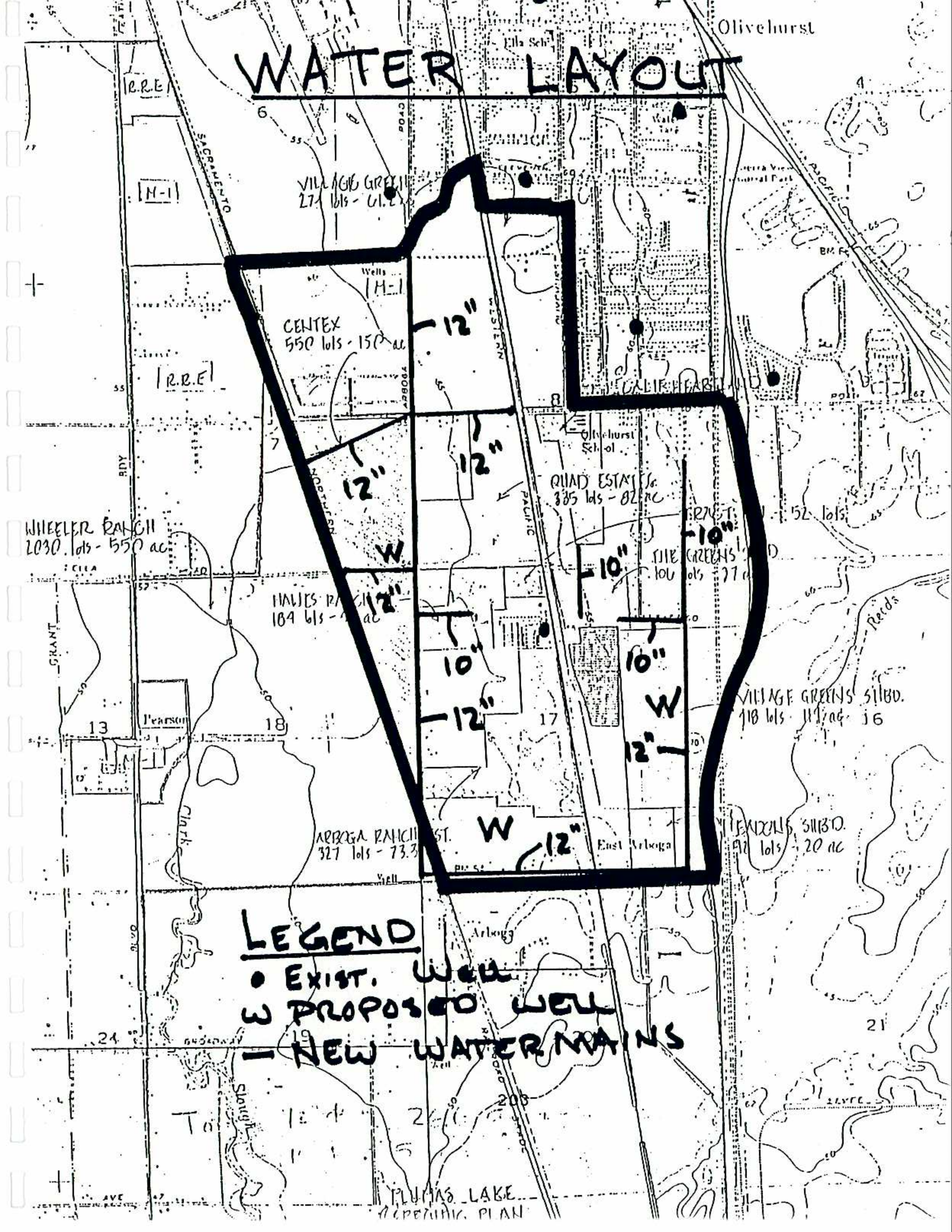

SEWER LAYOUT
Olivehurst
VILLAGE GREEN
CENTEX
550 lots - 150 ac
WHEELER RANCH
2030 lots - 550 ac
QUAD ESTATES
THE GREENS
HAWES RANCH EST.
184 lots
ARBOGA RANCH
327 lots - 73.3
VILLAGE GREENS SUBD.
MEADOWS SUBD.
CALIF HEARTLAND
Olivehurst School
East Arboga
Arboga
Pearson
SACRAMENTO
WESTERN
PACIFIC
R.R.E
M-1
Clark
Slough
PLUMAS LAKE
LEGEND
• COLLECTION POINT
— NEW SEWER MAIN
-- EXIST. SEWER MAIN


WATER LAYOUT
Olivehurst
CENTEX
550 lots - 150 ac
VILLAGE GREENS
12"
10"
W
QUAD ESTATES
385 lots - 82 ac
Olivehurst School
WHEELER RANCH
2030 lots - 550 ac
THE GREENS
VILLAGE GREENS SUBD.
ARBOGA RANCH EST.
327 lots - 73.3
East Arboga
Arboga
Pearson
R.R.E
M-1
GRANT
SACRAMENTO
PACIFIC
Reeds
Clark
Slough
LEGEND
• EXIST. WELL
W PROPOSED WELL
— NEW WATER MAINS
PLUMAS LAKE
SPECIFIC PLAN

APPENDIX 5

ENGINEER'S REPORT: DRAINAGE

(Prepared for RESEARCH ASSOCIATES by
M-H-M, Inc.)

NORTH ARBOGA STUDY AREA

DRAINAGE ANALYSIS

APRIL, 1992

92107/123
4/14/92

TABLE OF CONTENTS

92107/123
4/14/92

NORTH ARBOGA STUDY AREA

DRAINAGE ANALYSIS

GENERAL -- The North Arboga Study Area encompasses portions of two separate existing watershed areas which are presently divided by the Union Pacific Railroad right-of-way which runs north and south through the study area. (See Location Map - Plat No. 1)

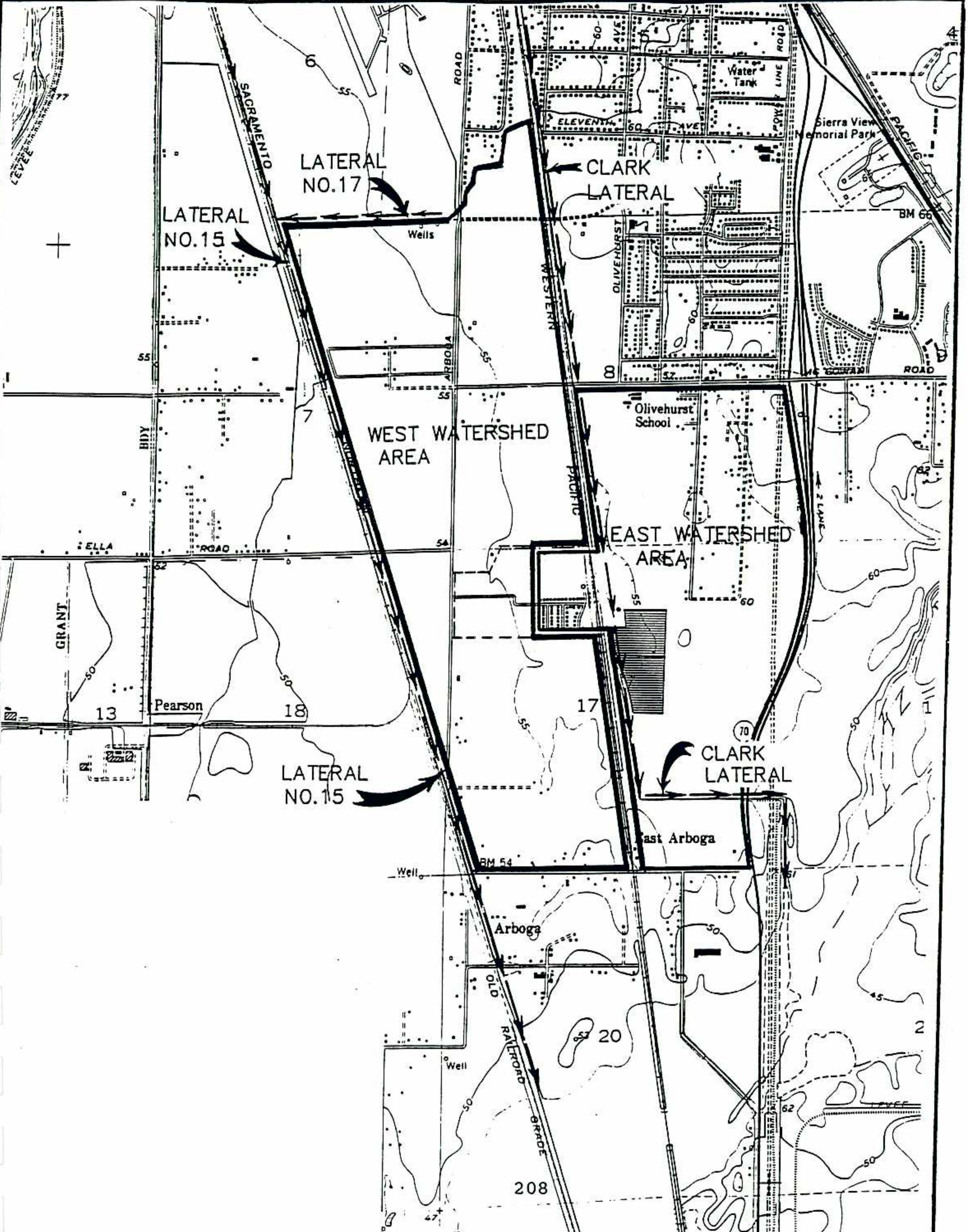
The westerly portion of the study area drains into Reclamation District No. 784's Lateral No. 15 and is generally bounded on the north by the Yuba County Airport, on the west by the old Sacramento Northern Railroad right-of-way, on the south by Plumas Arboga Road and on the east by the aforementioned Union Pacific Railroad. Excepted from this area are 28 acres, more or less, commonly known as the Tahitian Village area which is drained across the Union Pacific Railroad by means of a pump station into Clark Lateral.

The easterly portion of the study area drains into Clark Lateral and is generally bounded on the north by McGowan Parkway, on the east by State Highway 70, on the south by Plumas Arboga Road, and on the west by the aforementioned Union Pacific Railroad. Also included in this drainage area is the Tahitian Village area which has been described as an exception to the westerly area.

For ease of discussion, this report will address each of the two watershed areas separately. They will be defined hereafter as the "West Watershed Study Area" and the "East Watershed Study Area", each being defined by the boundaries described above.

RELATED DRAINAGE STUDIES -- It is noted that presently under consideration are two drainage studies which, if implemented would effect the North Arboga Study Area. The South Yuba Drainage Master Plan would effect the "East Watershed Study Area" and the Plumas Lake Specific Plan would effect the "West Watershed Study Area". In general, these two drainage studies under consideration are described as follows:

> **South Yuba Drainage Master Plan** -- This plan encompasses the East Linda Area and surrounding areas. It proposes various methods and alternates for transporting all storm flows accumulated within the East Linda Specific Plan Area and transporting the collected storm waters via a main collector channel down the easterly side of the Southern Pacific Railroad right-of-way to a point on the north side of Reeds Creek. At this point, the storm waters would be detained in a basin sized to regu-


LATERAL NO.17
LATERAL NO.15
CLARK LATERAL
WEST WATERSHED AREA
EAST WATERSHED AREA
CLARK LATERAL
LATERAL NO.15
SACRAMENTO
WESTERN
PACIFIC
OLD RAILROAD GRADE
ARBOGA ROAD
OLIVEHURST
ELEVENTH AVE
POWER LINE ROAD
Water Tank
Sierra View Memorial Park
PACIFIC
BM 66
MC GOWAN ROAD
Olivehurst School
ELLA ROAD
GRANT
Pearson
East Arboga
Arboga
BM 54
Wells
Well
LEVEE
70
208

SCALE: 1" =2000'

late flow into Reeds Creek at predevelopment levels. The stored storm waters would then be released into Reeds Creek and such releases are then anticipated to have minimal impacts on downstream or upstream flows or adjoining lands.

The construction of the facilities required and described in the South Yuba Drainage Master Plan would stop all current drainage presently entering the Olivehurst area through the drains crossing under the Southern Pacific Railroad, the Linda Drain and the Olivehurst Drain. Elimination of these two drainage flows into the Olivehurst area will essentially separate the Olivehurst area from all outside drainage influences and will allow existing Clark Lateral to use its full capacity to drain Olivehurst.

The implementation of the measures proposed in the South Yuba Drainage Master Plan would greatly enhance the present drainage facilities in the Olivehurst area and would provide very significant increased capacity to the Clark Lateral Drain, the main drain for the Olivehurst area. Since the Clark Lateral serves also as the primary drainage facility for the North Arboga Study Area after it crosses McGowan Parkway the benefit of implementation of the South Yuba Drainage Master Plan would be great. The East Watershed Area of the North Arboga Study Area would be directly benefited since Clark Lateral flows through this area and is presently the main collector within the area. The West Watershed Area may also benefit in that systems could be designed to collect storm waters along the easterly boundary of said West Watershed Area at designated collection points. These points could retain the storm waters as necessary and then release them into Clark Lateral by pumping the waters across the Union Pacific Railroad right of way after peak flows in the Lateral have passed.

Proposed Plumas Lake Specific Plan: This Specific Plan lies entirely within the boundaries of Reclamation District No. 784 and is located in the most southerly and westerly portion of the District. Due to the fact that the drainage of all lands within the boundaries of the District is accomplished through an integrated system, the Specific Plan must consider drainage throughout the entire District and not just within the limits of the Specific Plan area. The draft of the drainage analysis for the Specific Plan made assessments of existing conditions and facilities and gave conclusions which offered possible alternatives for handling drainage for various development scenarios.

Implementation of the improvements anticipated for the Proposed Plumas Lake Specific Plan Report could mitigate many of the impacts on Lateral 15 and downstream areas which would be created by development within the West Watershed Area of the North Arboga Study Area and therefore reduce many of the drainage improvements which would currently be required for development of the area.

However, since neither the Revised South Yuba Drainage Master Plan nor the

Proposed Plumas Lake Specific Plan have yet been adopted or implemented, the following text discussing the North Arboga Study Area will not consider the benefits this plan would have on the involved area. Discussion in the North Arboga Study Plan will be limited to potential improvements which will be required under existing conditions. Therefore, the improvements described and discussed herein are maximum requirements under present conditions with the possibility of downsizing should the Revised South Yuba Drainage Master Plan and Plumas Lake Specific Plan be implemented prior to development occurring in the North Arboga Study Area.

WEST WATERSHED STUDY AREA

Existing Conditions -- Presently, with the exception of one small developed area commonly known as the Sunny Acres area which lies about one-half mile south of the airport on the west side of Arboga Road, the entire West Watershed Study Area is in pasture, dry farming and rice acreage. The area is generally flat with a slight fall northeast to southwest. The existing ground elevations within the drainage area range from a high of approximately 58 in the northeast corner of the area to approximately 53 in the southwest corner, all elevations being U.S.G.S. datum.

The area is currently drained by Reclamation District No. 784's Lateral No. 15 which parallels the old Sacramento Northern Railroad right of way along the westerly boundary of the West Watershed Study Area. Lateral No. 15 presently drains not only this area but is also the main drain for the Yuba County Airport complex, some adjoining land to the west of the airport, and portions of the East and West Linda Community areas. There are also some contributing drainage areas south of this study area which drain to Lateral No. 15. Lateral 17, which lies along the south line of the airport and collects some airport drainage and some drainage from Arboga Road north of the study area, empties into Lateral No. 15 at a point at the most northwest corner of the study area. The study area itself generally drains by sheet flow either to Lateral No. 15 or to Arboga Road which then drains southerly and into Lateral No. 15. The entire West Watershed Area which contributes storm flows to Lateral No. 15 consists of approximately 840 acres.

Currently, most of that portion of the West Watershed Area lying east of Arboga Road lies outside the boundaries of Reclamation District No. 784. Prior to development, if these lands are to be drained into Lateral No. 15 they must be annexed into the district.

Developed Conditions -- For the purposes of this study, it will be assumed that the entire area within the West Watershed Area will be developed into single family residential use. This analysis considers four alternative methods of providing the necessary drainage improvements for the proposed development. These alternates are as follows:

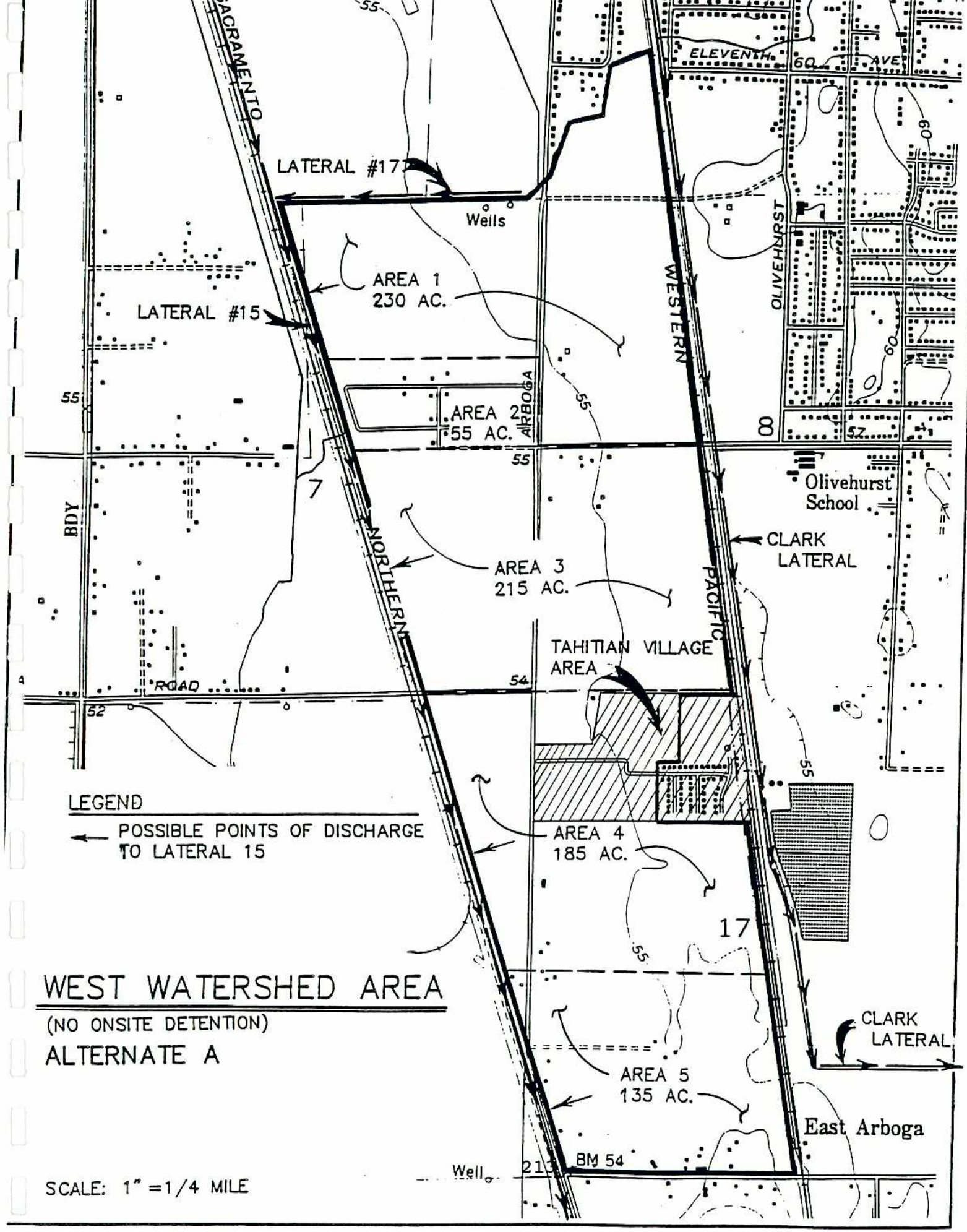
> **Alternate A** -- Provide gravity drainage for entire area through underground piped system to junction points along Lateral No. 15. Upgrade, as required, Lateral No. 15 and the Algodon Canal from north line of West Watershed Area southerly to Reclamation District 784 Pump Station No. 6 at Bear River. This would require ditch grading to provide a ditch to meet the design flow requirements, providing adequate pipe or box culvert crossings where the ditch crosses existing roads. The downstream flows would be reviewed to determine any necessary increased pumping and/or detention storage requirements at District Pump Station No. 6.

Alternate B -- This alternate will also drain all waters from the West Watershed Area to Lateral No. 15 but only at predevelopment flow rates. To maintain predevelopment flow rates, it will be necessary to retain the runoff in a detention pond or ponds. The pond(s) would be sized to contain anticipated increased flow rates and volumes, and meter the flow into Lateral 15 at predevelopment rates thus minimizing downstream impacts of the Reclamation District's facilities. If possible, the ponds would operate by gravity but pumping facilities could be required. The ponds would need to be sized to handle runoff from a storm with a 24-hour, 100-year return frequency.

Alternate C -- A third alternate would be to drain the West Watershed Area to the east into Clark Lateral. This would require the construction of a detention pond with pumps to transfer the collected storm water easterly across the Union Pacific Railroad embankment into Clark Lateral which in turn flows by gravity to the Bear River. The detention pond would be capable of retaining a storm with 24-hour, 100-year return frequency. The detention basin must also be sized to mitigate against any possible effects of surface elevation increases in East Plumas Lake.

Alternate D -- A final alternate would consist of a combination of Alternates B and C. This would allow the West Watershed Area to be drained both to the west to Lateral No. 15 and to the east to Clark Lateral. The improvement requirements as stated in Alternates B and C would both be required under this alternate but in a modified amount depending on the size of the watershed area to be drained to each of the laterals.

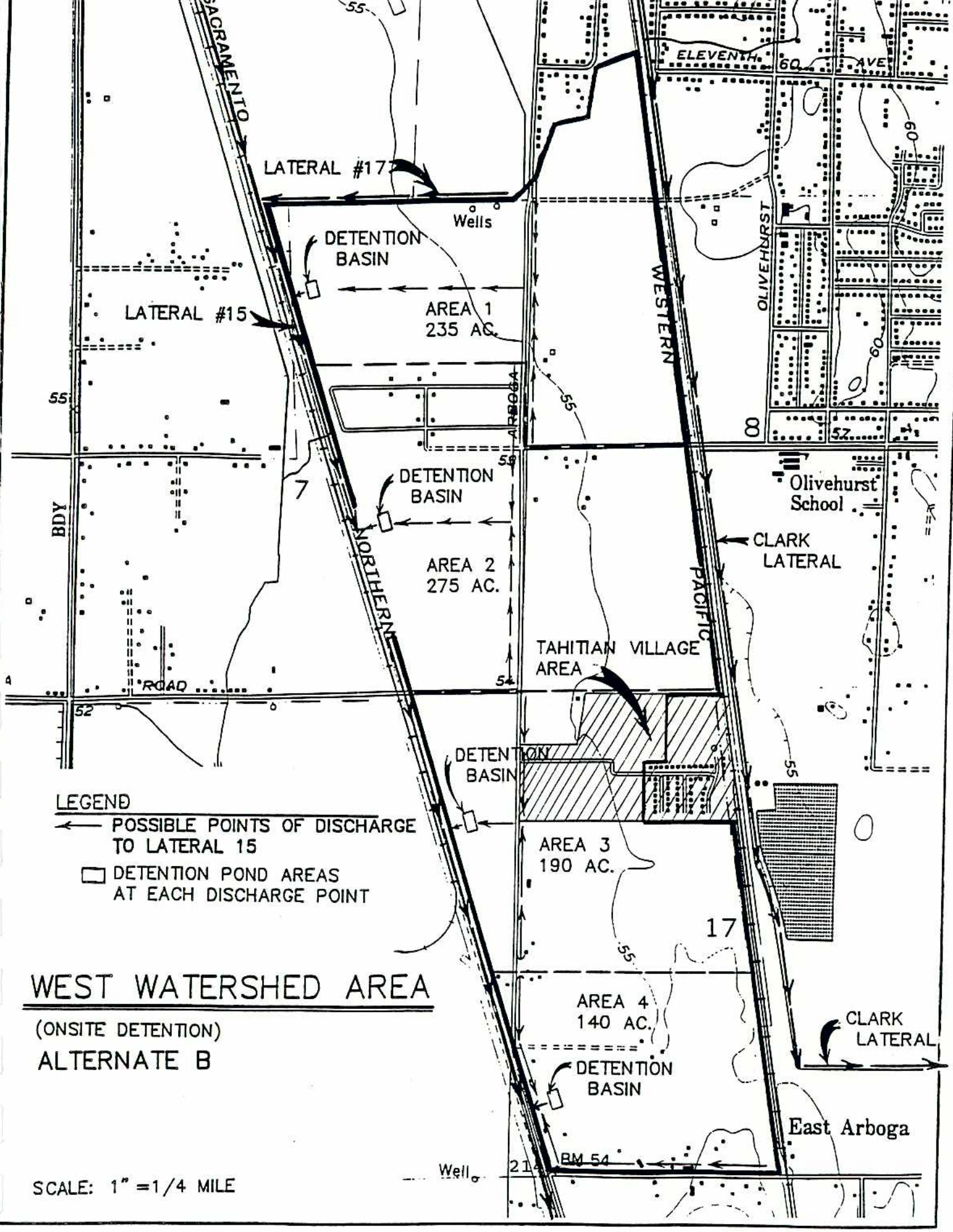
For each of the alternates described above any portion of the watershed areas not presently within Reclamation District No. 784 boundaries would be required to be annexed into the District.



WEST WATERSHED AREA

(NO ONSITE DETENTION)

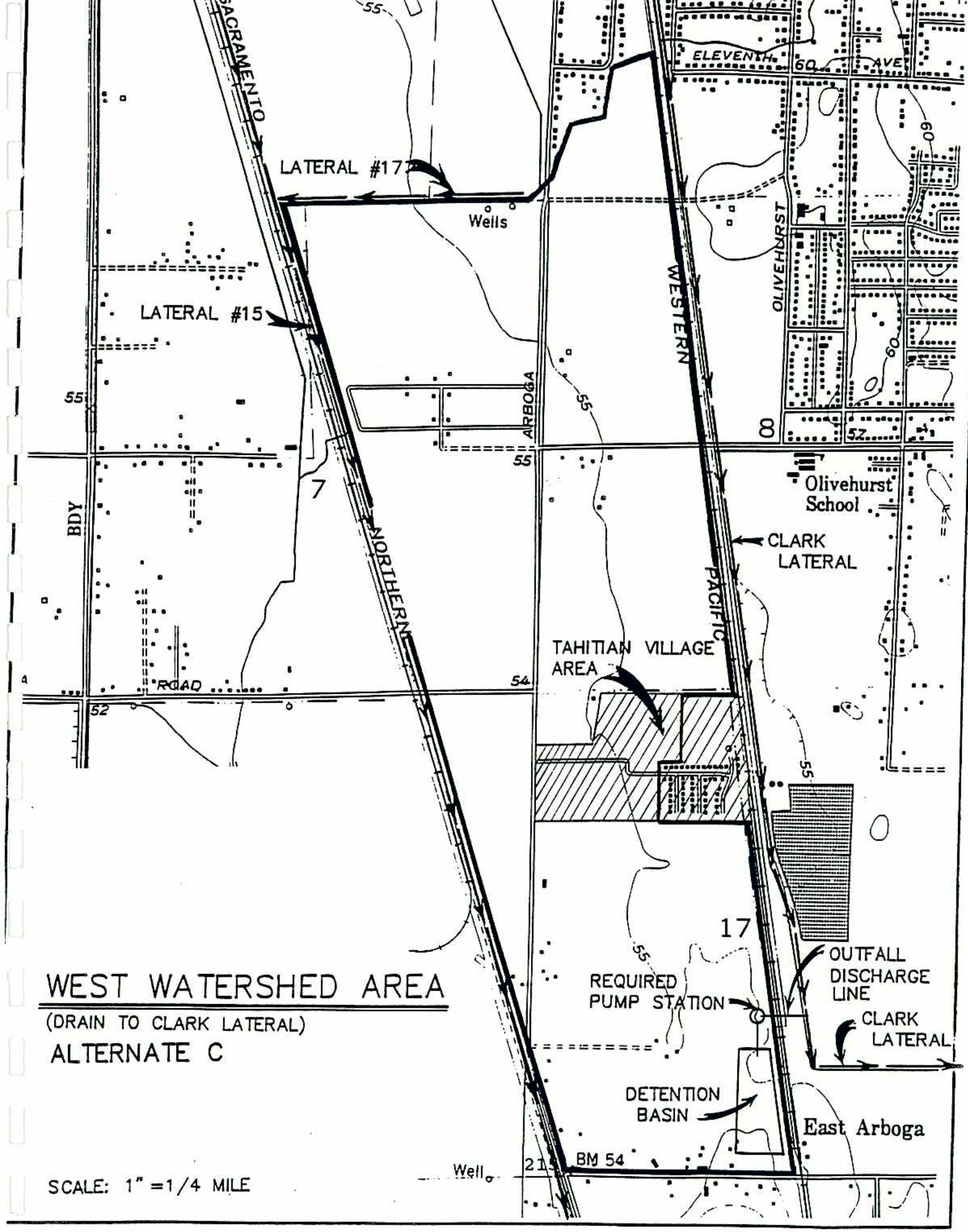
ALTERNATE A



WEST WATERSHED AREA

(ONSITE DETENTION)

ALTERNATE B

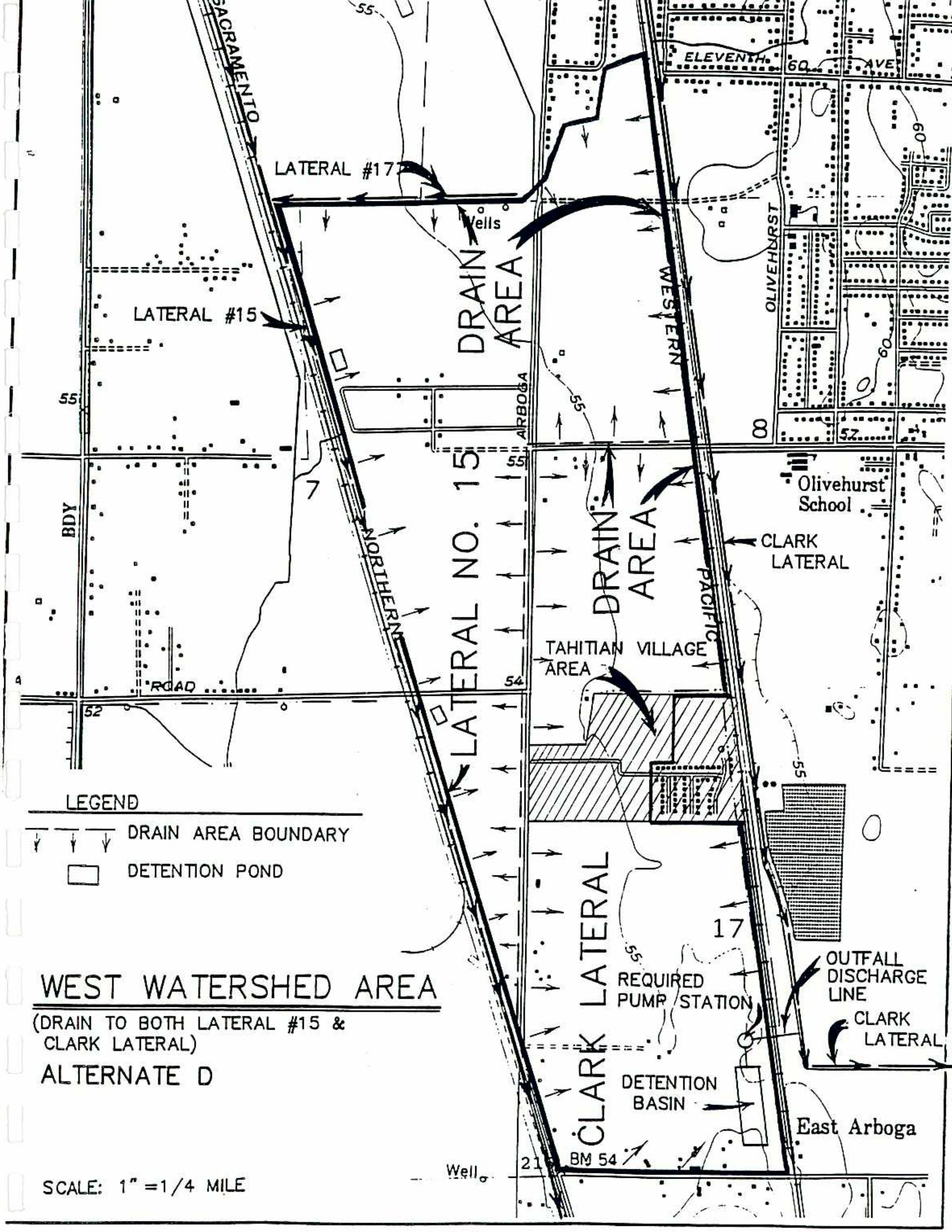


WEST WATERSHED AREA

(DRAIN TO CLARK LATERAL)

ALTERNATE C

SCALE: 1" =1/4 MILE


SACRAMENTO
NORTHERN
LATERAL #17
LATERAL #15
Wells
DRAIN AREA
LATERAL NO. 15
DRAIN AREA
ARBOGA
WESTERN
PACIFIC
ELEVENTH AVE
OLIVEHURST
Olivehurst School
CLARK LATERAL
TAHITIAN VILLAGE AREA
BDY
ROAD
CLARK LATERAL
REQUIRED PUMP STATION
OUTFALL DISCHARGE LINE
CLARK LATERAL
DETENTION BASIN
East Arboga
Well
BM 54
LEGEND
DRAIN AREA BOUNDARY
DETENTION POND
WEST WATERSHED AREA
(DRAIN TO BOTH LATERAL #15 & CLARK LATERAL)
ALTERNATE D
SCALE: 1" =1/4 MILE

EAST WATERSHED STUDY AREA

Existing Conditions -- Presently, the Easterly Watershed Area is comprised of several definite subareas which have their own existing drainage characteristics. For purposes of this analysis, the study area has been broken into six subareas as described below.

Subarea 1 - California Heartland Subdivision Area

Subarea 1 lies between the Union Pacific Railroad to the west and a north-south line approximately 150-feet east of the Olivehurst School property to the east, McGowan Parkway to the north and to a line lying 2500 +/- feet south of and roughly parallel to said McGowan Parkway to the south. This area is presently partially developed with single-family residential units and a large existing detention basin with the remainder undeveloped portion being committed to future residential development.

Subarea 1A - Proposed Village Green Subdivision

Subarea 1A lies to the north of Area 1 and is actually outside the limits of the Easterly Watershed Area but it drains into Subarea 1. Subarea 1A is bounded on the west by the Union Pacific Railroad right of way and on the east by Olivehurst Avenue, on the north by the approximate westerly extension of 13th Avenue, and on the south by McGowan Parkway. This area is presently proposed for development as residential and all of its drainage will be directed into the existing detention pond in Subarea 1 south of McGowan Parkway.

Drainage from Subarea 1 is proposed to be directed by underground storm drains into the large detention pond described above. Currently only Subarea 1 utilizes the detention pond which then drains into the Clark Lateral by gravity unless high flows in the lateral require the use of pumps which have been provided for within the detention pond. Subarea 1A, under existing conditions, drains directly into the Clark Lateral but as mentioned above, under development conditions, Subarea 1A's drainage would flow into the detention pond in Subarea 1.

Subarea 2 - Tahitian Village Area

Subarea 2 lies west of the Union Pacific Railroad and comprises an area of approximate 68 acres that was annexed into Reclamation District No. 784 in the earlier 1960's. Of the some 68 acres, about 28 acres have been developed and are referred to as "Tahitian Village, Units 1 and 2." The remainder is currently proposed for single family development as the Hawes Ranch Subdivision. Drainage from this

area is pumped across the Union Pacific Railroad into the Clark Lateral. The undeveloped portion of Subarea 2 drains partially into the pumped system and partially into the Arboga Road roadside ditch then ultimately into Lateral 15.

Subarea 3 - Olivehurst Treatment Plant

Subarea 3 consists of the land presently occupied by the Olivehurst sewage treatment plan. Subarea 3 has its own internal drainage system operated in conjunction with the treatment plan and drainage is discharged directly into the adjoining Clark Lateral.

Subarea 4 - Mary and George Avenue Area

Subarea 4 consists of the remaining lands in the northerly 3500 feet of the Easterly Watershed Area below McGowan Parkway. This area is roughly 50% developed with residential units on parcels ranging is size from less than a quarter of an acre up to 4 acres. Some of the land in this subarea is still undeveloped, in grazing or grass lands. Drainage from this area makes it way to the Clark Lateral via roadside ditches, overland flow, as well as some underground piping improvements.

Subarea 5 - Southerly End of Study Area

Subarea 5 lies in the southerly portion of the Easterly Watershed Area and is generally undeveloped pasture and grass lands. A majority of this subarea is encumbered by an inundation and flowage easement granted to Sacramento and San Joaquin Drainage District. The area drains directly into the Clark Lateral which adjoins the westerly and southerly limits of Subarea 5.

Subarea 6 - Plumas Arboga Road Area

Subarea 6 also lies at the southerly end of the East Watershed Area and is the only portion of the study area which lies entirely outside of both the 100-year flood plain area and the area encumbered by the existing inundation and flowage easements. This area is presently largely pasture and grasslands. It is separated from the rest of the East Watershed Area by Clark Lateral which runs along its northerly boundary and is protected from flooding by a small levee which borders said lateral. Existing drainage from the area is limited. Drainage is generally to the south along Plumas-Arboga Road roadside ditches to Reeds Creek which is a distance of approximately 4500 feet.

In general, all of the area encompassed by the Easterly Watershed Area, except for a few isolated areas in Subarea 1A and 4 and all of Subarea 6, lie within the 100-year flood plain as designated by FEMA.

Developed Conditions -- Under full development, the Easterly Watershed Area will have six separate and distinct drainage units. Possible alternatives for development of each of the subareas is discussed below.

Subarea 1 & 1A - Developed Conditions

Subarea 1 and Subarea 1A, when fully developed, will discharge into the existing detention pond located within Subarea 1. It is presently proposed that Subarea 1A will be drained into the existing detention pond in Subarea 1 via a siphon structure to be constructed under McGowan Parkway. The present pond has the capability of accepting all drainage from these two subareas without being enlarged. Some changes in the existing pump station may be required to handle full development of the areas. Pump capacities and discharge piping will be upgraded as this development takes place. During periods of low flow in the Clark Lateral, drainage from the detention pond can enter the lateral by gravity; however, pumping will be required at other times.

Subarea 2 - Developed Conditions

Subarea 2 comprises the Tahitian Village area. The total Tahitian Village area is the area lying west of the Union Pacific Railroad right of way and east of Arboga Road which is within the current boundaries of Reclamation District No. 784. Subarea 2 comprises some 68 acres of which 28 acres have been developed as Tahitian Village, Units 1 and 2, a single family home development. Reclamation District No. 784's Pump Station No. 4 serves these two subdivisions and pumps the runoff directly into the Clark Lateral across the Union Pacific Railroad. As originally proposed, the entire 68 acre area was to be served by Pump Station No. 4.

The remaining undeveloped area, being the proposed Hawes Ranch Subdivision, could be drained into the Clark Lateral as originally proposed or this area could drain south and west into the Lateral 15 system. This decision will probably depend on how development in the west NASA proceeds. There are current operational problems with Pump Station No. 4. If the Hawes Ranch project utilizes this pump station, improvements will be required to assure better operational reliability. The primary problem identified by Reclamation District personnel is a lack of detention storage. One potential solution being discussed by County and District personnel is the gravity connection of the Tahitian Village area to the large detention basin in Subarea 1.

Subarea 3 - Developed Conditions

Subarea 3, the Olivehurst Sewage Treatment Plan area, has its own internal system which directs flows to Clark Lateral and no additions will be made. Any enlarge.pa ment of the treatment plant, should it occur, is anticipated to drain in the same

manner, i.e., within an expanded internal system pumping into the Clark Lateral.

Subarea 4 - Developed Conditions

Subarea 4 is somewhat developed under existing conditions. Existing development along George and Mary Avenues has disrupted the historical drainage flow to the southwest. Roadside ditches, side yard swales, and the underground pipes along McGowan Parkway have redirected drainage with limited benefit to the area served. Drainage improvements, if installed, are suggested to follow the pattern of that established in Subarea 1, the California Heartland Subdivision. By utilizing the existing detention basin in Subarea 1, or constructing an additional basin in Subarea 5 and constructing main trunk lines or open channels leading to the detention basin(s), drainage would be substantially improved with Subarea 4.

Subarea 5 - Developed Conditions

Subarea 5 lies within the FEMA 100-year flood plain and additional much of the area is encumbered by the inundation and flowage easement granted to the Sacramento and San Joaquin Drainage District. This easement was obtained by the State of California via the Sacramento and San Joaquin Drainage District for purposes of operating the State flood control system. Specifically, at times of high flow in the Bear River, stormwater is allowed to back up from the Bear River and inundate the area in south Yuba County subject to these State inundation easements.

The storm waters are stored in these areas to help mitigate peak stage heights in the river and thus help prevent overtopping of the levees.

Prior to development within this easement area of Subarea 5, the County would have to be assured that the State of California had either relinquished their easement or that the project has mitigated the storage displacement due to development by creating an equivalent storage area. The equivalent storage area could be within Subarea 5 or could be offsite in an area within the Bear River back up affecting South Yuba County. It is estimated that the volume of storm water stored in Subarea 5 within the inundation easement is approximately 400 acre feet.

Assuming that Subarea 5 were to develop with on-site mitigation of loss of inundation storage, a possible alternative to developing this area could involve the following: 1) excavation of an area at the south end of Subarea 5 along the Clark Lateral to hold the some 400 acre feet of inundation storage. This storage would have to be connected by gravity to the Clark Lateral. 2) Creation of a detention basin and pump station to expel drainage from the area actually developed. This detention basin must be separate from the inundation storm area and could be accomplished as an enlargement of the existing detention pond in Subarea 1. 3) Soil extracted from the ponds described in item 1 and 2 would be used to fill the development area

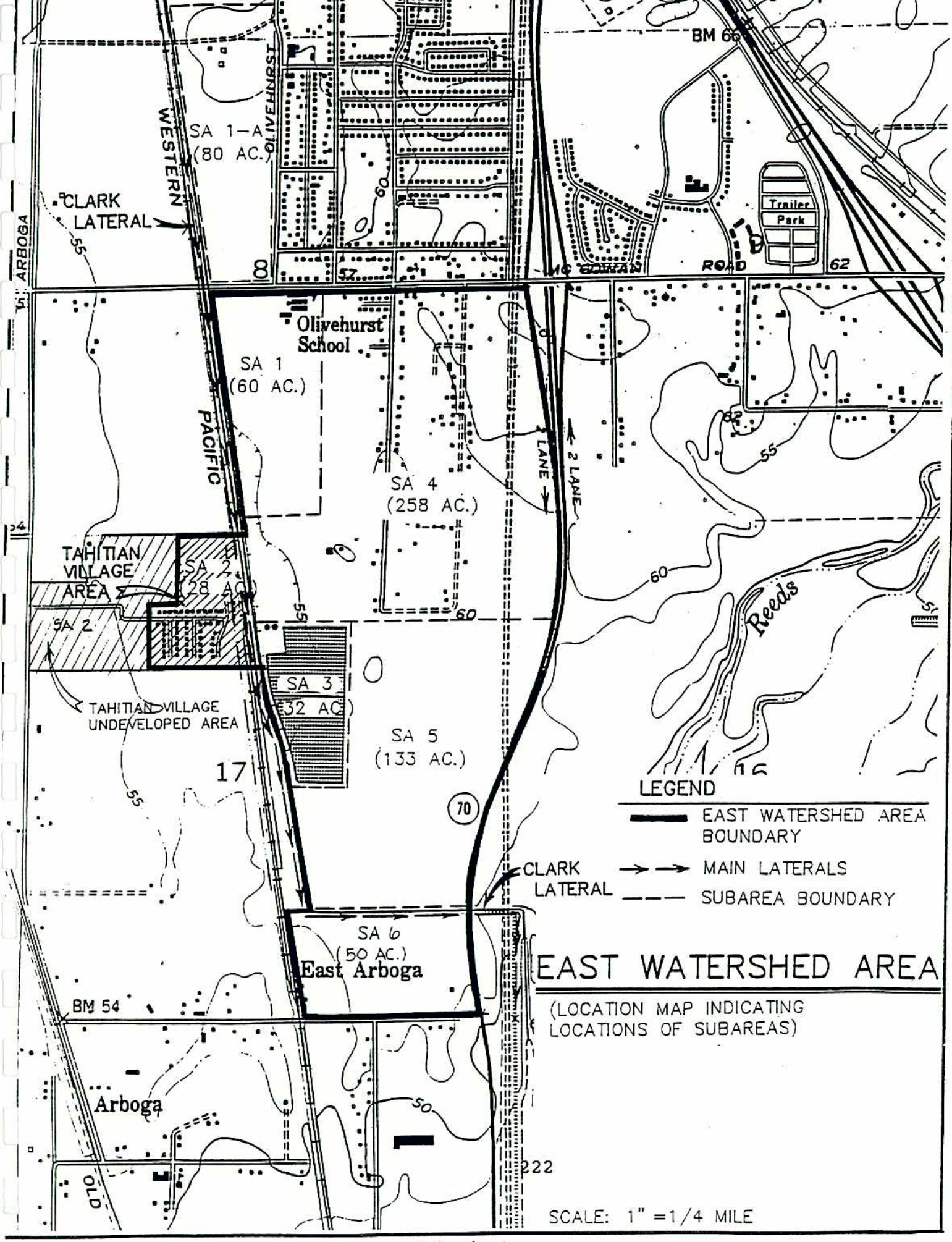
above existing elevations to assure homes would be built above the 100-year flood plain and streets to an acceptable elevation.

Subarea 6 - Developed Conditions

There appear to be two basic alternatives for draining Subarea 6. One involves gravity drains south to Reeds Creek and the other involves an onsite detention basin and pumping system to pump storm water north into the Clark Lateral.

Gravity drainage south could utilize a pipeline along Plumas Arboga Road. Such a pipeline would need to extend some 4000 feet to Reeds Creek. A possible alternative would involve an open ditch along State Highway 70's right-of-way on private land. The feasibility of either of these two options would be dependent on topographic analysis, landowner cooperation, and the cost of the resulting improvements.

The other alternative would involve constructing a detention pond within Subarea 6 equipped with a pumping station. The collected runoff would then be pumped into the Clark Lateral. The detention basin would need to be sized to handle runoff from a 24-hour, 100-year storm and also to mitigate against any possible effects of surface elevation increases in East Plumas Lake.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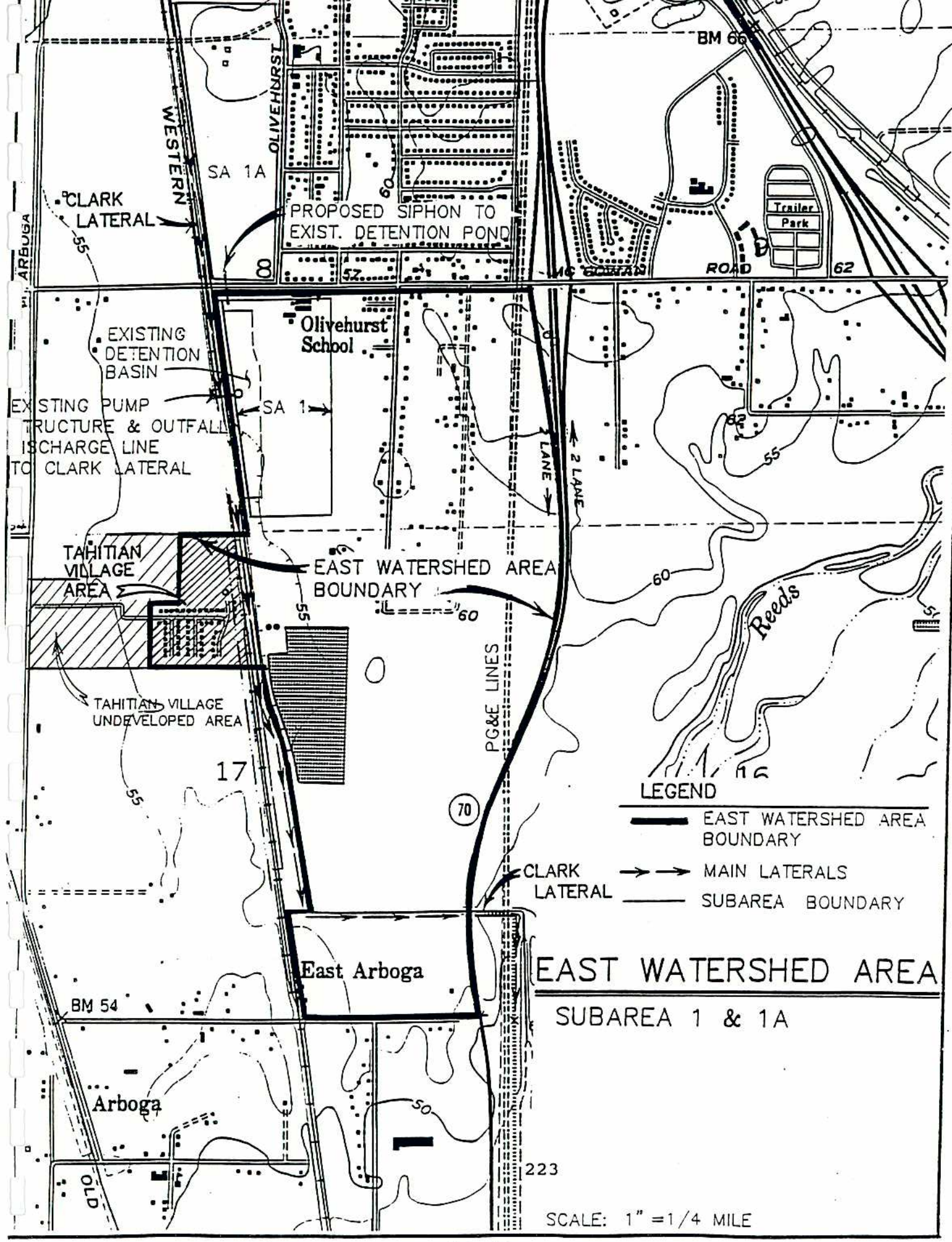
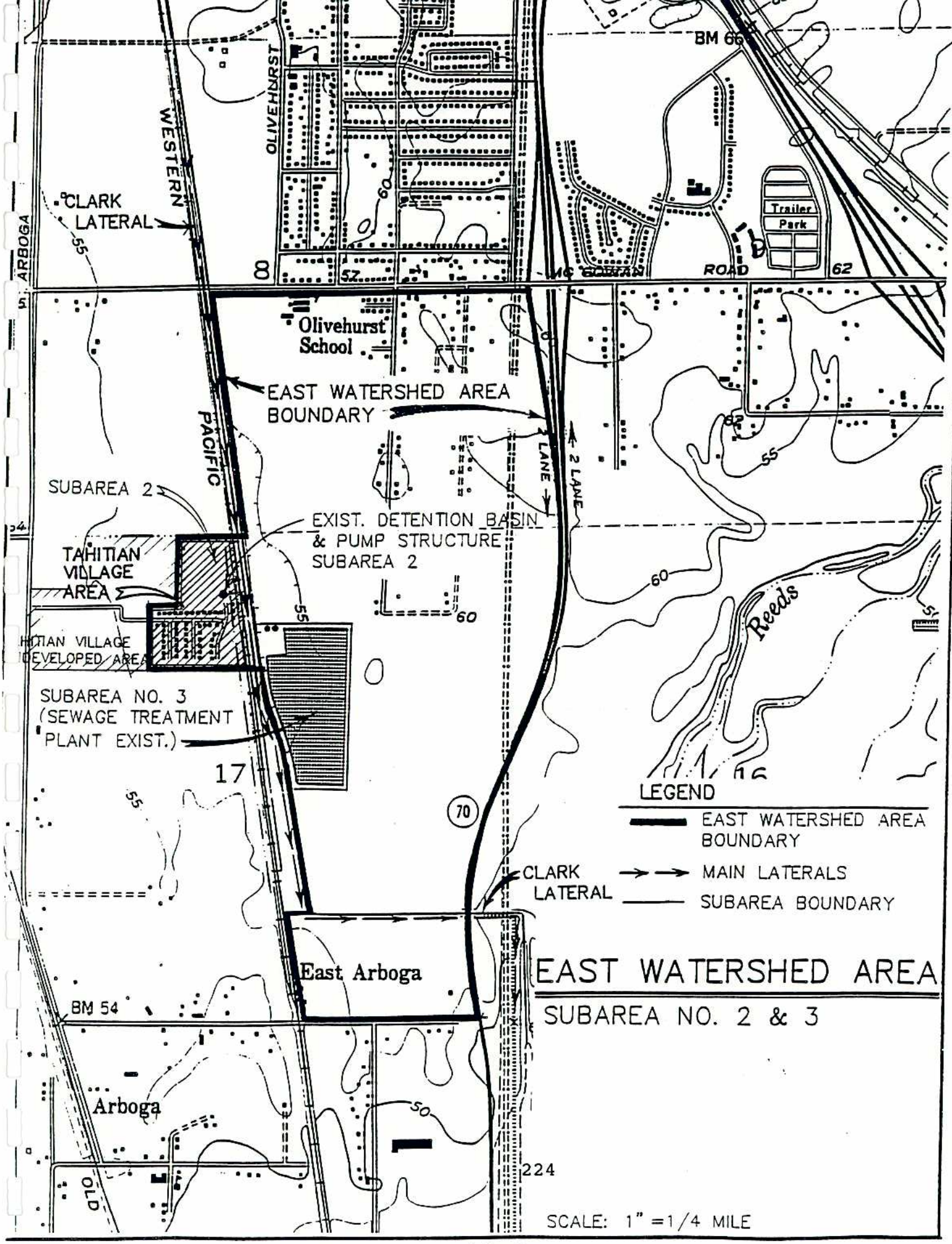
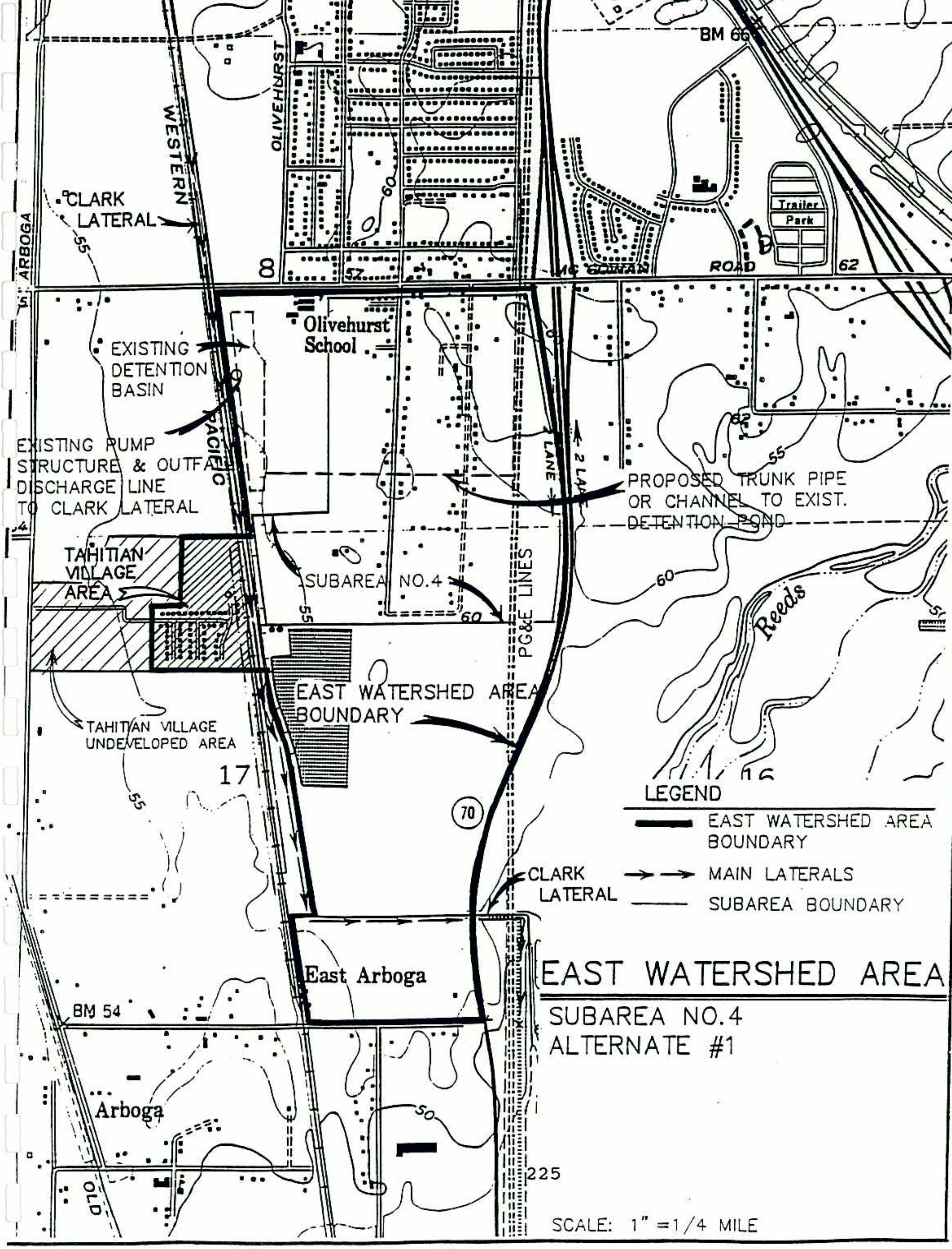
SA 1-A
(80 AC.)
OLIVEHURST
WESTERN
CLARK
LATERAL
ARBOGA
Trailer
Park
ROAD
62
Olivehurst
School
SA 1
(60 AC.)
PACIFIC
2 LANE
2 LANE
SA 4
(258 AC.)
TAHITIAN
VILLAGE
AREA
SA 2
(28 AC.)
SA 2
SA 3
(32 AC.)
TAHITIAN VILLAGE
UNDEVELOPED AREA
SA 5
(133 AC.)
17
70
Reeds
LEGEND
EAST WATERSHED AREA
BOUNDARY
CLARK
LATERAL
MAIN LATERALS
SUBAREA BOUNDARY
SA 6
(50 AC.)
East Arboga
BM 54
Arboga
OLD
222
EAST WATERSHED AREA
(LOCATION MAP INDICATING
LOCATIONS OF SUBAREAS)
SCALE: 1" =1/4 MILE


WESTERN
OLIVEHURST
SA 1A
CLARK LATERAL
PROPOSED SIPHON TO EXIST. DETENTION POND
BM 66
Trailer Park
MC GOWAN ROAD
62
ARBUGA
EXISTING DETENTION BASIN
Olivehurst School
EXISTING PUMP STRUCTURE & OUTFALL DISCHARGE LINE TO CLARK LATERAL
SA 1
2 LANE
TAHITIAN VILLAGE AREA
EAST WATERSHED AREA BOUNDARY
TAHITIAN VILLAGE UNDEVELOPED AREA
PG&E LINES
Reeds
17
70
East Arboga
BM 54
Arboga
OLD
223
LEGEND
EAST WATERSHED AREA BOUNDARY
CLARK LATERAL
MAIN LATERALS
SUBAREA BOUNDARY
EAST WATERSHED AREA
SUBAREA 1 & 1A
SCALE: 1" =1/4 MILE


BM 66
WESTERN
OLIVEHURST
CLARK LATERAL
ARBOGA
Trailer Park
MC GOWAN
ROAD
62
Olivehurst School
EAST WATERSHED AREA BOUNDARY
PACIFIC
2 LANE
SUBAREA 2
EXIST. DETENTION BASIN & PUMP STRUCTURE SUBAREA 2
TAHITIAN VILLAGE AREA
TAHITIAN VILLAGE DEVELOPED AREA
SUBAREA NO. 3 (SEWAGE TREATMENT PLANT EXIST.)
Reeds
17
70
East Arboga
BM 54
Arboga
OLD
224
LEGEND
EAST WATERSHED AREA BOUNDARY
MAIN LATERALS
SUBAREA BOUNDARY
CLARK LATERAL
EAST WATERSHED AREA
SUBAREA NO. 2 & 3
SCALE: 1" =1/4 MILE


CLARK LATERAL
ARBOGA
WESTERN PACIFIC
OLIVEHURST
BM 66
Trailer Park
MC GOWAN ROAD
Olivehurst School
EXISTING DETENTION BASIN
EXISTING PUMP STRUCTURE & OUTFALL DISCHARGE LINE TO CLARK LATERAL
LANE
2 LANE
PROPOSED TRUNK PIPE OR CHANNEL TO EXIST. DETENTION POND
TAHITIAN VILLAGE AREA
SUBAREA NO.4
PG&E LINES
Reeds
EAST WATERSHED AREA BOUNDARY
TAHITIAN VILLAGE UNDEVELOPED AREA
70
LEGEND
EAST WATERSHED AREA BOUNDARY
MAIN LATERALS
SUBAREA BOUNDARY
CLARK LATERAL
East Arboga
BM 54
Arboga
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SUBAREA NO.4
ALTERNATE #1
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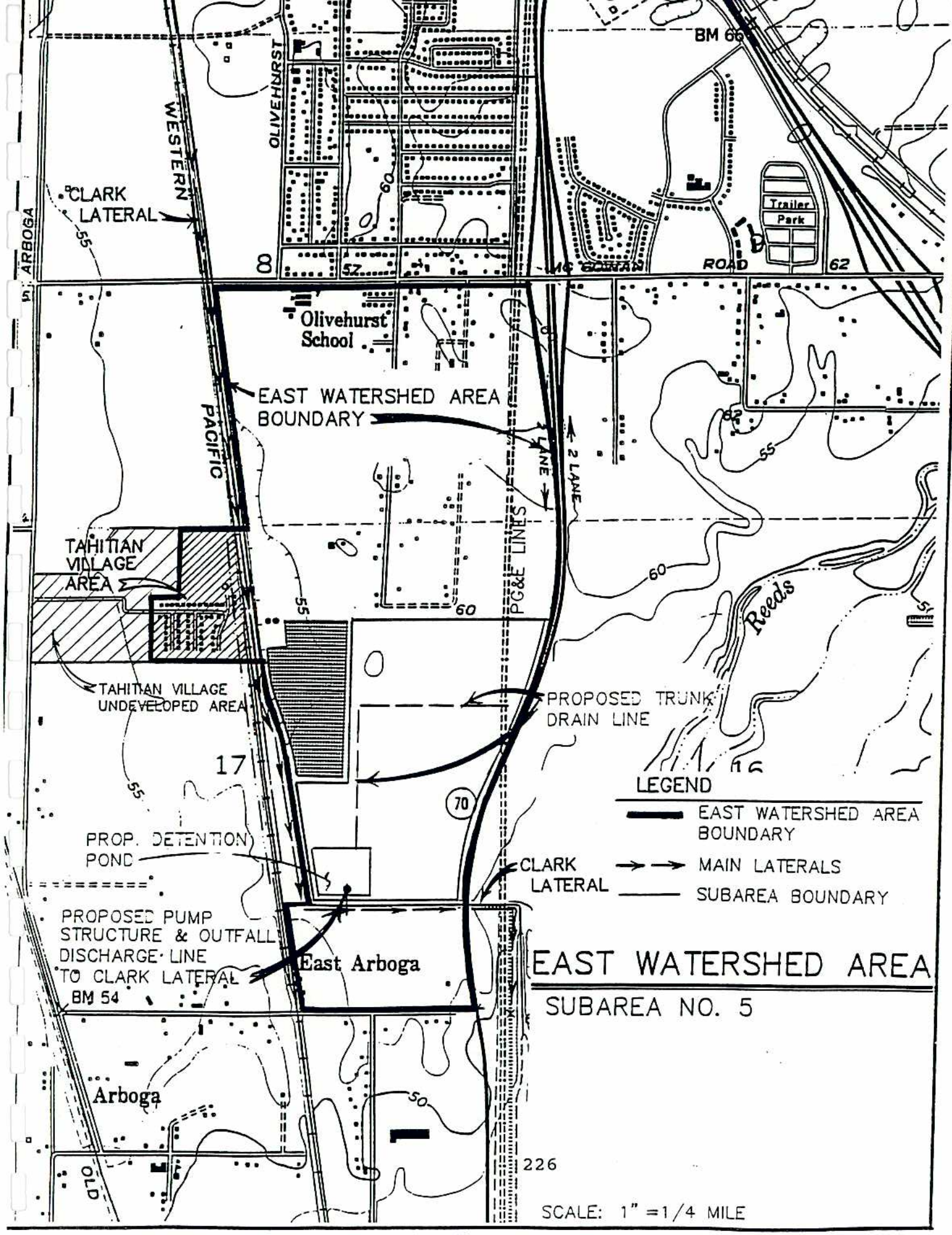
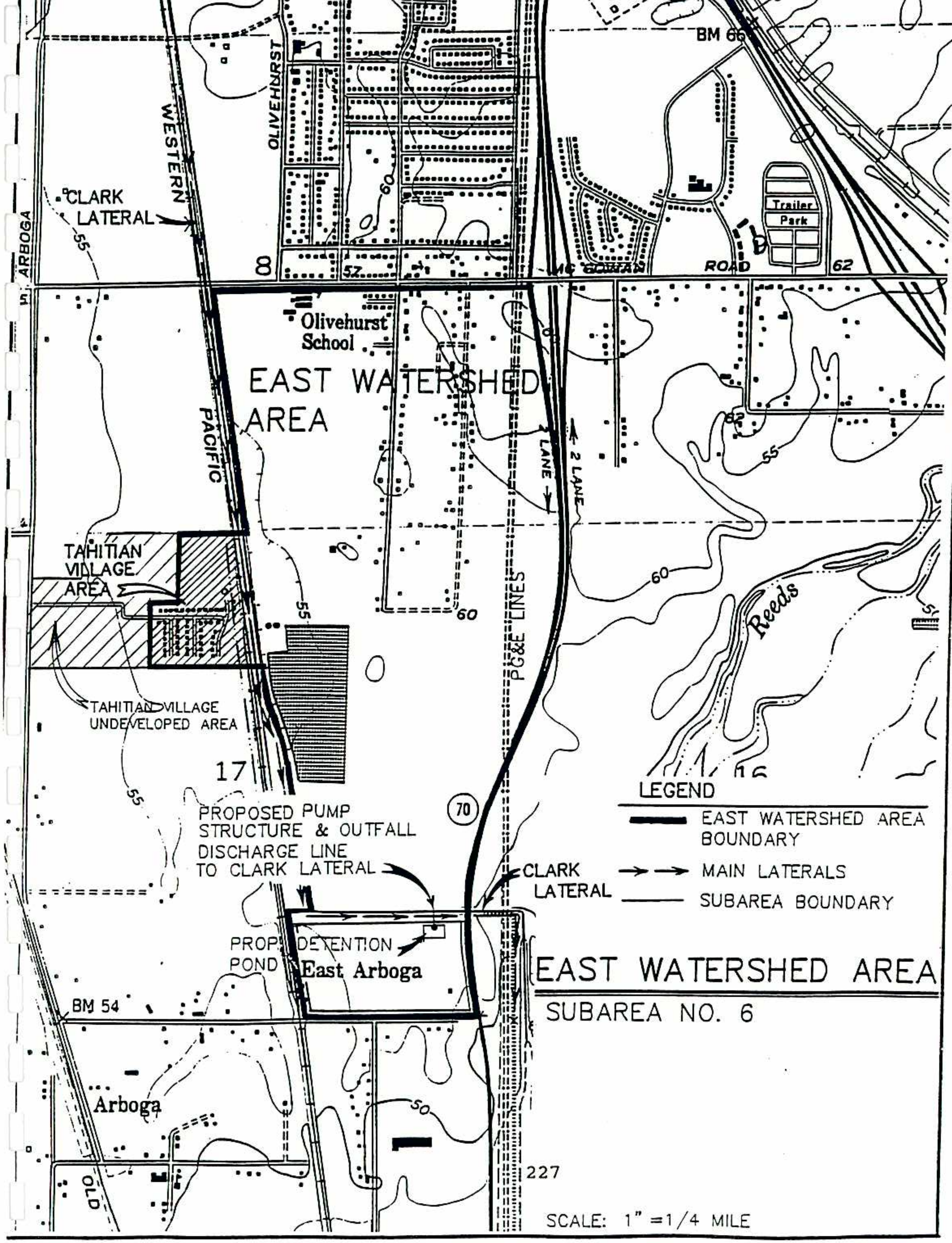

WESTERN
OLIVEHURST
ARBOGA
CLARK LATERAL
BM 66
Trailer Park
MC GOWAN ROAD
62
Olivehurst School
EAST WATERSHED AREA BOUNDARY
PACIFIC
2 LANE
PG&E LINES
TAHITIAN VILLAGE AREA
TAHITIAN VILLAGE UNDEVELOPED AREA
PROPOSED TRUNK DRAIN LINE
Reeds
PROP. DETENTION POND
PROPOSED PUMP STRUCTURE & OUTFALL DISCHARGE LINE TO CLARK LATERAL
BM 54
East Arboga
Arboga
OLD
226
LEGEND
EAST WATERSHED AREA BOUNDARY
MAIN LATERALS
SUBAREA BOUNDARY
EAST WATERSHED AREA
SUBAREA NO. 5
SCALE: 1" =1/4 MILE


EAST WATERSHED AREA
SUBAREA NO. 6
EAST WATERSHED AREA
LEGEND
EAST WATERSHED AREA BOUNDARY
MAIN LATERALS
SUBAREA BOUNDARY
SCALE: 1" =1/4 MILE
PROPOSED PUMP STRUCTURE & OUTFALL DISCHARGE LINE TO CLARK LATERAL
PROP. DETENTION POND
CLARK LATERAL
CLARK LATERAL
TAHITIAN VILLAGE AREA
TAHITIAN VILLAGE UNDEVELOPED AREA
Olivehurst School
East Arboga
Arboga
OLIVEHURST
WESTERN
PACIFIC
ARBOGA
MC GOWAN
ROAD
Trailer Park
PG&E LINES
2 LANE
2 LANE
Reeds
BM 66
BM 54
OLD
70
227
8
17
16
57
60
62
55
50

ESTIMATED STORM WATER RUNOFF VOLUMES AND DETENTION VOLUMES

Tables 1 and 2 indicate the estimated amount of storm water anticipated for both undeveloped and developed conditions for the East and West portions of NASA. Table 2 also presents the estimated volume of water within the Sacramento and San Joaquin Drainage District easement area and the estimated volume of water stored under existing conditions in areas of Olivehurst subject to 100-year FEMA flooding, but not within the inundation easement. It has been assumed that the volume of flood waters stored in the inundation easement area must be maintained, unless otherwise determined by the State of California; however, the volume of flood water in areas not encumbered by the State easement rights is assumed not to be essential to State flood control operations and, as such, the loss of the storage is not being compensated for.

All stormwater runoff volumes have been calculated for a 24-hour, 100-year storm event which has been determined to be 4.16 inches of rainfall in 24 hours. Other drainage calculation parameters are as follows:

Runoff Factors:

Undeveloped Areas	C = .20
Developed Areas	C = .50

Table 1

North Arboga Study Area
Drainage Analysis

West Watershed Area
Estimated Stormwater Runoff Volumes and Detention Requirements
(24-hour, 100-year strom event)

	Drainage Directed to Lateral 15				Drainage Directed to Clark Lateral			
Study Alternate	Area acres	Runoff Existing ac-ft	Runoff Developed ac-ft	Detention Required ac-ft	Area acres	Runoff Existing ac-ft	Runoff Developed ac-ft	Detention Required ac-ft
A	820	57	142	0	0	0	0	0
B	820	57	142	85	0	0	0	0
C	0	0	0	0	820	57	142	142
D	410	29	71	42	410	28	71	71

Table 2

North Arboga Study Area
Drainage Analysis

East Watershed Area
Estimated Stormwater Runoff Volumes and Detention Requirements
(24-hour, 100-year storm event)

Subarea	Area acres	Runoff Existing ac-ft	Runoff Developed ac-ft	Runoff Detention Required ac-ft	FEMA Flood Plan Storage loss ac-ft	Inundation Easement Storage loss ac-ft	Additional Storage required ac-ft
Subarea 1 (includes offsite Area 1-A)	140	10	24	24	218	0	0 230
Subarea 4	258	18	45	45	281	0	0
Subarea 5	133	10	23	13	410	300	300
Subarea 6	50	4	9	5	0	0	0

SUGGESTED MITIGATIONS:

1. All improvements should be constructed to County of Yuba and Reclamation District No. 784 standards.

2. All lands not presently in Reclamation District No. 784 should be annexed to the district during the development process and prior to recording of final maps.

3. All development within areas subject to flooding shall provide for flood proofing of all structures pursuant to FEMA and County requirements.

4. The State of California must grant approval for developments proposed in areas where the State has inundation and flowage easement rights under the Sacramento and San Joaquin Drainage District.

APPENDIX 6

ENGINEER'S REPORT: TRAFFIC

(Prepared for the County of Yuba by
KD Anderson & Associates)

TRAFFIC IMPACT ANALYSIS

FOR THE

MASTER ENVIRONMENTAL AREA (MEA)

Yuba County, California

Prepared For:

Yuba County Planning Department
938 14th Street
Marysville, CA 90901

Prepared By:

kdANDERSON Transportation Engineers
417 Oak Street
Roseville, CA 95678
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March 31, 1992
Job No. 9600-01

KD Anderson
Transportation Engineers

TABLE OF CONTENTS

KDA

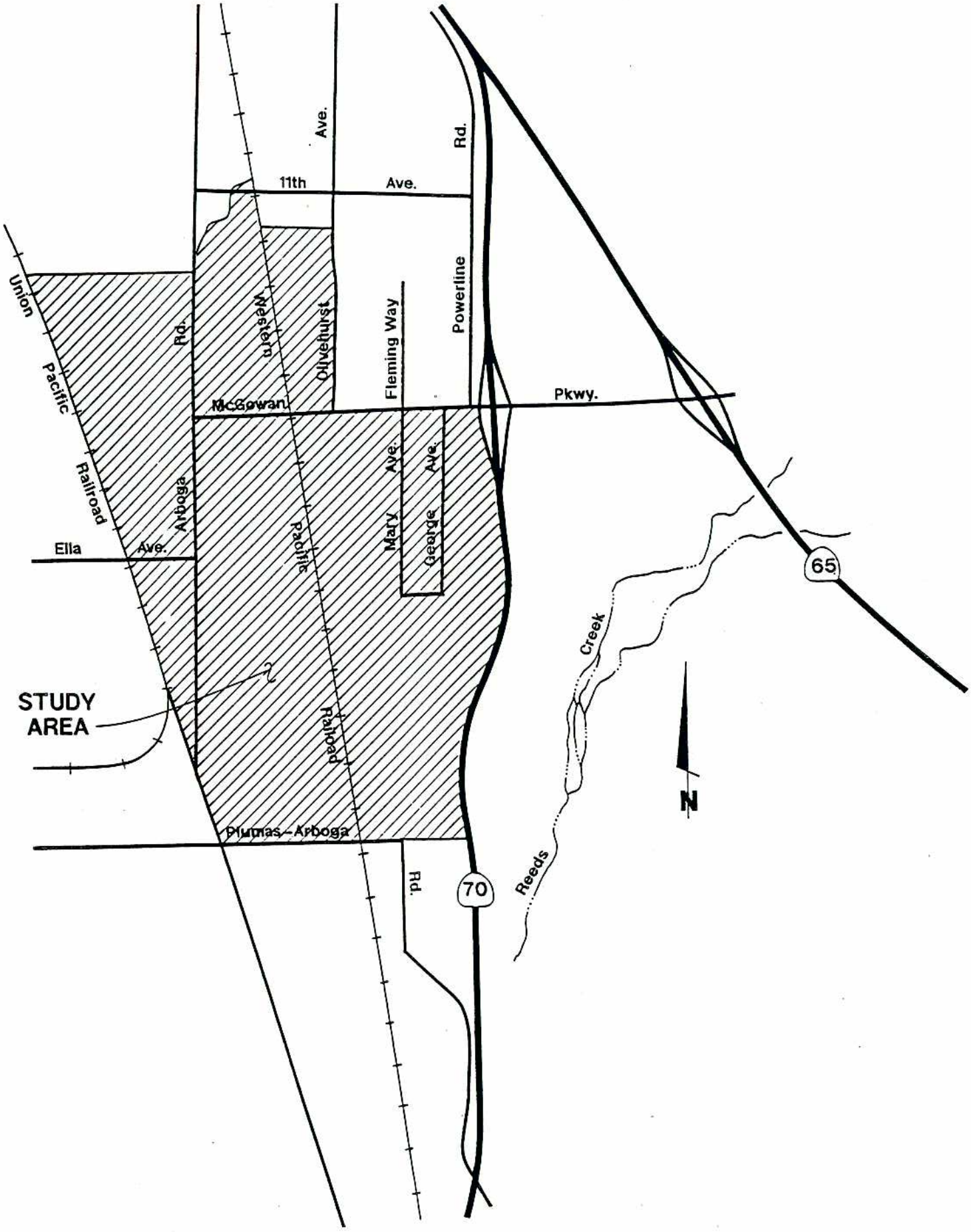
INTRODUCTION

This report documents kdANDERSON Transportation Engineers' assessment of the traffic impacts associated with development of the North Arboga area of Yuba County, California. This report is part of the Master Environmental Assessment (MEA) for the study area.

The North Arboga MEA study area includes parcels in various stages of development approval. The area includes thirteen distinct parcels which have tentative residential site plans and the McGowan Plaza Commercial Center. No proposals exist for the remainder of the study area, which was assumed to be built out at maximum allowable density. The study area lies west of the Union Pacific Railroad tracks, east of State Route 70, north of Plumas-Arboga Road and primarily south of Eleventh Avenue. Figure 1 displays the location of the project area within a regional setting.

The MEA study area lies within a broad region which is expected to transition from agricultural to residential uses over the next ten to twenty years. Other significant development proposals exist in the south Yuba County area, including the Plumas Lake Specific Plan Area (4,500 acres) directly to the south, the East Linda Specific Plan Area (3,500 units), Wheeler Ranch (550 acres) directly west and the Stonebridge Specific Plan Area (3,000 units). When combined with numerous smaller in-fill proposals, overall south Yuba County development could reach 30,000 residential units.

Significant Circulation System improvements are also being contemplated, although funding for these facilities has not been identified. Proposals to widen the highways serving this area are being planned, along with interchanges to serve the adjacent land uses. To the north, Caltrans is pursuing plans for the Third Bridge over the Feather River, an improvement which would drastically alter access to Yuba City. Longer term plans for a SR 70 Bypass of Marysville are also being considered. While these facilities would help to provide much improved access to the MEA, Caltrans staff is quick to note that State funding for these improvements is uncertain, and that significant local participation will be required to see each project to completion.



KD Anderson
Transportation Engineers

VICINITY MAP

figure 1

The report which follows describes current and future conditions in this area with regard to circulation. Currently available roadway capacity has been inventoried, and plans for future road, freeway and interchange improvements have been reviewed. The amount of vehicular traffic which might be generated by the MEA study area, as well as by other background development, has been estimated and assigned to the area circulation system. Resulting traffic operations have been quantified, and, where necessary, measures to mitigate identified impacts to a level of insignificance have been suggested. The extent to which the MEA study area should be required to participate in cumulative mitigation has also been calculated.

EXISTING SETTING

Traffic conditions in the study area are heavily influenced by commuter travel patterns. To adequately assess existing traffic conditions, a multi-faceted program of field investigation and traffic counts was undertaken.

Existing Roadways

The North Arboga Area is served by State Highways and Yuba County roads. The State Highways are primarily four lane controlled access facilities constructed to Caltrans standards. The existing Yuba County roads within the study area were often constructed to meet rural rather than urban design standards. Typical urban design standards would include curb, gutter and sidewalks in addition to providing sufficient pavement width for on-street parking where applicable. Most study area roads were typically designed to pre-existing rural standards and, as such, would be deficient by typical urban standards. Following is a description of the primary roadways within the study area.

Functional Classification. The Yuba County Circulation Plan (1970) identifies the functional classification and ultimate configuration of important roads within the County. The following function classifications have been adopted:

MAJOR ROADS: Ultimately, Major Roads within Yuba County will be divided highways with a center median. A 110 foot right of way is designated, with a 64 foot pavement section in rural areas and an 86 foot section, capable of providing on-street parking, designated in urban areas. Both sections provide four through travel lanes and a center median.

COLLECTOR ROADS: Collector Roads in Yuba County have an 84 foot right-of-way in urban areas. A 64 foot pavement section is provided, and Collector Roads are capable of providing four travel lanes with parking, or, by eliminating parking, or by widening, five lanes through intersections. In rural areas, a 40 foot pavement section is designated, providing two travel lanes and on-street parking or, at intersections, three travel lanes.

RESIDENTIAL STREETS: In Yuba County, residential streets are constructed within a 60 foot right of way. The pavement section in both rural and urban areas is 40 foot, with on street parking.

Study Area Roads and Highways. Most study area roads were typically constructed to meet the low traffic volumes occurring today in this generally agricultural area. Many do not yet meet the current County standards. Following is a description of the primary roadways within the study area.

State Route 65. State Route 65 is a four lane limited access highway within the study area, although the road narrows to a conventional two lane facility at South Beale Road. SR 65 runs in a generally north/south direction providing local access between the Marysville area and the areas of Wheatland, Lincoln and Roseville, while connecting the study area with Interstate 80 and points east. SR 65 joins State Route 70 between the McGowan Parkway and Olivehurst Avenue interchanges.

The Caltrans publication 1990 Traffic Volumes on California State Highways indicates average daily traffic volumes of 11,200 vehicles on SR 65 north of McGowan Parkway and 10,700 vehicles south of McGowan.

State Route 70. Through the study area, State Route 70 is a two lane conventional highway, although portions to the north and south are now a four lane limited access highway. SR 70 runs north/south linking Marysville and other northern regions with the Sacramento Metropolitan area via the Yuba River crossing. Caltrans counts indicate average daily traffic volumes of 12,200 vehicles on SR 70 north of McGowan Parkway in 1990, with a volume of 10,300 vehicles at the junction with State Route 65.

Over the past several years, Caltrans has completed several regional projects to increase capacity and safety on SR 70 and SR 65. Other improvement programs are also being pursued. Eventual completion of a four lane SR 70 from the SR 99 terminus to Marysville is expected, and preliminary planning for a SR 70 Bypass of Marysville east of the study are is being conducted. The Bypass of Marysville is in the Yuba County Circulation Plan.

Incrementally, SR 65 is being widened to four lanes from Roseville northward, and planning for expanded facilities around such communities as Lincoln and Wheatland is underway.

Locally, Caltrans is in the process of planning the Third Bridge Crossing over the Feather River. This facility would connect to SR 65 north of Erle Road and an interchange at Feather River Boulevard would provide another link between the MEA area and the Yuba City and Marysville communities. The Third Bridge Crossing is a designated Major Road in the Yuba County Circulation Plan.

McGowan Parkway (Major Road). McGowan Parkway is a major east/west roadway extending east of SR 65 to Arboga Road, with interchanges at SR 65 and SR 70. Between SR 65 and SR 70, McGowan Parkway has two lanes and a paved shoulder. Through the community of Olivehurst the road is a two lane facility with a center left turn lane. In this area the roadway is approximately 54 feet wide, curb to curb and has been striped to provide bicycle lanes or parking. Curb returns with sidewalks exist on the north side of this segment, but not on the south side. West of Olivehurst Avenue, McGowan Parkway narrows to two lanes before terminating at Arboga Road.

The Yuba County Circulation Plan anticipates that McGowan Parkway will eventually be extended west to Feather River Boulevard.

Plumas-Arboga Road (Major Road). Today, Plumas-Arboga Road is a rural two-lane road. It begins at a T-intersection with Arboga Road and travels east along the southern boundary of the MEA and as well as the northern boundary of the Plumas Lake Specific Plan Area for about one mile. The road then turns south and parallels SR 70 before crossing under the highway. After providing access to the highway via an at-grade intersection, Plumas-Arboga Road continues easterly to Forty Mile Road. The average pavement width of Plumas-Arboga Road is 24 feet.

The Yuba County Circulation Plan envisions ultimate development of Plumas-Arboga Road as a major east-west facility running from Feather River Boulevard via a connection to Country Club Drive to a new interchange at the South Beale Road intersection on SR 65. A new interchange would be also be constructed on SR 70 in the vicinity of the Plumas - Arboga Road / Algodon Road intersection.

Arboga Road (Major / Collector Road). Arboga Road is a rural two lane north/south roadway running from Olivehurst southerly to Plumas - Arboga Road and the northern limit of the Plumas Lake Specific Plan Area. It forms a short portion of the west boundary of the MEA site and the east boundary of the Wheeler Ranch site, then terminates. Average paved width of Arboga Road in the study area is 22 feet with no shoulder available south of McGowan Parkway. North of McGowan Parkway, Arboga Road is a Major Road, while it is a Collector Road south of McGowan Parkway.

Olivehurst Avenue (Collector Road). Olivehurst Avenue is a rural two lane north/south roadway providing access to residential areas north of McGowan Parkway. The road is approximately 1 1/2 miles long with the southern terminus at a "T" intersection with McGowan Parkway and the northern terminus at the Olivehurst interchange on State Route 70. The paved width of the road averages 22 feet with unpaved shoulders.

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Powerline Road (Collector Road). Powerline Road is a two lane frontage route which parallels State Route 70. Originating in the northwest, Powerline Road extends southeasterly to McGowan Road. The average pavement width of Powerline Road is 23 feet with limited shoulders.

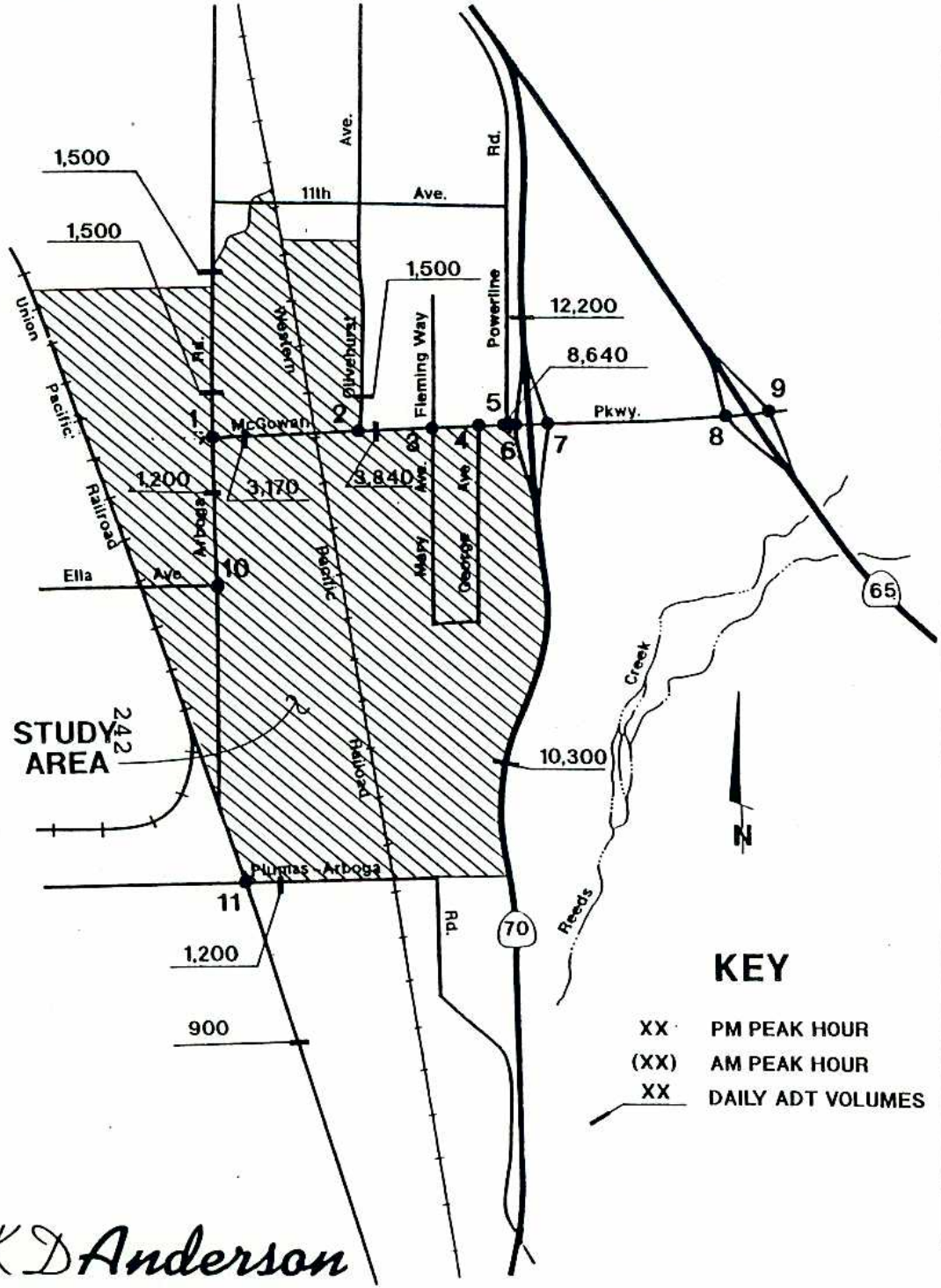
Ella Avenue (Residential Road). Ella Avenue is a two-lane rural road running east/west between Arboga Road and Feather River Boulevard. Ella Avenue is currently 22 feet in width with no shoulders.

George Avenue (Residential Road). George Avenue is a two-lane residential roadway. George Avenue originates in the north at McGowan Parkway. Extending to the south, George Avenue makes a 90 degree turn to the west to terminate at Mary Avenue. The average pavement width of George Avenue is 20 feet with no paved shoulders.

Mary Avenue/Fleming Avenue (Residential Road). Mary Avenue/Fleming Road is a two-lane road providing north-south circulation for area residents. Mary Avenue extends between George Avenue in the south and McGowan Parkway in the north. North of McGowan Parkway, Mary Avenue changes names to Fleming Avenue. Fleming Avenue extends north to Fourteenth Avenue where is changes names to Bowman Drive. The average pavement with of Mary Avenue/Fleming Avenue is 24 feet with no shoulders.

Existing Traffic Conditions

Current Traffic Volumes. To assess existing traffic conditions, **kdANDERSON Transportation Engineers** made new peak hour turning movement counts to supplement available data collected at key intersections in the study area. Peak hour turning movement counts were also made at intersections on state highways. Average daily roadway volumes were estimated based on a percentage of daily traffic assumed to occur during the peak hour, or, in the case of state highways, from Caltrans counts. **Figure 2** displays the existing peak hour turning movement counts at these locations, along with estimated daily volumes.



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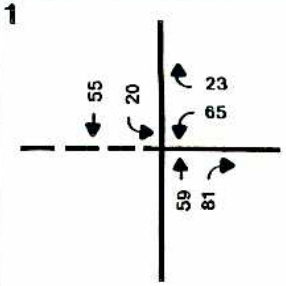

McGowan/Arboga

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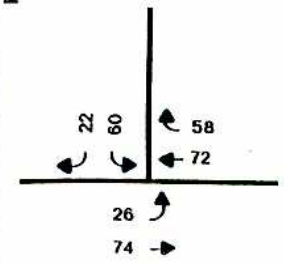

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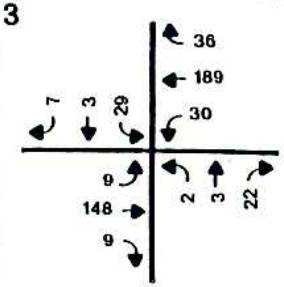

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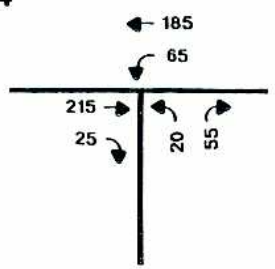

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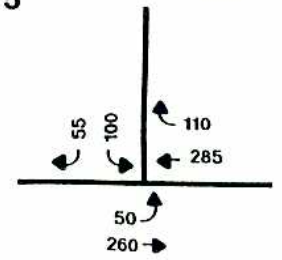

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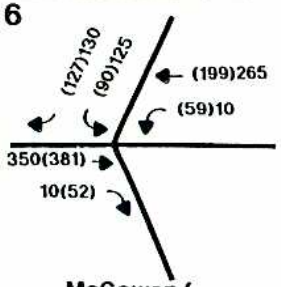

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SB Ramps Hwy.70

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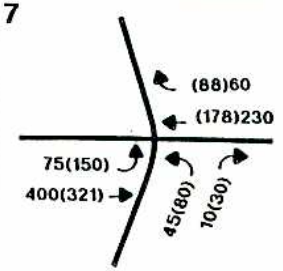

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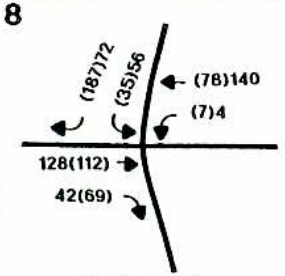

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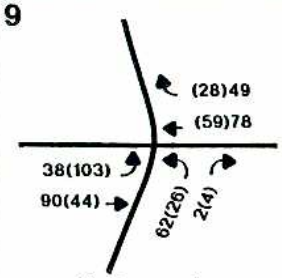

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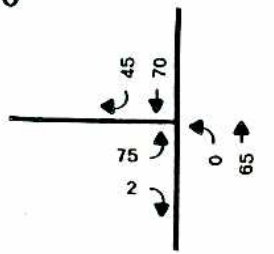

Arboga/Ella

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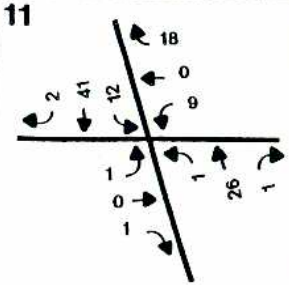

Arboga/Plumas-Arboga

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EXISTING TRAFFIC VOLUMES

figure 2

Levels of Service - Methodology

"Level of Service" is a qualitative measure of traffic operating conditions whereby a letter grade "A" through "F", corresponding to progressively worsening operating conditions, is assigned to an intersection or roadway segment. Table 1 presents the characteristics associated with each LOS grade. As shown in Table 1, LOS "A", "B" and "C" are considered satisfactory to most motorists, while LOS "D" is marginally acceptable. LOS "E" and "F" are associated with severe congestion and delay and are unacceptable to most motorists.

Unsignalized Intersections. Currently all of the study intersections are unsignalized. For unsignalized intersections, gap acceptance and reserve capacity are used for Level of Service analysis. Procedures used for calculating unsignalized intersection Level of Service are presented in the 1985 Highway Capacity Manual. Levels of Service at the unsignalized intersections, which are controlled by side street stop signs, are indicative of the magnitude of the delay incurred by motorists turning at the intersection. Because these calculations ignore the condition of through traffic flow (which is assumed to flow freely) a supplemental traffic signal warrant analysis is performed.

While the unsignalized Level of Service may indicate very long delays (i.e., LOS "E") traffic conditions are generally not assumed to be unacceptable unless signal warrants are satisfied. Meeting signal warrants signifies that an intersection has unacceptable operating conditions, but it does not mean that installation of a signal is the only way to mitigate those conditions. It is often possible to improve an intersection with additional lanes or improved geometrics so that a signal is not necessary. The signal warrant criteria employed for this study are those presented in the Manual of Uniform Traffic Control Devices (MUTCD) published by the Federal Highway Commission.

Roadway Segments. As previously mentioned, a Level of Service may also be calculated on a street or roadway segment. As for intersections, a letter grade "A" through "F", corresponding to progressively worsening operating conditions, is assigned to a roadway segment. However, unlike intersection Levels of Service which correspond to the peak hour, general roadway Levels of Service pertain to a traffic volume a facility can accommodate on a daily basis.

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TABLE 1
LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE	SIGNALIZED INTERSECTION	UNSIGNALIZED INTERSECTION	ROADWAY(DAILY)
"A"	Uncongested operations, all queues clear in a single-signal cycle. V/C ≤ 0.60	Little or no delay. reserve capacity > 400	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle V/C = 0.61-0.70	Short traffic delays. reserve capacity 300-399	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches V/C = 0.71-0.80	Average traffic delays. reserve capacity 200-299	Ability to maneuver and select operating speed affected.
"D"	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. V/C = 0.81-0.90	Long traffic delays. reserve capacity 100-199	Unstable flow, speeds and ability to maneuver severely restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approache(s) V/C = 0.91-1.00	Very long traffic delays. failure, extreme congestion. reserve capacity 0-99	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. V/C > 1.00	Intersection blocked by external causes	Forced flow, breakdown.

Capacity and Level of Service (LOS) analysis was conducted to identify the status of current traffic operations in and around the MEA study area and to provide an indication of the amount of existing roadway capacity available for future development. It is important to recognize that several different methodologies for measuring capacity and LOS exist, and as the area develops, the appropriate methodology may change.

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The MEA study area is presently primarily rural and features narrow two lane roads with long distances between intersections. Under these conditions, the condition of traffic flow might best be measured through application of the Rural Highway analysis techniques contained in the 1985 Highway Capacity Manual. These techniques generally use travel speed as the evaluation criteria and account for such factors as available passing sight distance, pavement width, truck percentage. As the area becomes more urbanized, evaluation criteria shift. It is recognized that under urban conditions, travel speeds will be lower and overall traffic flow will be governed by operation of key intersections which are usually signalized. Under urban conditions, the delay incurred by motorists while stopped at intersections, rather than travel speed between intersections, is the primary evaluation criteria.

Table 2 presents the characteristics associated with each LOS grade for urban facilities. Procedures used for calculating roadway Levels of Service are presented in the 1985 Highway Capacity Manual.

TABLE 2
EVALUATION CRITERIA FOR ROADWAY (DAILY) LEVEL OF SERVICE

Facility Type	LOS "C" ADT Volumes	LOS "D" ADT Volumes	LOS "E" ADT Volumes
Urban Street	V/C 0.71-0.80	V/C 0.81-0.90	V/C 0.91-1.00
Two Lane	10,700-12,000	12,000-13,500	13,500-15,000
Three Lane	14,200-15,950	15,950-17,950	17,950-19,950
Four Lane	21,300-24,000	24,000-27,000	27,000-30,000
Five Lane	28,300-31,900	31,900-35,900	35,900-39,900
Six Lane	32,000-36,000	36,000-40,500	40,500-45,000
Eight Lane	42,600-48,000	48,000-54,000	54,000-60,000

Source: Transportation Research Board, Circular 212 and the 1985 Highway Capacity Manual

The geometrics for each of the study intersections are presented on the following page in Table 3. Table 3 also includes the existing traffic control at each of the study intersections.

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TABLE 3
FACILITY ASSUMPTIONS

McGOWAN PARKWAY/ARBOGA ROAD

Control:	1-way stop on westbound McGowan Pkwy approach	
Geometrics:	Westbound (1):	1 left + right
	Northbound (1):	1 through + right
	Southbound (1):	1 left + through

McGOWAN PARKWAY/OLIVEHURST AVENUE

Control:	1-way stop on southbound Olivehurst approach	
Geometrics:	Eastbound (2):	1 left, 1 through
	Westbound (1):	1 through + right
	Southbound (1):	1 left + right

McGOWAN PARKWAY/MARY AVENUE/FLEMING AVENUE

Control:	1-way stop on NB Mary and SB Fleming approach	
Geometrics:	Eastbound (2):	1 left, 1 through + right
	Westbound (2):	1 left, 1 through + right
	Northbound (1):	1 left + through + right
	Southbound (1):	1 left + through + right

McGOWAN PARKWAY/GEORGE AVENUE

Control:	1-way stop on northbound George approach	
Geometrics:	Westbound (2):	1 left, 1 through
	Eastbound (1):	1 through + right
	Northbound (1):	1 left + right

McGOWAN PARKWAY/POWERLINE ROAD

Control:	1-way stop on southbound Powerline approach	
Geometrics:	Eastbound (2):	1 left, 1 through
	Westbound (1):	1 through + right
	Southbound (1):	1 left + right

McGOWAN PARKWAY/STATE ROUTE 70 SOUTHBOUND RAMPS

Control:	1-way stop on State Route 70 SB Ramp approach	
Geometrics:	Eastbound (1):	1 left + through
	Westbound (1):	1 through + right
	Southbound (1):	1 left + through + right

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TABLE 3 CONT
FACILITY ASSUMPTIONS

McGOWAN PARKWAY/STATE ROUTE 70 NORTHBOUND RAMPS

Control:	1-way stop on State Route 70 NB Ramp approach		
Geometrics:	Eastbound	(1):	1 through + right
	Westbound	(1):	1 left + through
	Northbound	(2):	1 left + through, 1 right

McGOWAN PARKWAY/STATE ROUTE 65 SOUTHBOUND RAMPS

Control:	1-way stop on State Route 65 SB Ramp approach		
Geometrics:	Eastbound	(1):	1 left + through
	Westbound	(1):	1 through + right
	Southbound	(1):	1 left + through + right

McGOWAN PARKWAY/STATE ROUTE 65 NORTHBOUND RAMPS

Control:	1-way stop on State Route 65 NB Ramp approach		
Geometrics:	Eastbound	(1):	1 through + right
	Westbound	(1):	1 left + through
	Northbound	(2):	1 left + through + right

ARBOGA ROAD/ELLA AVENUE

Control:	1-way stop on eastbound Ella approach		
Geometrics:	Eastbound	(1):	1 left + right
	Southbound	(1):	1 through + right
	Northbound	(1):	1 left + through

ARBOGA ROAD/PLUMAS-ARBOGA ROAD

Control:	1-way stop posted on WB approach assumed for EB		
Geometrics:	Northbound	(1):	1 left + through + right
	Southbound	(1):	1 left + through + right
	Eastbound	(1):	Dirt road, one lane approach
	Westbound	(1):	1 left + through + right

Table 4 presents the resulting intersection Levels of Service calculations and signal warrant analysis under existing conditions for the key intersections. Table 5 presents the Level of service calculation for the key roadway links within the study area.

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TABLE 4
EXISTING PM PEAK HOUR INTERSECTION LEVELS OF SERVICE

Intersection	Movements	LOS	Res Cap or V/C	Signal Warrant
1. McGowan/Arboga	WB left (minor)	A	537	Not Warranted
	SB left (major)	A	934	
2. McGowan/Olivehurst	SB left (minor)	A	579	Not Warranted
	EB left (major)	A	953	
3. McGowan/Mary/Fleming	SB left (minor)	A	454	
	NB left (minor)	A	414	Not Warranted
	EB left (major)	A	907	
	WB left (major)	A	938	
4. McGowan/George	NB left (minor)	B	390	Not Warranted
	WB left (major)	A	823	
5. McGowan/Powerline	SB left (minor)	D	187	Not Warranted
	EB left (major)	A	684	
6. McGowan/SR 70 SB Ramps	SB left (minor)	D	177	Not Warranted
	WB left (major)	A	672	
McGowan/SR 70 SB Ramps (AM Peak Hour)	**SB left (minor)**	**D**	**168**	**Not Warranted**
	WB left (major)	**A**	**553**	
7. McGowan/SR 70 NB Ramps	NB left (minor)	D	191	Not Warranted
	EB left (major)	A	757	
McGowan/SR 70 NB Ramps (AM Peak Hour)	**NB left (minor)**	**D**	**137**	**Not Warranted**
	EB left (major)	**A**	**691**	
8. McGowan/SR 65 SB Ramps	SB left (minor)	A	492	Not Warranted
	WB left (major)	A	965	
McGowan/SR 65 SB Ramps (AM Peak Hour)	**SB left (minor)**	**A**	**558**	**Not Warranted**
	WB left (major)	**A**	**956**	
9. McGowan/SR 65 NB Ramps	NB left (minor)	A	521	Not Warranted
	EB left (major)	A	939	
McGowan/SR 65 NB Ramps (AM Peak Hour)	**NB left (minor)**	**A**	**550**	**Not Warranted**
	EB left (major)	**A**	**873**	
10. Arboga/Ella	EB left (minor)	A	551	Not Warranted
	NB left (major)	A	978	
11. Arboga/Plumas-Arboga	EB left (minor)	A	751	
	WB left (minor)	A	769	Not Warranted
	NB left (major)	A	998	
	SB left (major)	A	985	

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TABLE 5
CURRENT DAILY TRAFFIC VOLUMES AND
CORRESPONDING LEVELS OF SERVICE

Roadway Segment	Location	Classification	Volume	Level of Service
Arboga Road	North of McGowan Pkwy	MAJOR	1,500	"A"
	No. of Plumas-Arboga	COLLECTOR	1,200	"A"
Olivehurst Rd	North of McGowan Pkwy	COLLECTOR	1,500	"A"
McGowan Parkway	East of Arboga Road	MAJOR	3,170	"A"
	East of Olivehurst Rd.	MAJOR	3,840	"A"
	West of SR 70 inter.	MAJOR	8,640	"A"
Plumas-Arboga Rd	East of Arboga Road	MAJOR	1,200	"A"
	North of SR 70 conn.	MAJOR	500	"A"
	South of SR 70 conn.	MAJOR	300	"A"
Powerline Road	North of McGowan Pkwy	COLLECTOR	3,200	"A"
State Route 70	No. of McGowan Pkwy	FREEWAY	12,200	"A"
	So. of McGowan Pkwy	FREEWAY	10,300	"C"
	No. of SR 65 Junction	FREEWAY	23,300	"C"
	So. of Feather River	HIGHWAY	10,700	"D"

Intersections. Currently, all but three of the key intersections experience acceptable Level of Service. The McGowan Parkway/ Powerline Road intersection experience LOS "D" operations for motorists turning left from Powerline Road during the evening peak hour. Both of the SR 70 off-ramp intersections at McGowan Parkway also experience long delays (i.e., LOS "D") for motorists turning left. However, signal warrants are not met at these locations due to the low volumes on the minor street approach. In addition, warrants for signalization are not met at any other of the study intersections.

Roadway Segments. As indicated in Table 5, the volume of traffic currently occurring on County roads in this area is generally low. Volumes ranging from less than 1,000 vehicles per day (vpd) to about 8,640 vpd on McGowan Parkway were observed. Under the existing condition, all of the study area roadways experience Level of Service "A" with the exception of State Route 70.

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State Route 70, south of Feather River Boulevard carries 10,700 ADT which correspond to LOS "D" on this two lane section of highway.

Existing Traffic Hazards

With one exception, most of the roads and intersections in the vicinity of the MEA present no obvious hazard to the motoring public. Although street lights might be installed to illuminate intersections, this feature is often missing in rural areas. Similarly, some of the traffic control devices on area streets are faded and in need of replacement.

A potential hazard exists on Arboga Road in the immediate vicinity of the Ella Avenue intersection. The alignment of Arboga Road on either side of the intersection is offset, creating a set of reversing curves through the intersection. This alignment is difficult to perceive at night and should be corrected.

Alternative Transportation Modes

The HUB Area Transit Authority provides alternative transportation modes to the Marysville/Yuba City/Olivehurst area. HUB's area of operations extends from the McGowan Parkway/Arboga Road intersection in the west to Griffith Avenue in the east and from the Murna/Feather River intersection in the south to the town of Marysville in the north.

The HUB is available to the general public and operates between the hours of 6:00 am and 5:00 pm Monday through Friday. Riders telephone in their location, destination and time desired to arrival time to the HUB, who in turn schedules the rider in the appropriate route. A minimum of 2-3 hour notice is required to insure the riders request can be accommodated.

PROJECT IMPACTS

Project Description

The study area lies west of the Union Pacific Railroad tracks, east of State Route 70, north of Plumas-Arboga Road and primarily south of Eleventh Avenue (refer to Figure 1). The North Arboga MEA study area is intended to consist of thirteen distinct parcels which have tentative residential site plans in addition to assumed build out

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of the remainder of the study area at maximum allowable density. In addition, the proposed McGowan Plaza Commercial Center is located within the MEA study area, southwest of the McGowan Parkway/ State Route 70 Southbound Ramp intersection.

The proposed/assumed uses are summarized in Table 6. The land use designations and parcel numbers are located in the Appendix. The thirteen residential parcels would ultimately total 2,674 single family residences. The proposed McGowan Plaza Commercial Center calls for construction of a 17,000 gross square foot retail center, a 6,000 gross square foot fast food restaurant and a 75 unit motel.

TABLE 6
PROPOSED/ASSUMED PROJECT USES

Parcel No/Land Use	Number of Dwelling Units / Acres
Residential	
1	147 du
2	274 du
3	335 du
4	212 du
5	45 du
6	182 du
7	106 du
8	418 du
9	62 du
10	228 du
11	37 du
12	92 du
13	536 du
RRE	120 du
	2,794 du
Industrial	
M1	205 ac
Commercial	
C	4 ac

The remainder of the MEA study area is estimated to contain approximately 325 acres of undeveloped land. Of this area, a total of 120 acres are currently zoned RRE (Rural Residential Estate), while the remaining 205 acres are zoned M1 (Industrial). According

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to County staff, the maximum density of RRE zoning is 1 dwelling unit per acre. Therefore, it is estimated that build out of the RRE zoning within the MEA study area would result in approximately 120 additional single family dwelling units.

Trip Generation

The number of automobile trips which can be expected to be generated by the project can be estimated through application of known trip generation rates. Rates used for estimating the residential and industrial trip generation were obtained from the Institute of Transportation Engineers (ITE) publication, Trip Generation (Fifth Edition).

Table 7 presents the rates used in this analysis, while Table 8 presents the trips generated by development of the residential and industrial portions of the MEA project area as well as the trips generated for the McGowan Plaza Commercial Center as presented in it's Traffic Impact Analysis (May 1990).

The Industrial M1 zoning could develop as either heavy or light industrial, therefore, as a conservative approximation it was estimated that 70% of the 205 industrial acres might be constructed as light industrial with the remainder built out as heavy industrial.

TABLE 7
TRIP GENERATION RATES

Land Use	Quantity	Daily Trip Rates	AM Peak Hour Rates			PM Peak Hour Rates		
			In	Out	Total	In	Out	Total
S.F. Residential								
MEA (12) Parcels	2,674 du	9.55/du	26%	74%	0.74	64%	36%	1.01
MEA build out	120 du	9.55/du	26%	74%	0.74	64%	36%	1.01
Industrial	205 acres*							
Light		51.8/ac	83%	17%	7.51	12%	88%	7.26
Heavy		6.8/ac	--	--	1.98	--	--	2.16

* Trip Generation of the M1 area was assumed to be a combination of light (70%) and heavy (30%) industrial.

As indicated by Table 8, development of the residential and industrial uses in the North Arboga MEA area would generate gross totals of 34,533 daily trips with 3,996 trips occurring during the evening peak hour.

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TABLE 8
TRIPS GENERATED

Land Use	Quantity	Daily Trips	PM Peak Hour Trips In	Out	Total
S.F. Residential					
MEA (12) Parcels	2,674 du	25,536	1,728	972	2,700
MEA build out	120 du	1,146	77	44	121
Industrial	205 acres	7,851	141	1,034	1,175
Subtotal:		34,533	1,946	2,050	3,996
McGowan Plaza*					
Retail	1,700 gsf	2,350	125	125	250
Motel	75 units	545	30	30	60
Fast Food	6,000 gsf	1,700	100	95	195
Subtotal:		4,595	255	250	505
Total On-Site Trips:		39,128	2,201	2,300	4,501
Passby Fast Food*	(45%)	765	45	45	90
Passby Retail*	(40%)	940	50	50	100
Internal Comm/FF*	(35%)	1,418	79	77	156
Internal Industrial	(30%)	2,355	43	310	353
Internal Residential	(47%)	12,540	848	478	1,326
NET OFF-SITE TRIPS		21,111	1,136	1,340	2,476

* Taken directly from Traffic Impact Analysis for the McGowan Plaza Commercial Center

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According to its traffic analysis, the McGowan Plaza Commercial Center when fully developed is expected to generate gross totals of 4,595 daily trips with 505 trips occurring during the evening peak hour. County staff identified Alternative 2 of the traffic study to be considered as the preferred alternative.

However, many of the study area trips represent opposite ends of trips which will originate and terminate within the project area boundary. Review of traffic projections made by the model suggest that about 54% of the gross area trips would leave the study area.

Based on research conducted by the Institute of Transportation Engineers and review of traffic projections generated by the Yuba/ Sutter Traffic Model, many of the trips generated by both the commercial and industrial uses will be made to or from the residences within the project. When the Arboga area is fully developed about 35% of the commercial trips and 30% of the industrial trips will be internal to the project area.

A significant number of the residential trips generated by the project will remain internal, either as the ends of trips generated by commercial/industrial uses or as two ends of trips generated between residences for school and social activities. These internal trips will not affect off-site study intersections. In addition to those trips which are destined for on-site commercial\ industrial uses, about 20% of the total residential trip generation would remain on-site as internal Social / Recreational trips.

In addition, a significant number of the trips generated by retail commercial uses are typically drawn from the stream of traffic passing the site. These "Pass-By" trips represent motorists who stop to shop as part of a trip they would otherwise make between primary origin and destination. The ITE suggests that 40% to 60% of the trips generated by shopping centers may in fact be "Pass-By" trips. It is important to note that Pass-By trip diversion can only occur when adjacent streets carry a significant amount of traffic.

After, accounting for the internal and "passby" trips, the total new external trip generation for of the project area would be 21,111 new daily trips, with 2,476 new trips occurring during the PM peak hour.

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Trip Distribution and Assignment

Trips generated by MEA area development were assigned to the adjacent street system using the Yuba-Sutter traffic model. The resulting distribution of external trips from the North Arboga MEA study area is shown in Table 9.

TABLE 9
REGIONAL TRIP DISTRIBUTION

DIRECTION	Percentage of Total New Trips
Arboga Road North	42%
Olivehurst	17%
SR 70 North	18%
SR 70 South	16%
SR 65 South	6%
Feather River South	1%
	100%

Existing Plus MEA Study Area Traffic Conditions

Resulting "Existing plus Project" traffic volumes on the study area street system are indicated in Figure 3. Figure 4 displays traffic volumes on the internal roadway system of the MEA study area as proposed in addition to the adjacent intersections.

To determine project specific impacts, Levels of Service were again calculated and the results compared to existing conditions. Where traffic signals would clearly be warranted to accommodate projected traffic, the need for signalization has been indicated. Table 10 presents the intersection Levels of Service while Table 11 displays the roadway Levels of Service.

As indicated, the addition of project generated traffic increases traffic volumes on most of the streets in the vicinity of the project. While build out of the MEA area will result in a traffic volume increase which more than double current traffic levels at some streets, most streets and intersections will continue to operate satisfactorily and thresholds for widening will not be met.

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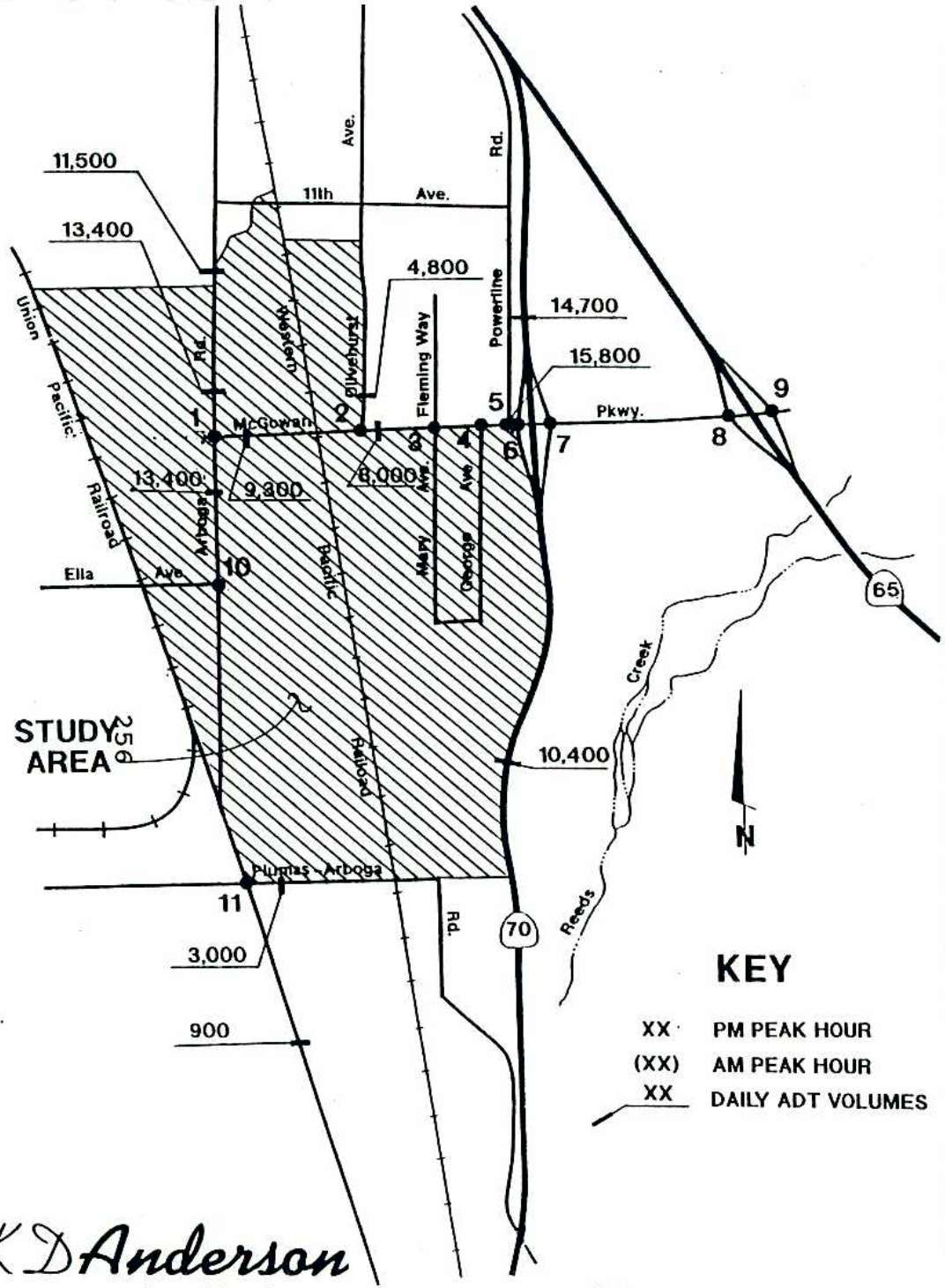

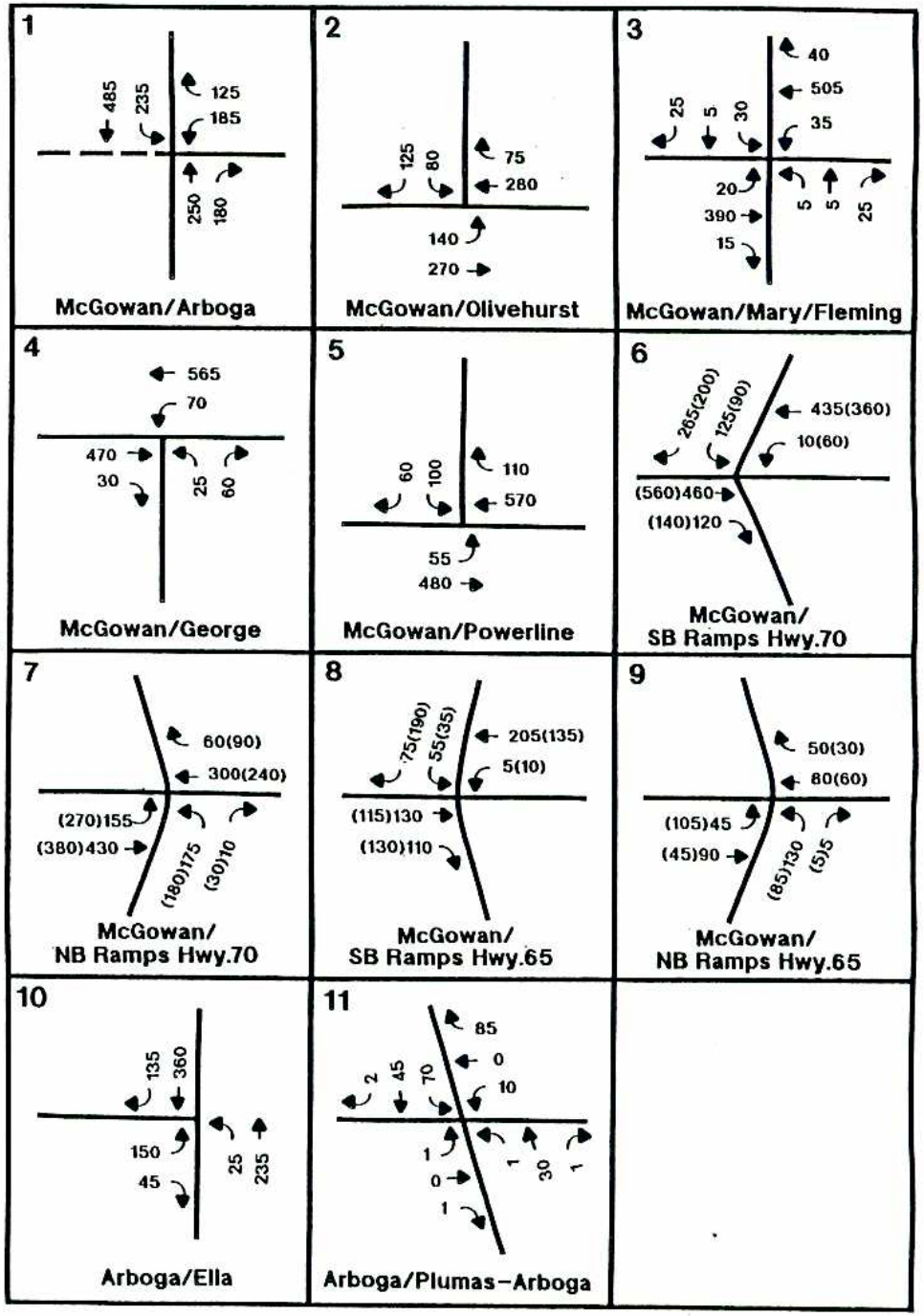

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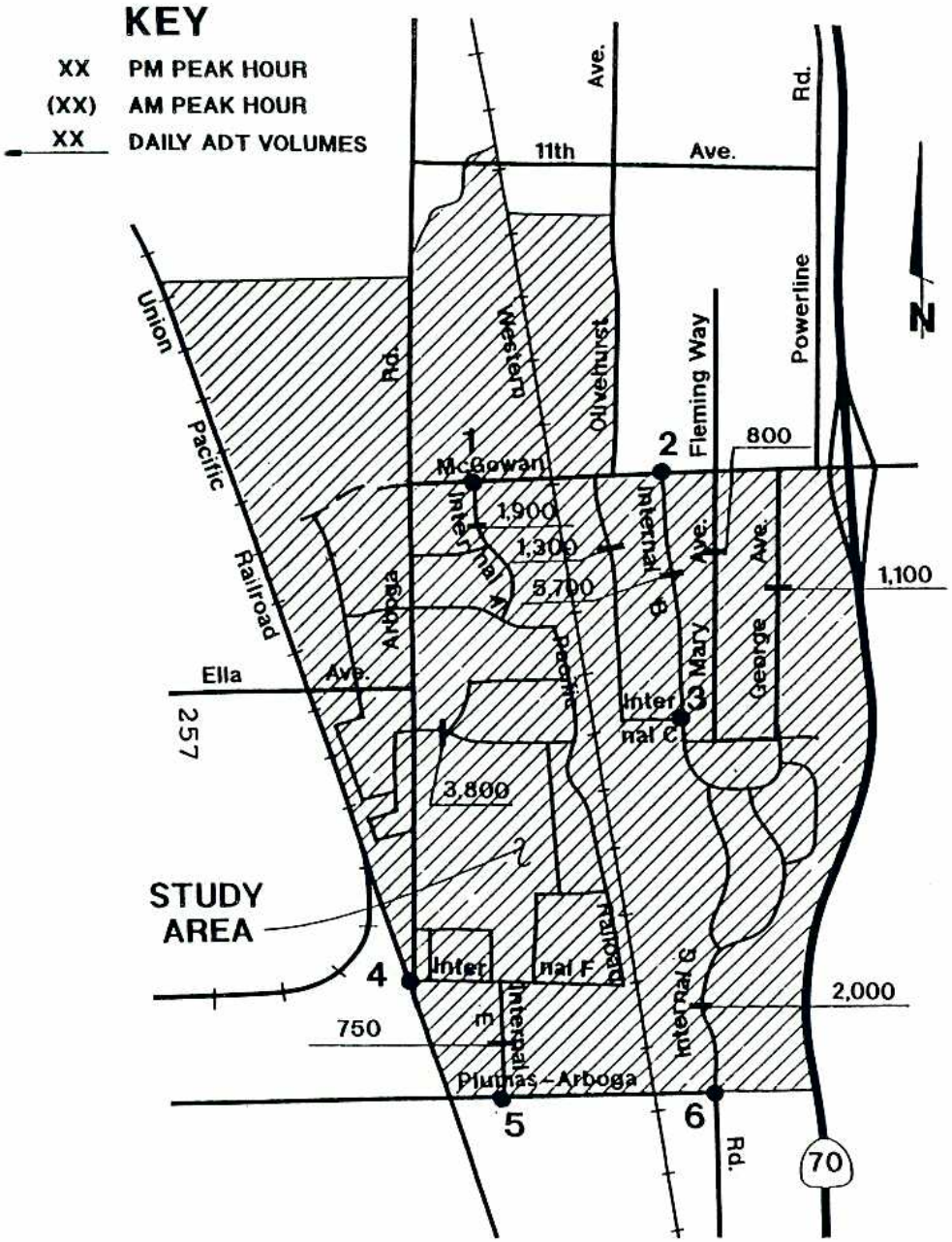
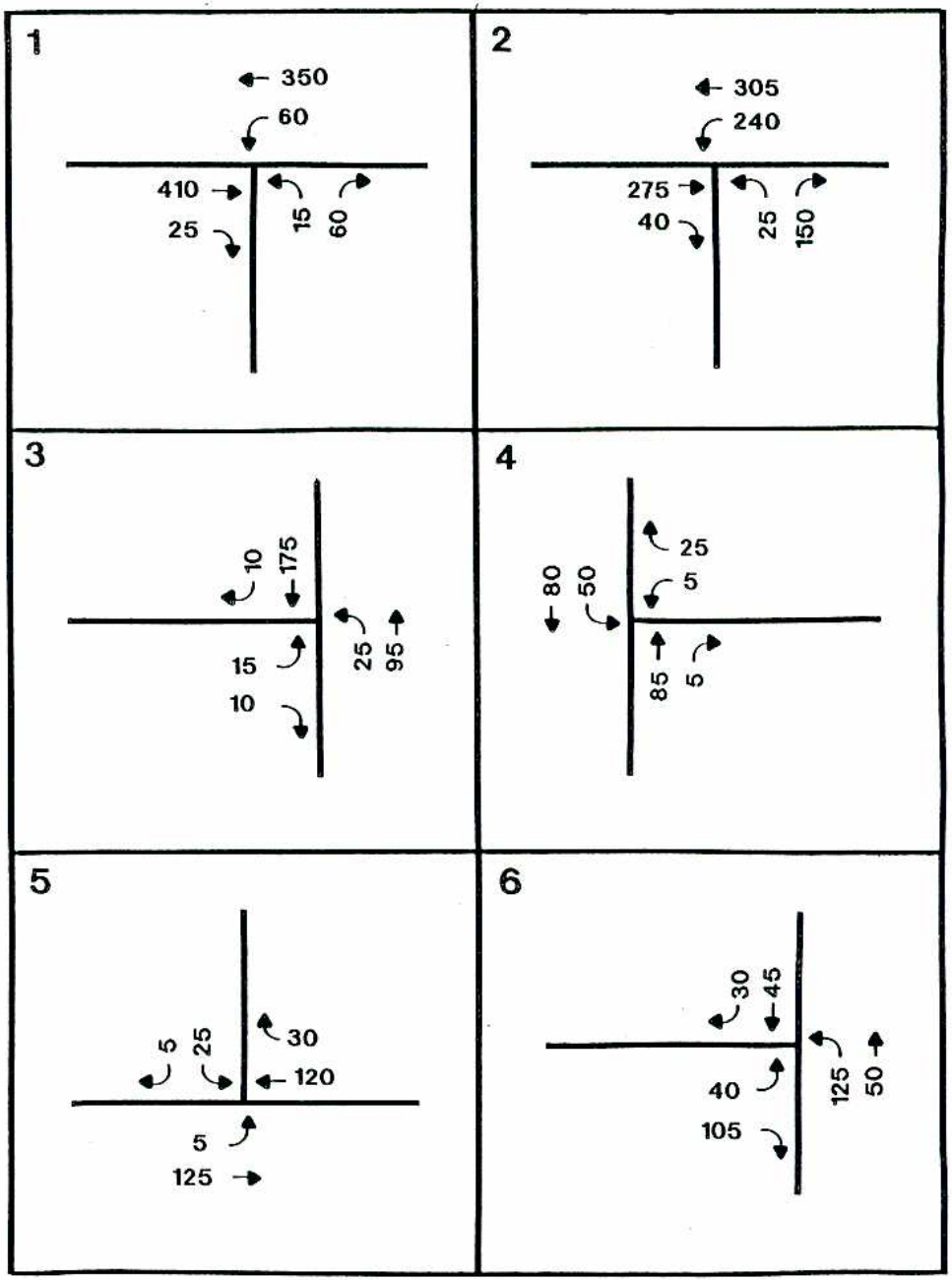
EXISTING PLUS PROJECT TRAFFIC VOLUMES

figure 3





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EXISTING PLUS PROJECT STUDY AREA VOLUMES

figure 4

TABLE 10
EXISTING PLUS MEA STUDY AREA PEAK HOUR
INTERSECTION LEVELS OF SERVICE

Intersection	Movements	LOS	Res Cap or V/C	Signal Warrant
1. McGowan/Arboga	WB left (minor)	F	-121	Warranted
	SB left (major)	A	426	
2. McGowan/Olivehurst	SB left (minor)	D	139	Not Warranted
	EB left (major)	A	610	
3. McGowan/Mary/Fleming	SB left (minor)	D	118	
	NB left (minor)	D	144	Not Warranted
	EB left (major)	A	587	
	WB left (major)	A	693	
4. McGowan/George	NB left (minor)	D	112	Not Warranted
	WB left (major)	A	610	
5. McGowan/Powerline	SB left (minor)	E	1	Not Warranted
	EB left (major)	A	447	
6. McGowan/SR 70 SB Ramps	SB left (minor)	E	13	Not Warranted
	WB left (major)	A	500	
McGowan/SR 70 SB Ramps (AM Peak Hour)	SB left (minor)	E	16	Not Warranted
	WB left (major)	B	354	
7. McGowan/SR 70 NB Ramps	NB left (minor)	F	-19	Not Warranted
	EB left (major)	A	587	
McGowan/SR 70 NB Ramps (AM Peak Hour)	NB left (minor)	F	-100	Not Warranted
	EB left (major)	A	477	
8. McGowan/SR 65 SB Ramps	SB left (minor)	B	388	Not Warranted
	WB left (major)	A	896	
McGowan/SR 65 SB Ramps (AM Peak Hour)	SB left (minor)	A	454	Not Warranted
	WB left (major)	A	884	
9. McGowan/SR 65 NB Ramps	NB left (minor)	A	426	Not Warranted
	EB left (major)	A	929	
McGowan/SR 65 NB Ramps (AM Peak Hour)	NB left (minor)	A	472	Not Warranted
	EB left (major)	A	871	
10. Arboga/Ella	EB left (minor)	E	68	Not Warranted
	NB left (major)	A	593	
11. Arboga/Plumas-Arboga	EB left (minor)	A	563	
	WB left (minor)	A	667	Not Warranted
	NB left (major)	A	998	
	SB left (major)	A	914	

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TABLE 10 CONT
EXISTING PLUS MEA STUDY AREA PEAK HOUR
INTERSECTION LEVELS OF SERVICE

Intersection	Movements	LOS	Res Cap or V/C	Signal Warrant
McGowan/Internal A	NB left (minor)	C	201	Not Warranted
	WB left (major)	A	618	
McGowan/Internal B	NB left (minor)	D	135	Not Warranted
	WB left (major)	A	530	
Internal C/Internal B	EB left (minor)	A	560	Not Warranted
	NB left (major)	A	932	
Arboga/Internal F	WB left (minor)	A	620	Not Warranted
	SB left (major)	A	938	
Plumas Arboga/Internal E	SB left (minor)	A	574	Not Warranted
	EB left (major)	A	971	
Plumas Arboga/Internal G	SB left (minor)	A	482	Not Warranted
	EB left (major)	A	895	

As shown in the following Table, the addition of project generated traffic will result in a traffic volume increase which more than double current traffic levels on some roads. While area traffic volumes will increase, only three locations would require widening. These locations are on Arboga Road adjacent to the industrial (M1) area and south of McGowan Parkway and on McGowan Parkway west of State Route 70.

Roads. At MEA are build out, the volume of traffic on Arboga Road north of McGowan Parkway will increase to 13,400 ADT with volumes increasing to 13,400 ADT south of McGowan Parkway. A four lane section would be needed in this area.

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TABLE 11
EXISTING PLUS MEA STUDY AREA
DAILY TRAFFIC VOLUMES AND CORRESPONDING LEVELS OF SERVICE

Roadway Segment	Location	Classification	Volume	LOS
Arboga Road	North of the study area	MAJOR	11,500	"C"
	North of McGowan Pkwy	MAJOR	13,400	"D"
	So. of McGowan Pkwy	COLLECTOR	13,400	"D"
	No. of Plumas-Arboga	COLLECTOR	2,900	"A"
Olivehurst Rd	North of McGowan Pkwy	COLLECTOR	4,800	"A"
McGowan Parkway	East of Arboga Road	MAJOR	9,300	"B"
	East of Olivehurst Rd.	MAJOR	8,000	"A"
	West of SR 70 inter.	MAJOR	15,800	"F"
Plumas-Arboga Rd	East of Arboga Road	MAJOR	3,000	"A"
	North of SR 70 conn.	MAJOR	3,700	"A"
	South of SR 70 conn.	MAJOR	300	"A"
Powerline Road	North of McGowan Pkwy	COLLECTOR	3,200	"A"
State Route 70	No. of McGowan Pkwy	FREEWAY	14,700	"A"
	So. of McGowan Pkwy	FREEWAY	10,400	"B"
	No. of SR 65 Junction	FREEWAY	25,000	"D"
	So. of Feather River	HIGHWAY	14,100	"E"

Development of the North arboga MEA study area will add approximately 9,000 vehicles per day to Arboga Road north of the project site. This represents a 600% increase over current volumes, and as a result, access to Arboga Road from adjacent residential and industrial areas will be made more difficult. However, the resulting volume (11,500 ADT) can still be handled by a two lane roadway. However, two locations on the existing street system will be impacted by the project.

The addition of project trips will also exacerbate the existing safety hazard which exists on Arboga Road in the vicinity of Ella Avenue. This problem should be corrected by realigning the road, preferably as part of an overall project to provide additional capacity and shoulders from Ella Avenue to McGowan Parkway.

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The other impacted location would be McGowan Parkway west of SR 70. Development of the North Arboga MEA area will add traffic through an area which is already functioning poorly due to the combination of moderate traffic, multiple access points and commercial development. The projected daily traffic on this road would reach 15,800 ADT west of State Route 70. Widening McGowan Parkway from Olivehurst Road to SR 70 would correct this problem.

Intersections. Development of the study area impacts very few intersections. As shown in Table 10, with development of the project area, the Arboga Road / McGowan Parkway intersection would require signalization. Once signalized, in conjunction with the roadway widening described earlier, this intersection would operate at LOS "A".

In addition, most of the study intersections along McGowan Parkway between the State Route 70 Ramps and Arboga Road operate below LOS "C" for the minor street left turns. This is primarily due to the increase in through traffic volumes on McGowan Parkway. However, even though motorists turning left onto McGowan Parkway are anticipated to experience long to very long delays, if McGowan Parkway is widened to four lanes, none of these intersections is expected to meet peak hour warrants for signalization.

The McGowan Parkway intersections on the State Route 70 interchange are a particular concern. If the interchanges are not modified to provide additional travel lanes, projected traffic volumes would meet warrants for signalization on a two lane road. However, it is not feasible to signalize these intersections without modifying the interchanges to add left turn lanes.

Access and Internal Circulation

To complete the area specific analysis, the effects of individual project access onto the major street system, as well as internal circulation between adjacent projects, was addressed. For the areas without specific development proposals, recommendations regarding access were made. Figure 5 displays the internal circulation system.

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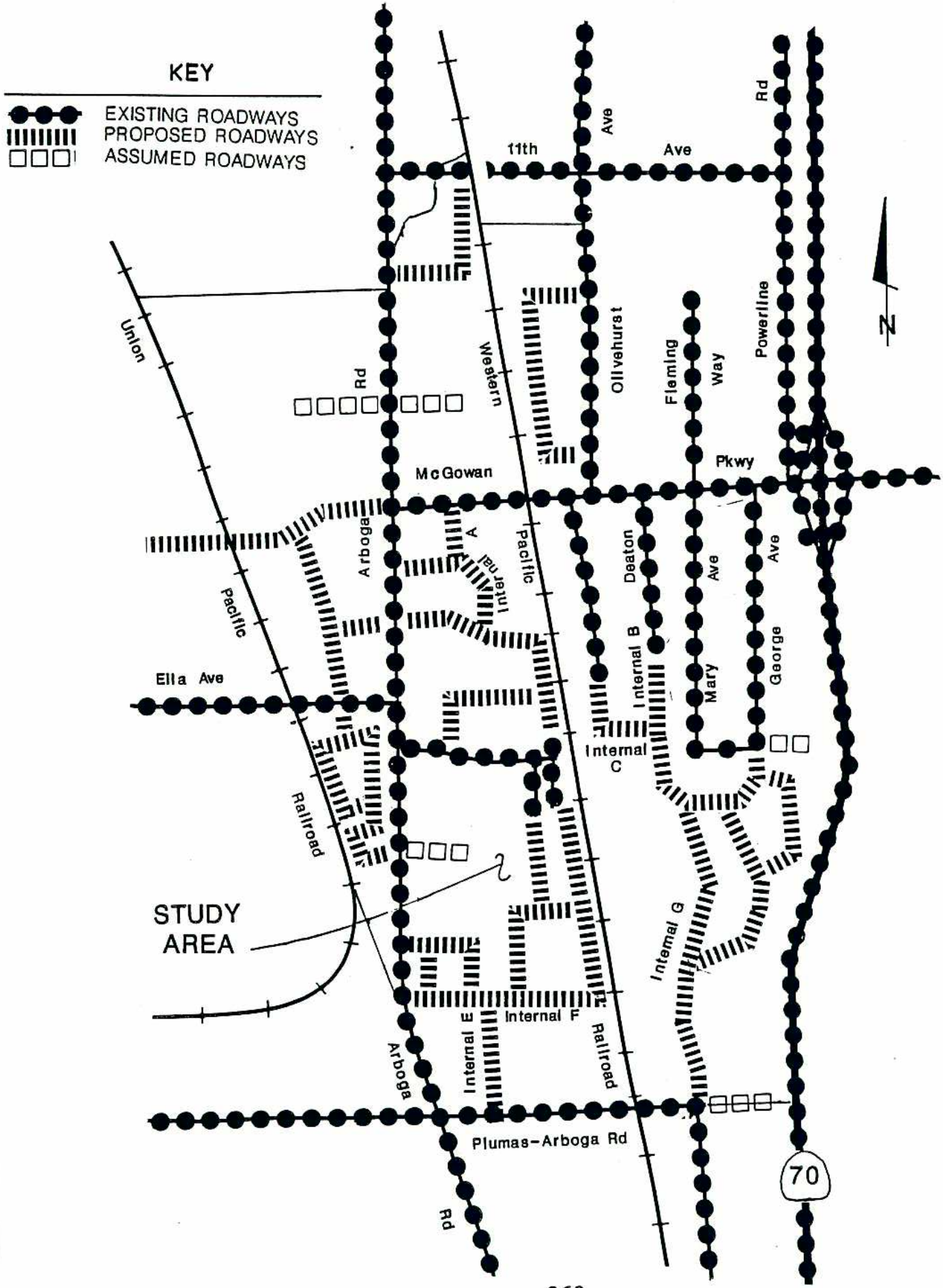

262

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INTERNAL CIRCULATION DIAGRAM

figure 5

Residential and Industrial Access. All thirteen proposed subdivisions within the MEA area are in different stages of development. At the time this report was prepared the most current site plans were utilized in regard to the number of dwelling units, access to the adjacent street system and internal circulation between projects within the study area. For the undeveloped areas, assumptions were made with regard to access to the adjacent street system and interaction with other proposed areas. The most direct routes were assumed with the exception of the area south of McGowan Parkway between George Avenue and State Route 70. This area should access George Avenue at the south rather than McGowan Parkway directly due to development which would prohibit such a direct connection.

The other area of interest for access onto the major roadway system is the Industrial area. Currently, no site plan exists for this area. Therefore, access was only assumed directly onto Arboga Road. Access directly onto the proposed extension of McGowan Parkway was not assumed, since industrial traffic would travel directly through an existing subdivision.

Intersection Spacing. With the proposed street system the spacing between intersections on major or collector streets appear adequate. Ideally, major intersections should be at least 1/4 mile apart with minor intersections at least 660 feet. The closest spacing is between Ella Avenue and Maplehurst Street in the Hawes Ranch about 700 feet to the south.

Parcel 5 fronts Arboga Road between Ella Avenue and Hawes Ranch. The previous site plan for this parcel proposed access directly onto Arboga Road and Ella Avenue. If allowed, spacing between the residential entrances of Parcel 5 and Maplehurst Street onto Arboga Road would be only 200 feet. However, from discussions with the project Engineer, we understand that the new site plan for Parcel 5 proposes two accesses, both into the Hawes Ranch subdivision and no direct access to Arboga Road. From a standpoint of access to the major street system, this is a preferred alternative. Therefore, it is recommended that the internal circulation system of Parcel 5 be designed to provide access through the Hawes Ranch subdivision rather than directly onto Arboga Road and Ella Avenue.

Parcel 2, the Halcyon property, proposes access directly onto McGowan Parkway only 110 feet west of Donald. This spacing is too close on major area roads. Therefore, it is recommended that Parcel 2 access McGowan Parkway via Olivehurst Avenue.

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Internal Roads. Volumes on the internal circulation system range between 750 ADT to 5,700 ADT as shown in **Figure 4**. Sufficient capacity exists on two lane roads to accomodate such daily traffic volumes, however, generally acceptable volume thresholds for residential streets where houses front directly onto the street is in the range of 3,000-4,000 ADT. Once traffic volumes exceed this threshold, area residents are effected and tend to complain that traffic volumes in the area are excessive.

Under "Existing plus MEA area Conditions", only one internal roadway is expected to carry daily traffic volumes above this residential threshold. This is Deaton Drive through the Kaufman-Broad Subdivision. However, traffic volumes on this roadway could be reduced to acceptable levels by providing area residents with alternative routes. While two such alternative routes currently exist (Mary Avenue and George Avenue), the pavement sections of both these streets are quite narrow with no shoulders and the pavement is in only "fair" condition. Improving both Mary and George Avenues would provide alternative routes which would tend to balance daily traffic volumes on the areas north-south street. Once these streets are improved, daily traffic volumes would be anticipated to range from perhaps 2,000-3,000 ADT on each of the residential streets.

Internal Intersections. All of the new study intersections created by development of the project are anticipated to operate acceptably at LOS "C" or better for the minor street movements with the exception of the McGowan Parkway/Internal B intersection. This intersection is expected to operate at LOS "D" for minor street left turns. As previously mentioned, this is primarily due to the large volume of through traffic on McGowan Parkway. None of the intersections created by development of the project meet peak hour warrants for signalization.

Alternative Transportation Modes

Development of the project will increase the need for transit services and alternative transportation modes to serve the south Yuba County area. It is likely that transit dependent residents of the Olivehurst and Arboga areas will want to travel to the industrial/shopping opportunities presented in the North Arboga MEA study area. Similarly, residents of the MEA area may desire to use transit service to connect them with off-site employment opportunities.

CUMULATIVE CONDITIONS

This report section describes the cumulative impacts of other development proposals and regional circulation improvements in south Yuba County. For this analysis, Yuba County Planning Department staff suggested that the cumulative traffic condition include the following assumptions:

1. Build out of the Plumas Lake Specific Plan Area;
2. Build out of Wheeler Ranch;
3. Completion of the SR 70 Marysville Bypass;
4. Completion of the Third Bridge over the Feather River to Yuba City between Erle Road and Bogue Road.
5. Balance of Yuba / Sutter Area to be developed per SACOG ten year forecast used in Yuba / Sutter Area Traffic Model.

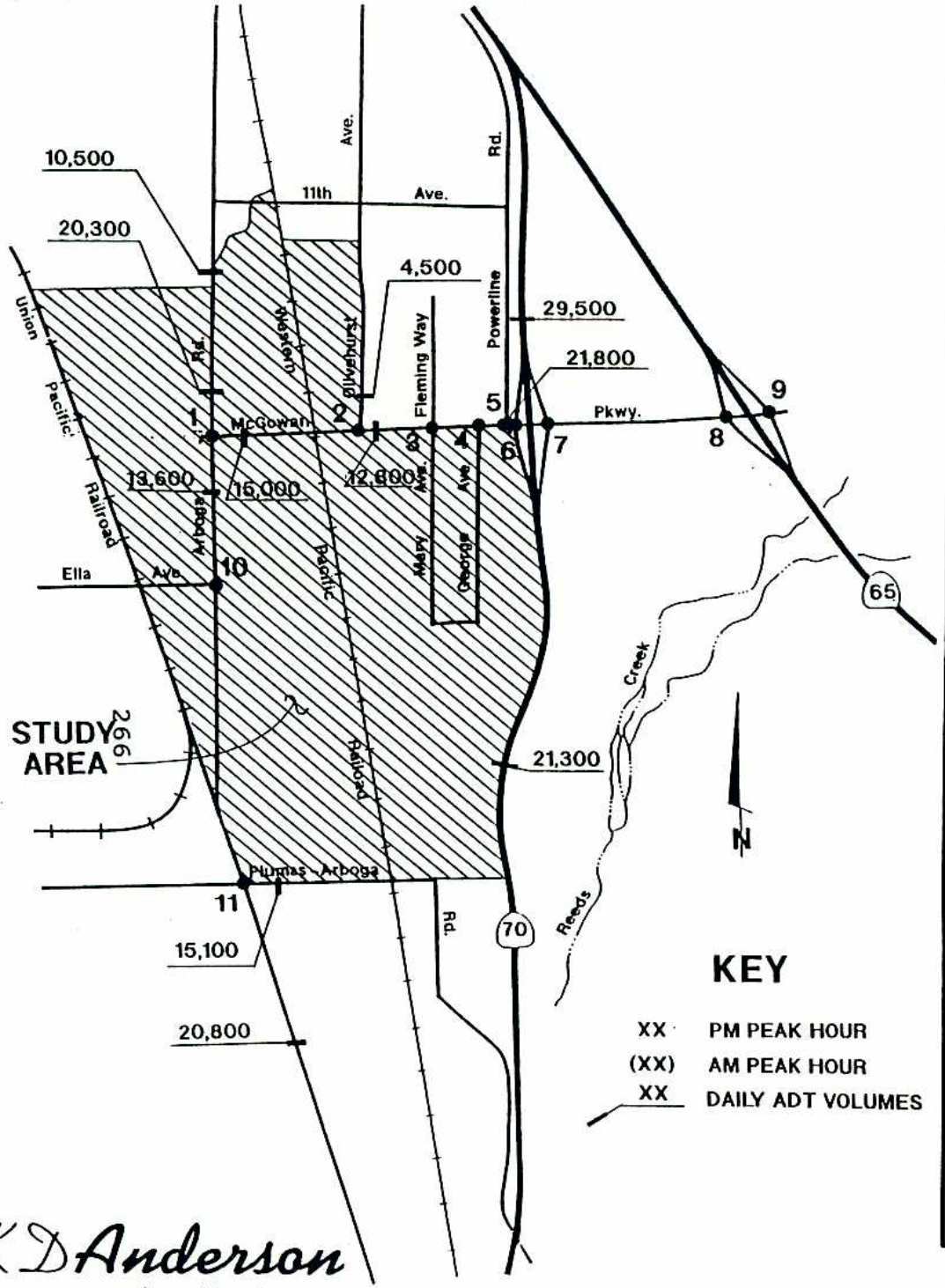
The Yuba Sutter Area Traffic Model was employed to prepare traffic volume projections under these assumed conditions. Daily and PM peak hour traffic projections were developed using the model, while AM peak hour forecasts at freeway interchanges were developed manually by interpolating PM peak hour data.

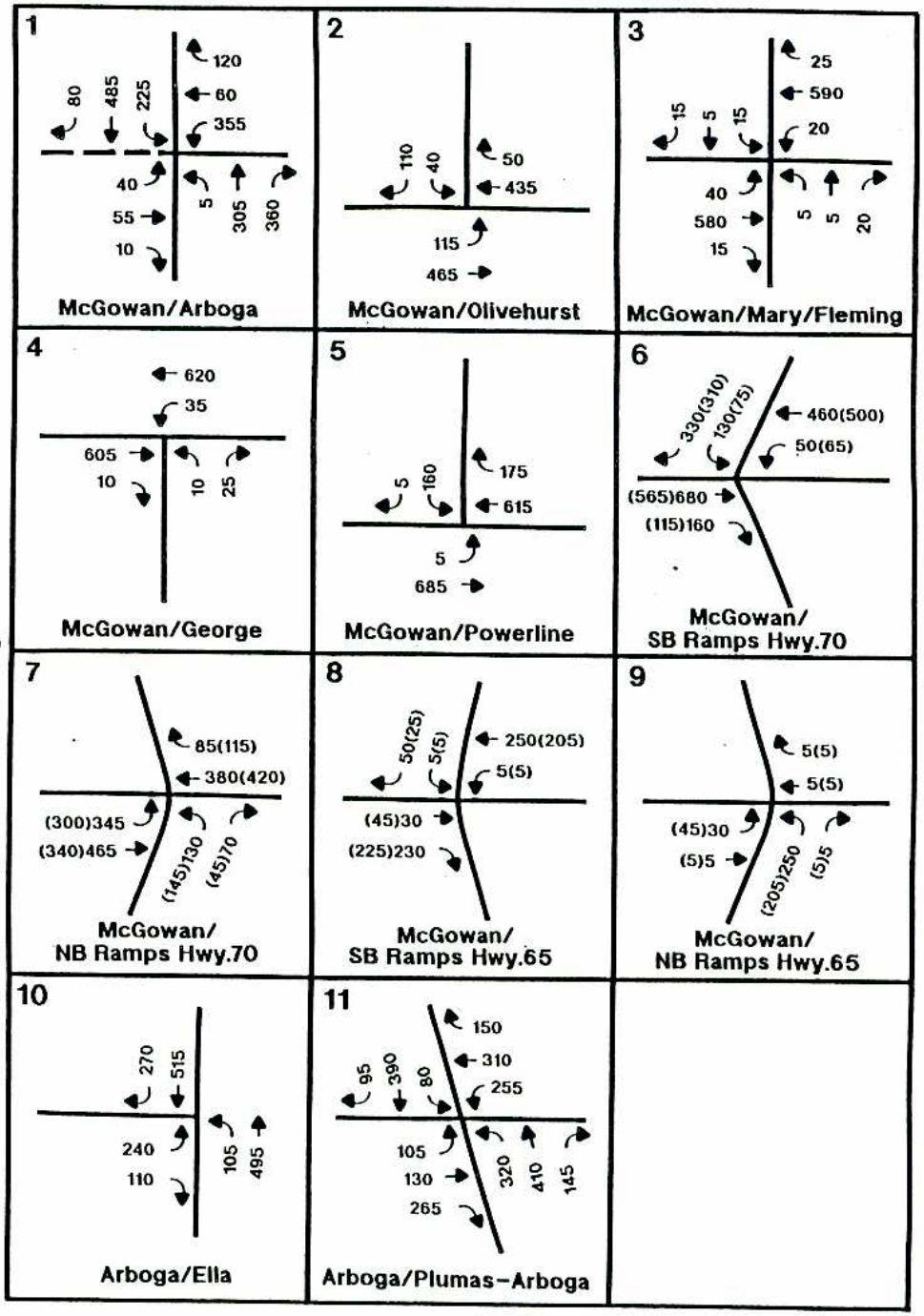
Future Land Uses

The future land uses assumed for the south Yuba County area are presented in Table 12. As indicated, more than 13,000 new residences and 900 acres of commercial / industrial development have been assumed for the area.

Future Traffic Volume Projections

The effect of this future development on area streets, highways and intersections will be significant. As indicated in **Figure 6**, most of the area streets which are included in the Yuba County Circulation Plan will carry volumes which will warrant widening the roads to four lanes. For example, all or parts of Arboga Road, McGowan Parkway, and Plumas Arboga Road will carry volumes in excess of 12,000 ADT. **Figure 7** presents the "Cumulative" condition traffic volumes for the internal project site circulation system.





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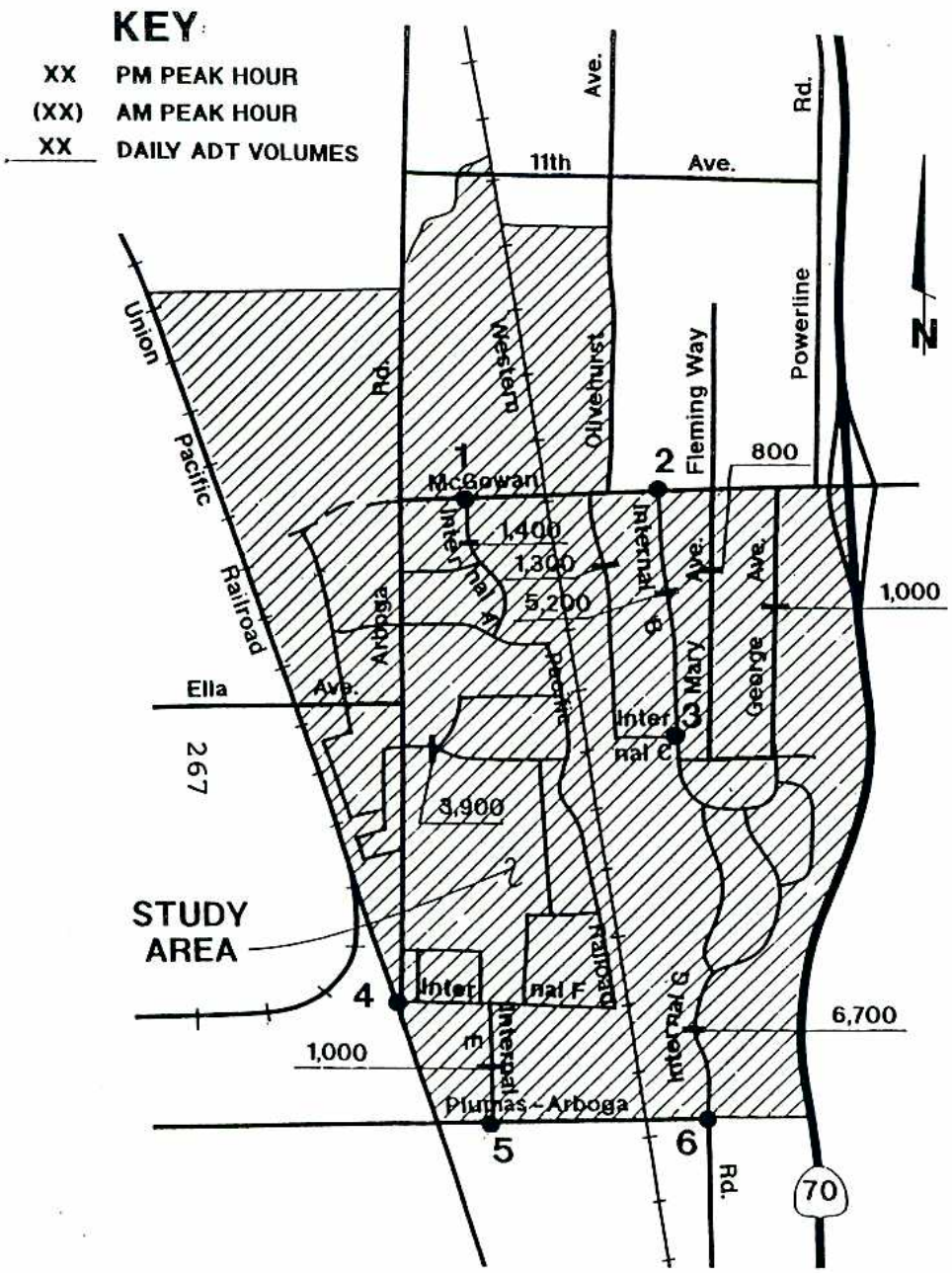
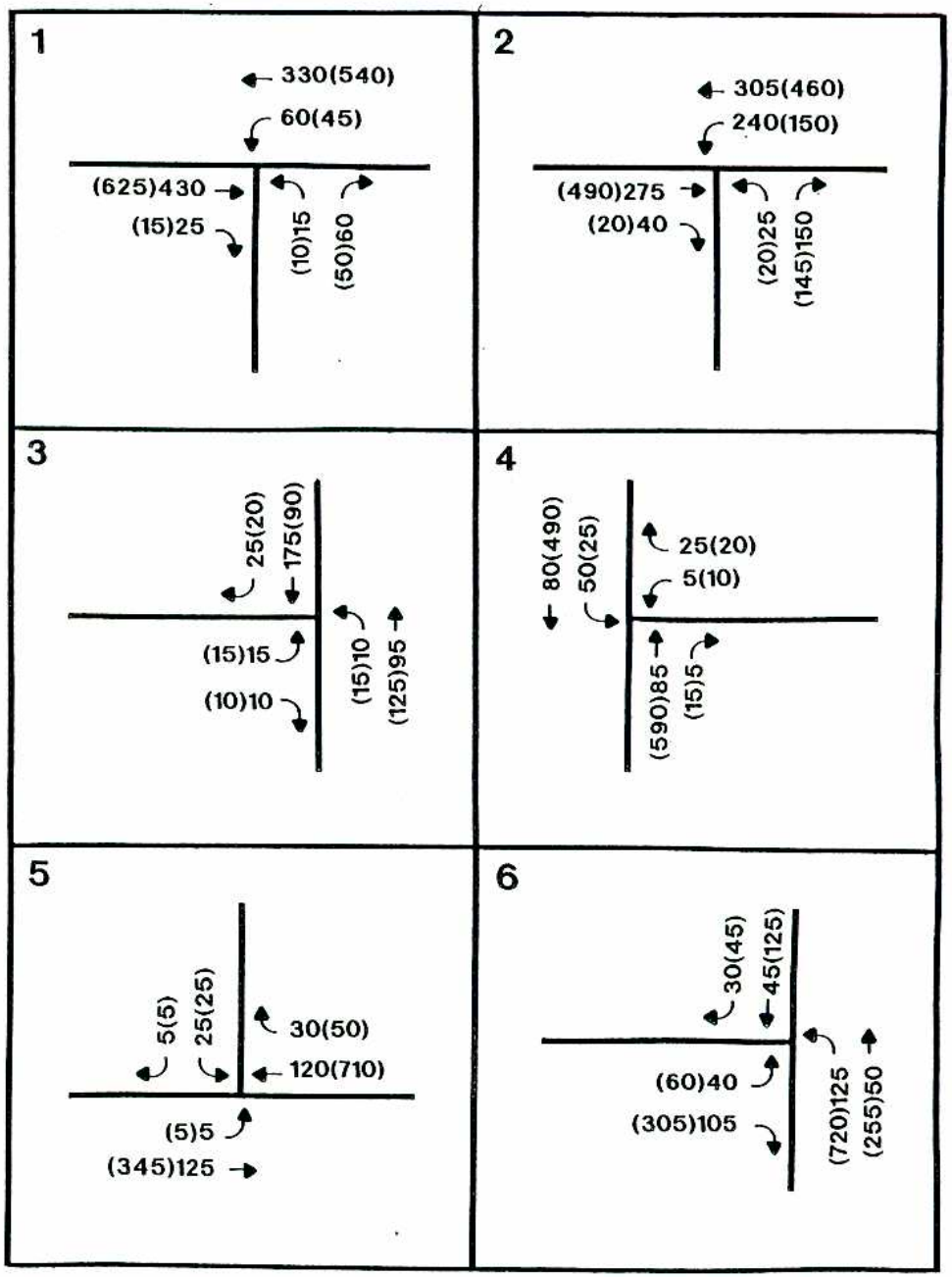
CUMULATIVE TRAFFIC VOLUMES

figure 6





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CUMULATIVE STUDY AREA VOLUMES

figure 7

TABLE 12
ALL ARBOGA AREA PROJECTS - TRIP GENERATION

Land Use	Quantity	Daily Trip Rate	Daily Trips	PM Peak Hour Trip Rate	PM Peak Hour Trips
RESIDENTIAL					
Wheeler Ranch	1,975 units	9.55/unit	18,862	1.01/unit	1,995
North Arboga MEA	2,794 units	9.55/unit	26,683	1.01/unit	2,822
Plumas Lake Spec. Plan	8,267 units	9.55/unit	77,797	1.01/unit	8,214
TOTAL Residential	13,036 units		123,342		13,031
NON-RESIDENTIAL					
North Arboga MEA					
Industrial	205 acres	38.29/ac	7,851	5.7 / ac	1,175
McGowan Plaza - NC	4 acres	525 / ac	2,890	50 / ac	315
Wheeler Ranch					
Convenience Comm	20,000 sf	129.23/ksf	2,585	11.8/ksf	236
Neighborhood Comm	130,000 sf	64.05/ksf	8,327	5.97/ksf	776
Industrial	16 acres	58.67/ac	939	11.0/ ksf	176
Plumas Lake Specific Plan Area					
NC - Neign. Comm	40 acres	525 / ac	21,000	50 / ac	2,000
CC - Comm Commercial	14 acres	650 / ac	9,100	65 / ac	910
HC - Highway Comm	20 acres	450 / ac	9,000	45 / ac	900
BI - Bus / Ind	268 acres	60 / ac	16,080	10 / ac	2,680
OP - Office Park	219 acres	195/ ac	42,705	28 / ac	6,132
GC - Golf Course	102 acres	5.4/ ac	545	0.4/ ac	41
TOTAL NON-RESIDENTIAL	902 acres		121,022		15,341
TOTAL ALL ASSUMED PROJECTS			244,364		28,372

Under this cumulative forecast, signalization will be required at the intersections of most major south Yuba County roads. Assuming that typical intersection geometrics are installed, as indicated in the Appendix, each intersection can be made to function at LOS "C" or better. This analysis accounts for two new interchanges on SR 70 which will need to be constructed and assumes that the McGowan Parkway Interchange on SR 70 will need to be reconstructed. Table 13 presents the calculated Levels of Service for this scenario.

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TABLE 13
CUMULATIVE CONDITION INTERSECTION LEVELS OF SERVICE

Intersection	Movements	LOS	Res Cap or V/C	Signal Warrant
1. McGowan/Arboga	Signalized	C	0.70	NA
2. McGowan/Olivehurst	Signalized	A	0.36	NA
3. McGowan/Mary/Fleming	SB left (minor)	E	57	
	NB left (minor)	E	70	Not Warranted
	EB left (major)	A	.438	
	WB left (major)	A	477	
4. McGowan/George	NB left (minor)	E	72	Not Warranted
	WB left (major)	A	444	
5. McGowan/Powerline	Signalized	A	0.40	NA
6. McGowan/SR 70 SB Ramps	Signalized	A	0.42	NA
McGowan/SR 70 SB Ramps	**Signalized**	**A**	**0.34**	**NA**
7. McGowan/SR 70 NB Ramps	Signalized	A	0.49	NA
McGowan/SR 70 NB Ramps	**Signalized**	**A**	**0.50**	**NA**
8. McGowan/SR 65 SB Ramps	SB left (minor)	B	355	Not Warranted
	WB left (major)	A	779	
McGowan/SR 65 SB Ramps (AM Peak Hour)	**SB left (minor)**	**B**	**379**	**Not Warranted**
	WB left (major)	**A**	**768**	
9. McGowan/SR 65 NB Ramps	NB left (minor)	A	427	Not Warranted
	EB left (major)	A	942	
McGowan/SR 65 NB Ramps (AM Peak Hour)	**NB left (minor)**	**A**	**445**	**Not Warranted**
	EB left (major)	**A**	**961**	
10. Arboga/Ella	Signalized	A	0.52	NA
11. Arboga/Plumas-Arboga	Signalized	C	0.77	NA

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TABLE 13 CONT
CUMULATIVE STUDY AREA PEAK HOUR
INTERSECTION LEVELS OF SERVICE

Intersection	Movements	LOS	Res Cap or V/C	Signal Warrant
A. McGowan/Internal A	NB left (minor)	E	79	Not Warranted
	WB left (major)	A	414	
B. McGowan/Internal B	NB left (minor)	E	64	Not Warranted
	WB left (major)	B	381	
C. Internal C/Internal B	EB left (minor)	A	604	Not Warranted
	NB left (major)	A	973	
D. Arboga/Internal F	WB left (minor)	D	102	Not Warranted
	SB left (major)	A	464	
E. Plumas Arboga/Internal E	SB left (minor)	E	92	Not Warranted
	EB left (major)	B	386	
F. Plumas Arboga/Internal G	All-Way Stop	C	0.68	Not Warranted

Under "Cumulative" conditions, seven study area intersections will meet signal warrants and should be signalized:

McGowan Parkway / Arboga Road
McGowan Parkway / Olivehurst Road
McGowan Parkway / Powerline Road
McGowan Parkway / SB SR 70 ramps
McGowan Parkway / NB SR 70 ramps
Arboga Road / Ella Avenue
Plumas - Arboga Road / Arboga Road

As shown, with development of the project site, long delays are anticipated for motorists turning left from the project site onto major area streets. However, warrants for signalization are not met and therefore, signalization is not required under this scenario beyond the seven locations previously mentioned.

TABLE 14
CUMULATIVE DAILY TRAFFIC VOLUMES

Roadway Segment	Location	Classification	Volume	LOS
Arboga Road	North of MEA Area	MAJOR	10,500	"C"
	North of McGowan Pkwy	MAJOR	20,300	"F"
	No. of Plumas-Arboga	COLLECTOR	14,100	"E"
	So. of Plumas-Arboga	COLLECTOR	20,800	"B"
Olivehurst Rd	North of McGowan Pkwy	COLLECTOR	4,500	"A"
McGowan Parkway	East of Arboga Road	MAJOR	15,000	"F"
	East of Olivehurst Rd.	MAJOR	12,800	"D"
	West of SR 70 inter.	MAJOR	21,800	"F"
Plumas-Arboga Rd	East of Arboga Road	MAJOR	15,100	"F"
Powerline Road	North of McGowan Pkwy	COLLECTOR	4,200	"A"
State Route 70	No. of McGowan Pkwy	FREEWAY	29,500	"E"
	So. of McGowan Pkwy	FREEWAY	21,300	"F"
	No. of SR 65 Junction	FREEWAY	28,800	"E"
	So. of Feather River	HIGHWAY	22,800	"F"

Internal Streets. The volume of traffic on most internal streets is not significantly affected by build out of the Olivehurst/Arboga area, and resulting traffic volumes remain low. The only street which would be impacted by future growth is Internal G. This street is expected to carry 6,700 vehicles per day at area build out. This projection accounts for the curvilinear nature of the area street system, and in fact, the volume could be higher if a direct north-south route was created. While this volume is well within the practical capacity of the road, future residents may perceive this volume to be excessive.

Impacts to Alternative Transportation Modes

Under cumulative conditions, the population and employment base in south Yuba County will be extensive enough to make alternative modes of transportation feasible and desirable. With urbanization of the area, facilities to promote bicycle and pedestrian activities will be needed. The assumed population will require expansion of existing public transit services to adequately serve the non-driving public and to help reduce regional air quality impacts. Measures to reduce dependency on the single occupant automobile will also be appropriate, including promotion of carpooling, vanpooling, park & ride etc.

MITIGATION MEASURES

The extent to which off-site roadway improvements or programs are needed to mitigate "Existing", "Existing plus the North Arboga MEA study area" and "Cumulative" conditions are described in the text which follows.

Implementation schedules have also been presented. It is recognized that in most instances, actual traffic volume levels should be used as a "trigger" for implementation. However, the volume of traffic on regional roads is a product of both MEA area and other development (i.e., Wheeler Ranch and Plumas Lake). Toward that end, volume thresholds have been presented and an approximate level of MEA area development which could produce such volumes alone have been suggested.

The volume threshold indicated is LOS "C", except where safety considerations are involved. At these locations (i.e., arboga Road) a LOS "B" has been used as the threshold.

Improvements Currently Needed

Impact: The existing roads in south Yuba County are generally adequate for current traffic levels. However, the intersection of Arboga Road and Ella Avenue is a potential safety hazard due to the curvilinear alignment of Arboga Road through the intersection and due to the lack of shoulders on Arboga Road.

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Mitigation: Reconstruct and realign Arboga Road through the Ella Avenue intersection. This improvement would cost about $200,000.

Implementation Schedule: This improvement is a safety, rather than capacity improvement. As such, it is difficult to suggest an appropriate level of area development which would "trigger" implementation.

Improvements required with development of the MEA study area

Impact: The development of the MEA will increase the volume of traffic on Arboga Road from Plumas-Arboga Road north, exacerbating the existing hazard which exists at the Ella Avenue / Arboga Road intersection.

Mitigation: Reconstruct and realign Arboga Road from a point approximately 1,000 feet south of Ella Avenue to the McGowan Parkway intersection. At a minimum, the roadway should be widened to its ultimate four lane section in the vicinity of the Ella Avenue and McGowan Parkway intersections in order to accommodate auxiliary turn lanes. This improvement would cost about $ 250,000 to $500,000 depending on the limits of widening.

Implementation Schedule: This improvement would not be needed until a significant portion of the MEA area west of the railroad is built. In fact, if McGowan Parkway is extended west through the Centex Subdivision (Parcel 13), the "Existing plus MEA area" daily traffic volume would be reduced to a level where a four lane road is not needed. Without the McGowan Parkway extension, the roadway would need to be widened when 80% of the MEA west of the railroad is built out.

Impact: Development of the MEA's industrial area while increase traffic on Arboga Road north of McGowan Parkway.

Mitigation: Widen Arboga Road north of McGowan Parkway to a four lane section. The roadway should be widened to its ultimate four lane section with shoulders and should extend from McGowan Parkway in the south to the limits of the industrial area in the north. This widening will be approximately 2,700 feet long. This improvement would cost approximately $405,000, depending upon the access layout of the industrial area onto Arboga Road.

Implementation Schedule: This improvement would not be required until traffic on Arboga Road reaches 12,000 ADT. This threshold would not be reached until about 85% of the MEA area is built out.

Impact: The development of the project will result in traffic volumes at the McGowan Parkway / Arboga Road intersection which meet warrants for signalization.

Mitigation: Reconstruct intersection and install a traffic signal. In conjunction with the Arboga Road reconstruction noted above, the McGowan Parkway intersection should be reconstructed to provide:

Northbound: 1 Through lane and 1 Through Plus Right Turn lane
Southbound: 2 Through lanes and 1 Left Turn lane
Westbound: 1 Left Turn Lane and Right Turn lane

The resulting intersection Level of Service would be "A" (V/C=0.44) The traffic signal would cost about $125,000.

Implementation Schedule: Install when warrants are met. This threshold is likely to be met when about 90% of the MEA is built out.

Impact: The development of the MEA will increase traffic volume on McGowan Parkway west of the SR 70 interchange, increasing overall delay and congestion.

Mitigation: Widen McGowan Parkway to a four lane section from Olivehurst Drive to SR 70. This improvement would cost about $1,400,000.

Implementation Schedule: This improvement should be triggered by 12,000 ADT on McGowan Parkway. This threshold would likely be reached when about 50% of the MEA is built out.

Impact: Development of the MEA area will contribute to the need to signalize the intersections on the State Route 70/McGowan Parkway Boulevard interchange.

Mitigation: Reconstruct the interchange.

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Implementation Schedule: This mitigation would not be needed until the area is nearly built out. We would recommend implementation as a cumulative mitigation.

Improvements needed under Cumulative Conditions

Impact. The cumulative development anticipated in the south Yuba County area will significantly increase traffic volumes on study area streets and intersections.

Mitigations. A two part strategy should be implemented to mitigate regional impacts.

First, a Public Facilities program, Area of Benefit or similar financing strategy should be established for the south Yuba County area, including, at a minimum the circulation system improvement indicated in Table 15. As indicated, these facilities are regional in nature, and either involve construction of roadways already included in the Yuba County Circulation Element or roadways which should be added to the Circulation Element.

However, it is difficult to unilaterally develop an area wide improvement program when the major potentially participating developments are on different schedules. While the DEIR for Wheeler Ranch has been prepared and the DEIR for the North Arboga Master Environmental Assessment Area is being prepared, the DEIR for the Plumas Lake Specific Plan is only beginning. Therefore, the recommended mitigation would be for the MEA area to agree to facilitate and participate in the establishment of a mechanism to finance identified circulation system improvements.

The second element of mitigation would be implementation of measures, programs and strategies to reduce trip generation and dependence on the single occupant automobile. Yuba County should provide a policy basis and Transportation Systems Management (TSM) ordinance which requires employers to implement such programs and requires that new development include provisions for alternative transportation modes.

As a part of this effort, the MEA should incorporate bicycle and pedestrian facilities into the project plan. In addition, the plan should include facilities, such as bus turn outs and Park & Ride Lots, which will facilitate future transit service and car pooling.

KDA

TABLE 15
SOUTH YUBA COUNTY CIRCULATION FACILITIES
NEEDED UNDER CUMULATIVE DEVELOPMENT

	DESCRIPTION	QUANTITY	UNIT COST	COST
1.	SR 70 / Feather River Interchange	1	$ 8,000,000	$ 8,000,000
2.	SR 70 / Algodon Interchange	1	$ 8,000,000	$ 8,000,000
3.	Arboga Road Extension to Feather River Blvd Interchange (4 lane Major Road)	30,000 lf	$ 250 / lf	$ 7,500,000
4.	New SR 70 Frontage Road from Plumas-Arboga Road to Algodon Road Interchange (4 lane Collector Road)	12,000 lf	$ 225 / lf	$ 2,700,000
5.	Plumas-Arboga Road Extension from Feather River Blvd to Arboga (4 lane Collector Road)	5,200 lf	$ 225 / lf	$ 1,170,000
6.	Country Club Drive Extension from Feather River Blvd to Arboga Road (2 lane Collector)	10,000 lf	$ 200 / lf	$ 2,000,000
7.	Algodon Road between Arboga Road and SR 70 (6 lane Major Road)	2,000 lf	$ 300 / lf	$ 600,000
8.	Feather River Blvd adjacent to SR 70 Int. (4 lane Major Road)	1,500 lf	$ 250 / lf	$ 375,000
9.	Feather River Boulevard from Country Club Drive to Third Bridge (4 lane Major Road)	25,000 lf	$ 125 / lf	$ 3,125,000
10.	McGowan Parkway Widening from Arboga to SR 70 (4 lane Major)	5,300	$ 325 /lf	$ 1,722,500
11.	Modifications to SR 70 / McGowan Pkwy Interchange	1	$ 4,000,000	$ 4,000,000
12.	Arboga Road widening No. of Plumas-Arboga. (4 lane Collector)	6,500 lf	$ 150 / lf	$ 975,000
13.	McGowan Parkway from Feather River Blvd to Arboga Road (New 4 lane Road)	5,000 lf	$ 250 / lf	$ 1,250,000
14.	Widening and overlaying Mary Ave and George Ave (4 Lanes)	8,300 lf	$ 120 / lf	$ 996,000
15.	Traffic Signals	14	$ 125,000 ea	$ 1,750,000

TOTAL ALL CIRCULATION COSTS	$44,163,500
TOTAL SOUTH STUDY AREA TRIP GENERATION	244,364 trips
EXAMPLE COST PER TRIP	$ 180.73
EXAMPLE COST PER DWELLING UNIT	$ 1,725

KDA

Impact. Cumulative Development in the South Yuba County area will contribute to the need for regional circulation improvements, including:

1. Third Bridge Crossing;
2. SR 70 Marysville Bypass; and
3. Widening of SR 70 to Freeway standards.

Mitigation. These improvements are being considered by Caltrans and Yuba County, although each is at a different planning stage. At this point in time, the Marysville Bypass exists only as a designated corridor around the community, with much work remaining before an alignment may be selected. Currently Caltrans is planning both SR 70 widening and the Third Bridge over the Feather River, but each project is many years from completion.

According to Caltrans, a key element in the eventual implementation of these improvements will be local (ie., Yuba County) participation in the cost of right-of-way and construction. Caltrans has indicated that without local participation, none of these improvements will be constructed. Various funding sources are being considered, including a local sales tax, a County-wide Circulation Fee and Impact fees.

County-wide Circulation Fee and Impact Fees has recently been identified for Yuba County. When implemented by Yuba County, the MEA area should participate in the local funding program to mitigate the MEA's cumulative impacts. The fee for the Olivehurst/ Arboga Area is about $1,500 per residences. Those elements included in both Table 15 and the Circulation Fee Program should not be replicated.

KDA

APPENDIX

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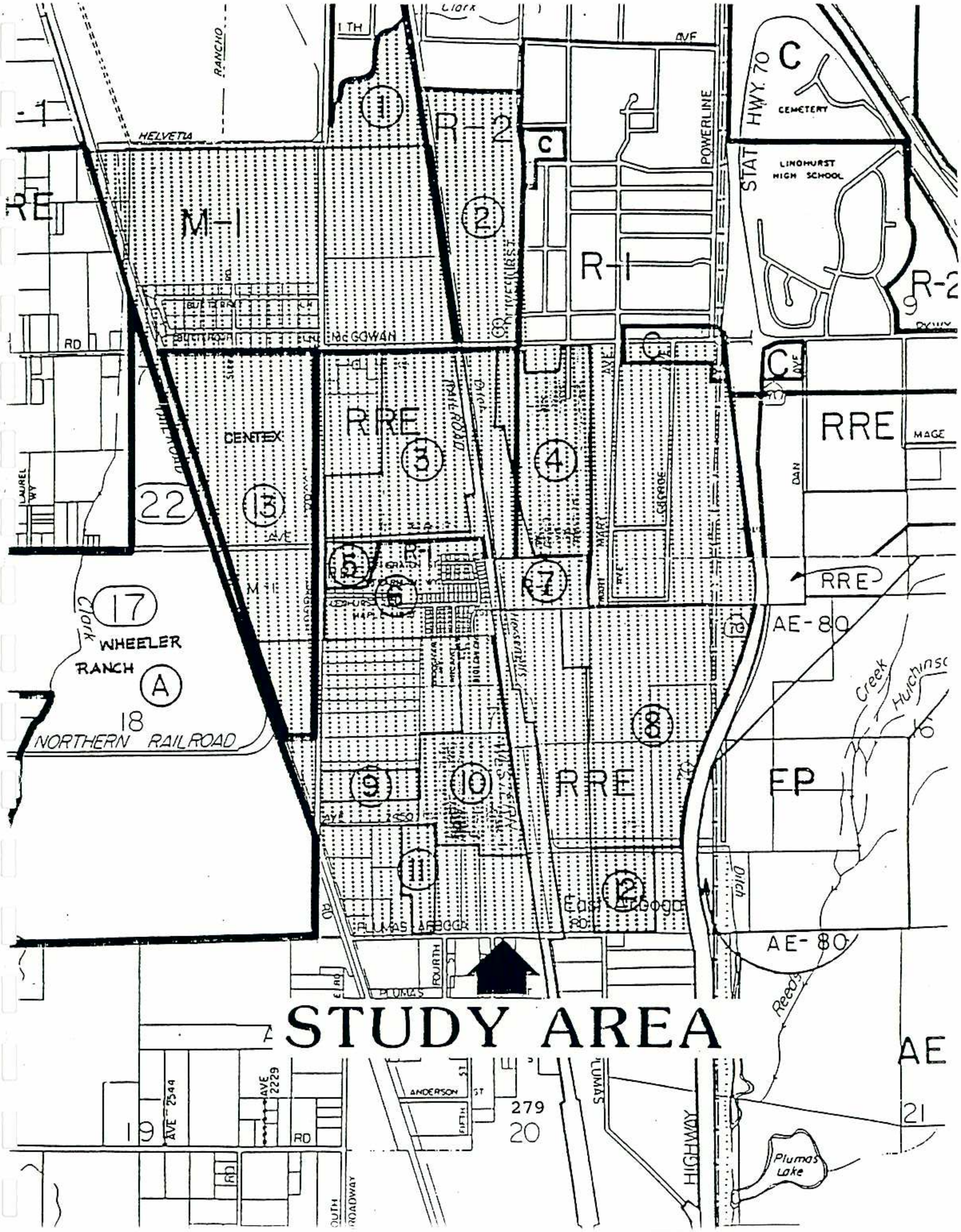
STUDY AREA
M-1
R-2
R-1
RRE
C
CENTEX
WHEELER
RANCH
NORTHERN RAILROAD
HELVETIA
McGOWAN
POWERLINE
STATE HWY. 70
CEMETERY
LINDHURST
HIGH SCHOOL
EP
AE-80
AE
PLUMAS ARBOGA
East Arboga RD
HIGHWAY
ANDERSON ST
Plumas Lake
Reeds
Creek
Hutchinson
Ditch
1
2
3
4
5
6
7
8
9
10
11
12
13
17
22
A
18
19
20
21
279

APPENDIX 7

AIR QUALITY ANALYSIS

(Prepared by RESEARCH ASSOCIATES,
Jeffrey G. Harvey, Principal, and
Kenneth D. Whitney, Ph.D.)

AIR QUALITY TECHNICAL ANALYSIS
North Arboga Study Area

Prepared by Research Associates

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Table A

Summary of the Adverse Health Effects of Key Air Pollutants

Air Pollutant		Health Effects
Ozone	-	Eye irritation
	-	Respiratory function impairment
Carbon Monoxide	-	Impairment of oxygen transport into the bloodstream
	-	Aggravation of cardiovascular disease
	-	Impairment of central nervous system function
	-	Fatigue, headache, confusion, dizziness
	-	Can be fatal in the case of high concentration in enclosed spaces
Sulfur Dioxide	-	Risk of acute and chronic respiratory disease
Nitrogen Dioxide	-	Aggravation of chronic lung disease
PM_{10}	-	Particulate matter, 10 microns or less in size, may lodge in and/or irritate the lungs

Source: Bay Area Air Quality Management District

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Auto Emissions

A study of potential air quality impacts of the development within NASA was conducted using the URBEMIS3 model of the AQAT Air Quality Analysis Package. The model was run using trip generation projections reported by KD Anderson. Average trip lengths, average trip speeds, ambient temperature, and vehicle fleet mix values were estimated based upon observed characteristics for the Yuba County area and estimates for previous analyses of similar types of development obtained from the Sacramento Metropolitan Air Quality Management District (SMAQMD). URBEMIS3 default values for 1995 were used for other pertinent factors (see Table C, following page).

SMAQMD stationary offset thresholds are as follows:

- 150 pounds per day for reactive organic gases (ROG)
- 150 pounds per day for nitrogen oxides (NOx)
- 550 pounds per day for carbon monoxide (CO)
- 80 pounds per day for particulate matter less than 10 microns (PM_{10}).

Table B compares anticipated project emissions to SMAQMD thresholds.

Table B
AUTO EMISSION PROJECTIONS - North Arboga Study Area
(Pounds Per Day)

	TOG	NOx	CO	PM10
Proposed Uses[1]	742.2	1629.2	6759.3	734.0
Impact	742.2	1629.2	6759.3	734.0
Significance Threshold	150.0	150.0	550.0	80.0
Residual Impact	592.2	1479.2	6209.3	654.0

(1. *Trip generation based, URBEMIS3 model*).

Table 3: AQAT Results

Project Name : NASA

Date : 05-20-1992

Analysis Year = 1995 Temperature = 75
EMFAC7 VERSION : EMFAC7D ...11/88

Unit Type	Trip Rate	Size	Tot Trips	Days Op.
Single Family Housing	10.0/Unit	2800	28000	
Community Shopping Center	616.0/Acre	10	6160	1
Industrial Park	56.1/Acre	200	11220	1

	Residential			Commercial	
	Home-Work	Home-Shop	Home-Other	Work	Non-Work
Trip Length	45.0	2.6	3.4	5.4	3.5
% Started Cold	88.2	40.1	58.0	77.2	27.0
Trip Speed	45	35	35	35	35
Percent Trip	27.3	21.2	51.5		

Vehicle Fleetmix

Vehicle Type	Percent Type	Leaded	Unleaded	Diesel
Light Duty Autos	72.8	1.7	95.6	2.7
Light Duty Trucks	14.3	2.2	95.0	2.8
Medium Duty Trucks	4.3	5.3	94.7	0.0
Heavy Duty Trucks	3.9	29.8	70.3	N/A
Heavy Duty Trucks	3.9	N/A	N/A	100.0
Motorcycles	0.9	100.0	N/A	N/A

Project Emissions Report in Lb/Day

Unit Type	TOG	CO	NOx
Single Family Housing	561.0	5057.3	1364.9
Community Shopping Center	55.9	506.6	83.8
Industrial Park	125.3	1195.4	180.5

Project Emissions Report in Lb/Day

Unit Type	FUEL USE	PM10	SOx
Single Family Housing	18319.9	149.7	171.9
Community Shopping Center	989.7	31.9	9.3
Industrial Park	2180.8	552.4	20.5

ASSUMPTIONS: HOME → WORK TRIP SPEED IS 45 MPH
1995 PROJECTIONS USED
SACRAMENTO ASSUMPTIONS USED

Stationary Sources

Furnace emissions produced by new homes are estimated as shown in the table below based upon average fuel consumption data transmitted by Yuba County and originally obtained from PG&E, and emissions factors for natural gas obtained from the federal Environmental Protection Agency.

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Table D

FURNACE EMISSION PROJECTIONS - North Arboga Study Area[1]

Pollutant	Emission Rates[2] (lbs/mil ft3)	Emissions (lbs/year)
Particulates	2.5	109.4
Sulfur Dioxide	0.6	26.3
Nitrogen Dioxide	100.0	4375.0
Carbon Dioxide	20.0	875.0
Non-Methane HC's	5.3	231.9
Methane HC's	2.7	118.1

(1. Assumes ultimate buildout of 2,500 single-family homes.
2. Assumes average fuel use rate of 175.0 therms/year/home; estimated fuel use at buildout in NASA = 437,500 therms/year = 43,750,000 cubic feet of gas.)

Source: Karri L. Campbell, Associate Planner, Yuba County; from Summerfield Subdivision EIR, date?)

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Wood burning: Table E shows a comparison of emissions for wood stoves with and without the catalytic system.

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Table E
COMPARATIVE WOOD STOVE EMISSIONS[1]

Stove Type	PM_{10} Emissions Rate	Total Emissions Tons/Year
Non-Catalytic	8.5 grams/hour	103.6
Catalytic	5.5 grams/hour	67.0

(1. For comparative purposes only, assumes 50% of new homes (1,250) use wood stove as supplemental heat source 6 hours per day, 91 days per year.

Source for emissions rates, Karri Campbell, Associate Planner, Yuba County; from Summerfield Subdivision EIR, date?)

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APPENDIX 8

GEOLOGIST'S REPORT

(Prepared for RESEARCH ASSOCIATES by
Richard L. Ford
California Registered Geologist #4489)

ENVIRONMENTAL GEOLOGY
OF THE
NORTH ARBOGA STUDY AREA

Yuba County, California

By

RICHARD L. FORD

CALIFORNIA REGISTERED GEOLOGIST (#4489)

Prepared for:

RESEARCH ASSOCIATES

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Carmichael, California 95608
(916) 863-0518

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Project Description and Location

The North Arboga Study Area (NASA) consists of approximately 1200 acres located in the valley region of southwestern Yuba County, California (Fig. 1). Currently, the primary land uses within the study area are agriculture and residential. This area is being considered for future development; potential land uses include light industry and/or additional single-family housing. This report was prepared as part of an initial feasibility study conducted by RESEARCH ASSOCIATES (Carmichael, CA). The goal of the larger study is to identify the environmental constraints which might affect future development.

The North Arboga Study Area is located in the Sacramento Valley, east of the Feather River, and approximately 35 miles (56 km) north of Sacramento, California. The site is immediately south of the town of Olivehurst, California (Fig. 1). California Highway 70 and the Sacramento Northern Railroad form the eastern and western boundaries of the project area, respectively (Fig. 2). The study area is bounded on the northeast by Olivehurst Road and the McGowen Parkway and on the south by the Plumas-Arboga Road. The northern boundary roughly coincides with Airport Road. The site encompasses land in sections 5, 6, 7, 8, 9, 16, 17, and 18, T14N-R4E MDB&M. The USGS Olivehurst (Calif., 1952, photorevised 1973) 7.5-minute topographic map covers the project area.

1.2 Purpose and Scope of Investigation

The purpose of this report is to document the potential geologic hazards that might affect the feasibility of any future development as well as the potential impacts that development might have on the geological environment. This investigation is only part of a broader environmental-constraints analysis. In addition to describing the geology, hydrology, and soil conditions in the vicinity of the project, specific mitigations will be identified for those hazards that might pose a significant environmental problem or impact. This report is intended for use by reviewing agencies, consultants, and contractors involved in the planning, permitting, design, and construction within the North Arboga Study Area. However, this report is not to be considered a geotechnical analysis of any specific project design within the North Arboga Study Area.

1.3 Methods and Procedures

The general scope and format of this investigation follows guidelines recommended by the California Division of Mines and

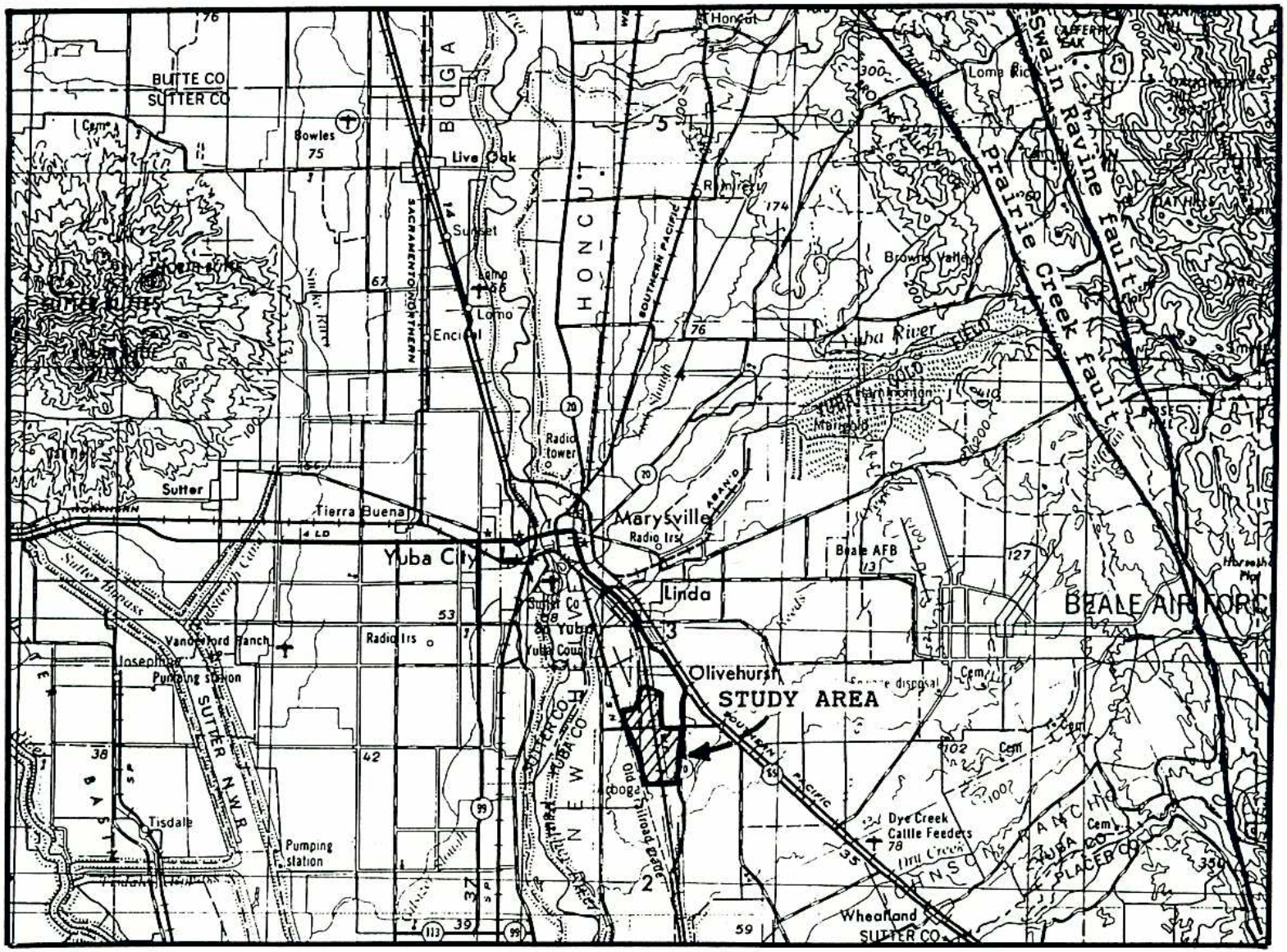
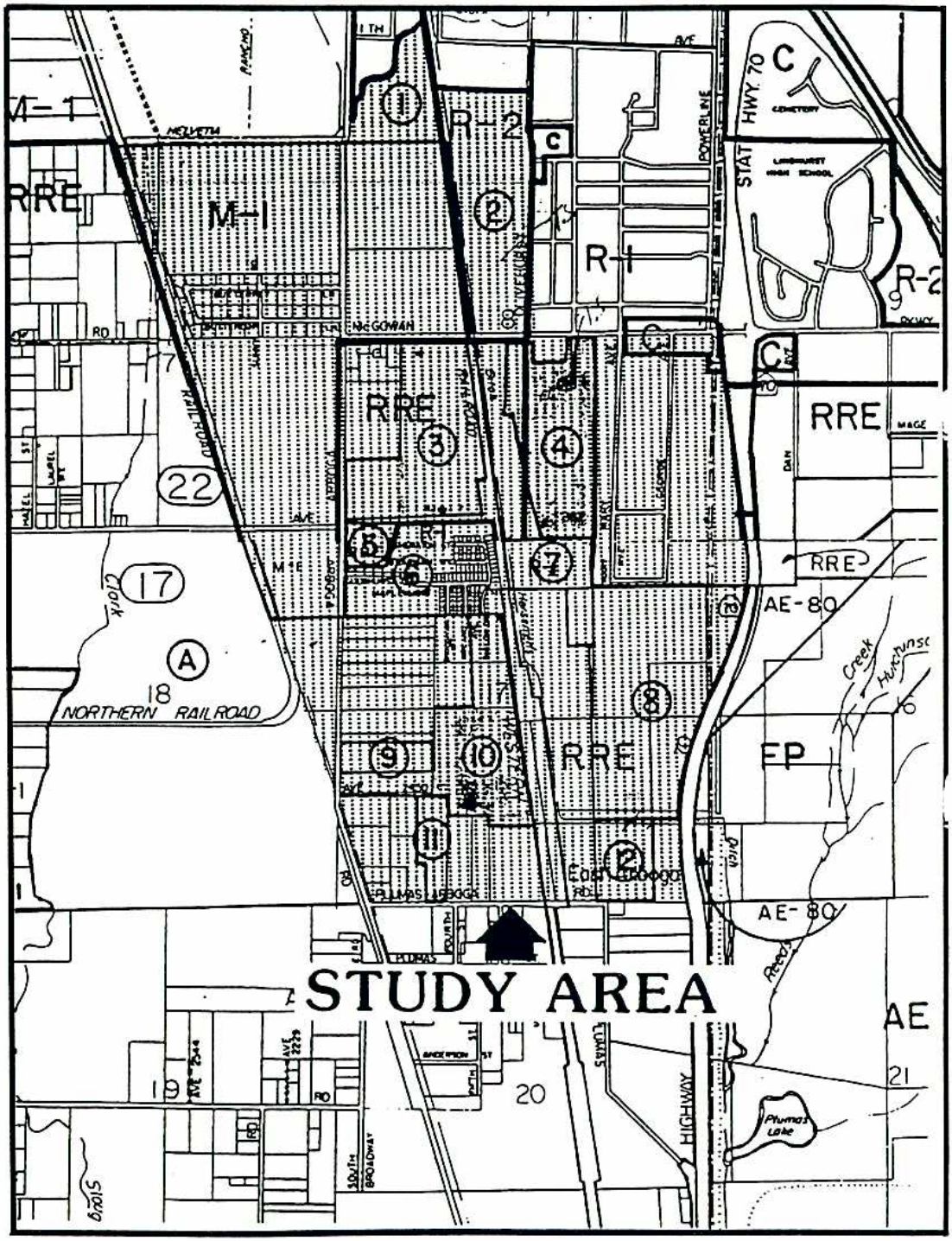


Figure 1. General location map for the North Arboga Study Area, Yuba County, California (1 inch = approx. 4.5 mi).

Figure 2. Detailed index and zoning map (provided by RESEARCH ASSOCIATES) of the North Arboga Study Area (1 inch = approx. 2400 ft).



Geology (CDMG, 1975a,b). I conducted a reconnaissance surface survey on February 7 and 8, 1992 in accordance with generally accepted geologic principles. In addition, I reviewed published and unpublished literature and maps concerning the geologic setting and potential hazards associated with the site. Soil characteristics were determined from a review of the preliminary Yuba County Soil Survey (Soil Conservation Service, 1987). The characteristics of the specific soils on the project area were confirmed by digging (using a standard 4-inch diameter hand auger) four shallow soil borings (24-33 in) within the project area (Fig. 3). Aerial photographs and topographic maps were analyzed to assess topography and drainage, distribution of soil types, and to detect fault-related topography.

2. GEOLOGY OF THE PROJECT AREA

2.1 Regional Setting

The study area is located in the Sacramento Valley, the northern half of the Great or Central Valley geologic and geomorphic province. The Great Valley is an elongate lowland, about 400 miles (640 km) long and 50 miles (80 km) wide, which lies between the Sierra Nevada and the Coast Ranges. Structurally, the Great Valley is a relatively un-deformed synclinal trough bounded by the uplifted and highly deformed Sierra Nevada and Coast Ranges provinces. The area has persisted as a lowland or shallow marine embayment since later Mesozoic time. The rocks at depth, within this trough or basin, are Upper Jurassic, Cretaceous, and lower Tertiary marine sedimentary units. By Pliocene time, regional uplift had drained the valley's seas. Since that time, brackish and freshwater lakes have periodically occupied the lower portions of the valley. The present surface of the Great Valley is composed of unconsolidated Quaternary sediments which were deposited as the alluvial, flood, and delta plains of the Sacramento and San Joaquin Rivers and their tributaries (Norris and Webb, 1990).

The study area lies approximately 12 miles (19 km) west of the regional shear zone within the foothills of the Sierra Nevada as mapped by the CDMG (1962). This zone coincides with the northern extension of the Bear Mountains Fault, the westernmost fault of the Foothills fault system as mapped by Clark (1960). The regional shear zone, as with other faults of the Foothills system, is the result of east-west compression, due to an arc-continent collision along the subduction zone which was located in the foothill area during Mesozoic time. These Mesozoic reverse faults strike north to northwest and dip vertically or steeply to the east (California Department of Water Resources, 1979, p. 65).

The Sierra Foothills area is also affected by a second major period of faulting that began in late Tertiary time and continues to the present (CDWR, 1979, p. 61). The late Tertiary tectonic regime is one of east-west extension which places the older Mesozoic faults in tension. As a result, many Mesozoic compressional faults have experienced reactivation as extensional faults during this time. This younger period of faulting continues to the present and manifests itself as numerous, low- to moderate-magnitude earthquakes occurring in the northern Sierra Nevada (CDWR, 1979, p. 19; Goter, 1988), including the 1975 Oroville earthquake. The 1975 Oroville earthquake, Richter magnitude (M) 5.7, was centered approximately 26 miles (42 km) north-northeast of the project area.

A number of regional lineaments, associated with the Foothills Fault System, lie within the regional shear zone to the east of the study area; the longest and most prominent being the Prairie Creek, Swain Ravine, and Paynes Peak lineaments (CDWR, 1979, p. 30 and Fig. 47). A lineament is a linear topographic feature of regional extent that is believed to be structurally controlled (Bates and Jackson, 1980). Within the foothills region, these lineaments are defined by broad, discontinuous, linear valleys and aligned tributaries and saddles. Lineaments are often, though not always, fault-related. Therefore, they are useful indicators of possible faults. The Prairie Creek and Swain Ravine Lineaments lie approximately 13 miles (21 km) to the east of the study area (Fig. 1).

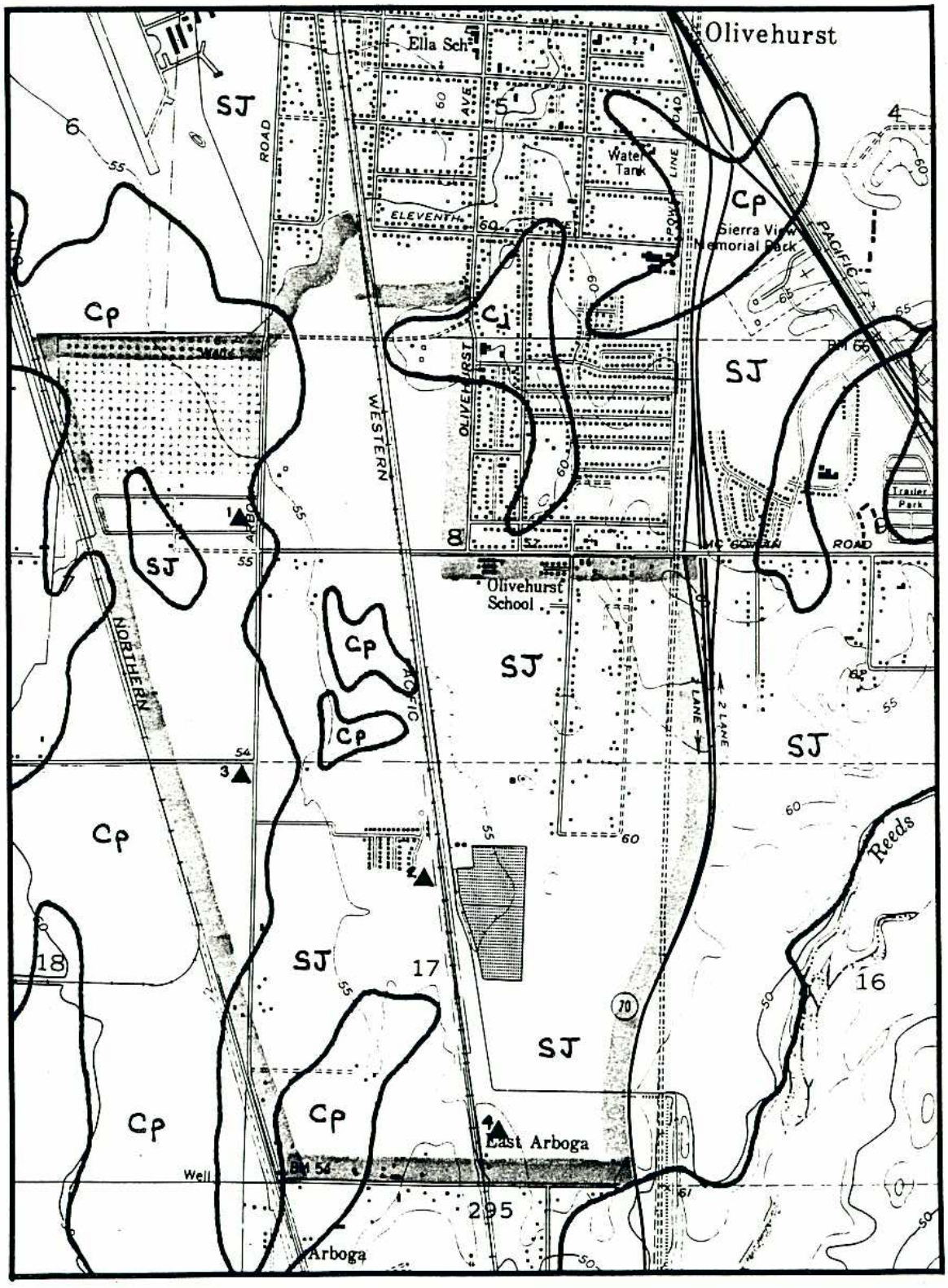
2.2 Topography and Geologic Deposits

The study area is located on undissected, very gently sloping terrain of the eastern Sacramento Valley. Elevations within the study area range from +60-64 ft (~20 m) in the northeast portion of the area to +54 ft (16 m) in the southwest (Fig. 3). The regional slope across the site is very gentle (~7 ft/mi) and toward the south-southeast.

Early geologic mapping in the vicinity of the study area was conducted by Lindgren and Turner (1895), who mapped the subject area as "alluvium". The study area is also covered by a regional geologic map of the Sacramento Valley (Olmsted and Davis, 1961) which was incorporated into the Chico Sheet of the Geologic Atlas of California (CDMG, 1962). The Chico Sheet indicates that the geologic deposits exposed at the surface over the study area are Quaternary alluvial-fan deposits, derived from the east.

The most detailed geologic mapping within the vicinity of the study area was conducted by Helley and Harwood (1985) who produced fairly detailed maps (scale 1:62,500) of the late Cenozoic deposits of the Sacramento valley. Their mapping indicates that two stratigraphic units are exposed over the

Figure 3. Generalized soil map of the North Arboga Study Area, Yuba County, California (modified from SCS, 1987). Topographic base map from the USGS Olivehurst, CA 7.5-minute quadrangle (1 inch = 2000 ft). Cp = Capay silty clay loam; SJ = San Joaquin loam; Cj = Conejo loam; ▲ = Soil boring location.



study area; sheet-like basin deposits of Holocene age and the Riverbank Formation of mid-Pleistocene age.

The extensive clay-rich alluvium the forms sheet-like deposits in the flood basins of the Feather and Sacramento Rivers are termed basin deposits. These overbank or fine-grained flood deposits typically consist of dark-gray to black clay and silty clay with minor lenses of sand and fine gravel. Basin deposits are 3-6 ft (1-2 m) thick along the eastern margin of the valley and thicken gradually to the west (Busacca and others, 1989). Basin deposits are exposed at the surface over the western third of the study area (roughly the area west of Arboga Road). Two shallow borings in this area (Fig. 3; Appendix A) revealed that the upper 3 ft (1 m) of the basin deposits are a brown to dark reddish brown, stiff, silty clay.

Underlying the basin deposits, and exposed at the surface over the eastern portion of the study area, is the unconsolidated but compact, reddish alluvium of the Riverbank Formation. The Riverbank Formation forms clearly recognizable alluvial fans, which slope westward from the Sierra foothills. Typically, the Riverbank formation consists of weathered sand and silt with minor amounts of gravel and clay (Helley and Harwood, 1985; Busacca and others, 1989). The Riverbank Formation within the study area consists of reddish brown, mixed silt and clay with minor amounts of sand and gravel. The fact that the site lies at the distal end of a large alluvial fan formed by the ancestral Yuba River explains the finer texture of the Riverbank Formation in this area. Although the base of the Riverbank Formation was not encountered in any of the soil borings, it is generally 18-30 ft (6-10 m) thick and underlain by mixed alluvium of the Pliocene Laguna Formation.

2.3 Faults

A review of fault maps of California (CDMG, 1975c; Hart, 1988) and all published geologic maps which cover the project area (Lindgren and Turner, 1895; Bryan, 1923; Olmsted and Davis, 1961; CDMG, 1962; Helley and Harwood, 1985) indicates that there are no known faults within the study area. In addition, an analysis of aerial photography as well as a surface survey failed to discover any evidence (e.g. tonal lineaments, scarps, aligned streams) of recent faulting.

The closest active fault to the project area is the Cleveland Hill fault, located approximately 24 miles (39 km) to the north-northeast. As a provision of the Alquist-Priolo Special Studies Act, the State of California defines an "active" fault as one that has surface displacement during the Holocene Epoch (approximately the last 10,000 yr). The previously unmapped Cleveland Hill fault ruptured during the 1975 Oroville earthquake (M = 5.7).

Several short faults exist along the flanks of the Sutter or Marysville Buttes (CDMG, 1962), located approximately 12 miles northwest of the project site. Several of these faults are shown on the state fault map (CDMG, 1975c) as having displacement during the Quaternary Period (approximately the last 2 million years).

Other potentially active faults ("potentially active" = Quaternary displacement) near the project area include the previously mentioned lineaments of the Foothill fault system. In a comprehensive study of these features, conducted after the 1975 Oroville earthquake, the California Department of Water Resources (1979, p. 68) concluded that the Prairie Creek, Swain Ravine, and Paynes Peak lineaments are complex zones of Mesozoic faulting. Numerous trenches across the Swain Ravine lineament fault zone revealed that it has been active during the Quaternary. In addition, the Swain Ravine lineament fault zone coincides with the ground rupture, subsequently called the Cleveland Hill Fault, that occurred during the 1975 Oroville earthquake.

2.4 Soils

Regional mapping by the Soil Conservation Service (SCS) (1987) indicates that the two predominant soil series occurring on the study site are the Capay silty clay loam and the San Joaquin loam (Fig. 3). There is a very close correlation between the two soil series on the project area and the two different geologic units. Soils developed on the very fine-grained basin deposits are designated the Capay silty clay loam, whereas the San Joaquin loams are those soils formed on the coarser Riverbank Formation. A small area of Conejo loam occurs adjacent to Olivehurst Avenue in the northeast portion of the project area.

The Capay soil is deep and moderately well drained. The A horizon ("topsoil") is typically a brown silty clay loam about 8 in. (20 cm) thick. The underlying B horizon ("subsoil") is a brown clay or clay loam about 40 in. (102 cm) thick. Capay soils generally have slow permeability. A silica-cemented hardpan occurs at a depth ranging from 40 to 60 in. (102-152 cm). The SCS (1987) rates the shrink-swell potential (expansive soil hazard) of Capay soils as high. The erosion hazard is slight owing to the cohesive nature of the soil and the very gentle slopes.

The San Joaquin soil is moderately deep and well drained. The A horizon is a light brown loam about 4 in. (10 cm) thick. The B horizon is typically a brown loam grading downward to a brown clay. Permeability is moderate in the upper 16 in. (40 cm) of San Joaquin soils, but very slow below this depth. A

brown iron/manganese-cemented hardpan occurs at a depth ranging from 20 to 40 in. (51-102 cm). The shrink-swell potential of the surface layer is low, but high for the zone below 16 in. (40 cm) depth.

The generalized physical characteristics of the Capay, San Joaquin, and Conejo soils are summarized in Table 1. Soil descriptions obtained from four (4) shallow borings on the project area are given in Appendix A. These borings generally confirmed the soil descriptions given by the SCS (1987) with the exception of slightly finer textures for the San Joaquin soils owing to the fine-grained nature of the parent Riverbank Formation in this area.

The high shrink-swell potential, slow permeability, and shallow hardpan in these soils do pose some significant limitations with respect to their use as building sites or locations for sewage-treatment lagoons. These limitations, summarized from the "(Preliminary) Soil Survey of Yuba County, California" (SCS, 1987), are presented in Table 2. The high shrink-swell potential (expansive soil hazard) is seen as a significant potential hazard and is discussed in detail later in this report.

2.5 Hydrology

2.5.1 Surface Drainage and Flooding. The project area lies approximately 3 miles (5 km) east of the south-flowing Feather River, one of the principal tributaries of the Sacramento River. The project site is situated on an interfluve between Clark Slough and Reeds Creek, originally two south-flowing tributaries of the Feather River (Fig. 3). The natural drainage within this part of the Sacramento valley has been significantly altered by stream channelization and road, railroad, and levee construction. Prior to this alteration, runoff from the western part of the study area would have drained west and southwest toward Clark Slough. The eastern portion of the area would have drained to the south and east toward Reeds Creek.

There are no natural stream channels on the site. However, drainage for the site is provided by several artificial ditches (Fig. 3). The portion of the study area east of the elevated Western Pacific Railroad bed drains southwestward toward a ditch immediately east of the railroad bed. This drainage ditch flows southward across the length of the site and empties into Plumas Lake, approximately 0.5 miles (0.8 km) to the southeast. The southeastern portion of the study area drains toward a ditch along the east side of the abandoned portion of the Sacramento Northern Railroad bed, which forms the western boundary of the study area. This ditch feeds into Clark Slough approximately 1.5 miles (2.4 km) south of the study area. The northwestern portion

Table 1. Physical characteristics of the soil units present in the North Arboga Study Area (summarized from SCS, 1987).

SOIL UNIT	HORIZON DEPTHS	USCS	SHRINK-SWELL HAZARD	CEMENTED HARDPAN	EROSION HAZARD	LOW SOIL STRENGTH	PERMEABILITY
CAPAY					Slight	Yes	
	0-8"	CH, CL	High	-			Slow
	8-43"	CH, CL	High	-			Slow
	43-47"	CL	Moderate	-			Slow
	47-65+"	-	-	Yes			-
CONEJO					Slight	No	
	0-6"	Cl-ML, ML	Slight	-			Moderate
	6-65+"	CL	Moderate	-			Moderate
SAN JOAQUIN					Slight	Yes	
	0-16"	CL-ML, ML	Slight	-			Moderate
	16-25"	CL	High	-			Very Slow
	25+"	-	-	Yes			-

USCS = Unified Soil Classification Scheme

ML: inorganic silts, very fine sands, or silty clayey fine sands; slightly plastic

CL: inorganic clays; slightly plastic to plastic

CH: inorganic clays; very plastic

Table 2. Potential building-site limitations/problems associated with the soil units present in the North Arboga Study Area (summarized from SCS, 1987).

SOIL UNIT	SHALLOW EXCAVATIONS	DWELLINGS w/o BASEMENTS	LOCAL ROADS and STREETS	LAWNS and LANDSCAPING	SEPTIC TANK ABSORPTION FLD.	SEWAGE LAGOONS
CAPAY	Severe: caving	Severe: flooding shrink-swell	Severe: low strength shrink-swell	Slight	Severe: slow perc	Moderate: hardpan
CONEJO	Slight	Severe: flooding	Slight	Slight	Severe: slow perc	Moderate: hardpan
SAN JOAQUIN	Severe: hardpan	Severe: flooding shrink-swell	Severe: low strength shrink-swell	Moderate: hardpan	Severe: slow perc hardpan	Severe: hardpan

of the study area drains toward a ditch along the active Sacramento Northern Railroad bed. This ditch is directed into a culvert under the railroad bed and joins the channelized Clark slough just west of the study area.

The portion of the study area east of the Western Pacific Railroad lies within a 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA). Inundation of this portion of the study area would occur if flood waters from the Bear River backed up into the channel and floodplain of Reeds Creek.

Due to its complexity and critical nature, the issue of drainage and potential flooding will be addressed in detail in the report of another consultant to RESEARCH ASSOCIATES.

2.5.2 **Groundwater.** A complete analysis of the groundwater conditions below the study area is beyond the scope of this investigation. However, general groundwater conditions in this portion of the Sacramento Valley, summarized from published reports, are given below.

The post-Eocene continental rocks and deposits within the Central Valley comprise a very important regional freshwater aquifer system. This aquifer system supplies half of the 22 million acre-feet of irrigation water applied to the Central Valley each year. In the Sacramento Valley, the post-Eocene continental deposits form an unconfined to locally confined aquifer with an average thickness of 2,400 ft (732 m). Most wells in the Sacramento Valley tap the upper 200 ft (61 m) of this aquifer. Prior to large-scale groundwater development, groundwater generally flowed from recharge areas in the higher ground surrounding the valley toward the Sacramento River. Groundwater now flows primarily toward cones of depression at major pumping centers (CDWR, 1978; Page, 1986; Bertoldi and others, 1991).

The estimated pre-development water table in the vicinity of the study area would have been at an elevation of +40-50 ft (~14 m) (Bryan, 1923; Bertoldi and others, 1991, Fig. 13, p. A20), or approximately 5-20 ft (2-6 m) below the ground surface. The water table in 1975 was at roughly +20 ft (35-45 ft below the surface) in the vicinity of the study area (Hull, 1984, Plate 1). Groundwater flow in 1975 would have been toward a large depression cone centered approximately 6 miles (10 km) to the east. Although the exact water table configuration during the winter of 1991-92 is unknown, the general depth to groundwater and flow direction is expected to be similar to that in 1975.

In general, groundwater from the east side of the Sacramento Valley has low to moderate dissolved solids concentrations and

relatively high dissolved silica concentrations. Bicarbonate is the predominant anion in the groundwater; calcium and magnesium are the predominant cations. The geochemistry of the groundwater in the eastern Sacramento Valley reflects the chemical characteristics of the recharge water from the granitic Sierra Nevada (Hull, 1984; Bertoldi and others, 1991).

During the wet season (December-April) there may be a shallow, perched water table beneath areas of the San Joaquin loam (SCS, 1987). This perched groundwater collects above the impermeable hardpan of the San Joaquin soils. In soil boring #2 (Appendix A), the gray mottling of the soil just above the hardpan is indicative of poor drainage and/or perched groundwater.

3. POTENTIAL GEOLOGIC HAZARDS AND IMPACTS

3.1 Hazards and Impacts Unlikely to Affect the Study Area

Potential geologic hazards and environmental impacts that are not likely to pose a significant problem with respect to future development include fault displacement/ground rupture, liquefaction, loss of mineral resources, groundwater depletion and/or contamination, mass movement/slope instability, reduced surface-water discharge and quality, accelerated soil erosion, land subsidence, volcanism, and induced seismicity. Justification for this conclusion is given below with respect to each potential geologic hazard.

3.1.1 **Fault Displacement/Ground Rupture.** In response to the 1971 San Fernando earthquake, during which a number of structures were damaged by ground rupture, the State of California enacted the Alquist-Priolo Special Studies Act, whose purpose is to prohibit the building of structures for human occupancy across the surface trace of active faults. However, there are no known faults, active or inactive, within the North Arboga Study Area. Thus the probability of structural damage within the study area due to ground rupture is very low.

3.1.2 **Liquefaction.** Liquefaction is the transformation of saturated granular material from a solid to a liquid caused by a rapid increase in liquid pore pressure brought about by intense ground shaking during an earthquake (Bates and Jackson, 1980). This condition is not likely to occur within the study area because most of the soils are compact, relatively well-drained, and clayey. For the same reasons, differential subsidence is not likely to occur on the site. Earthquake-induced landslides are unlikely because of the very gentle slopes and cohesive soils within the study area.

3.1.3 Loss of Mineral Resources. There is no evidence or suggestion of commercial mineral resources within the North Arboga Study Area. The upland portion of Yuba County lies within the Sierra Nevada gold region. However, the lowland of the eastern Sacramento Valley is not considered geologically favorable terrane for mineral deposits because the Sierran crystalline rocks are deeply buried by younger deposits (Albers and Fraticelli, 1984). Sand and gravel, clay, and stone are also commercially mined in Yuba County but the fine-grained nature of the alluvium within the study area precludes this type of mining activity.

The Sacramento Valley is a very prolific natural gas-producing area. The first discovery of commercial dry gas within the valley was at Sutter Buttes in 1933. Since that time many gas fields have been discovered and trillions of cubic feet of natural gas have been produced from Upper Cretaceous reservoir rocks. However, there is no gas production within Yuba County (Conservation Committee of California Oil Producers, 1990). The producing area nearest to the study area is the Tisdale gas field, located approximately 10 miles (16 km) to the west in Sutter County. The gas at Tisdale field is produced from thin sand beds, 6000 to 6500 ft below the surface, within the Upper Cretaceous Forbes Formation. These sand beds pinch-out toward the east forming a stratigraphic trap (California Division of Oil and Gas, 1982). As of the end of 1989 there were 15 producing wells at Tisdale and a total of 42.4 billion cubic feet of natural gas had been produced since the field was discovered in 1961 (CCCOP, 1990).

The sedimentary basin beneath the Sacramento Valley is asymmetrical; the thickest accumulation of sediments is beneath the western half of the valley (Safonov, 1962). The gas fields of the Sacramento Valley occur in a north-south trend, west of the study area, which generally coincides with the thickest portion of the basin. The eastern margin of the valley, including the study area, appears to be non-prospective for natural gas due to a lack of proper reservoir rocks and/or trapping structures.

3.1.4 Groundwater Depletion and/or Contamination. Groundwater depletion occurs as a result of the over-pumping of aquifers (rate of extraction is greater than the rate of natural groundwater recharge). It is not anticipated that future development within the study area will significantly impact local groundwater. New homes within the study area will not utilize individual residential wells; water will be supplied under contract to the project. Of course, any population increase associated with the proposed development will increase the demand for water service within the county.

In general, the greatest danger of groundwater contamination is from surface sources such as septic fields, leaking sewers, polluted streams, and solid waste landfills (Bell and others, 1987, p. 23). The shallow hardpan and very slow permeability of some of the soils within the study area pose some significant limitations on their use for septic-tank absorption fields (Table 2). However, the proposed installation of sewer lines to a regional sewage-treatment plant precludes any major risk to local groundwater quality.

3.1.5 **Mass Movements/Slope Instability.** Mass movement refers to the down-slope movement of rock and soil due to gravity once they have been displaced from their normal positions (Legget and Karrow, 1983, p. 39-1). Movements on slopes can range in magnitude from soil creep and small rockfalls to instantaneous and huge landslides (Bell and others, 1987, p. 14). Radbruch and Crowther (1973) mapped the relative occurrence of landslides in California using a classification scheme of 1 (least landslides) to 6 (most landslides). On this map, the project area is given a class 1 designation. Mass movements are very unlikely to occur within the project area due to relatively flat or very gently sloping terrain.

3.1.6 **Reduced Surface-Water Discharge and Quality.** At this time, future development will not involve the diversion of local surface water. The use of "natural" or drought-resistant landscaping will minimize changes in local soil moisture and runoff. The use of community sewage-treatment systems should preclude the contamination hazard (from septic fields) posed by the very slow permeability of the soils. There is a slight risk of pollution caused by the use of pesticides, herbicides, and fertilizer in residential landscaping. The quality of surface water draining from the site may decrease slightly during the construction phase due to increased turbidity caused by increased sediment input. Every effort should be made to control soil erosion on the site (see Accelerated Soil Erosion section below).

3.1.7 **Accelerated Soil Erosion.** Erosion and sedimentation are nearly ubiquitous natural processes. However, when humans disturb the natural vegetative cover and soil mantle of a locale, the rate of erosion and sedimentation is greatly accelerated with potentially devastating impacts on the environment (deep gullying, removal of plant nutrients, alteration of natural vegetation, fouling of aquatic ecosystems). The problem is especially serious during road construction when, inevitably, large areas of land are exposed to wind, rain, and runoff without their natural cover (Legget and Karrow, 1983).

I did not observe any active head-cutting gullies or other signs of accelerated erosion within the study area. The California Division of Mines and Geology (1973, p. 33) characterizes the estimated rate of soil erosion from undisturbed areas in the lowland of western Yuba County as low. The SCS (1987) has also characterized the erosion hazard within areas with Capay and San Joaquin soils as slight (Table 1).

Despite the very low potential for accelerated soil erosion (due to very gentle slopes and cohesive soils), Chapter 70 of the Uniform Building Code, as well as any local or county grading/erosion/sedimentation ordinances, should be adhered to during the design and construction phases of any future project. Possible preventive measures include (but are not limited to):

1. Timing the major phases of construction, especially road building, with the dry season.

2. Protecting existing vegetation during the construction phase and clearing only those areas necessary for efficient construction.

3. Reestablishing vegetation in disturbed areas at the first opportunity.

4. Restricting the movement of heavy equipment; preventing unnecessary trampling of vegetation.

5. Protection and proper location of soil material stockpiles and/or borrow pits.

6. Watering bare soil areas, such as roads under construction, during windy conditions to prevent wind erosion.

3.1.8 **Land Subsidence.** Human-induced land subsidence can occur as a result of the withdrawal of water or petroleum from poorly consolidated sediments, mine collapse, and hydrocompaction (the compaction of dry, loose, low-density deposits when water is added). Subsidence may create engineering and economic problems due to cracking of highways and irrigation canals and compression of irrigation and petroleum well casings. The largest volume of human-induced land subsidence in the world is in the Central Valley of California (Bertoldi and others, 1991). The largest and most intensely affected area is in the San Joaquin Valley south of the Merced River. Subsidence up to 30 ft (10 m) has been documented for an area in Fresno County. In the Sacramernto Valley, subsidence of more than 1 ft (30 cm) is limited to the Davis-Zamora area northwest of Sacramento (approximately 25 miles southwest of the study area). The risk of significant land subsidence within the study area is very low. At this time, large-scale groundwater withdrawal is not anticipated. However,

it is possible, though unlikely, that the study area could experience land subsidence as a result of off-site groundwater withdrawal.

3.1.9 Volcanic Activity. In some areas of the western United States, volcanic activity is potentially hazardous enough to be considered in long-range, land-use planning. However the immediate risk is low because eruptions are so infrequent in the conterminous United States that few, if any, occur during the lifetime of the average person (Mullineaux, 1976). Miller (1989, p.11-14) concludes that four volcanic areas within California (Mt. Shasta, Medicine Lake-Highland Volcano, Lassen Peak, and Mono Lake-Long Valley area) are capable of producing large to very large explosive eruptions of volcanic ash in the future. The nearest volcano to the project site is Lassen Peak, located approximately 100 mi (161 km) to the north. Depending on its size and the wind direction at the time, an eruption at Lassen Peak could deposit about 4 to 20 in. (10 to 51 cm) of compacted ash over the project site. This estimate is based on the distribution of ash associated with large historic and prehistoric eruptions of Cascade volcanos. However, the probability of these large eruptions is very low and the project area is downwind from Lassen Peak only about 5 percent of the time (Miller, 1989, p. 12-14).

3.1.10 Induced Seismicity. Earthquakes may be induced to occur as a result of human activities, most notably petroleum extraction, mining, construction of large reservoirs, and underground disposal of liquid waste (Bell and others, 1987, p. 28). The nature of any future development precludes this type of environmental impact.

3.2 Hazards/Impacts That Could Affect the Study Area

Potential geologic hazards that could pose a significant problem within the study area include earthquake activity (ground shaking), flooding, and expansive soil. Support for this conclusion is given below with respect to each of theses potential geologic hazards.

3.2.1 Earthquakes/Ground Shaking. In general, structural damage due to ground shaking is much more likely than a structure being severed by ground rupture. In addition, other hazards such as landslides, liquefaction, differential subsidence, and flooding may be triggered by an earthquake (Bell and others, 1987, p. 11). However, the most significant potential effect at the project site is damage to structures not designed to resist

the potential level of ground shaking.

Prior to the 1975 Oroville earthquake (M = 5.7), the Sierra foothills and eastern Sacramento Valley had not been considered to be an area of significant seismic activity or active faulting. Since 1975 the earthquake potential in this area has been reevaluated. A recent compilation of California earthquake epicenters (Goter, 1988) shows that there have been 55 earthquakes (M $\geq$3.0) from 1808 to 1987 within a 50-mile radius of the North Arboga Study Area. Of these, seven were greater than magnitude 4.5. These numbers include the main shock (M = 5.7) of the 1975 Oroville earthquake series, but do not include the numerous (approximately 77 $\geq$ M 3.0) fore- and aftershocks. The closest epicenter (M $\geq$3.0) shown on this compilation map (Goter, 1988) is centered less than 19 mi (31 km) north of the project site.

The closest active or potentially active fault to the study area is the Prairie Creek Lineament fault zone, approximately 13 miles (21 km) to the east in the Foothills of the Sierra Nevada (Fig. 1). Active or potentially active faults of the Foothills fault system are generally considered capable of producing a maximum credible earthquake (MCE) of magnitude 6.5 (CDMG, 1979, p. 1). The San Andreas (MCE = M 8.5) and Honey Lake (MCE = M 7.5) faults are located approximately 95 mi (153 km) southwest and 95 mi (1532 km) northeast of the study area respectively.

In 1979, the California Division of Mines and Geology published a comprehensive analysis of the seismic safety of the proposed Auburn Dam (located approximately 30 mi southeast of the project site). They concluded that the structure should be designed to withstand a MCE of magnitude 6.5 with peak ground acceleration of 0.6 g (60 percent of the acceleration of gravity) and a duration of strong shaking of 12 seconds (CDMG, 1979, p. xv). The recurrence interval of the MCE within the Foothills fault system was estimated to be 500 years. Inasmuch as the Auburn damsite is located within the Bear Mountain fault zone--a southerly continuation of the Prairie Creek Lineament fault zone, it is reasonable to assume that the MCE for the North Arboga Study Area would have similar characteristics.

Assuming a shallow (< 20 km focal depth), magnitude 6.5 earthquake centered approximately 20 km (12 mi) away, the North Arboga Study Area would likely experience a peak ground acceleration of 0.3 g and strong shaking for 8 seconds. These estimates are derived from the earthquake-related ground-motion curves of Krinitzsky and others (1987). These estimates are the mean values for a "soft" site, that is one with a soil cover of greater than 16 m (52 ft). (see Recommended Mitigation 1)

The nature of the terrain in the vicinity of the study area precludes the potential for earthquake-induced landslides. The potential of earthquake-induced flooding (caused by dam failure) in the vicinity of the site is very small, though possible due to the existence of several dams and reservoirs upstream from the study area on the Yuba and Bear Rivers.

3.2.2 **Flooding.** The fact that a portion of the North Arboga Study Area lies within a 100-year floodplain (as mapped by FEMA) indicates that there is a significant flooding hazard. Flooding has long been recognized as a serious geologic hazard in California and many laws relating to this hazard are now in effect within the state. The Subdivision Map Act (Sec. 11551.5, Business and Professions Code) specifies that the Division of Real Estate may deny approval of a housing subdivision if it is threatened by flooding (CDMG, 1973, p. 31). In light of the critical nature of this geologic hazard to the proposed development, the potential risk of flooding and suggested mitigations are to be addressed in detail by another consultant to the overall feasibility study.

3.2.3 **Expansive Soil.** Soils that greatly increase in volume when they absorb water and shrink when they dry out are termed "expansive." Expansive soils generally contain either the clay mineral montmorillonite or illite, which have the ability to absorb water molecules into their crystal structures. When buildings are placed on expansive soils, foundations may rise with each wet season and sink with each dry season. These movements may cause cracking of foundations, distortion of structural elements, and warping of doors and windows such that they do not function properly (CDMG, 1973, p. 32).

The CDMG (1973, p. 34) rates the expansiveness of the predominant soil type of the Sacramento Valley portion of western Yuba County as low. However, several general field criteria for the identification of expansive soils (Costa and Baker, 1981, p. 223), were observed on the site. Surface soils are generally very sticky and clingy and tend to build up on shoe soles and are easily molded into a ball or ribbon. In addition, the SCS (1973) rates the shrink-swell potential of the major soil types occurring in the study area as severe (Table 1). Thus, it is likely that expansive soils may impact the proposed development. In addition, the SCS (1987) states that both the Capay and San Joaquin soils may have subsoils with low shear strengths (Table 2). This condition may limit the ability of the subsoil to support a load, such as a road or building. (see Recommended Mitigation 2)

4. OTHER ENVIRONMENTAL IMPACTS: LOSS OF AGRICULTURAL LAND

Much of the land within the North Arboga Study Area is currently used for some type of agricultural activity, primarily rice cultivation and cattle grazing. Land with a Capay or Conejo soil is considered "prime farmland" by the Soil Conservation Service (SCS, 1987). The SCS defines prime farmland as land that has the best physical and chemical characteristics for producing crops and is available for this use. It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when managed according to acceptable farming methods. Areas of San Joaquin loam are not considered prime farmland. The land capability classifications for the soils in the project area are given in Table 3. In general, prime farmland embraces all land in Capability Class I and most of Class II. The SCS assigns these classifications on the basis of an established and standardized set of criteria. Neither the surface survey nor the soil borings revealed any soil conditions which would warrant the reclassification of these lands. Thus, a consequence of future development will be the loss of agricultural land, some of which is considered prime farmland by the SCS.

5. HAZARDS MITIGATION

5.1 Recommended Mitigation 1 (Earthquakes/Ground Shaking)

The state earthquake protection law (California Health and Safety Code, beginning at section 19100) requires that buildings be designed to resist stresses produced by earthquakes. Wood-frame buildings of not more than two stories in height in unincorporated areas are exempted under this law. However, I take a conservative stance and recommend that all future structures built within the study area be designed to withstand the ground shaking produced by a magnitude 6.5 earthquake on the Prairie Creek lineament fault.

As part of the design phase for any future development, the potential horizontal velocity, acceleration, and duration of ground shaking associated with such an earthquake should be more thoroughly studied by structural/earthquake engineers than in this reconnaissance-level report. These estimated parameters can then be used to evaluate the response of the proposed structures to that level of lateral shaking. It is important to note that previous earthquakes in California have demonstrated the importance of securing timber-framed houses to their foundations and reinforcing garage doors and large windows, which tend to lower the structure's shear strength.

Table 3. Agricultural land-capability classification of the soil units present in the North Arboga Study Area (summarized from SCS, 1987).

SOIL UNIT	LAND CAPABILITY CLASSIFICATION NON-IRRIGATED	IRRIGATED	PRIME FARMLAND?	PRIMARY AGRICULTURAL USE
CAPAY	IIIs-5	IIs-5	YES	Irrigated crops (mainly rice)
CONEJO	IIIc	I	YES	Irrigated crops (walnuts, peaches, prunes, almonds)
SAN JOAQUIN	IVs-3	IVs-3	NO	Rice and rangeland

SCS LAND CAPABILITY CLASSES:

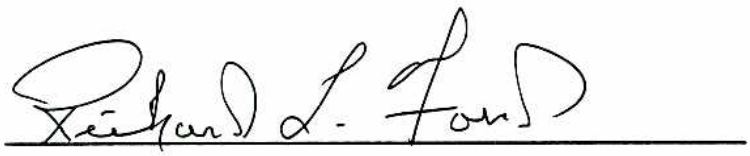
Class I: Soils with few limitations that restrict their use.
Class II: Soils with moderate limitations that reduce the choice of plants or require moderate conservation measures.
Class III: Soils with severe limitations that reduce the choice of plants, require special conservation practices, or both.
Class IV: Soils with very severe limitations that reduce the choice of plants, require very careful management, or both.

s-3 = limitation caused slow to very slow permeability of a substratum (i.e. hardpan).
s-5 = limitation caused by slow to very slow permeability in a fine-textured or clayey soil.
c = climatic limitation, insufficient moisture.

All potential home or property buyers should be informed of the seismic risk associated with the eastern Sacramento Valley. It may also be appropriate to establish a community seismic safety/emergency plan.

5.2 Recommended Mitigation 2 (Expansive Soil)

The Subdivision Map Act of the Business and Professional Code (section 11010) requires that soil conditions on all tract developments of five lots or more be studied by a registered civil engineer. I recommend that such a study include laboratory tests for soil expansion. Soil testing in the laboratory is the most accurate way of determining the expansive potential of soils (Costa and Baker, 1981, p. 222). If these tests indicate critical levels of expansion, corrective measures (e.g. CDMG, 1973, p. 35) can be designed into the foundations. In light of the fact that subsoils of the Capay and San Joaquin soils may have low shear strenths, I also recommend that the actual strength of the soils in the study area be determined by laboratory and/or field tests (e.g. direct shear tests, triaxial shear tests, penetration tests, vane or torsional shear test). If low-strength soils are found to exist within the study area, buildings and roads will have to be designed to offset the reduced ability of the subsoils to support a load.



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TOPOGRAPHIC MAP WHICH COVERS THE PROJECT AREA:

U.S. Geological Survey, Olivehurst, Calif., 1952, photorevised 1973, scale 1:24,000.

APPENDIX A

Descriptions of the soils of the

North Arboga Study Area

as revealed in hand-augered borings

SOIL BORING #1

LOCATION: SE¼ of NE¼ of Sec. 7-T14N-R4E, MDB&M; near NW corner of the intersection of Buttercup Lane and Arboga Road, Yuba County, California.

ELEVATION: + 54 ft

SOIL SERIES: Capay silty clay loam

PARENT MATERIAL: Basin deposits (Holocene), clay-rich alluvium

SOIL pH (surface): 6.2

VEGETATION: Grasses and forbs; land has been ploughed

DEPTH	DESCRIPTION
0-1 inch	Dark grayish brown (10YR 3/2) (moist) loamy clay; slightly sticky, slightly plastic.
1-27+ inches	Brown (7.5YR 4/2) (moist) silty clay; slightly sticky, slightly plastic; very stiff/firm.

NOTE: Shallow or perched groundwater was not encountered in this boring; total depth was 27 inches.

SOIL BORING #2

LOCATION: SE¼ of NW¼ of Sec. 17-T14N-R4E, MDB&M; near the southern termination of Biglow Drive, Yuba County, California.

ELEVATION: + 58 ft

SOIL SERIES: San Joaquin loam

PARENT MATERIAL: Riverbank Formation (Pleistocene), mixed alluvium

SOIL pH (surface): 6.0

VEGETATION: Grasses and forbs; land has been ploughed

DEPTH	DESCRIPTION
0-18 inches	Reddish brown (5YR 4/4) (moist) silty clay loam; slightly sticky, plastic.
18-24 inches	Reddish brown (5YR 4/4) (moist) silty clay loam; with gray (5YR 5/1) (moist) mottling; slightly sticky, plastic.
24 + inches	Cemented hardpan; auger will not advance.

NOTE: Shallow or perched groundwater was not encountered in this boring; mottling above hardpan indicates poorly drained conditions and/or seasonally perched groundwater; total depth was 24 inches.

SOIL BORING #3

LOCATION: NE¼ of NE¼ of Sec. 18-T14N-R4E, MDB&M; near SW corner of the intersection of Ella Avenue and Arboga Road, Yuba County, California.

ELEVATION: + 54 ft

SOIL SERIES: Capay silty clay loam

PARENT MATERIAL: Basin deposits (Holocene), clay-rich alluvium

SOIL pH (surface): 5.6

VEGETATION: Grasses and forbs; land has been ploughed

DEPTH	DESCRIPTION
0-4 inches	Dark reddish brown (5YR 3/2) (moist) silty clay loam; sticky, plastic.
4-23 inches	Dark reddish brown (5YR 3/3) (moist) silty clay loam; sticky, plastic; small manganese (?) nodules occur in interval 18-24 inches.
23-27+ inches	Dark reddish brown (5YR 3/3) (moist) silt loam; slightly sticky, slightly plastic; soil noticeably drier than above.

NOTE: Shallow or perched groundwater was not encountered in this boring; total depth was 27 inches.

SOIL BORING #4

LOCATION: SW¼ of SE¼ of Sec. 17-T14N-R4E, MDB&M; near the NE corner of the intersection of the Western Pacific Railroad and Plumas-Arboga Road, Yuba County, California.

ELEVATION: + 54 ft

SOIL SERIES: San Joaquin loam

PARENT MATERIAL: Riverbank Formation (Pleistocene), mixed alluvium

SOIL pH (surface): 6.0

VEGETATION: Grasses and forbs

DEPTH	DESCRIPTION
0-3 inches	Dark reddish brown (5YR 3/2) (moist) silt loam; non-sticky, slightly plastic.
3-12 inches	Reddish brown (5YR 4/3) (moist) fine sandy clay loam; non-sticky, slightly plastic.
12-14 inches	as above with yellowish red (5YR 5/8) (moist) mottling.
14-23 inches	Reddish brown (5YR 4/3) (moist) silty clay loam; slightly sticky, plastic.
23-25 inches	as above with light green to gray gravel; meta-basalt (?) with visible black hornblende (?) crystals, pebbles were once well rounded, now fractured.
25-33+ inches	Reddish brown (5YR 4/3) (moist) silty clay loam; slightly sticky, plastic.

NOTE: Shallow or perched groundwater was not encountered in this boring; total depth was 33 inches.

APPENDIX 9

BIOLOGIST'S REPORT

(Prepared for RESEARCH ASSOCIATES by
Kenneth D. Whitney, Ph.D., Consulting Biologist)

BIOLOGICAL SURVEY

NORTH ARBOGA STUDY AREA
COUNTY OF YUBA, CALIFORNIA

Prepared by:

Kenneth D. Whitney, Ph.D.
Consulting Biologist

7 April 1992
Date

For:
Research Associates
5813 Fernbrook Court
Carmichael, California 95628

7 April 1992

BIOLOGICAL SURVEY, NORTH ARBOGA STUDY AREA, COUNTY OF YUBA, CALIFORNIA

PROJECT SITE:

The North Arboga Study Area (NASA) is located in west-central Yuba county. It is bounded on the northwest by McGowan Parkway, on the northeast by the Yuba County Airport, on the east by State Highway 70, on the west by the Sacramento-Northern Railroad right of way, and on the south by Plumas-Arboga Road. The site is bisected into east and west halves by the Western Pacific Railroad right of way. Current land uses in the area are mainly agricultural, with rice, oats, and grazing the predominant activities. Several small single-family housing developments exist on site, along with some light commercial units at the McGowan Parkway/Highway 70 intersection. The area contains several man-altered or man-made watercourses. The largest of these parallel the railroad roadbeds.

METHODS:

A preliminary review of maps, aerial photographs, and other pertinent documents was made prior to visiting the site. A listing of the California Department of Fish and Game's Natural Diversity Data Base (NDDB) for the region (Appendix A) was generated to document reports of species of special concern in the area. Two visits to the North Arboga Study Area were made in February 1992. A general overview of the site was conducted by driving along most major and many minor roads in the area. Visits to specific areas with potential biotic resources were also made.

BIOTIC RESOURCES AND SENSITIVE SPECIES:

As the project site has been altered for agriculture and residential development, biotic resources on site are minimal. The Natural Diversity Data Base (NDDB) for the Olivehurst quadrangle revealed no specific instances of sensitive species occurring on the project site. The project site does have the potential to harbor three sensitive species, the Giant Garter Snake, the Valley Elderberry Longhorn Beetle, and the Tricolored Blackbird.

The Giant Garter Snake (GGS), *Thamnophis gigas*, is listed as an threatened species by the state of California. The GGS is often found inhabiting irrigation canals and rice fields, as well a other marshy habitats. A recent study (Brode and Hansen, 1992) shows the NASA project site to be east of the known range of this species. A survey of NASA site revealed several irrigation canals and rice fields that could potentially harbor this species.

The Valley Elderberry Longhorn Beetle (VELB), *Desmocerus californicus dimorphus*, is a threatened species under the Federal Endangered Species Act. VELB larvae live in the stems of Blue Elderberry (*Sambucus mexicana*) and this plant is afforded protection as sensitive species habitat. The NASA site lies within the range of the host plant and the beetle, but no elderberry plants were seen during two visits to NASA.

The Tricolored Blackbird (TCB), *Agelaius tricolor*, is classified as a Category 2 species under the Federal Endangered Species Act. Catagory 2 contains species which require additional information about their status prior to formal federal listing. The NDDB reports two populations of TCB south of the study area. Tricolored blackbirds are nomadic, and usually nest in marshes which have dense stands of cattails or tules, but they also utilize willow and blackberry thickets. It is doubtful that suitable TCB nesting habitat exists on the NASA site.

A review of aerial photographs of the site revealed several areas that may be subject to regulation by the U.S. Army Corps of Engineers (COE) as jurisdictional wetlands. The larger water-carrying ditches in the area appear to represent human-altered natural watercourses. If this is the case, further modification of these channels during construction on the NASA site may require COE permitting.

Based on aerial photo interpretation, several locations on site, most notably the parcel adjacent to Highway 70 in the northeastern part of NASA and a parcel southeast of the intersection of Arboga Road and McGowan Parkway, may contain vernal pools. The former location is relatively undisturbed, while the latter is currently in crop production. Other wetlands (especially vernal pools) subject to COE jurisdiction may exist on site, but their presence may be masked by past and current agricultural activities.

RECOMMENDATIONS:

There are very few biological constraints on the development of the North Arboga Study Area, in light of the long-term residential/agricultural use of the project site.

Two areas need to be addressed, however, when considering further development of the site:

1) Wetlands: The presence of extant vernal pools on site and the possibility of other wetlands masked by agricultural activities indicates a need for a comprehensive wetlands delineation for the site, or for portions of the site scheduled for development in the near future. Such a delineation would also determine whether the Army Corps of Engineers has jurisdiction over the irrigation canals/ditches in the area.

2) Sensitive Species: It appears unlikely that any sensitive species utilize the NASA site. However, the site does have the potential to harbor the three species listed above, and each site to be developed in NASA should be evaluated for the presence of these species prior to project initiation.

REFERENCES:

Brode, J. M., and G. E. Hansen. 1992. Status and future management of the giant garter snake (Thamnophis gigas) within the southern American Basin, Sacramento and Sutter Counties, California. Inland Fisheries Division; Endangered Species Project. 26 p.

APPENDIX A

NATURAL DIVERSITY DATABASE LISTING FOR OLIVEHURST QUADRANGLE

** California Department of Fish and Game ***** Natural Diversity Data Base **

COCCYZUS AMERICANUS OCCIDENTALIS
Western Yellow Billed Cuckoo

---------Status----------	NDDB Element Ranks	--------Other Lists---------
Federal: Category 3B	Global: G5T2T3	CDFG:
State: Endangered	State: S1	Audubon: Blue List
		CNPS List:
---Habitat Associations---		CNPS RED Code:

General: RIPARIAN FOREST NESTER, ALONG THE BROAD, LOWER FLOOD-BOTTOMS OF LARGER RIVER SYSTEMS.

Microhabitat: NESTS IN RIPARIAN JUNGLES OF WILLOW, OFTEN MIXED WITH COTTONWOODS, W/ LOWER STORY OF BLACKBERRY, NETTLES, OR WILD GRAPE.

*** Element ID: ABNRB02022 **********

Occurrence Number: 91
Quality: Unknown
Type: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Info Source: GAINES, D. 1977 (LIT)

--Dates Last Seen--
Element: 1976/06/27
Site: 1976/06/27

Quad Summary: Olivehurst (3912115), Yuba City (3912125)
County(ies): Sutter, Yuba

Location: CONFLUENCE YUBA & FEATHER RIVERS, VICINITY OF MARYSVILLE AND YUBA CITY.

Lat/Long: 39d 07m 59s / 121d 35m 46s
UTM: Zone-10 N4332302 E621318
Mapping Precision: NON-SPECIFIC (1 Mile)
Symbol Type: POINT
Group Number: 11092
Map Index Number: 11092
More Information? N
More Map Detail? N

Township: 15N
Range: 3E
Section: 99 Qtr
Meridian: M
Acres: 0
Elevation: 50 ft

Threats:

Comments: General Notes: HISTORICAL RECORDS FROM THE VICINITY OF MARYSVILLE IN 1878, 1884, AND 1885 (BELDING 1978, AND 1890) AND FROM THE VICINITY OF YUBA CITY (ORCHARDS) UNTIL THE 1940'S (ROGER WILBUR, PERS COMM). ONE CUCKOO OBSERVED AT THE CONFLUENCE IN 1976. Owner/Manager: PVT

** California Department of Fish and Game ***** Natural Diversity Data Base **

RIPARIA RIPARIA
Bank Swallow

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G5 CDFG:
State: Threatened State: S2S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: COLONIAL NESTER; NESTS PRIMARILY IN RIPARIAN AND OTHER LOWLAND HABITATS WEST OF THE DESERT.
Microhabitat: REQUIRES VERTICAL BANKS/CLIFFS WITH FINE-TEXTURED/SANDY SOILS NEAR STREAMS, RIVERS, LAKES, OCEAN TO DIG NESTING HOLE.
*** Element ID: ABPAU08010 **********

Occurrence Number: 75 --Dates Last Seen--
Quality: Unknown Element: 1985/XX/XX
Type: Natural/Native occurrence Site: 1985/XX/XX
Presence: Presumed Extant
Trend: Unknown
Main Info Source: HUMPHREY, J. 1986 (PERS)

Quad Summary: Olivehurst (3912115)
County(ies): Sutter, Yuba

Location: SHANGHAI BEND, ALONG FEATHER RIVER SOUTH OF YUBA CITY

Lat/Long: 39d 06m 02s / 121d 35m 58s Township: 15N
UTM: Zone-10 N4328669 E621089 Range: 3E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 0 Qtr
Symbol Type: POINT Meridian: M
Group Number: 11082 More Information? N Acres: 0
Map Index Number: 11082 More Map Detail? N Elevation: 50 ft

Threats:

Comments: General Notes: COLONY OF 10-20 INDIVIDUALS. Owner/Manager: UNKNOWN

** California Department of Fish and Game ***** Natural Diversity Data Base **

RIPARIA RIPARIA
Bank Swallow

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G5 CDFG:
State: Threatened State: S2S3 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: COLONIAL NESTER; NESTS PRIMARILY IN RIPARIAN AND OTHER LOWLAND HABITATS WEST OF THE DESERT.
Microhabitat: REQUIRES VERTICAL BANKS/CLIFFS WITH FINE-TEXTURED/SANDY SOILS NEAR STREAMS, RIVERS, LAKES, OCEAN TO DIG NESTING HOLE.
** Element ID: ABPAU08010 **********

Occurrence Number: 132 --Dates Last Seen--
Quality: Good Element: 1987/06/18
Type: Natural/Native occurrence Site: 1987/06/18
Presence: Presumed Extant
Trend: Unknown
Main Info Source: HUMPHREY & GARRISON, 1987 (LIT)

Quad Summary: Olivehurst (3912115)
County(ies): Sutter, Yuba

Location: FEATHER RIVER MI 21.5 LEFT BANK, 4 MI SW OF OLIVEHURST.

Lat/Long: 39d 02m 53s / 121d 36m 22s Township: 14N
UTM: Zone-10 N4322825 E620623 Range: 3E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 23 SW Qtr
Symbol Type: POINT Meridian: M
Group Number: 11061 More Information? Y Acres: 0
Map Index Number: 11061 More Map Detail? N Elevation: 55 ft

Threats:

Comments: Ecological Notes: BANK CUT AND PARTIALLY VEGETATED; AGRICULTURAL FIELD ABOVE COLONY. General Notes: 110 BURROWS ESTIMATED DURING SUMMER 1987 AERIAL SURVEY; 270 BIRDS OBSERVED. Owner/Manager: PVT

AGELAIUS TRICOLOR
Tricolored Blackbird

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Category 2 Global: G3 CDFG:
State: None State: S2 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: NOMADIC RESIDENT OF SACRAMENTO-SAN JOAQUIN VALLEYS AND LOW FOOTHILLS OF SIERRA NEVADA; SEA LEVEL TO 3400 FT.
Microhabitat: NESTS COLONIALLY IN VICINITY OF FRESH WATER, MARSHY AREAS. COLONIES PREFER HEAVY GROWTHS OF CATTAILS AND TULES.
*** Element ID: ABPBXB0020 **********

Occurrence Number: 20 --Dates Last Seen--
Quality: Unknown Element: 1982/06/17
Type: Natural/Native occurrence Site: 1982/06/17
Presence: Presumed Extant
Trend: Unknown
Main Info Source: HOSEA, R. C. 1986 (LIT)

Quad Summary: Olivehurst (3912115)
County(ies): Yuba

Location: PLUMAS-ARBOGA RD, APPROX 3 MI S OF OLIVEHURST.

Lat/Long: 39d 01m 45s / 121d 32m 15s Township: 14N
UTM: Zone-10 N4320853 E626594 Range: 4E
Mapping Precision: NON-SPECIFIC (1/5 Mile) Section: 28 Qtr
Symbol Type: POINT Meridian: M
Group Number: 11234 More Information? N Acres: 0
Map Index Number: 11234 More Map Detail? N Elevation: 55 ft

Threats:

Comments: Distribution Notes: COLONY OF APPROX 4240 ADULTS WITH FLEDGLING YOUNG NESTING IN TYPHA IN POND. Owner/Manager: PVT

** California Department of Fish and Game ***** Natural Diversity Data Base **

AGELAIUS TRICOLOR
Tricolored Blackbird

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Category 2 Global: G3 CDFG:
State: None State: S2 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: NOMADIC RESIDENT OF SACRAMENTO-SAN JOAQUIN VALLEYS AND LOW FOOTHILLS OF SIERRA NEVADA; SEA LEVEL TO 3400 FT.
Microhabitat: NESTS COLONIALLY IN VICINITY OF FRESH WATER, MARSHY AREAS. COLONIES PREFER HEAVY GROWTHS OF CATTAILS AND TULES.
*** Element ID: ABPBXB0020 **********

Occurrence Number: 21 --Dates Last Seen--
Quality: Unknown Element: 1982/06/17
Type: Natural/Native occurrence Site: 1982/06/17
Presence: Presumed Extant
Trend: Unknown
Main Info Source: HOSEA, R. C. 1986 (LIT)

Quad Summary: Olivehurst (3912115)
County(ies): Yuba

Location: SCHUSTER RANCH, APPROX 2.5 MI SE OF OLIVEHURST.

Lat/Long: 39d 02m 55s / 121d 31m 09s Township: 14N
UTM: Zone-10 N4323037 E628145 Range: 4E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 22 Qtr
Symbol Type: POINT Meridian: M
Group Number: 11278 More Information? N Acres: 0
Map Index Number: 11278 More Map Detail? N Elevation: 60 ft

Threats:

Comments: Distribution Notes: COLONY OF APPROX 730 ADULTS WITH FLEDGLING YOUNG NESTING IN RICE AND TYPHA. Owner/Manager: PVT

** California Department of Fish and Game ***** Natural Diversity Data Base **

GREAT VALLEY MIXED RIPARIAN FOREST
No Common Name

Status		NDDB Element Ranks		Other Lists	
Federal:	None	Global:	G2	CDFG:	
State:	None	State:	S2.1	Audubon:	
				CNPS List:	
---Habitat Associations---				CNPS RED Code:	
General:	NOT AVAILABLE AT THIS TIME.				
Microhabitat:	NOT AVAILABLE AT THIS TIME.				

*** Element ID: CTT61420CA **********

Occurrence Number: 22
Quality: Unknown
Type: Natural/Native occurrence
Presence: Presumed Extant
Trend: Increasing
Main Info Source: BURKE, M. T. 1980 (F SURV)

--Dates Last Seen--
Element: 1985/09/05
Site: 1985/09/05

Quad Summary: Nicolaus (3812185), Olivehurst (3912115)
County(ies): Sutter, Yuba

Location: WEST BANK (MOSTLY) OF FEATHER RIVER, BETW O"CONNER LAKES & 1.5 MI U/S OF NICOLAUS.

Lat/Long: 38d 57m 22s / 121d 34m 53s
UTM: Zone-10 N4312680 E622906
Mapping Precision: SPECIFIC (0 Mile)
Symbol Type: POLYGON
Group Number: 11139
Map Index Number: 11139
More Information? Y
More Map Detail? Y

Township: 13N
Range: 4E
Section: 30 Qtr
Meridian: M
Acres: 1290.3
Elevation: 33 ft

Threats:

Comments: Ecological Notes: TALL LUSH VEGOF COTTONWOOD, WILLOW, SCATTERED SYCAMORE, VALLEY OAK, WALNUT OVER BOX ELDER, VITIS, RUBUS, POISON OAK, ROSA, CEPHALANTHUS, ARTEMSIA DOUGLASII, ELYMUS TRITICHOIDES & INTRODUCED ANNUAL GRASSES. General Notes: AREA INCLUDES DFG ECOLOGICAL RESERVE & WILDLIFE AREA; AUDOBON SOCIETY AND PRIVATE OWNER. Owner/Manager: DFG, PVT, PVT-AUDUBON SOCIETY

GREAT VALLEY COTTONWOOD RIPARIAN FOREST
No Common Name

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: None Global: G2 CDFG:
State: None State: S2.1 Audubon:
CNPS List:
---Habitat Associations--- CNPS RED Code:
General: NOT AVAILABLE AT THIS TIME.
Microhabitat: NOT AVAILABLE AT THIS TIME.
*** Element ID: CTT61410CA **********

Occurrence Number: 25 --Dates Last Seen--
Quality: Unknown Element: 1985/09/05
Type: Natural/Native occurrence Site: 1985/09/05
Presence: Presumed Extant
Trend: Unknown
Main Info Source: WHITMORE, D. 1985 (LIT)

Quad Summary: Olivehurst (3912115)
County(ies): Sutter, Yuba

Location: AROUND ABBOTT LAKE, W SIDE OF FEATHER RIVER, JUST U/S FROM STAR BEND OF FEATHER RIVER.

Lat/Long: 39d 01m 21s / 121d 36m 26s Township: 14N
UTM: Zone-10 N4319999 E620552 Range: 3E
Mapping Precision: SPECIFIC (0 Mile) Section: 99 Qtr
Symbol Type: POLYGON Meridian: M
Group Number: 11057 More Information? Y Acres: 236.5
Map Index Number: 11057 More Map Detail? Y Elevation: 35 ft

Threats: AREA USED FOR HUNTING, FISHING.

Comments: Ecological Notes: POPULUS W/SALIX GOODDINGII, CEPHALANTHUS, ALNUS, ACER NEGUNDO & OTHERS. General Notes: ACQUIRED BY DFG IN 1985; MGMT PLAN EMPHASIS IS PRESERVATION OF INTERIOR WETLANDS & RIPARIAN HABITAT, DESIGNATED AS AN ECOLOGICAL RESERVE. Owner/Manager: DFG-ABBOTT LAKE ER

GREAT VALLEY COTTONWOOD RIPARIAN FOREST
No Common Name

Status		NDDB Element Ranks		Other Lists	
Federal:	None	Global:	G2	CDFG:	
State:	None	State:	S2.1	Audubon:	
				CNPS List:	
				CNPS RED Code:	

---Habitat Associations---
General: NOT AVAILABLE AT THIS TIME.
Microhabitat: NOT AVAILABLE AT THIS TIME.

*** Element ID: CTT61410CA **********

Occurrence Number: 26
Quality: Unknown
Type: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Info Source: HOLLAND, R. 1985 (F SURV)

--Dates Last Seen--
Element: 1985/09/05
Site: 1985/09/05

Quad Summary: Olivehurst (3912115)
County(ies): Yuba

Location: AGAINST LEVEE ON E BANK OF FEATHER RIVER U/S OF RIVER MI 18, ABOUT 1/2 MI D/S OF STAR BEND.

Lat/Long: 39d 00m 52s / 121d 35m 14s
UTM: Zone-10 N4319138 E622309
Mapping Precision: SPECIFIC (0 Mile)
Symbol Type: POLYGON
Group Number: 11110 More Information? N
Map Index Number: 11110 More Map Detail? Y

Township: 14N
Range: 3E
Section: 0 Qtr
Meridian: M
Acres: 69.8
Elevation: 35 ft

Threats:

Comments: Ecological Notes: APPEARED TO BE COTTONWOOD FOREST IN 1985 AERIAL IMAGERY, CONFIRMED IN BRIEF FIELD VISIT. Owner/Manager: PVT

** California Department of Fish and Game ***** Natural Diversity Data Base **

PSEUDOBAHIA BAHIIFOLIA
Hartweg's Pseudobahia

---------Status---------- NDDB Element Ranks --------Other Lists---------
Federal: Category 2 Global: G2 CDFG:
State: Endangered State: S2.1 Audubon:
CNPS List: 1B
---Habitat Associations--- CNPS RED Code: 2-3-3
General: VALLEY AND FOOTHILL GRASSLAND
Microhabitat: CLAY SOILS, PREDOMINANTLY ON THE NORTHERN SLOPES OF KNOLLS, BUT ALSO ALONG SHADY CREEKS OR NEAR VERNAL POOLS; 50-460 FT.
*** Element ID: PDAST7P010 **********

Occurrence Number: 10 --Dates Last Seen--
Quality: None Element: 1847/04/12
Type: Natural/Native occurrence Site: 1847/04/12
Presence: Possibly Extirpated
Trend: Unknown
Main Info Source: JOHNSON, D.E. 1974 (PERS)

Quad Summary: Olivehurst (3912115), Yuba City (3912125)
County(ies): Sutter, Yuba

Location: NEAR "CORDUAS FARM". N BANK OF YUBA RIV AT JCT OF YUBA & FEATHER RIV.

Lat/Long: 39d 07m 59s / 121d 35m 46s Township: 15N
UTM: Zone-10 N4332302 E621318 Range: 3E
Mapping Precision: NON-SPECIFIC (1 Mile) Section: 99 Qtr
Symbol Type: POINT Meridian: M
Group Number: 11092 More Information? N Acres: 0
Map Index Number: 11092 More Map Detail? N Elevation: 50 ft

Threats: AREA IS NOW LEVEES PER GRUENING (1982).

Comments: None for this occurrence.

Other Elements to Look for on OLIVEHURST Quad

MONARDELLA DOUGLASII VAR VENOSA PDLAM18082
VEINY MONARDELLA 1

Federal Staus: Category 2 Global Rank: G5TX
State Status.: None State Rank: SX
Habitat Associations----------
General.: VALLEY AND FOOTHILL GRASSLAND
Micro...: NOT AVAILABLE AT THIS TIME.
Location..: PLAINS OF THE FEATHER RIVER NEAR MARYSVILLE.
Source....: ABRAMS, L. 1951 (LIT)
Last Seen.: 1854-05-25

APPENDIX 10

THE ECONOMIC IMPACT OF DEVELOPMENT IN THE NORTH ARBOGA STUDY AREA ON YUBA COUNTY

(Prepared for RESEARCH ASSOCIATES by
Regional and Economic Sciences)

THE ECONOMIC IMPACT OF DEVELOPMENT IN THE NORTH ARBOGA STUDY AREA ON YUBA COUNTY

by

Jon S. Ebeling, Ph.D
and
Frederica Shockley, Ph.D.
with
Bob Storre
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5/29/92

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TABLE OF CONTENTS

APPENDIX D

LIST OF TABLES

APPENDIX B:

THE ECONOMIC IMPACT OF DEVELOPMENT IN THE NORTH ARBOGA STUDY AREA ON YUBA COUNTY

CHAPTER 1

INTRODUCTION AND OVERVIEW

Introduction

This report summarizes the potential economic impact of development in the North Arboga Study Area (NASA) on Yuba County. It is not designed to predict what will happen in NASA during the next 20 years since that is beyond the level of current forecasting technology. Instead, it is designed to predict what will happen to Yuba County's economy and local governments if certain types of development occur. The primary advantage of this type of analysis lies in its ability to forecast the economic outcome of different types of development so that policy makers can know more about their impact on the economy and government budgets.

Forecasts of changes in income, jobs, output, government costs and revenues will be presented over a 20 year period for three different development scenarios: (1) The first scenario will be a projection of the county's current low growth rate with only a portion of the currently proposed development in NASA reaching the construction stage. (2) The second scenario will be a rapid growth pattern in which all housing units in the 13 subdivisions recently approved or awaiting approval will be constructed. (3) Last, an alternative scenario will be considered in which NASA attracts a major industry in the northwest section zoned for manufacturing and all currently proposed housing is constructed as outlined in Scenario 2. All data will be in 1992 dollars unless otherwise stated.

In the next section an overview of proposed development within NASA will be presented, with the data used to analyze its economic impact under these assumed growth scenarios. In Chapter 2 the economic effects of the three development scenarios will be examined based upon results of an economic input-output model. Revenue and expenditure estimates for Yuba County government will be presented in Chapter 3. Revenue and expenditure estimates for special districts affected by NASA will be presented in Chapter 4.

Overview of Proposed Development

NASA is a 1300 acre unincorporated section of Yuba County located south of the Yuba County airport. According to the 1990 Census this area had a population of 1,645 with 547 single-family houses.[1] Although some land is zoned for manufacturing, there are no businesses located in NASA. A map of NASA on the next page shows the current zoning and the location of currently approved and newly proposed subdivisions.

Table 1 lists the subdivisions shown on the map, following with the number of proposed lots. If all lots are approved and houses are constructed, 2,831 single-family houses will be added to NASA, with an estimated 8,210 residents.[2]

Table 1
Recently Approved and Currently Proposed
Subdivisions within the North Arboga Study Area

Project Number	Number of Proposed Lots	Status
1	150	Proposed
2	274	Approved
3	350	Proposed
4	217	Approved
5	47	Proposed
6	184	Approved
7	106	Proposed
8	418	Proposed
9	47	Proposed
10	350	Proposed
11	60	Proposed
12	92	Proposed
13	536	Proposed
Total Lots	2,831	

Source: Karri L. Campbell, Associate Planner, Yuba County Planning Department, 1-8-92.

[1]. U.S. Department of Commerce, Bureau of the Census, Summary Tape File 1-A "Population and Housing", Yuba County, 1990.

[2]. The 2,831 houses includes the Kaufman and Broad development in which construction has already begun. The Yuba County Department of Planning and Building Services estimates an average 2.9 persons per household in the county. Multiplying 2.9 by 2,831 (the number of houses) yields 8,210 residents.

Table 2
Number of Houses Constructed in the North Arboga Study Area (NASA) and the Resulting Net Change in Yuba County Population

Scenario 1: Slow Growth

Year	Total Houses Completed	Total Residents in NASA (2.9 x Houses)	Net Change in Yuba County Population (.21 x Residents)
1992	37	108	23
1993	74	216	46
1994	111	324	69
1995	148	432	92
1996	185	540	115
1997	222	648	138
1998	259	756	161
1999	296	864	184
2000	333	972	207
2001	370	1,080	230
2002	407	1,188	253
2003	444	1,296	276
2004	481	1,404	299
2005	518	1,512	322
2006	555	1,620	345
2007	592	1,728	368
2008	629	1,836	391
2009	666	1,944	414
2010	709	2,052	437
2011	740	2,160	460

Source: Department of Finance population projections were used to derive an annual average sales of 37 houses per year within NASA based upon NASA's proportionate share of proposed lots in Yuba County. The Yuba County Planning Department's estimate of 2.9 residents per house was multiplied by 37 houses to obtain 108 new residents. The 108 new residents multiplied by .21 (the estimated proportion of NASA residents who are new to the county) yielded 23, the annual change in Yuba County population due to development of NASA. (See Appendix A for a more detailed explanation of the procedures used to derive the numbers for this table.)

Overview of Scenario 1: Slow Growth

The first scenario is based on the assumption that Yuba County grows at the average annual amount derived from Department of Finance projections.[3] This slow growth rate produces average annual sales of 37 houses if NASA's sales are proportionate to its share of proposed lots in Yuba County. Table 2 shows the number of new houses and residents in NASA under the slow growth assumption used in the first scenario.

Table 3 shows the infrastructure needed to support the slow growth of NASA described in Table 2. Since the section east of the Western Pacific Railroad appears to have more flooding problems, this table is based on the assumption that the land west of the railroad develops first.[4] In Table 2 sewer and water are listed first because both will be required for a small development. According to the traffic engineer, Kenneth Anderson, McGowan Road, which runs through NASA, has enough capacity for small projects, but a large development within NASA or near NASA would require that it be widened.[5] Development of the west side of the Western Pacific Railroad will also eventually require removing the "kink" in Arboga road.

Although there are drainage problems for all of the area within NASA, the cost is not included in Table 3 because there is considerable uncertainty about the approach that will be used to solve the problem. According to Mike Smith, engineer and president of M-H-M, Inc., NASA is in two drainage basins which may result in flooding in much of southern Yuba County.[6] Consequently, a large area drainage system that included NASA would be the least expensive way to solve the problem. Smith said that the cost of an area-wide drainage system for the Plumas Lake Specific Plan which included NASA would be about $1,000 per house.[7] However, it will be necessary for Yuba County to develop a master plan for drainage before a system-wide plan can

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[3]. State of California, Department of Finance, Demographic Research Unit, Interim Population Projections for State and Counties, April 1991, Official State Projections, Report 91 P-1. See Appendix A for a more detailed explanation of the method used to estimate the number of houses.

[4]. Letter from Kenneth Anderson, p. 1, 1-27-92.

[5]. Drainage problems were summarized by Mike Smith, engineer and president of M-H-M Inc., a consultant for the NASA report.

[6]. Ibid.

[7]. Telephone Interview on 2-10-92 with Mike Smith, engineer for MHM.

be implemented. If the county does not adopt a master plan, developers will have to provide individual solutions which will probably have a higher cost per house than a system wide plan.

Table 3
Infrastructure Required for Development of NASA
Scenario 1: Slow Growth

(1992 Dollars)

Year	Type	Cost
1992	Sewer & Wells	1,673,000
1993	Water	328,000
2001	Widen McGowan	1,722,500
2002	Remove Kink	500,000

Source: Cost data for the highways and roads was obtained from a letter written by Kenneth D. Anderson, engineer for K. D. Anderson Transportation Engineers, on 1-27-92. Cost data for the water and sewer was obtained in an interview with Sean O'Neill, engineer for Laughlin and Co., in Chico, California, on 2-7-92.

Overview of Scenario 2: Rapid Growth

Since NASA is located within commuting distance of Sacramento, it is important to consider changes in population and housing in the Sacramento area. When the Department of Finance estimates county population growth it does not take into consideration changes such as increased demand for housing by commuters who might move into Yuba County after filling up other suburban locations around Sacramento. Consequently, Department of Finance data underestimates growth rates when there are such shifts in demand. Scenario 2 reflects a more rapid rate of growth than the Department of Finance projections. Table 4 shows the number of new houses and residents in NASA assuming all of the 2,831 lots in Table 1 are approved and the houses are constructed over a 20 year period. The net change in population for Yuba County due to development of NASA is based on the assumption that 79 percent of all home buyers move into Yuba County when they purchase their houses in NASA. This assumes that residents of Yuba County purchase the same proportion of new homes at NASA as they purchase at other developments in the county.

Table 4
Number of Houses Constructed in
the North Arboga Study Area (NASA) and the
Resulting Net Change in Yuba County Population
Scenario 2: Rapid Growth

Year	Total Houses Completed	Total Residents in NASA (2.9 x Houses)	Net Change in Yuba County Population (.79 x Residents)
1992	142	412	325
1993	284	824	651
1994	426	1235	976
1995	568	1647	1301
1996	710	2059	1627
1997	852	2470	1951
1998	994	2883	2276
1999	1136	3294	2602
2000	1278	3706	2928
2001	1420	4118	3253
2002	1562	4530	3579
2003	1704	4942	3904
2004	1846	5353	4229
2005	1988	5765	4554
2006	2130	6177	4880
2007	2272	6589	5205
2008	2414	7001	5531
2009	2556	7412	5855
2010	2698	7824	6181
2011	2840	8236	6506

Source: The 2,831 lots requested in the 13 currently-approved and newly-proposed subdivisions within NASA were divided by 20 years to obtain an average of 142 houses sold per year. The Yuba County Planning Department's estimate of 2.9 residents per house was multiplied by 142 houses to obtain 410 new residents. The 410 new residents multiplied by .79 (the estimated proportion of NASA residents who are new to the county) yielded 325 (rounded), the annual change in Yuba County population due to development of NASA.

Past population growth in Yuba County cannot be used to justify absorption of 142 houses per year over the next 20 years. However, absorption of 142 houses per year does not appear unreasonable in view of the number of proposed housing units and the pace of sales at a recently approved subdivision in NASA. Developers propose to develop more than 25,000 lots, or an average of 1,250 per year, in the county over the next 20 years.[8] About 11 percent of the lots proposed for Yuba County are within NASA.[9] Although proposed lots may never be developed, evidence of the increasing pace of real estate activity can be seen at one of NASA's recently approved sub-divisions, California Heartland, where 60 out of 65 houses were sold in less than 6 months during a recession.[10]

Only one of the 60 buyers was from Yuba County; 54 were from Sacramento and the remaining 5 were from Placerville.[11] Southern Yuba County is attractive to commuters because it requires about the same driving time to Sacramento as other suburban areas while offering less expensive housing according to the developer.[12] Because of the increasing number of Sacramento commuters moving into the county, the number of new homes added each year to Yuba County's housing stock will likely be higher in the 1990's than in the 1980's. The Yuba County Department of Planning and Building Services estimates that more than 800 new housing units per year will be added to Yuba County's housing stock through 1996.[13]

Since Yuba County may be undergoing change that has not been recognized by the Department of Finance projections, it may be useful to compare the county to other counties surrounding the city of Sacramento, which is the employment center of this region.

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[8]. Department of Planning and Building Services, Housing Element, 1991-1996, p. 6.

[9]. 2,831/25,000 = 11%. See Table 1 of this report for source of the numerator.

[10]. Interview with Leslie S. Robillard, sales representative, Kaufman and Broad, Olivehurst, California, 1-8-92.

[11]. The data on buyers was obtained by Bob Storre, research assistant for Regional and Economic Sciences, in a telephone interview on 2-10-92 with Steve Lierly, a representative of Kaufman and Broad, developer of California Heartlands.

[12]. Department of Planning and Building Services, Housing Element, 1991-1996, p. 8.

[13]. Department of Planning and Building Services, Housing Element, 1991-1996, p. 6.

After comparing the area to the foothill counties of Placer, El Dorado, Nevada, and part of Yolo, Cone concluded that southern Yuba County could, with aggressive marketing, add between 6,000 and 8,000 housing units by 2010.[14] Thus the addition of 2,831 houses in NASA which is a portion of southern Yuba County appears reasonable under Cone's assumption of an aggressive marketing plan for housing prices below Sacramento area prices. The infrastructure needed to develop a rapidly growing NASA is presented in Table 5. It assumes that most of the area west of the Western Pacific railroad tracks develops first. Consequently, construction of infrastructure on the east side of the railroad track can be delayed. Cost of a drainage system is not included for reasons discussed on page 5 of this report.

He suggested an aggressive marketing plan. This implies continued demand for housing--i.e., no recession; continued presence of inexpensive land for development, and finally very important--the presence of the freeway which is planned in the area by the end of the decade. He only mentions the first item, but the others are either factual or are derived from his assumptions.

Table 5
Infrastructure Required for Development of NASA
Scenario 2: Rapid Growth
(1992 Dollars)

Year	Type	Cost
1992	Sewer, Water, & Well	3,167,000
1993	Widen McGowan	1,722,500
1995	Realign Arboga	500,000
1996	Sewer East of R.R.	518,000
1997	Build SR 70	1,125,000
2001	Well	1,300,000
2006	Well	1,300,000

Source: Cost data for the highways and roads was obtained from Kenneth D. Anderson's letter of 1-27-92. Cost data for the water and sewer was obtained in an interview with Sean O'Neill, engineer for Laughlin and Co., at Chico, California, on 2-7-92.

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[14]. Cone, John W., "Marketing Analysis for the Plumas Lakes Area of Southern Yuba County," Urban Economics and Planning Systems, Los Altos, CA, p. 3 and p. 4-1.

Overview of Scenario 3: Rapid Growth and a New Industry

Because of its proximity to the Yuba County Airport and railroad lines, part of the northwestern section of NASA that is currently zoned for manufacturing seems especially suitable for industrial development. County planners may want to leave the areas zoned manufacturing in order to encourage growth of jobs as well as housing. Consequently, we decided to examine the impact of a hypothetical industry that might locate in this area.

Scenario 3 is based on the same rapid growth assumptions found in Scenario 2 where an average of 142 houses per year are constructed and occupied. A hypothetical new industry also locates within NASA in the northwestern part that is zoned for manufacturing. The possibility of such a development was proposed by Tom Hart, Director of the Yuba and Sutter County Enterprise Zone and Airport Manager.[15] Such a firm might build a plant with infrastructure that will employ 300 workers. In Scenario 3 we assumed that the manufacturing plant will be built in 1994. In 1995 it will begin producing with 100 employees, and it will expand by 100 employees per year until it reaches its capacity with 300 employees in 1997.

This concludes the overview of the three growth scenarios for development of NASA. The first scenario projects the current slow population growth over the next 20 years with an average of only 37 new houses per year added to NASA. The second scenario assumes that all housing units proposed within NASA will be built over the next 20 years to yield a high growth rate with an average of 142 houses per year added to the area. The third scenario is based on the same high population growth rate as the second scenario with the addition of a hypothetical industry.

In the next chapter each of these three scenarios will be examined with the use of IMPLAN, an input-output model, in order to determine their impact on income, output and employment in Yuba County. Then these estimated impacts from Chapter 2 will be used in Chapter 3 to forecast the changes in costs and revenues to Yuba County that would result under each scenario.

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[15]. Telephone Interview with Tom Hart, Director of the Yuba and Sutter County Enterprise Zone and Airport Manager, 2-7-92.

ECONOMIC EFFECTS OF NORTH ARBOGA STUDY AREA (NASA)
ON YUBA COUNTY

CHAPTER 2

Introduction

In this chapter we will present estimates of income, output, and jobs that would result under each of the three scenarios summarized in the previous chapter. This chapter will be of primary interest to those who are concerned about the amount of income and the number of jobs that will be created as a result of development in NASA. However, these estimates were also used to develop the sales tax revenue estimates presented in the next chapter. We used an input-output model to predict these changes.

Description of the Input-Output Model

The data presented in Tables 2 through 5 were analyzed with the use of IMPLAN, an input-output model developed by the U.S. Department of Agriculture, Office of Emergency Services and the University of Minnesota, Department of Agricultural and Applied Economics. Input-output models are unique in that they are the only method of analysis that permits the user to predict the impact of a change in one industry on all other industries in the region being studied. With the use of such models it is possible to trace the impact of an initial (or primary) change in net expenditures through other industries in the economy to predict the ultimate change in industrial output, income and jobs within the region. The specific model used in this analysis contained data on value of product produced and cost of inputs purchased by 121 industrial and service sectors in Yuba County. Data from Tables 2 through 5 were used with IMPLAN to generate estimates of other primary changes as well as secondary and tertiary changes that are summarized in Tables 6 through 8.

Input-output models have certain limitations. IMPLAN, like other input-output models, is based on the assumption that cost and revenue relationships are linear. Thus firms can double their output without incurring either rising or falling average cost of production, and they can sell all of the additional output without decreasing their prices. Input-output models also assume that firms continue using the same proportion of inputs as they change their level of production. For example, a 10 percent increase in output will require a 10 percent increase in all labor, materials and capital. Input-output models also assume that firms continue using the same proportion of inputs as relative input prices change. For example, firms will continue using the same ratio of labor to materials in the construction of houses as they did in the base year even though the cost of labor may have increased much more rapidly than the cost of materials. (The base year for our model, the latest available, is 1985.)

Despite these limitations, input-output models are the best approach for estimating the multiplier effect by predicting the impact of one industry on other industries in the county.

Primary impacts in a regional economy are the initial changes in spending for such items as investments in lot improvements, the construction of houses, and expenditures for landscaping. When a developer, for example, hires a construction firm to build on-site and off-site improvements, she will cause primary changes in spending that increase production and create new jobs. Primary changes in spending also occur in Yuba County when people moving into the county spend their income on items such as groceries, utilities and clothing. The primary changes in spending are like a snowball that someone starts rolling at the top of a hill. As the snowball rolls down the hill it grows larger; as the primary effects ripple through the economy, production increases.

Secondary impacts are caused by the primary changes in spending. They result when the businesses affected by primary changes purchase supplies and services from other firms. This causes production to increase and jobs to be created. For example, when the construction firm hired to build the lot improvements orders cement, the cement company may produce more and hire more workers. These changes cause the snowball to grow as it rolls down the hill.

The tertiary changes result when workers and property owners spend the additional income that results from the primary and secondary impacts. For example, construction workers hired by the builder to make lot improvements, may eat out more often. The result will be increased production and more jobs in restaurants. Thus tertiary changes as well as secondary changes cause the snowball to grow as it rolls down the hill.

Primary Expenditures Due to Development of NASA

In order to use the model to forecast economic impacts, it is necessary to estimate the amount of primary changes in expenditures (or industrial output) that are generated by the development. Primary changes, as discussed in the preceding section, occur when there is a change in spending for final goods and services such as purchases of new houses and increased expenditures for groceries by new county residents.

Primary Expenditures for Infrastructure and Construction

Estimates for primary changes in expenditures (or industrial output) to develop the land and construct the houses were made with data presented in Tables 2 through 5. It was assumed that 30 percent of the labor and materials required for the infrastructure will be purchased within Yuba County and 60 percent of

the materials and labor for construction of the housing will be purchased within the county.[16]

Some restrictions were applied to this data in order to ensure that only expenditures defined as primary changes which impact net spending in Yuba County were used to make the analysis. Expenditures for newly produced products, such as houses, but not existing property, such as land were counted. However, expenditures for improvements, such as sewers and streets, are included in primary expenditures.

For a single house, the amount of primary change is calculated as follows:

$125,000	= Price of New House and Lot
- 20,000	= Price of Lot
$105,000	= Price of New House
x .40	= % of Purchases that are Local
$ 42,000	= Primary Change Per New House

Expenditures for infrastructure were included with expenditures for houses in the primary impacts.

Primary Consumption Expenditures by New County Residents in NASA

The development will also have a greater impact on Yuba County than one which would primarily attract residents from other parts of the county since new residents will increase total spending for consumer goods within the county. We estimated that each resident moving into NASA from outside Yuba County will spend approximately $9,082 per year (1992 dollars) in Yuba

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[16]. Kenneth Anderson, engineer and owner of K. D. Anderson Transportation Engineers, in a letter of 1-27-92, suggested that 30 percent of labor and materials purchased within the county was a "reasonable operating assumption." In a later phone conversation Anderson said that it was likely a larger percentage of materials would be purchased locally to build the houses since some of the houses will probably be built by small, local firms who do not find it cost effective to bring small shipments of materials into Yuba county. This estimate was based on more than 30 years work experience in Yuba County.

County.[17] The average income for a moderate income household in the west is $37,640 (1992 dollars) before taxes according to the Department of Labor Study.[18] With an income of $37,640 average expenditures on housing were $11,561, which would be the approximate amount required for mortgage payments on a 90 percent loan for a house costing $125,000 at 9 percent interest. After excluding taxes, savings, and housing expenditures, the average expenditures for a household in the west with a moderate income was $18,166 in 1992 dollars.

Only part of the $18,166 was used with IMPLAN because some of these expenditures are likely to be made outside Yuba County. Commuters are likely to make some of their purchases in the county where they work. Even long-time residents of Yuba County are likely to make some of their purchases in larger retail areas outside Yuba County. Other studies have shown that residents of small towns near growth centers make approximately 60 percent of their total purchases in their community while commuters make a little

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[17]. The average expenditures in 1989 dollars were derived from Table 8, Consumer Expenditure Survey, 1988-89, U.S. Department of Labor, Bureau of Labor Statistics, August, 1991 (Bulletin 2383) as follows:

Average Annual Expenditures	= $32,144
(Less)	
Housing Expenditures	= 10,247
Personal Taxes	= 3,047
Personal Insurance & Pensions	= 2,749
Average Annual Purchases	= $16,101

The above numbers were multiplied by 1,128 to obtain 1992 dollars.

[18]. Income, tax, and expenditure data are from U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, 1988-89, Bulletin 2383, p. 135-137.

over 50 percent of their purchases in their community.[19] We assumed that 50 percent of the $18,166 consumer expenditures were made within Yuba County. Thus each household that moves into NASA from outside the county will spend approximately $9,083 per year (1992 dollars) within the county.

Primary Expenditures for Production by New Industry

The hypothetical new plant and the required infrastructure are expected to cost about $25 million according to Tom Hart, Director of the Yuba and Sutter County Enterprise Zone and Airport Manager.[20] Only 30 percent of the materials and labor were estimated to be purchased in Yuba County. This is consistent with the estimate of 30 percent for labor and materials purchased inside the county to produce the infrastructure necessary for the residential development.[21]

Results of the Input-Output Model for Scenario 1

The total impact of Scenario 1 on output, income and jobs is summarized in Table 6. The total impact consists of the primary,

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[19]. These percentages were derived from Ironside R.G. and Williams, A.G., "The Spread Effect of a Spontaneous Growth Centre: Commuter Expenditure Patterns in the Edmonton Metropolitan Region, Canada," Regional Studies, Vol 14, Number 4, 1980, Table 3, p. 323 and Boehm, William T. and Pond, Martin T., "Job Location, Retail Purchasing Patterns and Local Economic Development," Growth and Change, January, 1976, p. 10. Using Ironside and Williams data collected from small towns near Edmonton, Canada, residents make approximately 61 percent of their purchases locally while commuters make approximately 55 percent of their purchases locally. Using data collected by Boehm and Pond from small towns in southern Indiana, residents make approximately 58 percent of their purchases locally while commuters make approximately 53 percent of their purchases locally. John Cone in "Marketing Analysis for the Plumas Lakes Area of Southern Yuba County," January, 1991, p. 411, estimated that 60 percent of retail purchases would be made locally without differentiating between commuters and non-commuters. We decided to err on the conservative side and use 50 percent for the proportion spent locally by the new residents of NASA.

[20]. Telephone Interview with Tom Hart, Director of the Yuba and Sutter County Enterprise Zone and Airport Manager, 2-7-92.

[21]. Kenneth Anderson, engineer and owner of K. D. Anderson Transportation Engineers, in a letter of 1-27-92, suggested that 30 percent of labor and materials purchased within the county was a "reasonable operating assumption" for the infrastructure necessary to develop NASA.

secondary, and tertiary changes. Primary changes are the initial changes in expenditures within the county for such items as houses. Secondary changes occur when firms buy goods and services from other firms within Yuba County in order to produce the houses needed for primary purchases. For example, a builder may purchase lumber made in Yuba County or the services of a local plumber in order to complete the house. Tertiary changes occur when people spend the additional income generated by the primary and secondary changes. For example, the plumber may eat out at local restaurants more often. Thus, primary changes generate secondary and tertiary changes; this is sometimes referred to as the "ripple effect."

Table 6
Changes in Industrial Output,
Income, and Jobs In Yuba County
Due to Development of NASA
Scenario 1: Slow Growth

(1992 dollars in millions)

Year	Industrial Output	Income	Jobs
1992	3,191,282	1,463,635	32
1993	2,809,859	1,262,470	27
1994	2,752,007	1,232,625	27
1995	2,798,288	1,257,869	28
1996	2,844,569	1,283,113	28
1997	2,890,850	1,308,357	29
1998	2,937,131	1,333,601	29
1999	2,983,412	1,358,845	30
2000	3,029,693	1,384,089	31
2001	3,777,288	1,727,778	38
2002	3,325,918	1,527,008	34
2003	3,168,536	1,459,822	33
2004	3,214,817	1,485,066	33
2005	3,261,098	1,510,310	34
2006	3,307,379	1,535,554	35
2007	3,353,660	1,560,799	35
2008	3,399,941	1,586,043	36
2009	3,446,222	1,611,287	37
2010	3,492,503	1,636,531	37
2011	3,538,784	1,661,775	38

Source: This data was derived from the use of data in Tables 2 and 3 with IMPLAN, an input-output model, developed by the U.S Department of Agriculture, Forest Service, the Federal Emergency Management Agency and the University of Minnesota, Department of Applied Economics. Income consists primarily of wages, corporate profits, rental income and returns to proprietorships and partnerships. It includes current development.

Each year the construction of 37 houses creates approximately 25 jobs and $1.2 million income in Yuba County after the "ripple effect" is taken into account. The additional spending of 23 new people moving into the county creates only .7 of a job and $25,000 of income each year.[22] In those years when infrastructure is constructed, an additional 1 to 7 jobs are created. Few jobs are created because there are many "leakages" into other counties. For example, when a new homeowner buys furniture in Yuba County, only the margin is an expenditure within the county. Since the furniture was produced outside the county, the amount the dealer paid for the furniture is a "leakage" from the county.

Only the jobs attributable to additional spending by new residents are permanent. Consequently, in the year 2012, approximately 13 permanent jobs (.65 x 20 years) and half a million dollars in income will be generated by NASA. There will be no construction jobs generated in NASA by 2012 or whenever the development is completed.

More jobs would be created if there were fewer "leakages" from the stream of spending that is created by the initial expenditures for construction and the additional spending for consumer goods by new residents. Leakages occur in initial expenditures for construction of water, sewer, and other infrastructure when materials and labor are brought in from outside the county. Keep in mind that this is based on the assumption that approximately 70 percent of the materials and labor for the infrastructure are purchased outside the county. If local firms are hired, more jobs will be created in Yuba County. For the construction of houses it was assumed that approximately 40 percent of the labor and materials was brought in from outside the county since smaller, local firms are more likely to be involved in building homes than building roads.

Based upon the results of IMPLAN we estimate that it would take approximately 12 new households with an average before tax income of $37,232 (1992 dollars) to create one new job in Yuba County.[23] The additional income brought in by new residents does not create many jobs because there are numerous leakages from this spending stream. After excluding taxes, savings, and housing expenditures, the average household with an income of about $37,000 spends approximately $18,000.[24] But only about half of

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[22]. 37 houses x 2.9 persons per household = 107 new persons at NASA. Since only 21% of the 107 residents are from outside the county, only 23 will be adding to consumption spending in Yuba county.

[23]. The number of households required to generate one new job was derived from the results of IMPLAN.

[24]. Income, tax, and expenditure data are from U.S. Department of Labor, Bureau of Labor Statistics, Consumer Expenditure Survey, 1988-89, Bulletin 2383, p. 135-137.

this will be spent in Yuba County which lies close to a much larger retail market that attracts consumers. There are even more leakages when the $9,000 is spent in Yuba County since few goods are produced in the county. A consumer, for example, may purchase a car in Yuba County. Since the car was not manufactured in Yuba County, most of that purchase becomes a leakage. Only the dealer's markup stays in the spending stream to generate more spending and jobs in Yuba County.

Table 7
Jobs Created by Industrial Sector
For Every 100 New Jobs Generated by
New Residents' Consumer Spending
In Yuba County

IMPLAN Sector	Number of Jobs (Rounded to nearest 1)
Fruits	1
Motor Freight	1
Communications	2
Wholesale Trade	4
Retail Trade	29
Banking	3
Credit Agencies	1
Insurance	6
Real Estate	3
Hotels & Lodging Places	1
Photographic Studios	2
Beauty & Barber Shops	2
Legal Services	1
Accounting & Auditing	1
Restaurants & Bars	11
Auto Repair & Service	2
Doctors and Dentists	6
Nursing Homes	4
Medical Services	2
Religious Organizations	2
Residential Care	1
Social Services	1
U.S. Postal Service	1
Federal Government	2
All Other Sectors	11
Total Jobs	100

Source: This data was derived from the use of data in Tables 2 and 3 with IMPLAN, an input-output model, developed by the U.S Department of Agriculture, Forest Service, the Federal Emergency Management Agency and the University of Minnesota, Department of Applied Economics. In order to create 100 jobs, approximately 1,200 moderate income households would have to move into Yuba County using our estimates for consumer spending.

Approximately 40 percent of the jobs created when the new county residents spend their income are in retail trade, restaurants, and bars. The following table shows where jobs would be created if there were enough consumer spending to create 100 jobs. In order to generate 100 new jobs, approximately 1,200 new households would have to move into Yuba County.

Results of the Input-Output Model 2: Rapid Growth

The total impact of Scenario 2 is presented in Table 8. This is the combined primary, secondary, and tertiary effects of a growth scenario where an average of 142 houses per year are sold within NASA and all the infrastructure described in Table 5 is constructed.

Table 8
Changes in Industrial Output,
Income, and Jobs In Yuba County
Due to Development of NASA
Scenario 2: Rapid Growth

(1992 dollars in millions)

Year	Industrial Output	Income	Jobs
1992	11,897,230	5,440,510	120
1993	12,103,654	5,508,354	123
1994	12,076,306	5,557,922	126
1995	12,955,907	6,019,548	137
1996	14,005,381	6,601,479	151
1997	14,578,107	6,915,979	159
1998	14,777,957	7,033,128	163
1999	15,453,370	7,401,929	173
2000	16,128,783	7,770,730	182
2001	17,217,700	8,358,315	196
2002	17,479,608	8,508,333	201
2003	18,155,021	8,877,135	210
2004	18,830,434	9,245,936	220
2005	19,505,846	9,614,737	229
2006	20,594,764	10,202,322	243
2007	20,856,672	10,352,340	248
2008	21,532,085	10,721,142	258
2009	22,207,497	11,089,943	267
2010	22,882,910	11,458,744	276
2011	23,971,828	12,046,329	290

Source: This data was derived from the use of data in Tables 4 and 5 with IMPLAN, an input-output model. Income consists primarily of wages, corporate profits, rental income and returns to proprietorships and partnerships.

The construction of 142 houses creates approximately 96 jobs and $4.8 million of income in Yuba County after the "ripple" effect is considered. The additional spending by the 313 new residents who move into the county creates about 9 jobs and approximately $380,000 in income each year. In those years in which infrastructure is constructed, an additional 4 to 13 jobs are created in the county. Again, only the additional spending by new residents creates permanent jobs and income. In the year 2012 there will be approximately 188 jobs and about $7.3 million of additional income generated by the new people moving into NASA from outside the county. However, there will not be any construction jobs after the development stops. See the discussion of leakages on page 17 of this report for an explanation of the low job generating power for the local economy of consumer spending.

Results of the Impact of Rapid Growth with Industry: Scenario 3

The new industry will provide 300 new jobs per year when it reaches capacity, and the ripple effect will generate another 251 jobs to yield a total of 551 permanent jobs for Yuba County. The new industry clearly produces more jobs for the people of Yuba County than housing construction and the additional spending of new households moving into Yuba County. Whether or not all 300 jobs go to Yuba County residents depends upon the development of the industry. Although the housing construction produces approximately 96 jobs per year, the jobs are not permanent. Only the consumption spending of new people moving into the county and the new industry produce permanent jobs. However, new residents are a weak generator of jobs. According to our analysis, approximately 6,400 new households would have to move into Yuba County to create as many new jobs as the new industry with a work force of 300 employees.

The new industry also clearly produces more income for the people of Yuba County than housing construction and the additional spending of new households moving into Yuba County. Construction of 142 houses each year creates approximately $4.6 million income annually. However, this income is reduced to zero when construction stops. The first year that 313 new residents move into NASA from outside the county, approximately $380,000 additional income is generated in Yuba County. After 20 years with an average annual increase of 313 new county residents, the annual addition to income will be $7.6 million. However, the new industry will add approximately $30.3 million in total income annually when it reaches capacity during the third year of its operation.

Average wages created by the new industry will be somewhat higher than wages created by the additional consumption expenditures of new residents. The average wage resulting in the new industry is $22,855 while the average wage resulting from the new residents is $21,726 (1992 dollars) according to our IMPLAN results.

Table 9
Changes in Industrial Output,
Income, and Jobs In Yuba County
Due to Development of NASA
Scenario 3: Rapid Growth With Industry

(1992 dollars in millions)

Year	Industrial Output	Income	Jobs	
1992	11,897,230	5,440,510	120	15,473
1993	12,103,654	5,508,354	123	15,666
1994	22,472,693	10,694,057	236	30,414
1995	49,689,394	15,524,689	319	44,152
1996	88,585,491	25,899,794	520	73,660
1997	125,891,705	35,719,434	710	101,587
1998	125,936,145	35,756,380	712	101,692
1999	126,611,558	36,125,181	722	102,741
2000	127,286,971	36,493,983	731	103,790
2001	128,375,888	37,081,567	747	105,461
2002	128,637,796	37,231,586	750	105,888
2003	129,313,209	37,600,387	759	106,937
2004	129,988,622	37,969,188	769	107,986
2005	130,664,035	38,337,990	778	109,035
2006	131,752,952	38,925,574	792	110,706
2007	132,014,860	39,075,593	797	111,132
2008	132,690,273	39,444,394	807	112,181
2009	133,365,686	39,813,195	816	113,230
2010	134,041,098	40,181,997	825	114,279
2011	134,716,511	40,550,798	835	115,328

Source: This table was derived with the use of data provided by Tom Hart, Director of the Yuba and Sutter County Enterprise Zone and Airport Manager, and the data in Tables 4 and 5 of this report. The data was used with IMPLAN, an input-output model. Income consists primarily of wages, corporate profits, rental income and returns to proprietorships and partnerships.

This concludes the discussion of the development's impact on output, income and jobs. The next chapter of the report will be concerned with the impact of NASA on the costs and revenues of general county government.

FORECASTED REVENUES AND COSTS FOR YUBA COUNTY
DUE TO THE DEVELOPMENT OF NASA

CHAPTER 3

INTRODUCTION AND OVERVIEW OF FORECASTING METHODS

Introduction

Forecasted changes in county revenues and expenditures due to the development of NASA under the three growth scenarios will be presented in this chapter. It is divided into four parts: (1) an introduction to the forecasting methods; (2) a summary of forecasted revenues to the year 2011; (3) a summary of forecasted costs of government operations to the year 2011; (4) a set of net revenues from the forecasts.

Methods of Forecasting Government Revenues and Costs

There are three ways to estimate future revenues and expenditures. Each has its unique benefits and shortfalls. The first approach relies on the most recent budget and population data to produce ratios of revenues and costs per capita that are used to estimate future revenues and costs. Since this approach uses only one year's data, it does not take into consideration changes in costs and revenues that may occur over time. If, for example, welfare costs per capita are increasing over time, using last year's cost to forecast the next 20 years will result in an underestimate of the county's cost.

The second approach uses interviews and descriptive information to estimate future costs and revenue. This approach is useful for a short-run forecast when no historical data is available. However, this approach also relies too heavily on one year's data without any recognition of changes in revenue and costs that may occur over time. It may also be subject to error if managers present biased views.

The third approach utilizes a mathematical model with historical data to forecast changes in government revenues and expenditures. We chose this approach because it produces forecasts with lower rates of error. In this study we used the county's last fourteen years of financial and population data to determine the impact of NASA on Yuba County government. This is more useful and more reliable because it takes into consideration historical patterns of data and changes in historical relationships. This approach relies upon methods similar to those discussed in the League of California Cities publication, Revenue and Expenditure Forecasting Guidebook.[25] Results are summarized in this chapter. For a more detailed analysis of the methods of forecasting, see Appendix B.

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[25] Ralph Anderson & Associates, Revenue and Expenditure Forecasting Guidebook,, (Sacramento, CA: League of California Cities, December, 1981)

Sources of Data

The data used to make these forecasts is from the reports submitted by Yuba County to the State Controller's office for each year from 1977 to 1990. These reports also contain the State Department of Finance's estimates of county population. Table 1 presents the 1990 per capita revenues for Yuba County. Table 2 presents the 1990 per capita expenditures for the main categories of Yuba County Government as described in the Controller's reports.[26]

County Revenues

The sources of revenues for Yuba County are local, state and federal. These revenue sources are grouped into the following six categories: (1) public assistance (PUBASREV); (2) State aid (STAID); (3) property taxes (PROP); (4) licenses, fees, fines and interest income (LICFINMO); (5) Federal aid (FAID); (6) sales taxes (SALEST); (7) service charges (SERVICH); and (8) other revenues (OTHEREV); . Table 1 shows the per capita revenue sources for each of these revenues for 1990, the latest year available.

Table 1
1990 Per Capita Revenues
Yuba County
(1990 Dollars)

Revenues	Per Capita Collected
Public assistance (PUBASREV)	481.00
State aid (STAID)	163.19
Property Taxes (PROP)	126.50
Licenses, Fines, Fees Use of Money (LICFINMO)	39.14
Federal Aid (FAID)	31.81
Sales Taxes (SALEST)	31.19
Service Charges (SERVICH)	19.31
Other Revenues OTHEREV)	5.79
Total Per Capita	897.93

Source: State of California, Controller's Office, Annual Report of Financial Transactions Concerning Counties of California, 1989-90.

[26] State of California, State Controller's Office, Annual Report of Financial Transactions Concerning Counties of California, Fiscal Years 1976-77 to 1989-90.

Public assistance, the largest category of per capita county revenue, comes into Yuba County from Federal and State sources. The second largest revenue category is state aid, and the third largest source of revenue is property taxes. Of these three categories, only property taxes, sales taxes, service charges, licenses and fees are from local sources.

County Expenditures

Table 2 shows the pattern of spending by the county over the fourteen year period. The following are the main expenditure categories found in the publications of the county financial transactions reports: (1) Public Assistance expenditures (PUBASEX) are combined to include Welfare, Social Services, General Relief, Veteran's services, and Other Public Assistance; (2) Public Protection (PUBPROT) that includes Sheriff, Fire, Judicial, Detention and Corrections, Protective Inspections, and Other Protection activities; (3) General Expenditures of Government (GENEXP) that includes the annual expenditures of Legislative and Administrative activities, Finance, County Counsel, and Plant Acquisition activities; (4) Public Works and Facilities (PWFAC) that includes Roads, Transportation systems and Terminals, and Parking Facilities; (5) Health and Sanitation (HEALSAN) expenditures are combined to include Public Health, Medical Care, Mental Health, Drug and Alcohol Abuse, and Sanitation activities; and (6) Recreation and Education (RECED) are combined to include School Administration, Library services, Agricultural Education, Other Education, Recreation Facilities, Cultural Services, and Veteran's Memorials.[27]

Some of these categories, such as Public Assistance, are heavily dependent on payments from state and federal sources. Some other categories such as Public Works and Facilities fluctuate wildly over time. We accounted for these different sources of funding and these fluctuations in spending in the forecast. Table 2 shows the 1990 per capita spending in these categories.

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[27]. The expenditure categories found here are from the Annual Report of Financial Transactions Concerning Counties of California, all years from 1976-77 through 1989-90. It should be noted that some of the categories have been changed by the Controller's Office over that time span, and the categories listed here are adjusted to make consistent the patterns of expenditures over the time span of the data. The definitions of all expenditure categories are found in the introduction sections of each of the volumes. The terms used in parenthesis in all capitals are the variable names created by these authors for the forecasting work presented later in the report.

Table 2
1990 Per Capita Expenditures
Yuba County

(1990 Dollars)

Expenditure	Per Capita Expended
Public Assistance (PUBASEX)	572.77
Public Protection (PUBPROT)	177.60
General Government (GENEXP)	69.41
Public Works/Facilities (PWFAC)	44.26
Health & Sanitation (HEALSAN)	25.77
Recreation-Education (RECED) Culture	5.19
Total Per Capita	895.00

Source: State of California, Controller's Office, Annual Report of Financial Transactions Concerning Counties of California, 1989-90.

A forecast will be presented for each of the three scenarios discussed in Chapters 1 and 2 of this report. In the first scenario an average of 37 houses per year are sold in NASA to produce slow residential growth. The second scenario results in rapid residential growth with 142 houses per year sold. The third scenario includes a new industrial plant with the rapid residential growth of scenario 2.

A. Impact of Scenario 1: Slow Growth

The impact of the slow rate of housing completion on NASA, shown in Table 3, produces total revenues that start in 1992 at $44,226 and grow by the year 2011 to $977,316. These total revenue projections consist of the following items: (1) property tax yields; (2) sales tax yields; (3) state aid (not including welfare); (4) federal and state welfare payments; (5) revenues from licenses, fees and fines; (6) revenues from service fees; (7) revenues from miscellaneous sources; (8) federal aid (not including welfare). Table Three shows the projected values of these sources from 1992 to 2011.

Table 3
Forecasted Changes in Yuba County Revenues
Due to Development of NASA
Scenario 1: Slow Growth

(1992 Dollars)

Year	Prop Tax	Sales Tax	State Aid (not Welf	Welfare	Licenses Fees Fines	Service Fees	Oth Rev	Fed Aid	Total Revenue
1992	20553	4163	4647	12648	927	465	128	690	44226
1993	41107	3591	5119	26272	1889	972	268	645	79867
1994	61661	3506	5622	40914	2885	1524	420	602	117138
1995	82215	3578	6157	56617	3919	2123	586	559	155756
1996	102769	3649	6724	73425	4990	2772	765	516	195615
1997	123323	3721	7323	91383	6100	3474	961	475	236763
1998	143877	3793	7955	110534	7251	4231	1173	434	279250
1999	164431	3865	8619	130923	8444	5047	1403	393	323128
2000	184985	3937	9315	152595	9680	5924	1654	354	368446
2001	205539	4914	10045	175595	10962	6864	1926	315	416163
2002	226093	4343	10807	199969	12291	7872	2222	276	463877
2003	246647	4152	11603	225764	13668	8949	2544	239	513569
2004	267201	4224	12432	253025	15096	10099	2893	202	565175
2005	287755	4296	13295	281799	16575	11324	3273	165	618487
2006	308309	4367	14192	312135	18109	12628	3686	129	673559
2007	328863	4439	15123	344079	19700	14013	4134	94	730449
2008	349417	4511	16089	377679	21348	15482	4622	59	789211
2009	369971	4583	17089	412985	23057	17039	5152	25	849904
2010	390525	4655	18125	450045	24828	18686	5727	0	912586
2011	411079	4726	19195	488910	26664	20427	6353	0	977316

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The property tax revenues in Table 3, which reflect only the 44 percent allocated to Yuba's general county government, are based on an average housing price of $125,000 with a homestead exemption of $7,000. Since we are only interested in the forecasted changes in revenues, $2,000 was subtracted from the sales price in order to obtain the average assessed value of the lot before development. Thus each house is assessed at $116,000 which is the estimated change in assessed value. It should be emphasized that only 44 percent of the total property taxes collected are shown in Table 3; approximately 56 percent of property taxes are allocated to other units of local government in Yuba County.

Since there is an average of 2.9 persons per household, and 21 percent of those houses are sold to people from outside Yuba County, the annual net change in county population within this development area is 23 for the slow growth scenario. (See Appendix A for a discussion of the method used to determine the net change in county population.)

Table 4 shows the impact of the slow rate of housing completion in NASA on county expenditures as forecasted with our regression results. Total county expenditures due to the development vary from $24,006 in 1992 to $345,106 in 2011. The six expenditure categories are: (1) General County; (2) Welfare; (3) Public Protection; (4) Public Works; (5) Health and Sanitation; and (6) Recreation and Education. Only the NASA portion out of the total county expenditures is included in these tables.

Table 4
Forecasted Changes in Yuba County Expenditures
Due to Development of NASA
Scenario 1: Slow Growth

(1992 Dollars)

Year	General County	Welfare Expense	Public Protec	Public Works	Health Sanit	Rec Educ	Total
1992	1844	15805	4564	1119	560	111	24006
1993	3862	17146	9405	2255	1142	223	34036
1994	6070	18560	14533	3407	1746	337	44656
1995	8487	20049	19961	4575	2370	451	55896
1996	11131	21612	25700	5759	3016	566	67786
1997	14019	23251	31763	6958	3682	681	80357
1998	17171	24965	38162	8173	4367	798	93638
1999	20605	26755	44908	9402	5073	915	107661
2000	24338	28622	52015	10646	5798	1033	122454
2001	28390	30566	59495	11904	6542	1152	138051
2002	32778	32587	67360	13176	7305	1271	154480
2003	37522	34687	75623	14463	8086	1391	171775
2004	42641	36865	84297	15763	8886	1512	189966
2005	48152	39123	93394	17076	9703	1634	209085
2006	54076	41461	102929	18403	10538	1756	229164
2007	60431	43879	112913	19743	11390	1879	250236
2008	67236	46379	123360	21095	12259	2003	272334
2009	74510	48960	134284	22461	13145	2127	295489
2010	82274	51625	145697	23838	14047	2252	319735
2011	90547	54372	157615	25228	14965	2377	345106

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Table 5
Forecasted Net Changes in Yuba County
Expenditures and Revenues
Due to Development of NASA
Scenario 1: Slow Growth

(1992 Dollars)

Year	Total Revenue	Total Expenditures	Net Revenue
1992	44226	24006	20219
1993	79867	34036	45831
1994	117138	44656	72482
1995	155756	55896	99860
1996	195615	67786	127828
1997	236763	80357	156405
1998	279250	93638	185611
1999	323128	107661	215466
2000	368446	122454	245991
2001	416163	138051	278112
2002	463877	154480	309396
2003	513569	171775	341793
2004	565175	189966	375208
2005	618487	209085	409401
2006	673559	229164	444394
2007	730449	250236	480212
2008	789211	272334	516877
2009	849904	295489	554415
2010	912586	319735	592851
2011	977316	345106	632209

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Table 5 shows the forecasted net change in Yuba County's revenues and expenditures due to development of NASA. The results indicate a positive flow of net revenues over the twenty year period varying from $20,219 the first year to $632,209 the last year.

There are two major reasons why the development of NASA results in more revenue than expenses for Yuba County. First, since all of these houses are new, they are assessed at their sales price less the homestead exemption. Second, Yuba County receives approximately 44 percent of the total property tax, a rather generous allocation. The result is that property taxes per capita are higher for this project than for most existing housing developments in the county.

Impact of Scenario 2: Rapid Growth

The procedures discussed above were used with a higher rate of housing sales for NASA to produce the forecasts in Table 6 and Table 7. In this scenario 142 houses within NASA are sold each year. In order for the county to grow rapidly enough to produce this rapid rate of sales, a larger percentage of people from outside the county buy houses in NASA. Since there is an average of 2.9 persons per household, and we estimate that 80 percent of the houses are sold to people from outside Yuba County, the annual net change in county population is 325. (See Appendix A for a discussion of the method used to determine the net change in county population.)

Table 6
Forecasted Changes in Yuba County Revenues
Due to Development of NASA
Scenario 2: Rapid Growth

(1992 Dollars)

Year	Prop Tax	Sales Tax	State Aid	Welf-Rev	Licens Fees	Serv Fees	Other Rev	Fed Aid	Total Revenue
1992	73203	15475	63250	172131	12623	6335	1752	9396	354168
1993	146406	15668	69666	357531	25709	13238	3657	8790	640670
1994	219609	15809	76515	556787	39273	20747	5727	8194	942665
1995	292812	17122	83796	770487	53334	28899	7977	7608	1262038
1996	366016	18777	91512	999227	67909	37731	10422	7031	1598629
1997	439219	19672	99666	1243605	83017	47281	13079	6465	1952006
1998	512422	20005	108259	1504224	98678	57586	15966	5907	2323052
1999	585625	21054	117295	1781691	114912	68686	19104	5359	2713729
2000	658828	22103	126774	2076619	131739	80617	22514	4820	3124019
2001	732032	23775	136701	2389624	149183	93420	26220	4289	3555246
2002	805235	24202	147078	2721327	167265	107131	30247	3768	4006255
2003	878438	25251	157908	3072357	186008	121791	34623	3255	4479633
2004	951641	26300	169193	3443345	205437	137439	39380	2750	4975487
2005	1024845	27349	180937	3834929	225576	154114	44548	2254	5494556
2006	1098048	29020	193144	4247753	246453	171856	50166	1766	6038209
2007	1171251	29447	205816	4682468	268093	190706	56270	1286	6605339
2008	1244454	30496	218957	5139727	290525	210703	62904	814	7198583
2009	1317657	31545	232570	5620194	313778	231888	70113	350	7818099
2010	1390861	32594	246661	6124536	337881	254304	77948	00	8464681
2011	1464064	34265	261231	6653429	362866	277990	86462	00	9139757

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Table 6 shows that county revenues derived from development of NASA under Scenario 2 will vary from $354,168 the first year to $9,139,757 the last year. Property tax revenue resulting from the additional houses in NASA is a major part of revenue from its own

sources. Again, only 44 percent of the total property tax collected in NASA is reported in the above table since the remainder is allocated to other units of local government in the county. But revenue from state and federal sources for welfare is an even larger component of total revenues derived from NASA.

Table 7
Forecasted Changes in Yuba County Expenditures
Due to Development of NASA
Scenario 2: Rapid Growth

(1992 Dollars)

Year	General County	Welfare Expense	Public Prot	Public Works	Health Sanit	Rec Educ	Total
1992	25104	206132	62122	15236	7626	1517	317739
1993	52560	223615	127997	30696	15548	1529	451947
1994	82610	242062	197785	46376	23762	1540	594139
1995	115501	261478	271650	62273	32264	1552	744720
1996	151479	281868	349753	78382	41047	1563	904095
1997	190791	303238	432260	94702	50108	1574	1072675
1998	233685	325593	519336	111227	59442	1584	1250869
1999	280410	348940	611148	127955	69044	1595	1439093
2000	331216	373286	707863	144882	78910	1605	1637764
2001	386354	398636	809652	162005	89036	1615	1847300
2002	446077	424999	916685	179321	99417	1625	2068126
2003	510638	452381	1029134	196826	110049	1635	2300666
2004	580293	480790	1147175	214518	120928	1645	2545351
2005	655298	510234	1270981	232393	132050	1654	2802612
2006	735910	540722	1400730	250449	143411	1663	3072887
2007	822389	572261	1536601	268681	155006	1673	3356614
2008	914997	604860	1678774	287088	166833	1682	3654237
2009	1013997	638528	1827431	305667	178887	1691	3966203
2010	1119652	673276	1982756	324414	191164	1699	4292964
2011	1232229	709111	2144935	343328	203662	1708	4634975

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Table 8
Forecasted Net Changes in Yuba County
Expenditures and Revenues
Due to Development of NASA
Scenario 2: Rapid Growth

(1992 Dollars)

Year	Total Revenue	Total Expenditures	Net Revenue
1992	354168	317739	36429
1993	640670	451947	188722
1994	942665	594139	348525
1995	1262038	744720	517318
1996	1598629	904095	694533
1997	1952006	1072675	879331
1998	2323052	1250869	1072182
1999	2713729	1439093	1274635
2000	3124019	1637764	1486254
2001	3555246	1847300	1707945
2002	4006255	2068126	1938129
2003	4479633	2300666	2178967
2004	4975487	2545351	2430136
2005	5494556	2802612	2691943
2006	6038209	3072887	2965322
2007	6605339	3356614	3248725
2008	7198583	3654237	3544346
2009	7818099	3966203	3851896
2010	8464681	4292964	4171717
2011	9139756	4634975	4504781

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Table 8 shows the forecasted Net Change in Yuba County's revenues and expenditures due to rapid development of NASA. The results indicated a positive flow of net revenues over the twenty year period varying from $36,429 the first year to $4,504,781 the last year. Under this set of assumptions rapid growth will have a more positive impact on county revenues than the slow growth assumption of Scenario 1.

Scenario 3: Rapid Growth With Industry

The next 3 tables show the forecasts of the impact of NASA on county revenues and expenditures when there is rapid sales of housing and the addition of a new industry. Table 9 shows the forecasted revenues due to the impact of the industry and the housing sales on property taxes and sales taxes. The industry does not have any impact on the county until the third year when construction of the plant begins. Since it is assumed that an incoming industry would pay for most of the tangible costs that it imposes on the county; it is unclear at this time what, if any, spillover social costs will be generated. The expenditure

forecasts are the same as those associated with rapid growth assumptions. Consequently, Table 10 is a repeat of the forecasted county expenditures, and Table 11 shows the net result of the scenario on county revenues and expenditures.

Table 9
Forecasted Changes in Yuba County Revenues
Due to Development of Nasa
Scenario 3: Rapid Growth With New Industry

(1992 Dollars)

Year	Prop Tax	Sales Tax	State Aid	Welf-Rev	Licens Fees	Serv Fees	Other Rev	Fed Aid	Total Revenue
1992	73203	15473	63250	172131	12623	6335	1752	9396	354166
1993	146406	15666	69666	357531	25709	13238	3657	8790	640667
1994	275160	30414	76515	556787	39273	20747	5727	8194	1012821
1995	403915	44152	83796	770487	53334	28899	7977	7608	1400171
1996	477118	73660	91512	999227	67909	37731	10422	7031	1764614
1997	550321	101587	99666	1243605	83017	47281	13079	6465	2145024
1998	623525	101692	108259	1504224	98678	57586	15966	5907	2515841
1999	696728	102741	117295	1781691	114912	68686	19104	5359	2906519
2000	769931	103790	126774	2076619	131739	80617	22514	4820	3316808
2001	843134	105461	136701	2389624	149183	93420	26220	4289	3748035
2002	916337	105888	147078	2721327	167265	107131	30247	3768	4199044
2003	989541	106937	157908	3072357	186008	121791	34623	3255	4672422
2004	1062744	107986	169193	3443345	205437	137439	39380	2750	5168276
2005	1135947	109035	180937	3834929	225576	154114	44548	2254	5687344
2006	1209150	110706	193144	4247753	246453	171856	50166	1766	6230997
2007	1282353	111132	205816	4682468	268093	190706	56270	1286	6798127
2008	1355557	112181	218957	5139727	290525	210703	62904	814	7391371
2009	1428760	113230	232570	5620194	313778	231888	70113	350	8010887
2010	1501963	114279	246661	6124536	337881	254304	77948	-105	8657469
2011	1575166	115328	261231	6653429	362866	277990	86462	-554	9331921

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The new industry does not have any impact on Yuba County revenues until the third year when it is constructed. It adds about $110,000 per year in property taxes starting in year 4. Additional sales tax revenues are also generated by the new industry since it increases income and spending in the county. Property tax collections in the above table reflect only the 44 percent allocated to the county.

Table 10
Forecasted Changes in Yuba County Expenditures
Due to Development of NASA
Scenario 3: Rapid Growth With New Industry

(1992 Dollars)

Year	General County	Welfare Expense	Public Protec	Public Works	Heal Sanit	Rec Educ	Total
1992	25104	206132	62122	15236	7626	1517	317739
1993	52560	223615	127997	30696	15548	1529	451947
1994	82610	242062	197785	46376	23762	1540	594139
1995	115501	261478	271650	62273	32264	1552	744720
1996	151479	281868	349753	78382	41047	1563	904095
1997	190791	303238	432260	94702	50108	1574	1072675
1998	233685	325593	519336	111227	59442	1584	1250869
1999	280410	348940	611148	127955	69044	1595	1439093
2000	331216	373286	707863	144882	78910	1605	1637764
2001	386354	398636	809652	162005	89036	1615	1847300
2002	446077	424999	916685	179321	99417	1625	2068126
2003	510638	452381	1029134	196826	110049	1635	2300666
2004	580293	480790	1147175	214518	120928	1645	2545351
2005	655298	510234	1270981	232393	132050	1654	2802612
2006	735910	540722	1400730	250449	143411	1663	3072887
2007	822389	572261	1536601	268681	155006	1673	3356614
2008	914997	604860	1678774	287088	166833	1682	3654237
2009	1013997	638528	1827431	305667	178887	1691	3966203
2010	1119652	673276	1982756	324414	191164	1699	4292964
2011	1232229	709111	2144935	343328	203662	1708	4634975

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Table 10 is identical to Table 7 since it is assumed that the new industry pays for any expenses that it imposes on Yuba County. Housing sales at NASA and resulting population changes in the county are also identical in Scenarios 2 and 3.

Table 11 shows the forecasted Net Change in Yuba County's revenues and expenditures due to rapid growth and a new industry in the NASA area. The results indicate a positive flow of net revenues over the twenty year period varying from $36,427 in 1992 to $4,696,946 in 2011.

Table 11
Forecasted Net Changes in Yuba County Expenditures and Revenues
Due to Development of NASA
Scenario 3: Rapid Growth With New Industry

(1992 Dollars)

Year	Total Revenue	Total Expenditures	Net Revenue
1992	354166	317739	36427
1993	640667	451947	188720
1994	1012821	594139	418681
1995	1400171	744720	655451
1996	1764614	904095	860518
1997	2145024	1072675	1072349
1998	2515841	1250869	1264971
1999	2906519	1439093	1467425
2000	3316808	1637764	1679044
2001	3748035	1847300	1900734
2002	4199044	2068126	2130918
2003	4672422	2300666	2371755
2004	5168276	2545351	2622924
2005	5687344	2802612	2884731
2006	6230997	3072887	3158110
2007	6798127	3356614	3441513
2008	7391371	3654237	3737134
2009	8010887	3966203	4044684
2010	8657469	4292964	4364504
2011	9331921	4634975	4696946

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A comparison of Tables 8 and 11 shows that Scenario 3 produces even better positive revenues for the county than Scenario 2. It should be emphasized that this result is based on the assumption that the industry pays for the necessary infrastructure and for any additional operating expenses that it imposes on the county.

The industry will produce about $80,000 in additional sales tax revenue and approximately $110,000 in property tax revenue for the general government of Yuba County. It will produce another $140,000 property tax revenue for other local governments in Yuba County. Since it is assumed that the industry will pay for any costs that it imposes on the county, its location within NASA is clearly beneficial to Yuba County.

Yuba County planners should consider encouraging industrial development of the land within NASA zoned for manufacturing in order to provide employment for its residents and net revenue for its government. If compatible industry locates in NASA, the area can become more than just a bedroom community for Sacramento commuters. The northwest part of NASA that is already zoned for manufacturing is particularly suitable for industrial development.

Summary

All three scenarios produce more revenue than costs for the county over the forecasted 20 year period. Net revenue to the county varies from approximately $20,000 in 1992 to over $600,000 in 2011 under slow growth in scenario 1. Under the rapid growth of scenario 2, net revenue varies from a low of approximately $36,000 to a high of approximately $4.5 million. In scenario 3, which adds an industry to scenario 2, net revenues vary from approximately $36,000 to approximately $4.7 million. These estimates do not include infrastructure discussed in the next chapter which will be paid for by the developers and the home buyers.

SUPPLY OF PUBLIC SERVICES TO NASA FROM SPECIAL DISTRICTS

CHAPTER FOUR

INTRODUCTION

Introduction

Two special districts, the Olivehurst Public Utility District (OPUD) and the Marysville Joint Unified School District (MJUSD), will be affected by the development of NASA. OPUD supplies water, waste water treatment, fire services, street lighting, and parks and recreation to Olivehurst, a community adjacent to NASA. MJUSD supplies educational services to an area of Yuba County that includes NASA. In this chapter we will summarize the capital costs of the services provided by OPUD and MJUSD for NASA, and we will estimate the per unit impact of financing these services on NASA housing.

Cost data used in this chapter was taken from the following three studies: Feasibility and Planning Study Water Supply and Treatment and the Wastewater Facilities Master Plan (both completed by CH2M Hill) and the study for MJUSD by Shilts Consultants, Inc., entitled Ten Year Facilities Master Plan, and from interviews in person and by telephone. The first part of this chapter is concerned with the capital cost of OPUD services, the second part discusses capital cost of MJUSD services, and the third part summarizes the local government fees collected to cover operating and capital costs.

OLIVEHURST PUBLIC UTILITY DISTRICT (OPUD)

Water Supply

Since OPUD has the sphere of influence over the region contained in NASA, the development of water supplies for NASA is subject to its approval. At present OPUD services a population

of 10,700 that is projected to grow to 15,000 by the year 2010.[28] The estimated maximum water needs of this population are projected to be 8.2 million gallons per day. OPUD has authorized a feasibility study examining four proposed options for drinking water treatment in order to evaluate the potential drinking water needs and subsequent capital requirements through the year 2010.[29] OPUD adopted the option that requires the development of a new well with treatment at the well.[30] This option, discussed in the CH2M Hill plan, will provide the needed 8.2 mgd by 2010.[31] According to Gary Plasterer, general manager, the District is prepared to supply water to NASA residents if they pay for any incremental cost and reimburse OPUD for prior capital improvement costs of any surplus capacity used by NASA.[32]

OPUD, which has surplus capacity, charges a $1,000 hook-up fee for each new house in order to pay for the recently completed expansion of their water treatment facility. Although a developer might drill for water and supply it to residents, any well water treatment in NASA would have to meet OPUD's standards. Since that cost is unknown, we will base our analysis of water supply costs on the $1,000 per home hook-up charge levied by OPUD. Table 1 indicates the flow of cash over the twenty year period for the low growth and the high growth assumptions.

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[28] The study assumed an annual growth rate of 2%, which is 1/2% points higher than both the California State Department of Finance and the Federal Government have assumed for the County.

[29] Feasibility and Planning Study for Olivehurst Public Utility District, Prepared by CH2M Hill, No publisher, May 1989, P. 2-1.

[30] Interview with Gary Plasterer, General Manager, OPUD, Olivehurst, California, 1/9/92.

[31] Feasibility and Planning Study for Olivehurst Public Utility District, Prepared by CH2M Hill, No publisher, May 1989, P. 2-1.

[32] Interview with Gary Plasterer, General Manager, OPUD, Olivehurst, California, 1/9/92, and 3/10/1992.

Table 1
Cumulative Revenue Collected by OPUD
For Water Hookups at NASA

(1992 Dollars)

Year	Scenario 1: Slow Growth	Scenario 2: Rapid Growth
1992	37000	142000
1993	74000	284000
1994	111000	426000
1995	148000	568000
1996	185000	710000
1997	222000	852000
1998	259000	994000
1999	296000	1136000
2000	333000	1278000
2001	370000	1420000
2002	407000	1562000
2003	444000	1704000
2004	481000	1846000
2005	518000	1988000
2006	555000	2130000
2007	592000	2272000
2008	629000	2414000
2009	666000	2556000
2010	703000	2698000
2011	740000	2840000

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Waste Water Treatment

The Olivehurst wastewater treatment plant has 500,000 gallons of available capacity. Three years ago OPUD established a master plan, which requires a three phase expansion spread over a 20 year period.[33]

[33] Wastewater Facilities Master Plan, Prepared for the Olivehurst Public Utility District, CH2M Hill, November, 1989, Page 4-1.

The first phase will increase capacity by 1.8 mgd, the second phase will complete elements of the first phase, and the third phase will increase capacity to 2.6 mgd.[34] Total costs for the project will be approximately $4.5 million. Cost for each phase will be $1.4 million, $1.1 million, and $2 million in 1990, 1995, and 2000 respectively.

OPUD will require a $1,250 hookup fee for each house in order to recover the capital improvement charges for the creation of the newer treatment plant facility.[35] Since a current fee study is underway, the hookup fee may increase. Table 2 shows the twenty year costs of this connection activity in 1992 dollars in the NASA region.

Table 2
Cumulative Waste Water Treatment Fee Revenue
Collected from NASA Houses

(1992 Dollars)

YEAR	Rapid Growth	Slow Growth
1992	46250	177500
1993	92500	355000
1994	138750	532500
1995	185000	710000
1996	231250	887500
1997	277500	1065000
1998	323750	1242500
1999	370000	1420000
2000	416250	1597500
2001	462500	1775000
2002	508750	1952500
2003	555000	2130000
2004	601250	2307500
2005	647500	2485000
2006	693750	2662500
2007	740000	2840000
2008	786250	3017500
2009	832500	3195000
2010	878750	3372500
2011	925000	3550000

[34] Ibid.

[35] Interview with Mr. Gary Plasterer, General Manager, OPUD, January and by telephone March 10, 1992.

Fire Protection

Although Linda County Fire Protection District supplies fire protection to the NASA area, OPUD has a sphere of influence over the area, according to Gary Plasterer, general manager. The general manager estimated one new employee in the OPUD fire service system would be required for every 300 new houses.[36] Using this ratio, 2.5 fire persons would be required for NASA when development is completed under Scenario 1, the low growth assumption with average annual sales of 37 houses; 9.5 fire persons would be required at completion under Scenario 2, the high growth assumption with average annual sales of 142 houses. This results in an additional cost of $30,000 per 300 homes, or $100 per home in 1992 dollars. It should be noted that the estimates do not include the cost of additional equipment.[37] The County Planning Department might want to consider a resolution to the supply of fire services in the NASA region. We have just learned that a fire mitigation study has been completed by the Abbey Group of Grass Valley. We have not seen this study but we have been told that the capital costs for fire equipment is approximately $0.39 per square foot for a house. For a standard house that we have been assuming in NASA, that would be equal to approximately $546 per home.[38]

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[36] Interview with Mr. Gary Plasterer, General Manager, OPUD, by Telephone, March 10, 1992. This assumption seems to be in conformity with the National Fire Protection Association, Fire Protection Handbook, Fifteenth Edition, 1981 where NASA would seem to fit into the category of a "low hazard occupancy rating. This is defined as one, two or three family dwellings and scattered small businesses and industrial occupancies", Table 14-7a page 14-87. Further, the staffing of such a system suggests that with a 42 hour work week there should be 2.5 fire fighters per 1000 persons, which turns out to be .5 fire fighters on duty per 1000 population, see page 14-12, "Staffing Practices of Fire Departments". Mr. Plasterer's view suggests a fire fighter per 870 persons assuming the density per household of 2.9 persons as we have suggested for NASA. There are significant issues, such as appropriate fire fighter working schedules, that would require a more detailed study to resolve.

[37]. We have been unable to estimate the fire equipment capital costs, but we can provide the following suggestions: A location such as NASA, if it is defined as being in the category of a low hazard occupancy should require the following: "At least two pumpers, one ladder truck, one Chief Officer, and other specialized apparatus...". Further, the NFPA suggests that there be "...not less than twelve fire fighters and one chief officer", page 14-87.

[38]. Telephone conversation with Mr. Gary Plasterer, May 28, 1992. It should be noted that this is a very tentative estimate since we have not seen the study nor was Mr. Plasterer completely sure of the cost per square foot.

Parks and Recreation

OPUD will charge a parks and recreation capital assessment fee of $250 per home if the homes in NASA are added to the parks and recreation services. This produces a total twenty year revenue of $185,000 in 1992 dollars for Scenario 1, the low growth assumption, and $710,000 for Scenario 2, the high growth assumption.

It is important to note that the operating and maintenance costs of the inclusion of the NASA in the OPUD Parks and Recreation services implies the creation of an assessment district which would be annexed to OPUD and have an average household operating cost of $100 for the services.[39]

Street Lights

The general manager could not estimate either the service cost or the capital cost of street lights because there is no lighting design for the development. But Plasterer said that the lights, which must meet District standards, would have an annual operating cost equal to 5 percent of the capital costs. Since this really depends on the style of the development, we were not able to find the forecasted costs of this service except to say that it will be approximately 5 percent of the capital costs of the infrastructure.[40]

Mr. Plasterer indicated that the developer would have to contract with PG&E to meet their and OPUD's standards. The charge per light is $1,200 and it is indicated that there would be one light needed for each 8.5 homes. The expected operating and maintenance cost per light is $100 annually. This suggests almost $12 per home per year for street lighting.[41]

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[39]. Telephone conversation with Mr. Gary Plasterer, May 28, 1992.

[40] Interview with Mr. Gary Plasterer, General Manager, OPUD, by Telephone, March 10, 1992.

[41]. Mr. Gary Plasterer, May 28, 1992 and interviews with Kaufman and Broad and PG&E, same date.

MARYSVILLE JOINT UNIFIED SCHOOL DISTRICT

Introduction

Enrollment in the MJUSD will grow dramatically over the next 10 years according to the *Marysville Joint Unified School District's Ten Year Facilities Master Plan*, written by Shilts Consultants, Inc. Shilts projects an increase from 9,452 students in 1990-91 to 15,516 in the 2000-01. Approximately 21,000 of the 26,000 students entering MJUSD will come from new development in Yuba County to help produce the annual compound growth rate of 14.2 percent.(42)

Twenty-one new schools need to be constructed at a cost of $311.6 million in order to meet the needs of 25,500 additional students according to Shilts. When additional costs of expansion, renovation, and support facilities are added, the projected total cost for facilities in the District is $378 million. Shilts recommends the formation of a Mello-Roos Community District (CSD) with the use of developer impact fees and general obligation bonds to raise the $378 million.

Developer Impact Fees

While Shilts recommended an $11,598 per house developer fee for the MJUSD Facilities Master Plan, one should consider the impact that higher fees might have on the demand for housing in NASA. There are two types of fees presented in Tables 5 and 6: Fixed School Fees, set by the relevant School District; and AB2926 fees. The assumption in this study is that the average house in NASA will be 1,400 square feet. This would yield $5,040 per house in NASA for the locally determined fee.

The second source of revenue for capital construction are the state mandated funds resulting from the imposition of up to $1.65 per square foot on new houses. The recent change in AB2926 raised the burden from $1.58 to $1.65 per square foot.

Together the two fees result in a maximum of $5.25 per square foot up to a maximum of $8,818. (43) Since the average size of the homes we estimated for the forecast is 1,400 square feet, we estimate that the total cost to be added to a home is $7,350. The total school impact fees alone might raise the price of a house by more than 5% above the assumed prices used for the forecasts here. Since low price appears to be a major attraction for home buyers within NASA, planners should consider carefully how much fees to levy. If the price of housing increases too much in relation to the price of housing in the surrounding areas, demand at NASA will decline.

42 *Marysville Unified School District Ten Year Facilities Master-Plan*. Shilts Consultants, Jan. 1991. Page 26.
43 Interview, Karri Campbell, Yuba County Department of Planning and Building Services, July 16, 1991.

Mello-Roos

The principal financing mechanism is the use of a Mello-Roos community facilities district (CFD) authority. If approved, the Mello-Roos district could raise approximately $281.5 million for new school facilities. The creation of a CFD which will have the authority to impose taxes and sell bonds requires approval by 2/3 of those voting. Given the historical rate at which citizens in Yuba County support increases in taxation or revenue raising initiatives, it is doubtful this will be successful. Yuba County voters approved only 18 percent of the 53 state wide bond measures on the ballot from 1976 through 1990. State wide voters approved 64 percent of the same ballot measures.[44]

Rather than trying to get the entire school district's voters to pass a Mello-Roos CFD, Shilts' suggests that elections can be held for one acre sections of vacant land as development occurs.[45] Since the owners are developers, they will likely approve a Mello-Roos CFD for which the tax becomes effective after the houses are sold. While this approach increases the chances of adopting a Mello-Roos CFD, it may lead to fractionated districts and inefficiencies of scale.

Table 5 shows the expected cash flow of revenues to the School district and the Olivehurst Public Utility District under scenario 1 in which an average of 37 houses per year are sold in NASA. Table 6 has the same information about the districts for Scenario 2 in which an average of 142 houses per year are sold. Various experts working for either the county or the special districts have helped to determine the appropriate fees reflected in Table 5. Our research did not indicate any major differences between the fee schedules and the revenue needed to cover actual capital cost. However, validation of special district fees is not the major objective of this study: the county and other units of local government have hired other experts to determine the fee structure. We do urge caution, however, in assuming that the demand for housing in NASA is high enough to sustain the fees without a negative impact on sales.

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[44]. California, Secretary of State, March Fong-Eu, Statement of the Vote, primary and general elections, 1976-1990.

[45]. See Ibid. Page 48.

Scenario 1: Slow Growth

Table 5 summarizes the cumulative fee revenue collected by local government under scenario I in which an average of 37 houses per year are sold. It is based upon the estimates for per unit capital cost presented in the previous section of this chapter.

Table 5
Estimated Cumulative Fee Revenue Collected from NASA
By Local Government Under
Scenario 1: Slow Growth

(1992 Dollars in Thousands)

Year	Fixed School	School Fees per 1400 sq ft House	Water Hookup	Waste Water Treatment	Parks	TOTAL FEES
1992	61*	85*	37	46	9	238*
1993	248*	170*	74	93	19	604*
1994	558	255	111	139	28	1,091
1995	744	340	148	185	37	1,454
1996	930	425	185	231	46	1,817
1997	1,116	510	222	278	56	2,182
1998	1,302	595	259	324	65	2,545
1999	1,488	505	296	370	74	2,733
2000	1,674	765	333	416	83	3,271
2001	1,860	850	370	463	93	3,636
2002	2,046	935	407	509	102	3,999
2003	2,232	1,020	444	555	111	4,362
2004	2,418	1,105	481	601	120	4,725
2005	2,604	1,190	518	648	130	5,090
2006	2,790	1,275	555	694	139	5,543
2007	2,976	1,360	592	740	148	5,816
2008	3,162	1,445	629	786	157	6,179
2009	3,348	1,445	666	833	167	6,544
2010	3,534	1,615	703	870	176	6,907
2011	3,720	1,700	740	925	135	7,270

*It is our understanding that there is an ordinance being considered that will allow this new fee structure to be phased in at a rate of 1/3 its cost in the first year, 2/3 its cost in the second year and the full cost in the third year. The data here reflect that assumption. Further note, this table is in thousands of dollars. This means, for example, that the total fee revenue is estimated to be $7,270,000 by the year 2011 under the low growth scenario.

Table 6
Estimated Cumulative Fee Revenue Collected from NASA
By Local Government Under
Scenario 2: (Rapid Growth)

(1992 Dollars in Thousands)

Year	Fixed School Fees	School Fees per 1400 Sq Ft	Water Hookup	Waste Water Treatment	Parks	TOTAL FEES PAID
1992	236*	328*	142	178	36	700*
1993	955*	438*	284	355	71	2,103*
1994	2,147	984	426	533	107	4,197
1995	2,863	1,312	568	710	142	5,594
1996	3,578	1,640	710	888	178	6,994
1997	4,294	1,968	852	1,095	213	8,392
1998	5,010	2,296	994	1,243	249	9,792
1999	5,725	2,624	1,136	1,420	284	11,189
2000	6,441	2,952	1,273	1,598	320	12,539
2001	7,157	3,280	1,,120	1,775	355	13,987
2002	7,372	3,608	1,562	1,953	391	15,386
2003	8,588	3,936	1,704	2,130	426	16,784
2004	9,300	4,264	1,846	2,308	462	18,180
2005	10,020	4,592	1,988	2,435	497	19,582
2006	10,735	4,920	2,130	2,663	533	20,981
2007	11,451	5,248	2,272	2,840	568	22,379
2008	12,167	5,576	2,414	3,018	604	23,779
2009	12,882	5,904	2,556	3,195	639	25,176
2010	13,598	6,232	2,698	3,373	675	26,576
2011	14,314	6,560	2,840	3,550	710	27,974

*It is our understanding that there is an ordinance being considered that will allow this new fee structure to be phased in at a rate of 1/3 its cost in the first year, 2/3 its cost in the second year and the full cost in the third year. The data here reflect that assumption. Further note, this table is in thousands of dollars. This means, for example, that the total fee revenue is estimated to be $27,974,000 by the year 2011 under the rapid growth scenario.

Scenario 2: Rapid Growth

Table 6 summarizes the cumulative fee revenue collected from NASA housing development under scenario 2 in which an average of 142 houses per year are sold. It is based upon the estimates for per unit capital cost presented in the previous section of this chapter.

SUMMARY OF LOCAL GOVERNMENT FEES

Total Fees Per House

Local government, will impose almost $10,400 in fees on each house in NASA as shown in Table 7. Although this will reduce the quantity demanded of NASA houses, the additions to infrastructure, such as sewer lines and roads, should increase the demand for NASA housing. If impact fees increase the price of housing in NASA relative to the price of housing in surrounding areas enough to offset the perceived benefits of services, housing sales in NASA will decline. If, on the other hand, home-buyers consider NASA housing relatively inexpensive and the level of NASA government services acceptable, NASA will continue developing as a residential community. Note that this table does not include charges for recapturing the costs of county infrastructure as suggested in the Brooks thesis. (46) Nor are there estimates available for capital cost of street lights.

Table 7
Total Fees Per House in NASA from Services
Supplied by the Two Districts and County Government
(1992 Dollars)

School Fixed Fee	5,040
School Fee for 1400 Sq Ft	2,310
Water Hookup	1,000
Waste Water Treatment	1,250
Parks	250
(OPUD) Fire Protection	549 (47)
TOTAL FEES PER HOUSE	10,399

Note: This excludes Larry Brooks' estimates to cover the cost of county infrastructure. Brooks estimated $823 per house if a fee is levied against all houses in the county; if the burden is on new houses only, then the costs are unknown until the number of new households is known. For the East Linda development he estimated the present value of the cost to be $1,561 per house.

46. Larry Brooks, unpublished Master's Thesis, California State University, Chico, "Financing Capital Facilities Needs for Yuba County Resulting from Development of the East Linda Specific Plan", Summer, 1991. It should be noted that Brooks indicated a per unit cost for each house of $1,561.00 for the area he studied. This cost might be less dependent on the number of homes to be added to the NASA area.

47. Based on a discussion with Gary Plasterer who had indicated the proposed charges of $0.39 per square foot for a new house for fire protection capital costs and assuming a household size of 1400 square feet.

Conclusions to the Economic Impact Study

Overall NASA appears to offer a positive impact on Yuba County's net revenues under either the slow growth scenario or the fast growth scenario. This positive outcome is due to the relatively high 44 percent allocation of tax revenue, the relatively low per capita government expenditures, and the careful assessment of infrastructure costs by local governments serving NASA. Industry compatible with residential development within NASA will provide much needed jobs for Yuba County residents, However, planners should carefully consider school impact fees which comprise approximately 71 percent of the known local government fees proposed for NASA housing. If prices of housing in NASA relative to other regional housing become too high, even the slow growth assumption may be too optimistic.

Conclusions Regarding the Cost of Capital

Total impact fees are estimated to be more than $10,000 per house with 71 percent of this total going to schools. The newly proposed fixed school fee of $7,350 per house, regardless of its size, will add more than 5 percent to current housing prices. Although availability of public services does add to housing value, planners should be cautious about fees that might be perceived to be excessive. Home buyers may not think that the level of public service in NASA is sufficient to justify the resulting higher prices. Fees are especially critical since price appears to be a major attraction for recent and future housing purchasers at NASA. If the price of housing at NASA increases relative to prices of housing in the market region, housing sales may decline.

The County should explore alternatives to the fixed impact fee of $7,350 per house. This type of fee forces current home buyers to pay for the capital costs of schools that will benefit future generations. School bonds are a more equitable means of finance because the cost is spread on future generations as well as current residents all of whom enjoy the benefits of living in a society where the masses are educated.

Conclusions Regarding the Operating Cost

For the assumptions made and within the limits of the modelling technique employed, it is indicated that NASA will generate more revenue than costs for Yuba County under either a slow growth or a rapid growth scenario. An industry locating in the area zoned for manufacturing within NASA will generate even more net revenue for the county if it is compatible with the residential uses and county planners make sure that it pays for its infrastructure. Moreover, an industry will provide jobs for people in an area that might otherwise be a bedroom community for Sacramento commuters.

APPENDIX A

METHODS USED TO ESTIMATE RATE OF HOUSING SALES AND THE PROPORTION OF NEW COUNTY RESIDENTS DUE TO DEVELOPMENT OF NASA AS SHOWN IN TABLES 2 AND 4

Scenario One: Slow Growth (Table 2)

First, the proportion of Yuba County's proposed lots that are in NASA was estimated as follows:

2,831/25,000 = .11
where 2,831 = the number of proposed lots in NASA;
25,000 = the number of proposed lots in Yuba County estimated by SACOG as found in the Yuba County Housing Element, p.8.

Second, the average number of new houses per year that will be built in Yuba County during the next 20 years was estimated as follows:

987/2.9 = 340
where 987 = average annual change in Yuba County population derived from Department of Finance Report 91 P-1, 4/91;
2.9 = number of persons per households estimated by Yuba County Planning Department.

Third, the number of new houses in NASA was determined as follows:

340 x .11 = 37
where .11 = the proportion of Yuba County proposed lots in NASA.

Last, the proportion of NASA residents that will be moving into the county was estimated as follows:

207/987 = .21
where 207 = average number of immigrants to Yuba County estimated by the Department of Finance;
987 = average total annual change in Yuba County population derived from Department of Finance Report 91 P-1, 4/91.

Scenario Two: Rapid Growth (Table 4)

First, the number of houses sold to residents of Yuba County under slow growth was estimated as follows:

37 x .79 = 29
where 37 = number of houses sold in NASA under slow growth.
.79 = proportion of houses bought by county residents under slow growth assumptions.

Next, the number of houses sold to people moving into Yuba County under rapid growth assumptions was estimated as follows:

142 - 29 = 113
where 142 = number of houses sold in NASA under rapid growth assumptions.

Last, the proportion of new residents at NASA was estimated as follows:

113/142 = .8
where 113 = the number of new houses bought by people outside Yuba County;
142 = number of houses sold at NASA.

APPENDIX B

METHODS USED TO FORECAST REVENUES

Overview of Methods Used

Regression analysis and curve fitting was used to forecast all government revenues except property taxes and sales taxes. Population change was found to be the best predictor of revenue in all cases where regression was used. For those revenues that failed to meet the criterion of "best fit", extrapolation from the past fourteen years was used to make the forecast. Changes in income forecast with IMPLAN were used to estimate changes in sales tax revenues. (See page 11 for a discussion of IMPLAN.) Property taxes were estimated by projecting one percent of the change in value of the property within NASA, and the county's apportionment schedule was used to allocate property taxes among local governments in Yuba County.

Regression Estimates of Revenue

The regression based estimates of revenue are decomposed into estimates of revenues for public assistance from federal and state government subventions; revenues from fees, fines, forfeitures and the use of money (referred to as licenses and fees); service charges collected by Yuba County government; and a minor revenue category entitled "other revenues". Fourteen years of revenue and population data was used in the regression analysis.[48]

The regression equations that met the criterion of "best fit" were used to estimate total revenue as follows: (1) The estimated total revenue derived from the equation was divided by the estimated total population to yield estimated per capita revenue. (2) Per capita revenue was multiplied by the estimated number of persons who will be new county residents under each scenario to yield forecasted changes in revenue due to development of NASA. (3) These forecasts were then made for each year through the year 2011.

Other variables were examined as predictors of revenues and expenditures. They included revenues in prior years for expenditures in later years, total revenues in a given year, first differences between years. None of the independent variables made as much sense in predicting as using population; nor did they produce, as systematically, the best fit for the equations used here.

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[48]. State of California, State Controller, Annual Report of Financial Transactions Concerning Counties of California, Fiscal Years 1976 through 1990.

IMPLAN Derived Estimates of Sales Tax

Techniques other than regression or extrapolation are used for revenues from property taxes and sales taxes. Sales taxes are estimated from the IMPLAN input-output modeling technique. This is a more accurate technique of forecasting since it produces the total amount of spending based on the "ripple" effects of spending in a regional economy. Sales taxes are forecasted by the analysis of changes in economic activity resulting from the production of new houses in the zone. This total sales yield is then multiplied by the ratio of total sales taxes paid to total income in the county for 1985. This value is then applied to the total sales derived from the IMPLAN forecast.

Projections of One Percent of Property Values

Property tax revenues are produced using the assumed growth rates for each scenario and the value of each new house or industrial plant. The value of the undeveloped land and the homeowners exemption was subtracted from the sales price of the new homes to determine the net change in assessed value of property within NASA. These are conservative estimates of property values since we have not used the allowable change in assessments of 2 percent annually nor have we estimated the impact of housing resales on assessments.

Regression Equations

In the next section two tables are presented for each forecast. The first table indicates the comparison between the use of the regression method and the extrapolation method of forecasting. The criterion for use is the method that produces the lowest MAPE (Mean Absolute Percentage Error). The "naive" forecast is based on the average annual change from one year to the next in the revenue or expenditure series. It produces less valuable information for planning purposes because it suggests a rate of growth without relating it to population changes in the County.

Graphs are presented for each of the forecast values in which regression is used. These graphs are located at the end of each section in which the regression method is used.

Criterion of Best Fit

The criterion used to select the best method of forecasting requires comparing the absolute margin of error between the "naive" forecasts to the margin of error in the regression forecasts. The

criterion for selection is to choose that estimate which has the smallest margin of error between the forecasted value and the actual value. This information will be presented in the appendix for each of the forecasted values in revenues and expenditures for the county. This is calculated by dividing the error of the forecasted value compared to the actual value by the actual value, dropping the sign and multiplying the ratio by 100. The data used to compare forecast to the actual is the last fourteen years of revenue reports and expenditures by the county. The estimation procedure that has the lowest MAPE is considered the best forecasting procedure to use. This selection procedure was used for all the forecasts except for sales tax revenues and property tax revenues which were forecasted with the use of data from IMPLAN. In addition, two revenue categories were analyzed using regression and found to have higher error rates than the "naive" approach. These two categories were forecast using the prior years' average rate of change, otherwise known as an extrapolation method.

Tests Used for Regression Equations

There are two important tests used to determine if the variables in these equations are worthy of being used for forecasting. The first test requires the use of "t". If the value of "t" is equal to or greater than 1.96, we concluded that the variable in the equation was useful for the forecast because the coefficient has a slope different than zero.

A second important test used in these equations required the examination of adjusted R^2. Generally we chose regression equations with the highest R^2 since we can be more confident that the overall equation is more useful for forecasting as R^2 approaches 1. However, in those cases where the variables were not efficient for forecasting, the equations selected were not those with the highest R^2.

Public Assistance Revenues

Public assistance revenues were forecast with the use of population and population squared. As Table B-1 indicates the regression equation is better for forecasting these sources of revenue over the past fourteen years than the average rate of change in the revenues over time. Table B-2 shows the results of the regression estimation. Unless changes in federal or state rules occur, these estimates can be used to forecast public assistance revenues. Refer to the graph labeled PUBASRF in Appendix C for a visual portrayal of these relationships.

Table B-1
Comparison of Two Forecasting Techniques for
Public Assistance Revenues
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	12.83	7.81	2.19	31.88
Regression	14	6.02	6.46	.26	16.04

Table B-2
Equation for Predicting
Welfare Revenues to Yuba County
From Federal and State Sources

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Pubasrev					1.46e+07
Pop	-6157.702	2054.048	-2.998	0.012	52018.93
Pop2	.0763782	.0196672	3.884	0.003	2.72e+09
Cons	1.27e+08	5.34e+07	2.380	0.036	1

Durbin-Watson Statistic = 2.45; Adj R-square = 0.98

Licenses, Fines, Fees and the Use of Money

The regression equations for this estimate are not as good as the naive procedure for forecasting as shown in Table B-3. Consequently, a simple extrapolation was used to forecast the next twenty years of public assistance revenue. The forecast uses the average annual rate of change over the last fourteen years as the prediction method. Hence last year's revenue is the best estimate of next year's, subject to a slight increase based on the average change over the prior years. Table B-3 shows the comparison of the two methods. The average annual change in revenues for this source of income over the past fourteen years is 5.4 percent. This will be used to produce expected changes in revenues for the county. It should be noted that this estimate is independent of the changes occurring in NASA and therefore the forecast is not tied to the planned changes in the zone. This presents a problem in focusing on the changes in this revenue stream. Since NASA, according to the 1990 census, is 2.83 percent of the total county population, this figure will be used to take the portion of future income from this source as the portion expected to be derived from NASA.

Table B-3
Comparison of Two Forecasting Methods for
Licenses, Fees and Use of Money
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	13.98	11.21	.53	34.12
Regression	14	15.98	13.54	3.96	55.47

Service Charges

The sources of revenues from service charges were forecast using population and population squared. The quality is good as seen in Table B-4. The criterion indicates that the regression method produces better forecasts than the "naive" method does. Table B-5 shows the regression equation used to make the forecasted revenue from service charges. Appendix C has a graph, labeled SERVICE, that shows the relationship between service charges and population.

Table B-4
Comparison of Two Methods to Forecast
Revenue from Service Charges
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	12.05	8.13	2.30	31.94
Regression	14	7.68	6.23	.15	16.90

Table B-5 shows the results of the regression estimation of the relationships between population change and the changes in service fees revenues over time. The results show that there is a high R^2 and that the Durbin-Watson statistic is in acceptable range The "t" values indicate that the relationships between population and the changes in the flows of revenues for service charges are significant. This equation was used to forecast service revenues to the county.

Table B-5

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Serv Chgs					548570.6
Pop	-405.339	153.4097	-2.64	0.023	52018.93
Pop2	.0044103	.0014689	3.00	0.012	2.72e+09
Cons	9636677	3988636	2.41	0.034	1

Durbin Watson Statistic = 2.03; Adj R-square = 0.91

Other Revenues

Table B-6 shows a comparison of the accuracy of regression methods and the "naive" approach for forecasting. The quality of the regression equation for this source of revenue is so poor that extrapolation methods were used for forecasting. The average annual change in revenues from this source, 10.5 percent, was used to forecast the changes in this source of revenue for the county, and the 2.83 percent of the county that is in NASA was used to estimate revenues derived from the development of NASA.

Table B-6
Comparison of Two Methods to Forecast
Revenue from Service Charges
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	83.50	106.94	1.05	322.68
Regress	14	86.02	122.90	3.66	379.40

State Aid Not Welfare

The state provides revenues to the county other than for welfare. This revenue is subject to fluctuations because of the changes that occur in state government policy over time. Table B-7 indicates that the use of regression estimation methods is best for this data series, and that method was used to forecast this revenue stream.

Table B-7
Comparison of Two Methods
To Forecast State Payments,
Other than Welfare, to Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	13.30	10.43	.56	33.86
Regress	14	8.25	7.29	.15	25.10

Table B-8 contains the variables used in the regression equation for forecasting state aid to the county. The R^2 is quite high and the DW statistic suggests that the serial correlation is not obvious in the estimation. The graph of this relationship is found in Appendix C with the name of SAIDGR.

Table B-8

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Said					4730388
Pop	-4741.294	1150.78	-4.120	0.002	52018.93
Pop2	.0509348	.01	4.623	0.001	2.72e+09
Cons	1.13e+08	2.99e+07	3.770	0.003	1

Durbin Watson Statistic = 2.0251851; Adj R-square = 0.9527

Federal Sources of Revenues

Federal sources of county revenues are declining as population increases due to reductions in spending by the federal government during the 1980's. Thus by the end of the forecast period the federal revenues to the county become negative. Table B-9 shows the comparison between the naive forecast and the regression forecast; it is apparent that the regression method is slightly better than the naive method, but both have high levels of error. However, the reader should note that the quality of the regression equation is very weak. This is partly due to the wide variation in the federal government's support of Yuba County over the fourteen year period. Population is used to make the forecast of this relationship, and the graph in Appendix C entitled FAIDGR shows that the federal support has been declining over the past years.

Table B-9
Comparison of Forecasting Methods for
Federal Aid to Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	39.31	37.52	.97	126.73
Regress	14	35.69	25.73	6.05	106.77

Table B-10

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Faid					2520316
Pop	893.03	2598.39	0.344	0.738	52018.93
Pop2	-.00939	.0248792	-0.377	0.713	2.72e+09
Cons	-1.84e+07	6.76e+07	-0.272	0.790	1

Durbin Watson Statistic = 1.690253; Adj R-square = -0.0628

This concludes the technical material on the forecasting methods used in revenue forecasting. The next section of the Appendix presents material on the methods of expenditure forecasting. In most instances the regression method produced more systematic relationships using population as the independent variable for expenditures as well as for revenue.

METHODS USED TO FORECAST EXPENDITURES

The same methods and criteria were used to select and forecast revenues. Thus "t" values, R^2, Durbin-Watson and, most importantly, the MAPE are used to select the equations here as in the prior section. See the section above, entitled "Methods Used to Forecast Revenues" on page 48.

Regression Equations

The six county spending categories from Table 2 of Chapter 3 are forecast using regression equations. Population is again the primary method of forecasting these values to the year 2011.

General County Government Expenditures

The first forecast in this section is for general county expenditures. This is the spending by county government for such things as legislative and administrative activities, finance administration, county counsel, and plant acquisition activities.

Table B-11
Comparison of Two Forecasting Techniques on
General County Expenditures for
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	11.68	10.72	1.421968	43.55877
Regression	14	5.92	4.10	.4344376	15.4593

The equation for general county expenditures with an R^2 of .80 looks quite good as an estimate of the relationship between population change and spending for general county government. An examination of Table B-12 shows that this approach is superior to the naive approach. Moreover, the Durbin-Watson statistic indicates that there is a reasonable expectation that the series is not confounded by serial correlation. The "t" values are significant. A graph of this relationship, entitled GENEXFI, is located in Appendix D.

Table Appendix B-12
Regression Results for County General Expenditures

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Genexp					2895488
Pop	-2729.122	496.0723	-5.501	0.000	52018.93
Pop2	.0268819	.0047498	5.660	0.000	2.72e+09
Cons	7.17e+07	1.29e+07	5.562	0.000	1

Durbin Watson Statistic = 2.89; Adj R-square = 0.80

Public Assistance Expenditures

The main predictor of public assistance expenditures over the past fourteen years has been the change in population. Table B-13 indicates that this relationship can be forecasted best using regression analysis. The regression equation for this relationship is found in Table B-14.

Table B-13
Comparison of Two Forecasting Techniques
on Public Assistance Expenditures for
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	11.17636	6.795399	3.488724	30.06289
Regression	14	6.252215	5.469054	.6285182	19.01365

The results for total County Public Assistance expenditures are a good fit. The "t" values are significant, the R^2 = .97, but the DW is inconclusive as to the existence of serial correlation. If there is serial correlation in this estimate, there will be a tendency to find significant coefficients when in fact they may not be significant.[49] Appendix D graph labeled PUBASEXF contains the relationships between public assistance expenditures and population.

[49] Robert S. Pyndick and Daniel L. Rubinfeld, Econometric Models and Economic Forecasts Second Edition, (New York: McGraw-Hill Publishing Company, 1976) P.153-194.

Table Appendix B-14
Regression Results on Total Public Assistance Expenditures

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Pubasex					1.73e+07
Pop	-10376.05	2880.23	-3.603	0.004	52018.93
Pop2	.1187296	.0275778	4.305	0.001	2.72e+09
Cons	2.34e+08	7.49e+07	3.126	0.010	1

Durbin Watson Statistic = 1.59; Adj R-square = 0.97

Public Protection Expenditures

The equation for predicting public protection expenditures uses county population and the county population squared in order to provide a good fit with the data. This is the same procedure as used in the other forecasts.

For this expenditure activity the criterion of minimum error is also best for the regression equation. Table B-15 shows the comparison of the results for the naive forecast and the regression methods of forecasting these expenditure data. Finally, Table B-16 shows the regression equation for this expenditure.

Table B-15 shows the regression equation for public protection expenditures; the fit is good with an R^2 = .97, but the DW indicates potential serial correlation. The "t" value for population is slightly low to meet our criteria for significance (p=.067), but it was included anyway because of the need to use it for forecasting in the context of land use change and its implications for population change. Appendix D graph labeled PUBPROF has the graphical results of this relationship.

Table B-15
Comparisons of Forecasting Methods for
Public Protection Expenditures
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	8.712344	5.673835	.7783361	17.12941
regression	14	4.607858	4.453704	.3238561	15.17272

Table Appendix B-16
Regression Results on the County Expenditures for Public Protection

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Pubprot					6248734
Pop	-1642.02	806.66	-2.036	0.067	52018.93
Pop2	.0211358	.0077237	2.736	0.019	2.72e+09
Cons	3.42e+07	2.10e+07	1.629	0.132	1

Durbin Watson Statistic = 1.37; Adj R-square = 0.97

Public Works and Facilities

Forecasting expenditures for public works and facilities with regression is difficult. It is clear, however, that expansion of needs in the public works and facilities sector of spending will require further analysis. Much of the historical costs of these items is bound with acquisition of capital equipment and facilities. Although we used the same forecasting methods for this series of expenditures, it should be recognized that public works are "lumpy" projects. As a result, the trends are not smooth. Thus one should not expect to find a good fit between population change and expenditures on public works and facilities as these types of expenditures are often "lumpy" or expenditures that are in anticipation of a change in population. Hence, expenditures from this equation were not well predicted with population as they were for some other categories of expenditures.

While several variables were able to predict the behavior of this spending category more effectively, they did not have the instrumental power of population as a source of change. Hence the equation is based solely on the use of population in the county. While the overall error in predicting is better with the regression equation, the absolute percentage errors are quite close to the naive forecasting method. Table B-17 presents those results.

Table B-18 contains a very poor quality regression equation. But there is no better method of forecasting than the use of population change. Consequently, the Public Works expenditures forecasts are based on the use of the population variable. Much of the problem in using this equation is found when one inspects Appendix D graph labeled PWFAC1.

Table B-17
Comparisons of Forecasting Methods
Public Works and Facilities Expenditures in
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	17.37679	16.45797	2.098612	58.15319
Regress	14	16.02101	13.35314	3.992316	45.46918

Table B-18
Regression Equation on Public Works and Facilities

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Pwfac					2177909
Pop	91.97376	33.39703	2.754	0.017	52018.93
Cons	-2606468	1741863	-1.496	0.160	1

Durbin Watson Statistic = 1.14; Adj R-square = 0.3362

Brooks found that the total per capita capital cost for all facilities in the county as a service area is $823.38.[50] This analysis is based on the assumption that new households will require the old county facilities and equipment for services delivery to be replaced or expanded as new persons move into the county. He goes on to provide a discounted value per household using a 3 percent discount rate and a forty year life. That cost is based on incremental expansion of the facilities over the life of the project, and present value of the cost per unit is $1,561.[51]

We did not build into the regression equations or the forecasts, the values that Brooks estimated. We have added Brooks' estimates into Table 7 of the prior chapter, but we are not sure what issues are involved in such a complex public policy problem since his work entails both intergenerational equity and examination of current burdens of taxes under assumptions that are also quite complex. These issues should be left to a more complex analysis using economic criteria of taxation.

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[50] Larry Brooks, unpublished MA thesis, CSU, Chico, Summer, 1991, "Financing Capital Facilities Needs of Yuba County Resulting from Development of the East Linda Specific Plan", page 49.

[51] Brooks, page 54.

Thus in this analysis we have two factors to consider, the costs of public works services provision and the additional costs of county facilities and equipment. The forecasted values of public works produces a per capita, total county, cost of $47.69 in 1992. The marginal per capita cost is $91.97 per year.

Health and Sanitation

The forecasts for health and sanitation use population as the basis for the forecast. The quality of the forecast meets the same standards as found in earlier forecasted values for other county services. The per capita cost of this service is $23.05, but the marginal cost is $81.72. The overall forecast results suggest that the equation is good for use in this forecasting. Table 20 shows the comparisons of the two forecasting methods. Note that the equation is a good fit; the R^2 is .90; the "t" values are significant beyond p=.000; but the Durbin-Watson statistic suggests that there may be some serial correlation. Overall, the equation for predicting health and sanitation expenditures for Yuba County is a good one. The graph of this relationship is found in Appendix D labeled HEALS1.

Table B-19
Comparisons of Forecasting Methods
Health and Sanitation Services Expenditures in
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Naive	13	13.04833	8.200525	1.192726	33.0815
Regress	14	11.91675	9.352213	1.268802	33.60334

Table B-20
Regression Equation for
Health and Sanitation Expenditures

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Healsan					798121.9
Pop	81.7191	7.441543	10.981	0.000	52018.93
Cons	-3452818	388122.9	-8.896	0.000	1

Durbin Watson Statistic = 1.11;Adj R-square = 0.90

Recreation and Education

Population was used to forecast the expenditures for recreation and education in a regression equation. The quality of the two ways of forecasting is shown in Table B-21. It is clear that the regression approach is superior to the "naive" forecast. Table B-22 has the overall results of the regression equation. Moreover, the quality of the regression is not outstanding as indicated by the R^2 of .55; the "t" values are not significant, but the DW is good. This equation was used to forecast the values into the year 2011 for recreation and education spending in the county. The graph of the equation, found in Appendix D, is labeled RECEDF1.

Table B-21
Comparisons of Forecasting Methods for
Recreation and Education Expenditures in
Yuba County

Variable	Obs	Mean	Std. Dev.	Min	Max
Recnaiv1	13	11.46328	10.91935	.304798	43.70348
Mape 2	14	7.868626	6.773512	.2616723	23.26723

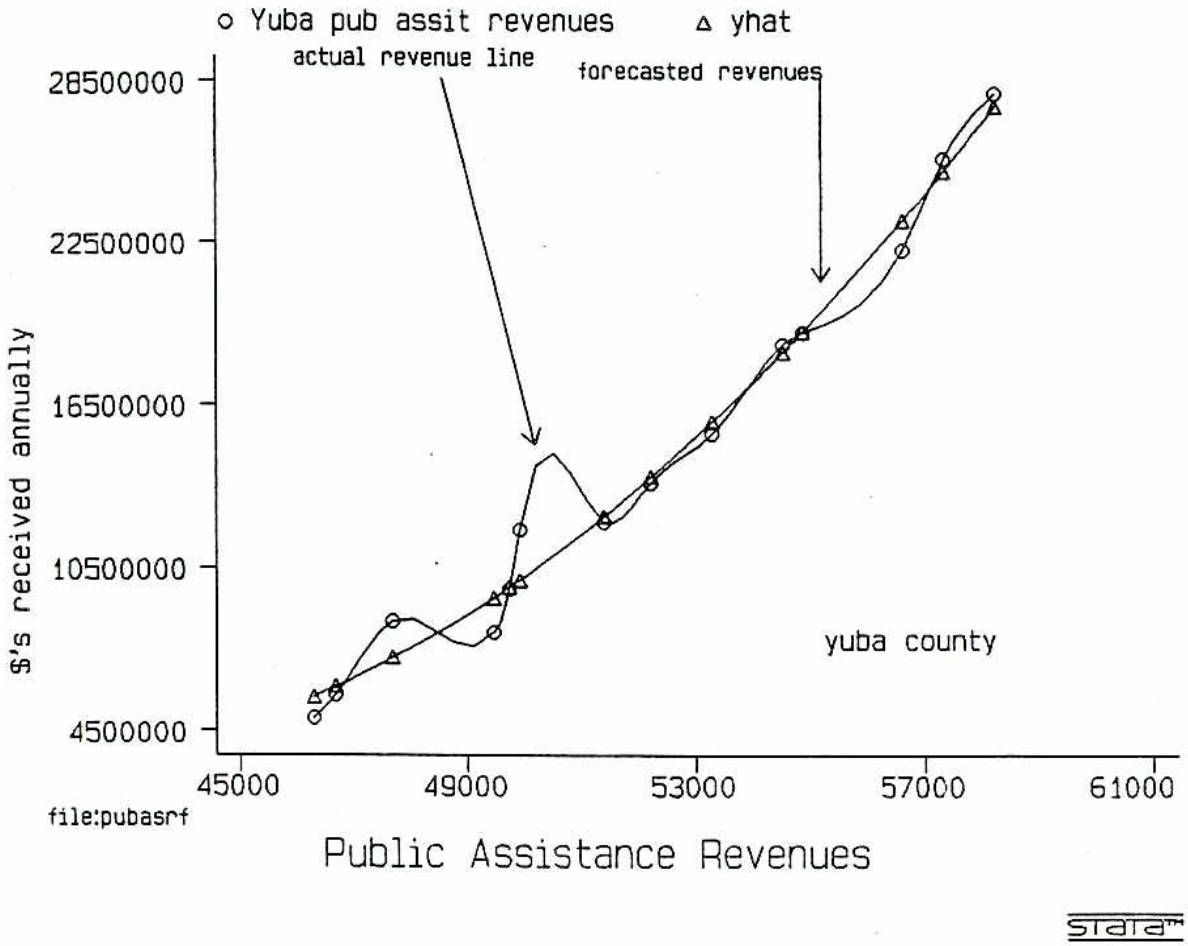
Table B-22
Regression Results from the Recreation
And Education Forecasting Equation

Variable	Coefficient	Std. Error	t	Prob > |t|	Mean
Reced					233922.7
Pop	-67.52617	55.19975	-1.223	0.247	52018.93
Pop2	.0007148	.0005285	1.352	0.203	2.72e+09
Cons	1802034	1435188	1.256	0.235	1

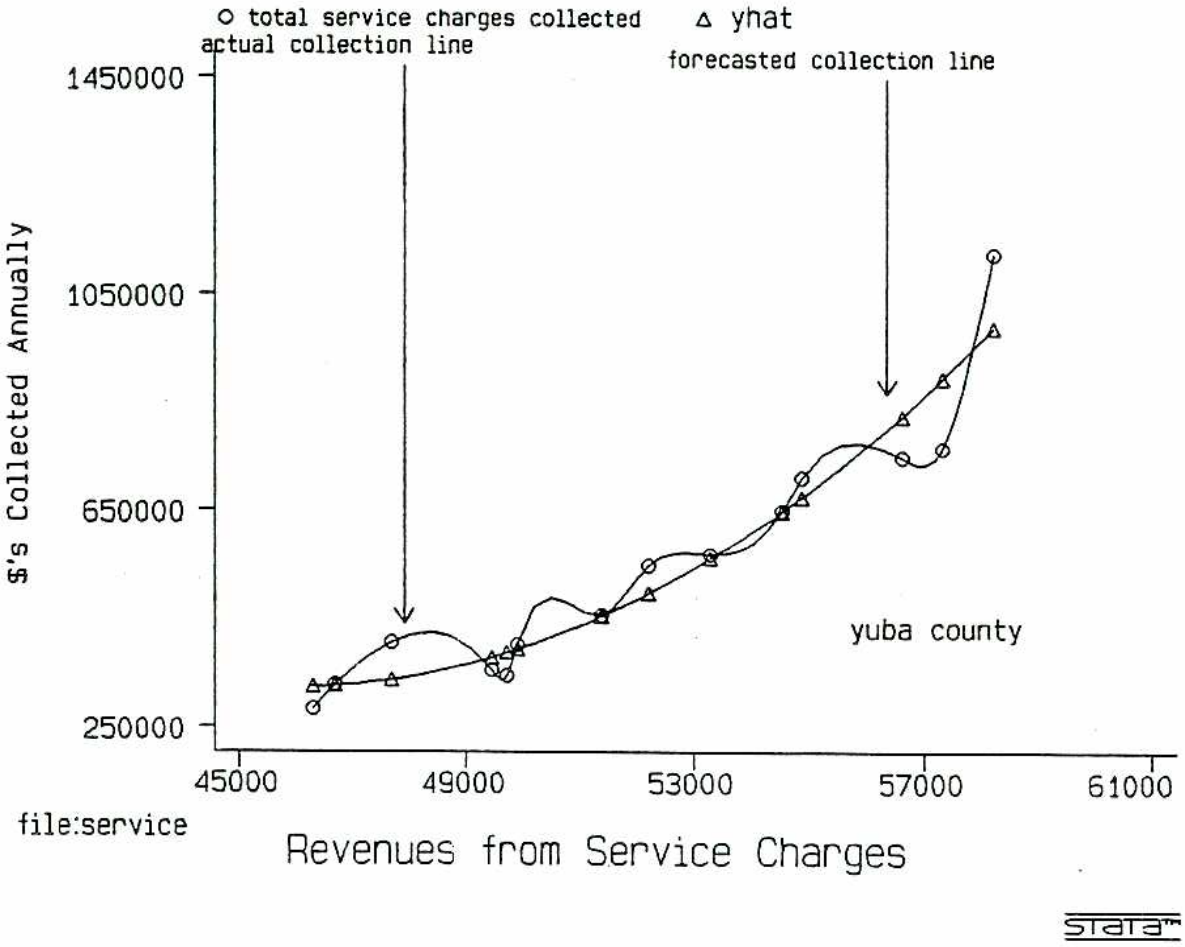
Durbin Watson Statistic = 1.9837502; Adj R-square = 0.5488

APPENDIX C
GRAPHS OF TOTAL COUNTY REVENUES BY SOURCES

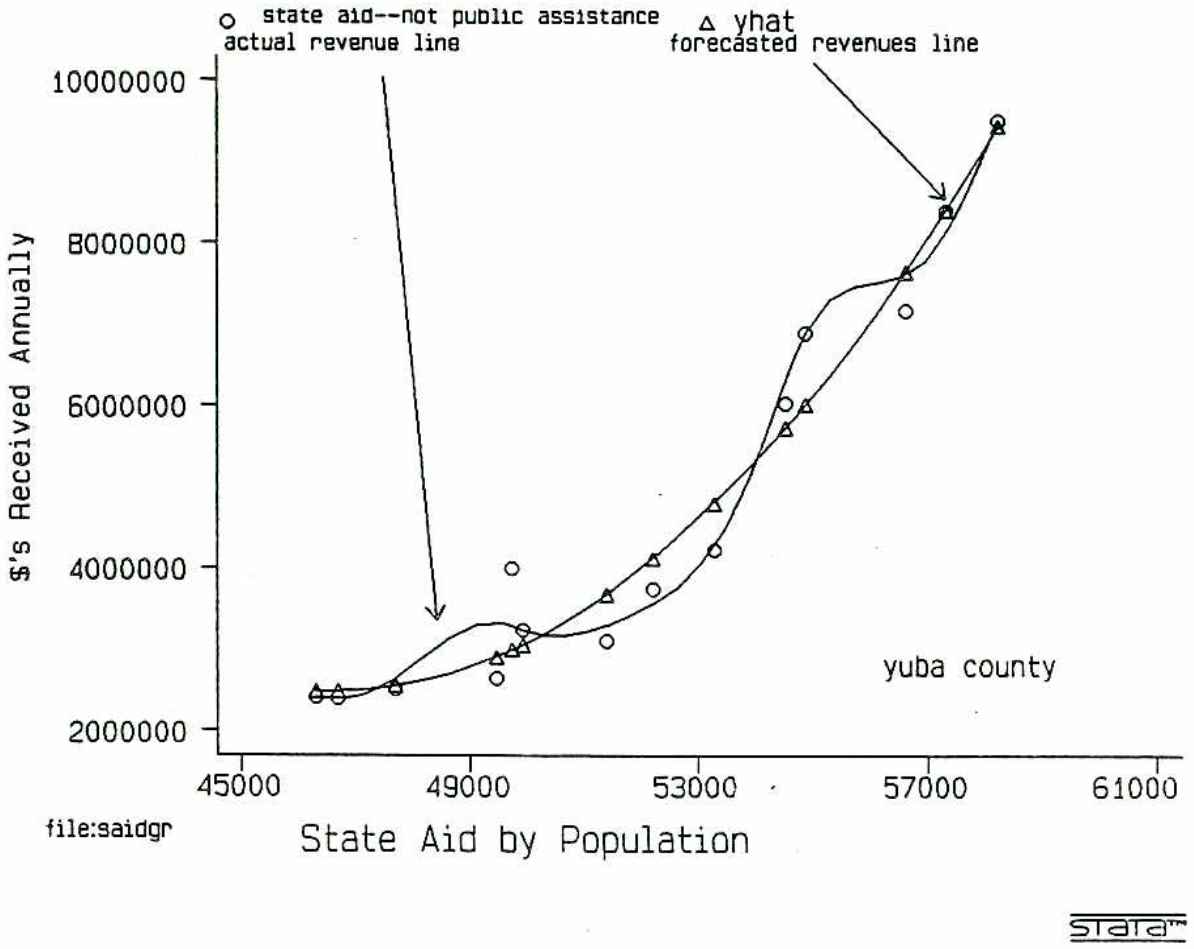
GRAPH OF PUBASRF
REVENUES FROM STATE AND FEDERAL WELFARE
PAYMENTS TO THE COUNTY



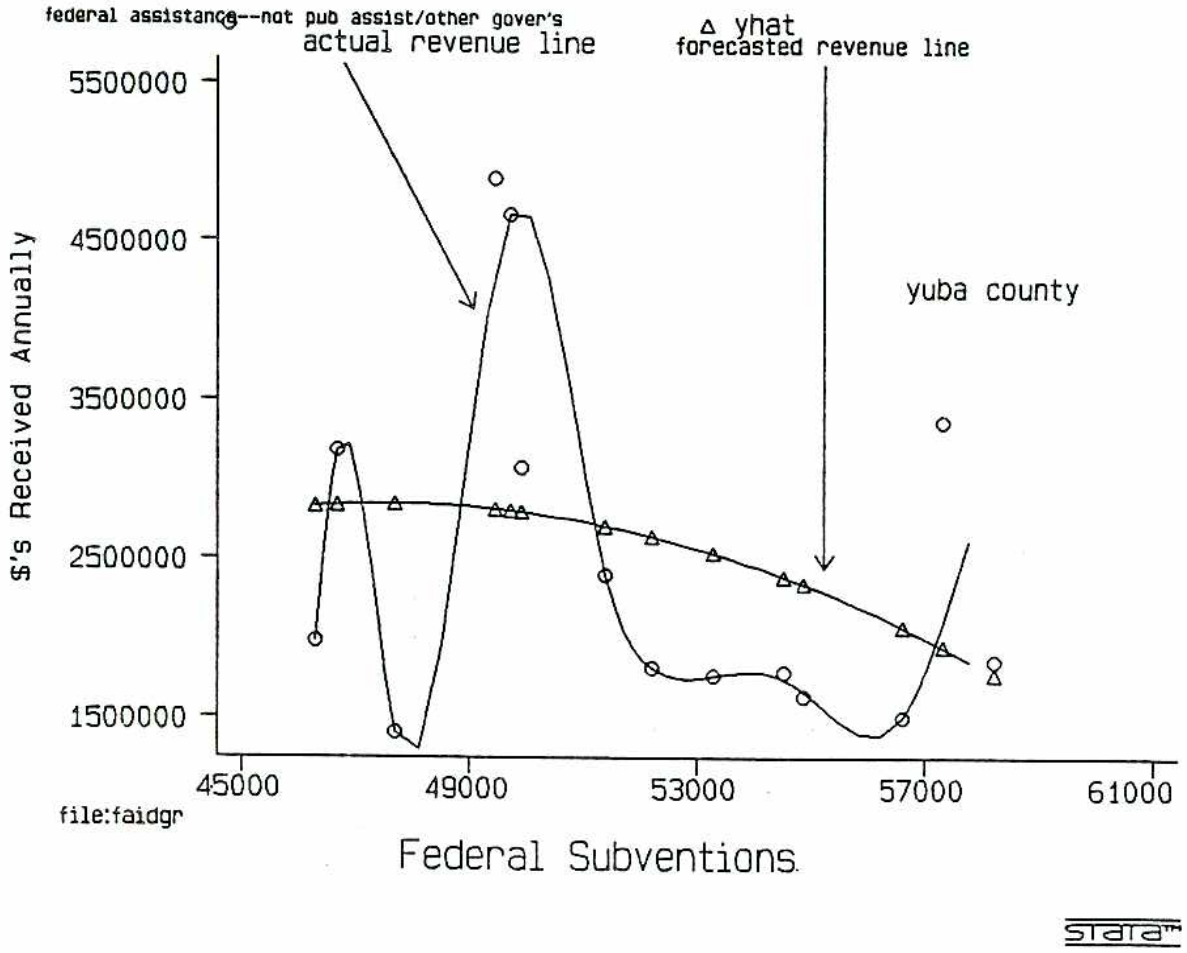
GRAPH OF SERVICE
REVENUES FROM SERVICE CHARGES



GRAPH OF SAIDGR
STATE ASSISTANCE TO THE COUNTY NOT INCLUDING WELFARE

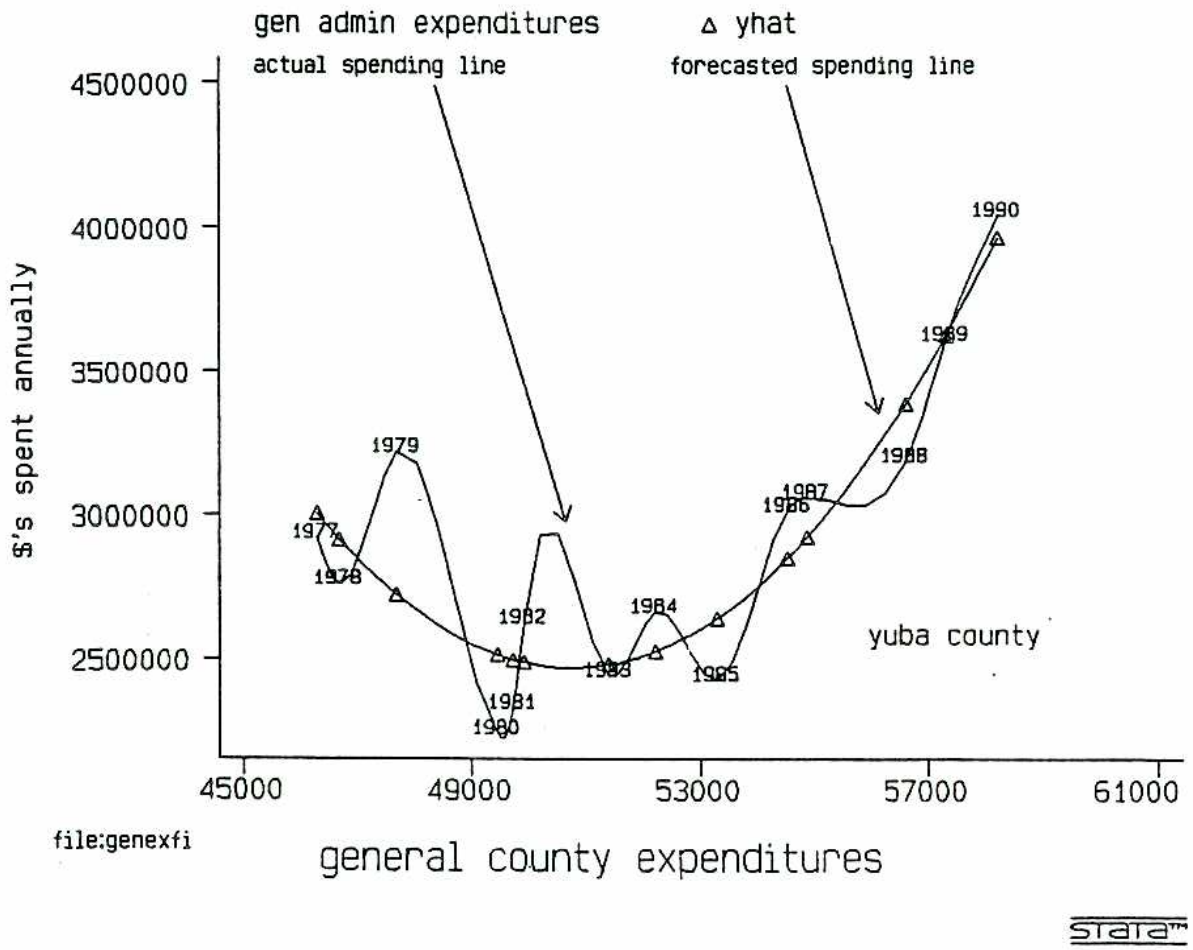


GRAPH OF FAIDGR
FEDERAL ASSISTANCE TO THE COUNTY NOT INCLUDING WELFARE

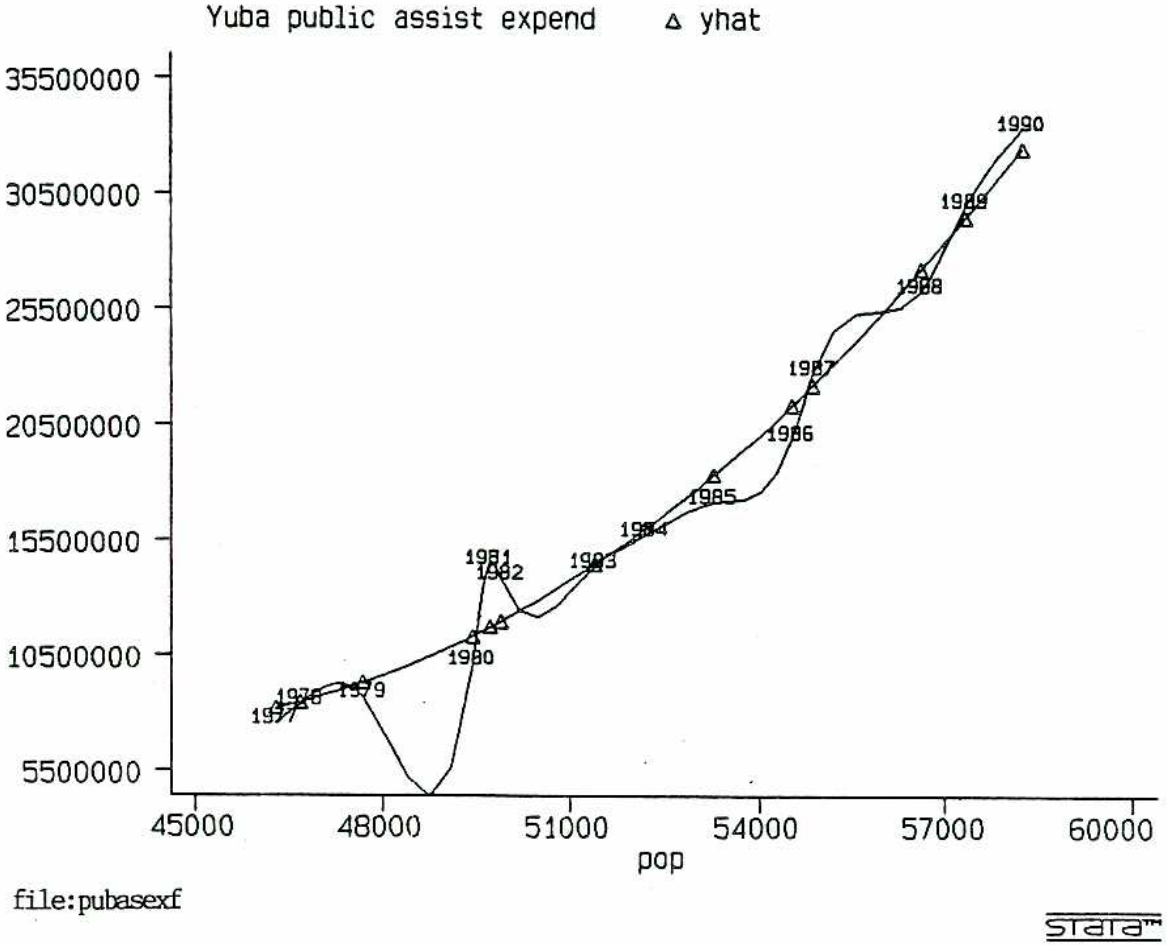


APPENDIX D
GRAPHS OF
TOTAL COUNTY SPENDING CATEGORIES

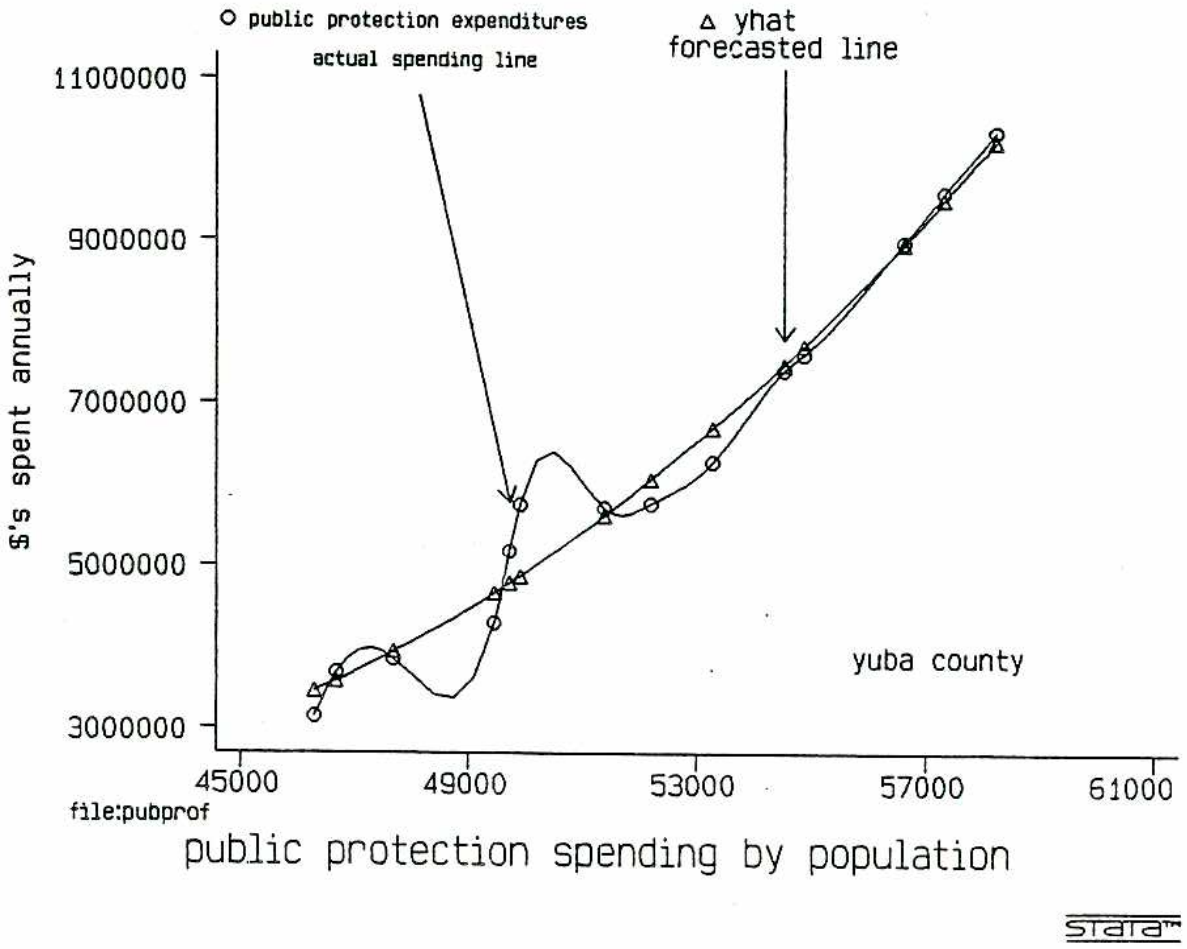
GRAPH OF GENERAL EXPENDITURES
GENEXFI



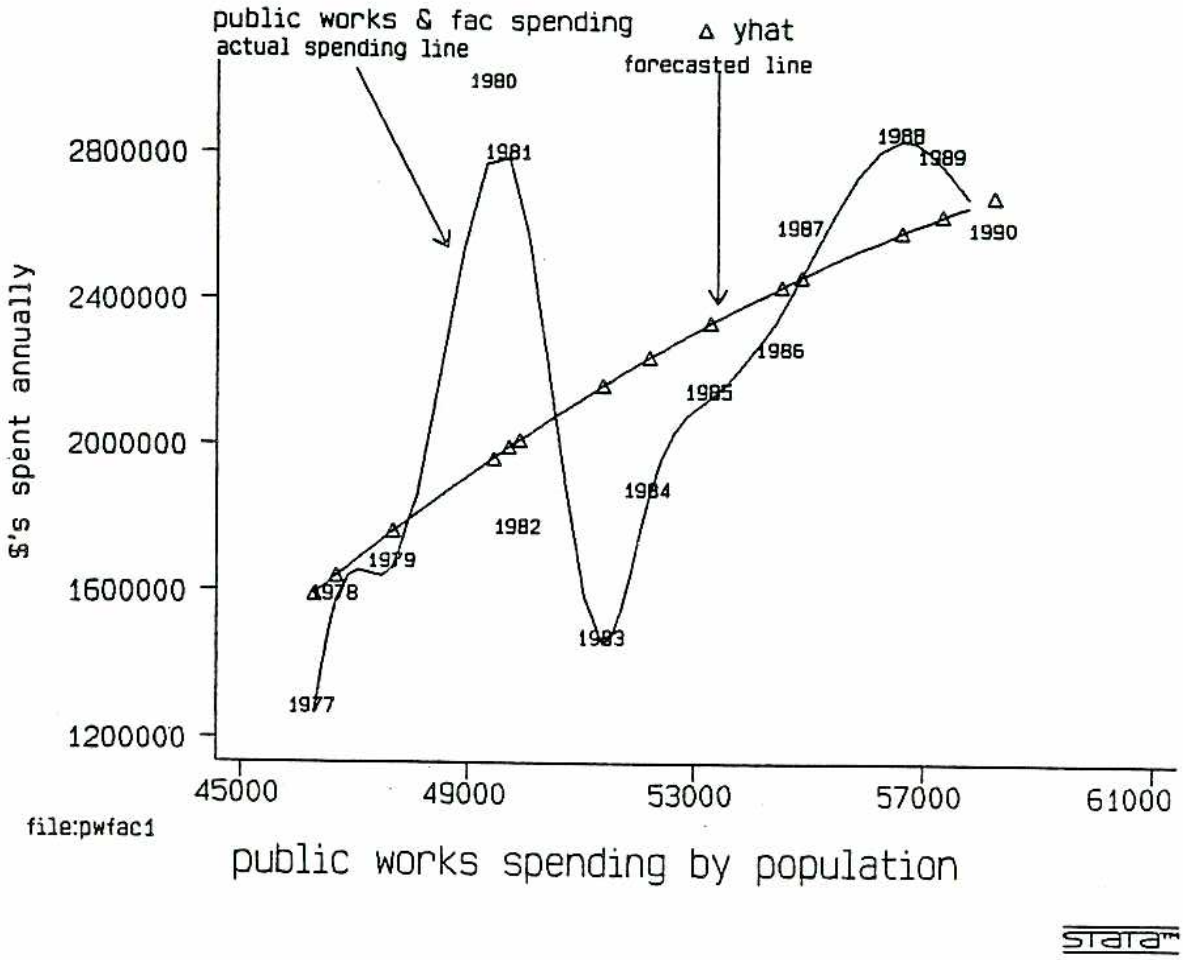
GRAPH OF PUBLIC ASSISTANCE EXPENDITURES
PUBASEXF



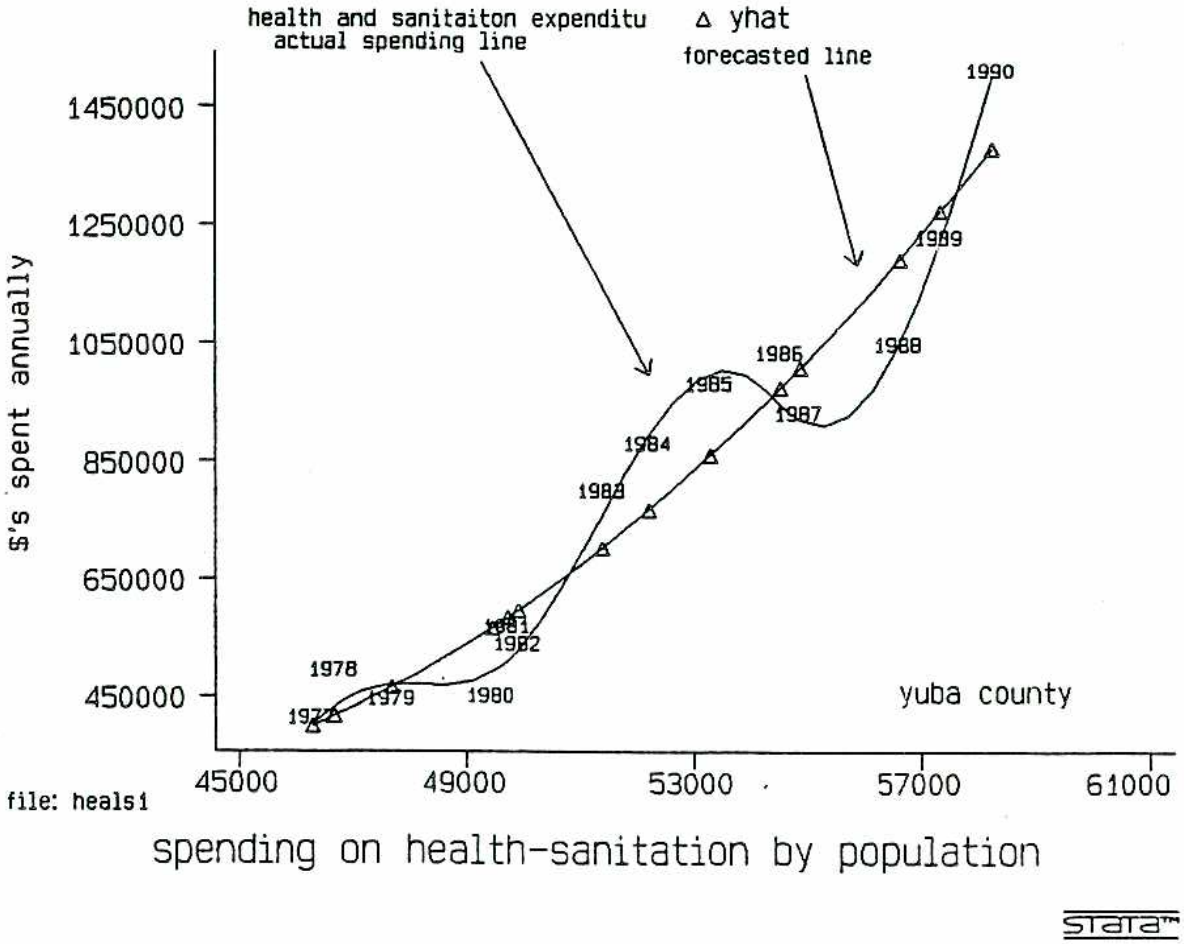
GRAPH OF PUBLIC PROTECTION EXPENDITURES
PUBPROF



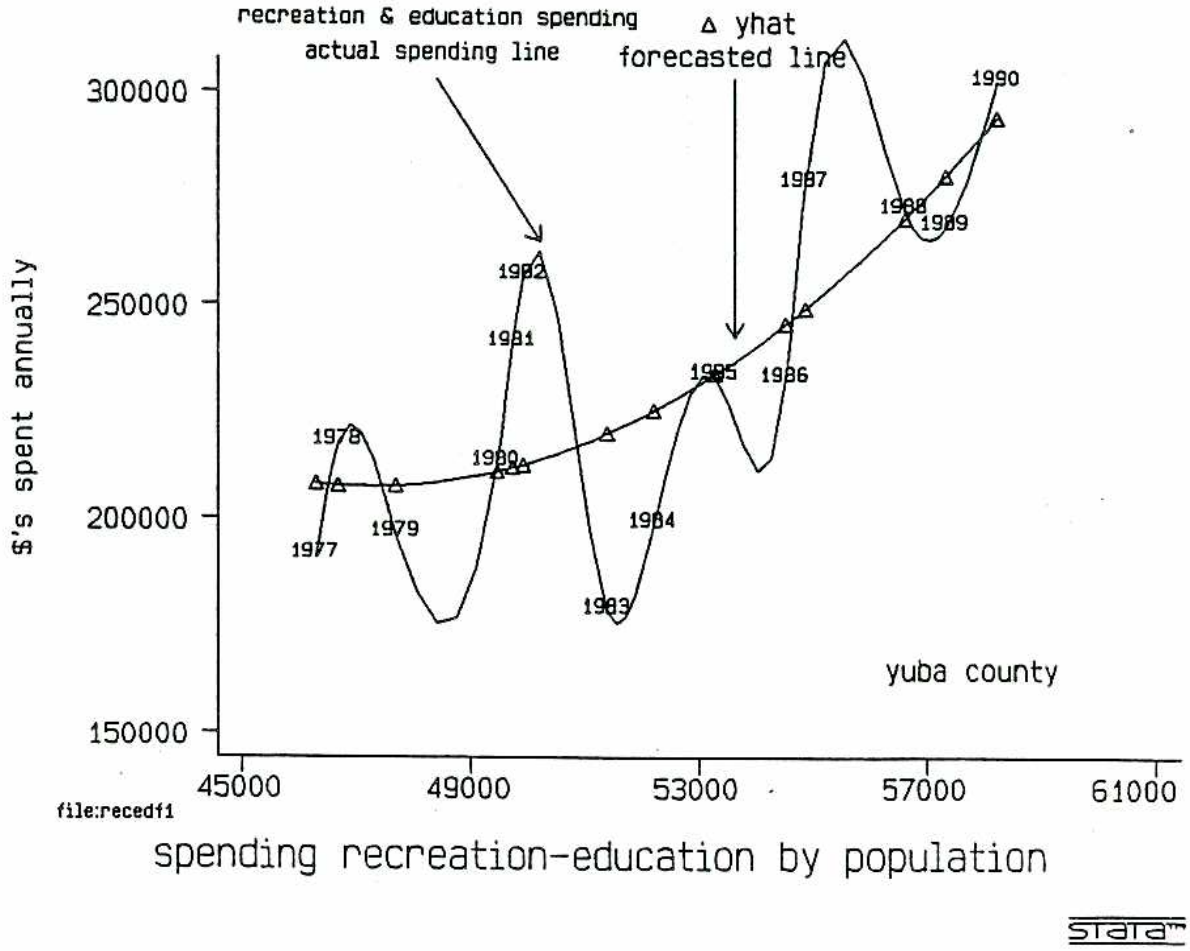
GRAPH OF PUBLIC WORKS AND FACILITIES EXPENDITURES
PWFAC1



GRAPH OF HEALTH AND SANITATION EXPENDITURES
HEALS1



GRAPH OF RECREATION AND EDUCATION EXPENDITURES
RECEDF1



FINAL
ENVIRONMENTAL IMPACT REPORT

for the

NORTH ARBOGA STUDY AREA (NASA)

Master Environmental Assessment
and Constraints Analysis

County of Yuba

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Table of Contents

- the County airport north of the area, including the Airport Enterprise Zone;
- active railroad lines which run north and south through the center, and along the northwestern margin of the study area;
- State Highway 70, which forms the eastern boundary to project lands;
- a high-voltage powerline corridor parallel to Highway 70;
- mixed agricultural uses including grazing land and grain crops;
- the existing sewage treatment plant operated by the Olivehurst Public Utility District (OPUD);
- mixed residential uses ranging from older low-income multi-family and single-family housing, to new middle-income single-family tract homes, and a variety of small farm houses;
- limited neighborhood commercial uses, including a convenience store and gas station on McGowen Parkway at the State Highway 70 interchange, an auto parts store, and two family-owned markets;
- other large special study planning areas, particularly: the Plumas Lake Specific Plan which now includes 13,000± dwelling units and the former Wheeler Ranch project.
- several agricultural/industrial plants located approximately 0.75 mile west of the study area;

Three different property owners have title to lands proposed for development as eight (8) separate subdivisions within the project area. Preliminary development proposals in NASA are summarized in Table 1 below.

Use of this Report and Required Approvals

The "project" in this case does not involve specific land development plans, but rather a land use scenario in which existing land use designations are changed to allow a variety of residential, commercial, and industrial development on lands surrounding the Arboga area. Existing County land use designations include a mixture of industrial (M-1) and residential (RRE, R-1, and R-2) classifications.

For the eight proposals identified above, development entitlements are to be granted at this time, including revision of General Plan and zoning land use designations, and approval of tentative subdivision maps. Individual development proposals are evaluated utilizing the information and mitigation requirements identified in this report in the draft EIR section entitled *Summary Evaluation of Individual Projects* (Draft EIR, pp. 115-126).

Table 1

Existing Development Proposals Within the North Arboga Study Area

Project #*	# of lots	Developer
1	NA - project deleted from NASA Study	
2	274 ±	Approved Tentative Map*
3	350 ±	Ron Ward Construction
4	217 ±	Approved Final Map*
5	47 ±	Withdrawn
6	184 ±	Approved Tentative Map*
7	106 ±	Jon Quitiquit Investments
8	418 ±	Jon Quitiquit Investments
9	47 ±	Jon Quitiquit Investments
10	217 ±	Ron Ward Construction
11	60 ±	Jon Quitiquit Investments
12	92 ±	Jon Quitiquit Investments
13	536 ±	Centex Homes / Fred Draper
Total:	2548 ±	

See Figure 3, page 10, DEIR, for location within study area.
(Source: Yuba County Department of Planning and Building Services, 1991)
*Included for purposes of cumulative impact analysis

Multiple discretionary actions are required before construction could begin on any of the development proposals (Table 1) within the North Arboga Study Area. This EIR document, together with a project specific Initial Study to evaluate adoption and implementation of the mitigation requirements identified herein, will be used as a basis for project review by each of the reviewing agencies.

Individual applicants will be required to obtain a range of approvals and entitlements preliminary to gaining approval of Tentative Subdivision Maps and Tentative Parcel Maps, which will include the following:

- the County must first approve a Mitigation Implementation Plan prior to final approval of specific projects in every case;
- a General Plan Amendment(s) to establish consistent land use designations;

- rezoning consistent with the General Plan and development proposals;

- annexation(s) to integrate lands within service agency boundaries for water, sewer, drainage, and fire protection, and in some cases, detachments from existing service boundaries as a part of annexation;

- formal abandonment of flood inundation easement rights owned by the State of California;

- Approval of wetlands delineation studies and wetlands mitigation plans by the U.S. Army Corps of Engineers;

- approval of aviation noise easements for properties within designated airport noise zones;

- others as required to meet Federal, State, and local legal requirements.

Additional approvals may be required as conditions of approval for Final Maps and/or issuance of building permits, including:

- Final Improvement Plans;

- grading and erosion control plans;

- final design of storm drainage systems to meet standards imposed under the County's National Pollution Discharge Elimination System permit (NPDES);

- approval and implementation of specific funding mechanisms, special district formation, and/or payment of impact fees;

- others as required to meet Federal, State, and local legal requirements.

Developers must also obtain demolition permits from the County Building Department prior to removal of existing structures. The Yuba County Health Department must issue certification of abandonment of any wells, septic tank(s), and irrigation systems on the property.

All required development and impact fees must be paid to the appropriate agencies by the developers. Additional requirements may have to be met to satisfy State and Federal Regulations, and to meet County regulations regarding mitigation compliance, and other legal standards, and are not excluded by inadvertent omission from this listing.

Revised Mitigation Summary
(Revised text underlined and replaced text shown struck out.)

GENERAL PLAN, ZONING, & LAND USE (DEIR pp. 14-24)

Land Use Conflicts and the Enterprise Zone

Mitigation 1: The M-1 zoned land north of Buttercup Lane and McGowan Road must be maintained for industrial use. It is recommended to be rezoned ~~may be desirable to rezone it~~ to M-3, Light Industrial, to provide a more transitional land use between the airport zone and surrounding residential land uses.

Mitigation 2: In conformance with the policies of the Airport Land Use Commission, residential development shall be restricted to a density not to exceed two (2) dwelling units per acre, net, on lands located within the Approach-Departure Zone of the Yuba County Airport. ~~That portion of the RRE zoned property that lies south of McGowen Parkway, east of Arboga Road, and west of the Western Pacific Railroad tracks should be maintained in its present zoning, permitting only low-density residential development in conformance with the airport zone restrictions.~~

Conflicts with Agricultural Uses

Mitigation 3: A solid fence a minimum of six feet in height shall be constructed for all lots with property bordering active agricultural uses.

Mitigation 4: Owner shall record a covenant in the deeds of each parcel created by the subdivision which requires ~~The County will require that~~ pets be restricted to fenced yards or tethered within the limits of each parcel, and furthermore, that pets be ~~the owner's property, and~~ controlled on a leash when off the owner's property.

Loss of Agricultural Land

Mitigation 5: Pursuant to Yuba County Ordinance 11.55, a person or agent acting as an agent for the seller or lessor of real property located within the County shall provide knowledge to all potential purchasers or lessees of the right to farm and mine within the County. ~~The County will require inclusion of an informational deed clause notifying residents of the presence of nearby agricultural activities and of the County's intent to allow and protect those activities.~~

Airport Safety Zones and Public Safety

Mitigation 6: No development will be permitted within the "*Clear Zone*" (Zone 1). Development within the "*Approach - Departure Zone*" (Zone 2) shall be limited to single-family residential uses which do not exceed two (2) to the acre and which adhere to all "*Overflight Zone*" (Zone 3) standards. ~~residential uses which adhere to the RRE zoning standards, and to all Zone 3 standards.~~ Development within ~~the "*Overflight Zone*"~~ Zone 3 may include residential and industrial development that does not require or utilize any steady or flashing light that could be confused with an FAA navigational signal, generate smoke, attract large numbers of birds, or otherwise create interference detrimental to the safe operation of aircraft or airport instrumentation. Installations involving hazardous materials such as above ground oil tank farms or other chemical storage are also excluded from this zone.

High Voltage Power Lines

Mitigation 7: A minimum ~~lot-line~~ building setback of 100 feet from right-of-way is required for development of human-occupied structures beside the ~~high-voltage~~ powerline easements which parallel State Highway 70 and extend east-west from Highway 70 paralleling the alignment of Ella Avenue. This requirement applies to powerlines mounted on steel towers, and not to wood-pole mounted lines.

Mitigation 8: Individual owners must coordinate with PG&E prior to beginning construction to identify construction safety measures. A record of consultation with the utility shall be placed on record with the Department of Planning and Building prior to issuance of building permits.

Odor

Mitigation 9: A minimum lot-line setback of 200 feet from the existing and future OPUD ponds shall be established for residential structures, and a solid fence shall be constructed to provide odor, sight, and noise control from the sewage treatment plant. The setback area may be occupied by uses such as parks, but not including schools.

Mitigation 10: ~~The County will require inclusion of an informational deed clause notifying residents of the~~ A person or agent acting as an agent for the seller or lessor of real property located within the County shall provide knowledge to all potential purchasers or lessees of the presence of the nearby sewage plant and of the County's intent to protect the existing land use.

PUBLIC SERVICES (DEIR pp. 25-50)

Schools

Mitigation 11: In addition to the fees adopted under Government Code Section 53080, the owner shall pay impact fees for construction of Marysville Joint Unified School District facilities in accordance with the adopted fee schedule as adopted by the County. Said fees shall be due prior to final building permit inspection. ~~The owner shall pay the Marysville Joint Unified School District fees adopted under Government Code Section 53080 at time of issuance of building permits.~~

Mitigation 12: Deleted ~~The owner / applicant shall annex into the existing, or support the formation of, a school district sponsored Mell-Roos Community Facilities District (CFD) prior to recordation of the Final Map; provided the school district allows the annexation or causes the formation of a new CFD within 24 months of the date the Tentative Map is approved; and provided further that the applicant's obligation under the CFD plus the fees paid under Government Code Section 53080 is limited to mitigating the impacts to school facilities directly resulting from the project.~~

Mitigation 13: Deleted ~~The owner shall reserve for sale to the Marysville Joint Unified School District (MJUSD) parcels of land identified by the district as potential school sites which lie within the owner's property. The reservation and acquisition of said properties shall be in conformance with provisions of the Subdivision Map Act.~~

Mitigation 14: Deleted ~~The above conditions pertaining to school facilities shall be waived by the County if the applicant and the Marysville Joint Unified School District reach agreement to mitigate the impacts on the school facilities caused by the project and jointly request in writing that one or more of these conditions be waived.~~

Parks, Recreation, and Open Space

Mitigation 15: Prior to Final Map recordation for each phase of development, the owner shall improve and dedicate recreation floodway corridors and all other landscaped setback areas in accordance with conditions of the tentative map. Improvements shall be subject to review and approval of the Director of Public Works.

Parks, Recreation, and Open Space (cont.)

Mitigation 16: Prior to Final Map recordation for each phase of development, the owner shall dedicate park land and/or pay fees in-lieu of land dedication to the County agency designated by the Director of Public Works as provided under Yuba County Ordinance Code section 11.15.661.1. ~~The fair market value shall be determined by a written appraisal report prepared by an appraiser acceptable to the Public Works Department and paid for by the owner. The appraisal shall be made within 30 days before the Board of Supervisors approves the Final Map. The fair market value shall be based upon the average per acre value of the entire development area at the time of appraisal.~~

Mitigation 17: Subject to applicable conditions in (a) and (b) below, the owner shall annex into an existing Mello-Roos Community Facilities District (CFD) for schools, sewer, water, roads and their maintenance (public facilities) or pay to each entity responsible for each public facility a fee equivalent in value to the impact on these facilities that will be caused by the development (impact fees). Such impact fees shall have been established by statute or ordinance or by resolution or order of the entity imposing such fee or by law. Owner shall provide the Public Works Department written acknowledgement by each applicable entity of Owner's satisfaction of this condition.

a) In lieu of annexing into an existing CFD or paying an impact fee for one or more such public facilities, Owner shall provide an entity or entities, on terms and conditions approved by the County, to accept and maintain one or more of such public facilities described by these Conditions of Approval.

b) Condition 17 shall be waived to the extent that Owner submits to the Public Works Department a certified copy of a written agreement between Owner and the entity responsible for a public facility indicating that impact of the project will be adequately mitigated on such entity and its public facilities and further indicating that Owner and such entity jointly request that the condition herein relating to such entity and public facility by waived.

Mitigation 18: The owner shall annex into or support the formation of a Landscape and Lighting District prior to recordation of the Final Map. The District shall provide for ~~the acquisition of parkland and~~ park improvements including the installation of landscaping and park equipment, bike paths, sidewalks, irrigation, and lighting as well as maintenance of parks and the landscaped recreation/ floodway corridors along arterial and collector streets.

Parks, Recreation, and Open Space (cont.)

Mitigation 19: The owner shall submit to the Planning and Building Services and Public Works departments a residential street tree plan for review and approval prior to map recordation. Said plan shall be in accordance with the Yuba County Ordinance Code Section 12.82.40(10). Said street trees shall be planted prior to the issuance of the Certificate of Building Occupancy.

Water supply

Mitigation 20: Prior to building permit approval, the Fire Flow Requirements of the Uniform Fire Code must be met for individual land use proposals. The ~~Linda Fire Protection District~~ Fire Chief of the appropriate fire protection district shall certify the adequacy of fire flows prior to issuance of any building permits within the North Arboga Study Area boundaries. Issuance of building permits for projects within OPUD is expressly conditioned upon full participation in the District for the construction and installation of required water lines, wells and treatment facilities, and any supporting equipment required.

Mitigation 21: Water service systems for individual projects must be designed to be fully integrated into the OPUD water service system to provide looped water systems. Connection must be made to link water lines with the existing system in addition to the new wells and lines required. Final water system design will be subject to review and approval of OPUD, in consultation with the County Public Works Director.

Sanitary Sewer

Mitigation 22: Sewer service systems for individual projects must be designed to be fully integrated with OPUD designs for the area-wide sewer service system. Final sewer system design will be subject to review and approval of OPUD, in consultation with the County Public Works Director.

Stormwater Drainage

Mitigation 23: Deleted ~~All drainage improvements must be constructed to County of Yuba and Reclamation District No. 784 standards. Drainage plans must be submitted for review and approval by the District's engineer and the Public Works Director prior to Tentative Map approval.~~

Mitigation 24: All lands not presently in Reclamation District No. 784 must be annexed into the district, provided the district allows the annexation, ~~during the development process and~~ prior to recordation of final maps.

Stormwater Drainage (cont.)

Mitigation 25: All development within areas subject to flooding shall provide for flood proofing of all structures pursuant to FEMA and County requirements, subject to review and approval of the Public Works Director.

Mitigation 26: Approval must be obtained from the State of California to abandon flood inundation easements, or, to obtain approval of development plans in areas where the State has inundation and flowage easement rights under the Sacramento and San Joaquin Drainage District.

Mitigation 27: The owner shall submit to the Public Works Department for review and approval drainage plans and calculations for the proposed project which are prepared by a registered engineer ~~for the proposed project to determine the quantity of increased drainage runoff~~ which quantify the amount of increased drainage run-off from the project. Said plans shall be submitted and approved prior to recordation of the Final Map. Projects that will increase downstream drainage flow will not be approved by the County until adequate drainage facilities are completed. Initially, projects may be approved that incorporate on-site detention or retention ponds that will prevent any increase in downstream storm water runoff. Owner shall construct the drainage facilities in conformance with the plans approved by the Public Works Department and Reclamation District 784. Oil and grit separators, sediment traps, evaporation basins, slow restriction devices and/or other methods to reduce the volume of grease and oil pollutants caused from street surface runoff shall be included in the storm drain design to meet requirements of the County's NPDES permit.

Mitigation 28: Detention basin and drainage corridor areas shall be landscaped to meet with approval of the County of Yuba and Reclamation District No. 784. Landscaping shall consist of grass or other ground cover approved by the Public Works Department and Planning and Building Services Department.

Mitigation 29: Deleted ~~Subdivision design shall include provision of for an on-site drainage detention facility. Lot design shall include a provision for prevention of off-site ponding of surface water runoff on adjacent lands. Plans for the detention facility and lot design shall be prepared by a registered engineer and submitted to the Yuba County Department of Public Works for review and approval.~~

TRAFFIC & CIRCULATION (DEIR pp. 51-75)

Improvements currently needed.

Mitigation 30: Arboga Road must be reconstructed and realigned through the Ella Avenue intersection. Road improvement costs can be collected as a special impact fee, by requiring the first developer to construct the improvements with establishment of an area of benefit for reimbursement, or by formation of an assessment or Mello-Roos district. ~~or alternatively, necessary improvements can be required of the first developer, with establishment of an area of benefit for reimbursement as subsequent development occurs.~~ The ~~preferred~~ mechanism shall be subject to the approval of ~~should be determined by~~ the Planning and Building Services Director ~~in consultation with~~ and the Public Works Director prior to recordation of final maps.

Improvements required with development of the NASA study area.

Mitigation 31: Arboga Road must be reconstructed and realigned from a point approximately 1,000 feet south of Ella Avenue to the McGowan Parkway intersection. At a minimum, Arboga Road should be widened to a four-lane roadway in the vicinity of the Ella Avenue and McGowan Parkway intersections to accommodate auxiliary turn lanes. ~~Road improvement costs can be collected as a special impact fee, or alternatively, necessary improvements can be required of the first developers, with establishment of an area of benefit for reimbursement as subsequent development occurs. The preferred mechanism should be determined by the Planning Director in consultation with the Public Works Director.~~

Implementation Schedule: This improvement would not be needed until a significant portion of the NASA area west of the railroad is built. In fact, if McGowan Parkway is extended west through the Centex Subdivision (Project 13), the "Existing plus NASA area" daily traffic volume would be reduced to a level where a four lane road is not needed. Without the McGowan Parkway extension, the roadway would need to be widened when 80% of NASA west of the railroad is built.

Mitigation 32: Arboga Road must be widened north of McGowan Parkway to provide a four-lane section. The roadway must be widened to its ultimate four-lane section with shoulders and must extend from McGowan Parkway in the south to the limits of the industrial area in the north. This widening will be approximately 2,700 feet long.

Implementation Schedule: This improvement would not be required until traffic on Arboga Road reaches 12,000 ADT. This threshold would not be reached until about 85% of the NASA area is built out.

Traffic & Circulation (cont.)

Mitigation 33: The intersection of McGowan Parkway and Arboga Road must be reconstructed and signalized. In conjunction with the Arboga Road reconstruction noted above, the McGowan Parkway intersection should be reconstructed to provide the following configuration:

Northbound:	1 Through lane and 1 Through Plus Right Turn lane;
Southbound:	2 Through lanes and 1 Left Turn lane;
Westbound:	1 Left Turn Lane and Right Turn lane

(Estimated traffic signal cost = about $125,000.)

Implementation Schedule: Install when warrants are met. This threshold is likely to be met when about 90% of the NASA is built out.

Mitigation 34: McGowan Parkway must be widened to a four-lane section from Olivehurst Drive to SR 70.

Implementation Schedule: This improvement should be triggered by 12,000 ADT on McGowan Parkway. This threshold would likely be reached when about 50% of the NASA project is built out.

Mitigation 35: The McGowan Parkway/State Route Highway 70 interchange must be reconstructed as build out approaches.

Implementation Schedule: This mitigation would not be needed until the area is nearly built out, and may best be implemented as a cumulative mitigation.

Improvements needed under cumulative conditions.

Mitigation 36: A two part strategy should be implemented to mitigate regional impacts:

36A. A Public Facilities program, Area of Benefit or similar financing strategy should be established for the south Yuba County area, including, at a minimum the circulation system improvements indicated in Table 10 (DEIR). As indicated, these facilities are regional in nature, and either involve construction of roadways already included in the Yuba County Circulation Element or roadways which should be added.

Traffic & Circulation (cont.)

Mitigation 36: (cont.)

36B. Programs and strategies to reduce trip generation and dependence on the single occupant automobile must be developed. Yuba County must provide a policy basis and Transportation Systems Management (TSM) ordinance which requires employers to implement such programs and requires that new development include provisions for alternative transportation modes. As a part of this effort, the NASA owners must incorporate bicycle and pedestrian facilities into the project plan. In addition, the plan should include facilities, such as bus turn outs and Park & Ride Lots, which will facilitate future transit service and car pooling.

Mitigation 37: An area-wide funding mechanism must be established for the improvements identified in mitigation measures 31 through 36 above, and 39 below, in the form of a traditional acquisition assessment district or a Mello-Roos community facilities district encompassing all development proposals that will receive benefit. The funding mechanism must be established, and each subject property must agree to full participation, prior to recordation of final maps. ~~When implemented by Yuba County, the NASA area should participate in the local funding program to mitigate the MEA's cumulative impacts.~~

AIR QUALITY (DEIR pp. 76-83)

Post-Project Emissions

Mitigation 38: Industrial and commercial development with more than 25 employees will be required to prepare and implement a trip reduction and ridesharing program including coordination of carpools, and establishment of some form of flex-time work hours including staggered work schedules and compressed work weeks (ie., 4 days @ 10 hours).

Mitigation 39: An appropriate site near the McGowen / Highway 70 interchange should be identified by Department of Planning and HATA staff for development of a park-and-ride lot. HATA staff must also identify the acreage and improvements required to create an operational park-and-ride lot. ~~A per-unit based fee can be assessed for all new development to cover the costs of development of the lot.~~

Mitigation 40: The County will require preservation of the abandoned railroad corridor that forms the southwestern NASA boundary and extends through the Plumas Lake Specific Plan area as a potential long term light-rail route to link with the Sacramento rapid transit system, or alternatively, as a future roadway or bicycle route within the south County area.

Air Quality (cont.)

Mitigation 41: ~~The County will require that only wood stoves~~ All new residential units constructed in the Study Area which are to have wood stoves and/or fireplaces shall be equipped with catalytic systems ~~and~~ certified as meeting or exceeding ~~to meet or exceed~~ EPA standards. No units which have wood burning stoves or fire places shall receive final building permit clearance until verification of compliance with this measure is made. ~~may be installed in new units. This measure will be monitored as a part of routine building inspection procedures prior to issuance of occupancy permits.~~

Construction Impacts

Mitigation 42: Dust and particulates from construction grading must be minimized by regular sprinkling of exposed soils, and curtailing grading activities on days when wind exceeds 20 miles per hour. A grading and dust control plan will be required as a part of Improvement Plan review and approval. Specific methods for dust control shall be approved by the Director of the Public Works Department and the Feather River Air Quality Management District.

Mitigation 43: An "Authority to Construct" permit must be obtained from the Yuba County Air Pollution Control District by individual owners prior to beginning development.

NOISE (DEIR pp. 84-89)

Highway Noise

Mitigation 44: For all residential development, a 100-foot ~~lot-line~~ building setback is required from the edge of pavement of Highway 70, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the ~~Public Works~~ Planning and Building Services Director in consultation with the California Department of Transportation.

Mitigation 45: Deleted ~~Window or through-the-wall ventilation or air- conditioning units shall not be permitted for units along the highway or railroad corridors.~~

Noise (cont.)

Mitigation 46: Exterior walls facing the highway or railroad tracks shall be designed and constructed to meet a Sound Transmission Control Rating of 34. ~~wood frame structure with enhanced insulation in cavities. Wood or stucco finish should be applied over wood or gypsum sheathing. Gypsum wall board 0.5 inch thick, attached with resilient channels, shall be used on interior wall faces and ceilings, or equivalent method to meet STC requirements.~~ Proposed design standards shall be submitted and approved by the Planning and Building Services Director prior to issuance of building permits.

Mitigation 47: ~~Double-pane~~ Windows ~~with~~ shall have a minimum Sound Transmission Control (STC) rating of 34 ~~shall be used~~ on all wall sides facing towards the highway or railroad tracks. ~~Windows on these sides should comprise less than 25 percent of the wall area.~~ Sliding glass doors and other doors facing towards the highway should have a minimum STC rating of 34.

Railroad Noise

Mitigation 48: For all residential development, a 100-foot ~~lot line~~ building setback is required from the edge of the railroad tracks, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the ~~Public Works~~ Planning and Building Services Director.

Yuba County Airport

Mitigation 49: New single-family residences and school classrooms will be allowed in areas having airport caused noise between ~~the~~ 65 to 70 ~~75~~ db (Community Noise Equivalent Level: CNEL) provided the following criteria are met:

a) The proposed structure is constructed in such a manner so that the interior noise level does not exceed 45 db(CNEL).

b) Avigation noise easements are secured prior to issuance of building permits and as a condition of subdivision or other discretionary permit approval.

Mitigation 50: New hotels, motels, apartment houses, and dwelling units except single-family dwellings, will be permitted in areas having an airport caused noise between 65 to 75 db(CNEL) provided the following criteria are met:

a) The units are constructed in accordance with the noise reduction requirements set forth in the California Administrative Code, Title 24, Section 28 and in Chapter 35 of the Uniform Building Code.

b) Avigation noise easements are secured prior to issuance of building permits and as a condition of subdivision or other discretionary permit approval.

Noise (cont.)

Future Arterial Road Noise

Mitigation 51: All lots fronting on arterial roadways shall be separated from the roadway by a solid block masonry wall or combination wall and berm. Said wall or wall/berm combination (barrier) shall not be less than six feet in height. The design of the barrier shall be subject to review and approval of the Planning and Building Services Director and shall be constructed prior to issuance of building permits.
~~Minimum lot-line setbacks of 25-feet shall be required from the edge of right-of-way along all arterials, and a solid block or masonry wall will be placed at the lot-line to shield residences from the road. Alternatively, the setback could be increased and the barrier eliminated. Barrier design shall be subject to review and approval of the Planning Director. The wall shall be constructed by the owner/ applicant prior to map recordation. Structures over one (1) story in height shall be constructed to limit interior levels to a maximum of 45 dB.~~

Industrial / Residential Land Use

Mitigation 52: Uses on industrial parcels adjacent to the residential zone shall be limited to activities which do not include noise generation in excess of County standards for residential areas (65 dB as measured on the residential property boundary). In particular, compressors, generators, or other loud equipment that might be mounted or otherwise located along the outer side and walls of buildings should be prohibited, or located in such a way to orient away from residential properties.

Mitigation 53: Individual industrial users must minimize noise transmission to meet performance standards established by the County. Techniques may include, but are not limited to, restrictions on the duration of activities, building orientation and location, and requirements for construction of building envelopes which are properly sealed to prevent noise transmission to surrounding properties. Except for emergency equipment, public address systems, bells, or electronic signalling devices which can be heard outside of buildings will not be permitted.

Mitigation 54: ~~Except for emergency equipment, public address systems, bells, or electronic signalling devices which can be heard outside of buildings will not be permitted.~~ The owners of residential developments adjacent to existing M-1 Industrial zoned properties shall construct a solid barrier wall along the shared boundary. The wall shall be constructed prior to issuance of occupancy permits, and shall be designed based upon a noise attenuation study prepared for the owner by a qualified engineer, subject to review and approval of the Director of Planning and Building Services.

GEOLOGY & SOILS (DEIR pp. 90-102)

Seismic Safety

Mitigation 55: Deleted ~~All structures built as part of this project should be designed with frames bolted to foundations. In addition, potential home buyers should be informed through an informational deed clause of the seismic risk associated with the Sierra foothills region.~~

Expansive Soil

Mitigation 56: The Subdivision Map Act of the Business and Professional Code (section 11010) requires that soil conditions on all tract developments of five lots or more be studied by a registered civil engineer. The engineering study should include laboratory tests for soil expansion.

Erosion Control

Mitigation 57: Owner shall submit an Erosion and Sediment Control Plan to the Public Works Department for review and approval. The plan shall identify best management practices to be utilized during all construction phases, and landscaping or other post-construction surface stabilization measures. ~~Subject to approval by the Public Works Department, oil and grit separator, sediment traps, evaporation basins, slow restriction devices and/or other methods to reduce the volume of grease and oil pollutants caused from street surface runoff shall be installed in the storm drain system. Owner shall also submit storm drainage plans to the Public Works Department for review and approval.~~

BIOLOGICAL RESOURCES (DEIR pp. 103-105)

Mitigation 58: The project shall incorporate a 25-foot average nondevelopment setback buffer from the high bank of ~~intermittent drainages,~~ drainage ditches and swales. ~~ponds and perennial watercourses.~~

Mitigation 59: ~~Owners shall secure a Stream Bed Alteration Agreement if required, from the State Department of Fish and Game prior to construction within the 100-year floodplain.~~

Biological Resources (cont.)

Mitigation 60: Prior to Tentative Map approval, the owners of projects 3, 8, and 13 shall cause submit a biological survey prepared by a recognized consultant which will include delineation of wetland acreage by type if any, within the owners land. Once the survey is completed, the consultant shall calculate the area of jurisdictional wetlands, if any. Said area shall be classified as pond, river, seasonal wetland, marsh, drain or other classification. If said area is between one (1) and ten (10) acres, then the owners shall complete and forward a Nationwide Permit 26 to the U.S. Army Corps of Engineers. If said area is over ten (10) acres, then the owner shall apply to the Corps for a Section 404 permit prior to development. The owner shall submit a copy of the survey and permit to the Planning and Building Services Department for review prior to map recordation.

Mitigation 61: A detailed map showing the location and quantity of vernal pools, water courses, and wetlands in the project area shall be submitted to the Planning and Building Services Director for review prior to map recordation.

Mitigation 62: The owner shall cause to prepare and submit to the Planning and Building Services Director for review and approval a complete revegetation plan which when implemented, will result in no net loss of protected wetland acreage (ie. one acre or greater area) or protected wetland habitat value. Said revegetation shall be planted or bonded for prior to map recordation. A detailed revegetation monitoring plan shall also be prepared by the owner to assure compliance.

Mitigation 63: All healthy existing oak trees on the site shall be preserved and protected from changes in grading and soil moisture regimes. An arborist's report shall be prepared and submitted to the Planning and Building Services Director for review and approval prior to any removal of oak trees on the site and prior to map recordation.

CULTURAL RESOURCES (DEIR p. 106)

Mitigation 64: Should any prehistoric or historic artifacts be exposed during excavation and construction operations, work shall cease immediately and the Department of Planning and Building shall be notified. A qualified archaeologist shall be consulted to determine whether any such materials are significant prior to resuming ground breaking construction activities. Standardized procedures for evaluating accidental finds and discovery of human remains shall be followed as prescribed in Appendix K of the California Environmental Quality Act.

FINDINGS OF UNAVOIDABLE IMPACTS

If mitigation measures 1 through 64, as amended and identified in this Final EIR are adopted as required conditions of project approval, the County can adopt a finding that site-specific and individual project impacts will be reduced to levels that are less than significant. However, cumulative impacts related to regional air quality degradation and loss of habitat have been identified as significant and unavoidable, despite the mitigation requirements imposed.

Cumulative Air Quality Impacts

As for all projects in the Feather River air basin, this project will contribute to cumulative regional air quality impacts. Project features or mitigation requirements which partially mitigate this impact include:

- equitable contribution funding for a park-and-ride lot(s),
- provision of bike lanes and secure bicycle parking facilities throughout residential and recreational areas and connecting with commercial areas,
- construction of sidewalks and interconnected walk ways.
- establishment of mixed land use to promote a better balance between local housing development and employment opportunities,
- development of commercial and professional services near residential development to reduce the need for extended travel.
- preservation of the abandoned railroad corridor that forms the southwestern NASA boundary and extends through the Plumas Lake Specific Plan area as a potential long term light-rail route to link with the Sacramento rapid transit system.
- only wood stoves equipped with catalytic systems and certified to meet or exceed EPA standards may be installed in new units.

The Feather River Air Quality Management District has suggested that, given every project's contribution to the District's non-attainment status, and the California Clean Air Act's mandate for no net increase in emissions, any project should be considered cumulatively significant and the impact unavoidable.

It is therefore recommended that the County should find the contribution to the non-attainment status within the air basin from development of the North Arboga Study Area represents an adverse unavoidable cumulative impact. A Statement of Overriding Considerations (CEQA section 15091) must be adopted prior to approval of individual projects.

Cumulative Habitat Degradation Impacts

Sensitive biological resources do exist within project lands, and mitigation measures are identified to prevent significant adverse impacts. Even with the full implementation of the prescribed measures, some residual impact will occur in the reduction of habitat value, and the cumulative contribution to regional losses and/or degradation of habitat. A conclusion that the site specific residual impacts are less than significant is supported by the following findings:

- The site has been heavily disturbed by historic activities, including grazing, grading, road cutting, and construction of utility lines;

- The surrounding land has been heavily disturbed by human activities and urban development. Adjacent and nearby land uses include residential development, industrial development, a sewage treatment plant, State Highway 70, the Southern Pacific Railroad tracks, and local traffic arterials such as Feather River Boulevard and McGowan Parkway;

- As a part of its long term land use planning program, the County of Yuba has adopted urban land use designations for the property, intended to permit development of residential units as recognized in the present General Plan and zoning;

As a Responsible Agency under CEQA, the California Department of Fish and Game has recommended that this project's contribution to a cumulative loss of habitat should be recognized as significant. This conclusion is supported by the following finding:

- This project contributes to an incremental reduction in waterfowl habitat area caused by the encroachment of urban development on irrigated farmland used to grow rice throughout the County of Yuba and the surrounding Sacramento Valley areas.

By this criteria, the impact of almost any project on land used to grow rice should be considered cumulatively significant and the impact unavoidable.

It is therefore recommended that the County should find that development of former rice lands within the North Arboga Study Area may contribute to a regional reduction in waterfowl habitat values, and represents a significant adverse unavoidable cumulative impact. A Statement of Overriding Considerations (CEQA section 15091) relative to this finding must be adopted prior to approval of individual projects.

RESPONSES TO COMMENTS

INTRODUCTION

Section 15088 of the California Environmental Quality Act requires that written responses be prepared to all responsible comments submitted in writing to the Lead Agency or given as testimony at public hearings regarding the draft EIR. Comments were submitted by the following:

A. Office of Planning and Research

B. State Department of Transportation (Caltrans)

C. State Department of Fish and Game

D. California Resources Agency, The Reclamation Board

E. Reclamation District No. 784

F. Feather River Air Quality Management District

G. Hub Area Transit Authority

H. Commissioner William H. Back, County of Yuba

I. Centex Homes

J. Land Development Services, Inc.

K. Richard E. Webb

L. Planning Commission Hearing, 2 September 1992

Responses are provided below under individual headings. Original comment letters proceed individual responses. Technical assistance in preparing these responses was provided by Research Associates. Additional comments identifying revisions for mitigation language were prepared by Kerri Campbell, Associate Planner, and Pete Calarco, Associate Planner, of the Yuba County Planning Department. All revisions identified by the staff have been made as shown in the Revised Mitigation Summary above, and are incorporated in the Final Mitigation Implementation Plan attached at the end of this document.

STATE OF CALIFORNIA PETE WILSON, *Governor*

GOVERNOR'S OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

Sep 25, 1992

PETER CALARCOL
YUBA COUNTY
938 14TH STREET
MARYSVILLE, CA 95901

Subject: NORTH ARBOGA STUDY AREA
SCH # 92012045

Dear PETER CALARCOL:

The State Clearinghouse submitted the above named environmental document to selected state agencies for review. The review period is closed and none of the state agencies have comments. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call Russell Colliau at (916) 445-0613 if you have any questions regarding the environmental review process. When contacting the Clearinghouse in this matter, please use the eight-digit State Clearinghouse number so that we may respond promptly.

Sincerely,

Christine Kinne

Christine Kinne
Acting Deputy Director, Permit Assistance

RESPONSE A

Office of Planning and Research

The comment confirming the County's compliance with State Clearinghouse review requirements is acknowledged. No further response is required.

STATE OF CALIFORNIA — BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 3, SACRAMENTO
P. O. BOX 942874-MS 41
SACRAMENTO, CA 94274-0001
TDD 916-741-4509
FAX 916-323-7669
Telephone 916-327-3859

October 7, 1992

DYUB028
North Arboga Study Area
General Plan & Zone Change
03-YUB-70 PM-7.3

Mr. Larry F. Brooks, Director
Yuba County Planning Department
938 14th Street
Marysville, CA 95901

Dear Mr. Brooks:

We have reviewed the above-referenced document and request consideration of the following comments:

• 1. The Draft Environmental Impact Report (DEIR) is inconsistent in its conclusions regarding the State Route 70 (SR-70)/McGowan Road Interchange. On page 66, it states that signal warrants would be met under existing plus project conditions, and correctly points out that the number of lanes crossing over the freeway would have to be increased before the interchange could be signalized. On page 73 it states that the interchange will not need to be reconstructed until the area is nearly built out. Reconstruction of this interchange will be necessary before the North Arboga Study Area is built-out, due to the substantial amount of development proposed East of the McGowan Road interchange. The County should plan on reconstructing the interchange at the same time that McGowan Road is widened to 4 lanes west of the interchange.

• 2. Although the Powerline/McGowan intersection is listed as warranting signals under the cumulative analysis, it is too close to the SR-70 south bound ramp intersection to allow it to be signalized. As we have previously commented regarding the McGowan Plaza Commercial Center, a raised median will need to be constructed through the Powerline Road intersection. This will limit it to right turns only from McGowan Road, and divert the left-turn movements.

• 3. On Figure 8, page 67, an extension of Plumas-Arboga Road east to SR-70 is indicated. An interchange is not planned at this location. The figure and traffic study should be revised to show impacts with and without this interchange.

- 4. The traffic study should be amended to reflect 20 year traffic projections since many of the improvements and build-out schedules will not be completed during the period covered by the current document.

- 5. Given the location and limited jobs expected to be available in this area, a large number of vehicle trips will use the State Highway System to reach job centers to the south. This will cause a disproportionate negative impact on both traffic congestion and air quality. All reasonable means of reducing these impacts should be considered and employed. The County should develop a set of very specific traffic and air quality mitigation measures that all new development would be required to follow. These measures could include:

  - Development of a Transportation System and Demand Management Plan. Progress and services to meet and exceed the objective of a peak hour average per vehicle ridership rate of 1.5 person per vehicle.A county-wide pedestrians and bicycle circulation plan that insures adequate access to schools, parks, and shopping from residential areas. The plan should also require each development or specific plan to include a compatible design and implementation plan.

  - Provisions for neighborhood telecommute work centers.

    Transit provisions, including funding mechanisms that insure capital and operating funds for transit services are available.

  - For further suggestions regarding TSM and TDM progress, please contact Caltrans' Sacramento Rideshare at 916-445-7665 or 1-800-468-7665.

If you have any questions, please contact Tom Meyers at 916-323-0543 or FAX 916-323-7669.

Sincerely,

JEFFREY PULVERMAN, Chief
Planning Branch C

RESPONSE B

State Department of Transportation (Caltrans)

1. The "with-project" scenario implies post-development conditions, and is not inconsistent for analysis of NASA area development. Caltrans is correct that the interchange reconstruction should be completed as needed due to cumulative development levels, and NASA properties must contribute on an equitable basis to costs.

2. The comment is noted; Caltrans has approval authority for final designs for improvements to McGowan Road and the affected intersections.

3. The "assumed roadway" segment is shown based upon long term road improvements required to serve the NASA area and adjacent Plumas Lakes developments to the south.

4. The estimated buildout for the NASA area is approximately 20 years, subject to market conditions which cannot be accurately forecast. Required road improvements are tied to development levels and may also be delayed under a slow-growth scenario.

5. The County is preparing a preliminary Transportation System and Demand Management Plan as a part of its revised General Plan Circulation Element. Traffic related air emissions are addressed in mitigation measures 38 through 40.

Comment C

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME
REGION 2
1701 NIMBUS ROAD, SUITE A
RANCHO CORDOVA, CALIFORNIA 95670
(916) 355-7020

September 22, 1992

Mr. Karri Campbell
Yuba County Planning Department
938 14th Street
Marysville, California 95901

Dear Mr. Campbell:

The Department of Fish and Game (DFG) has reviewed the Draft Environmental Impact Report (EIR) for the North Arboga Study Area (NASA).

The study area includes 1,000± acres located in the southwestern region of Yuba County approximately five miles south of the City of Marysville. The area is bound by the Northern Railroad tracks on the west, Plumas-Arboga Road on the south, State Highway 70 on the east, and Helveta Road, Clark Slough, and 11th Avenue on the north. Four different property owners have title to lands in the project area.

Significant resources in the project area include the Clark Lateral, other waterways, and wetlands. The wetlands may be providing habitat for the giant garter snake (Thamnophis couchi gigas). Much of the area is in rice production and is habitat for both summering and wintering waterfowl. The area is located within the American Basin of the Central Valley.

The DFG recommends that the following additions or changes be incorporated into the NASA EIR.

1. Mitigation 28: The project shall incorporate a ~~25-foot~~ 50-foot nondevelopment setback buffer from the high bank of intermittent drainages and swales, and 100-foot nondevelopment setback buffer from ponds and perennial watercourses.

2. Mitigation 60: Prior to Tentative Map approval, the owners of projects 3, 8, ~~and~~ 13, and any other project impacting wetland habitat shall submit a biological survey prepared by a recognized consultant which will include delineation of wetland acreage by type if any, within the owner's land. Once the survey is completed, the consultant shall calculate the area of jurisdictional wetlands, if any. Said area shall be classified as pond, river, seasonal wetland, marsh, drain or other classification. If said area is between one (1) and ten (10) acres, then the owners shall complete and forward a

Nationwide Permit 26 to the U.S. Army Corps of Engineers. If said area is over ten (10) acres, then the owner shall apply to the Corps for a Section 404 permit prior to development. If the acreage to be filled is under one (1) acre, a wetlands compensation plan shall be submitted to the DFG. The County of Yuba will accept a map delineating wetlands which has been accepted by the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act of 1972 and by the California Department of Fish and Game. It should be the policy of the County of Yuba to ensure on a project-by project basis, that there will be no net loss of wetland acreage or value.

The owner shall submit a copy of the survey and permit approval to the Planning and Building Services Department for review prior to map recordation.

3. There was a paucity of information on the impacts of urban pollutants (oil, grease, heavy metals, silt) on local waterways in the EIR. The DFG believes that, at a minimum, the following comments should be included in the EIR. Storm runoff from urbanized portions of Yuba County will contribute to the level of urban pollutants in area waterways which receive this runoff. These pollutants create a significant adverse impact to the fish and wildlife resources. The following policies to reduce this pollutant level should be included.

   a. It should be the policy of Yuba County to retrofit Best Management Practices (BMPs) into existing urbanized areas whenever possible.

   b. BMPs should be incorporated into the design of drainage systems for individual projects within the NASA.

   Project applicants will be responsible for the design and construction of on-site drainage facilities which will serve to reduce the levels of contaminants associated with the discharge of urban runoff to local waterways to the regional standard referred to below. The strategy to control contaminant levels will rely, in part, on the implementation of BMPs. Typical urban runoff BMPs include retention and detention ponds, permanent ponds with established wetland vegetation, infiltration trenches, filter strips, and grassed swales. These BMPs are generally passive in their operation and, therefore, function without routine direct management, although some periodic maintenance may be required.

4. The DFG recommends that stream corridors be incorporated into the plan area as aesthetic and biological resources. We suggest that the stream corridor be located across the street from a row of homes rather than behind the backyards.

   This policy will substantially increase the biological values of the stream corridors.

5. The rice land in this project area is habitat for a variety of migratory waterfowl and other shorebirds. The loss of rice fields within the American Basin would be considered a significant adverse impact to waterfowl and other avian wetland species. Impacts to rice field habitat values should be thoroughly discussed. Impacts from the loss of rice lands to avian wetland species should be discussed.

6. The County of Yuba will require fee title or a restricted easement recorded over any property that contains areas designated for preservation, including wetlands, vernal pools, and rare, threatened and endangered species habitat. Such easements would restrict the use and type of structures located within them.

7. Project-specific surveys for rare, threatened, and endangered vernal pool plant species shall be conducted by a qualified botanist during the appropriate flowering season.

8. Sufficient watershed area shall be preserved so as to maintain the hydrologic integrity of each vernal pool to be preserved. A qualified botanist shall recommend the appropriate watershed area for preservation.

9. Wildlife corridors shall be preserved to permit the free movement of wildlife and to integrate this free movement with the preservation of wetland resources.

10. In consultation with a wildlife biologist, road crossings in wildlife corridors shall be designed to accommodate and facilitate the free passage of wildlife.

11. To the extent practicable, all habitat preserves, park lands, and wildlife corridors shall be interconnected.

12. Breeding season surveys for raptor nests shall be conducted and any nest trees and surrounding environs shall be avoided during the breeding season.

13. Bicycle/equestrian pathways shall generally be placed as far from the stream/wetlands as possible to avoid wildlife impacts.

14. Grassland Preserves - Many raptors and other wildlife species rely on annual grasslands for foraging habitat. Many of these species rely also on adjacent woodland or riparian habitats for reproduction, escape cover, and migration or dispersal corridors. Annual grasslands that are adjacent to riparian and other woodland habitats. often provide foraging habitat that is essential to their survival. Fragmentation, isolation, or elimination of annual grassland habitat is considered to be a significant impact. Protection of these resources should be included through establishment of adequate annual grassland preserves adjacent to riparian and other woodlands.

15. Threatened, Endangered, Special Status, or Other Listed Species.

    Development could result in the loss of rare, threatened, or endangered plant and wildlife species, their potential habitat or special-status natural communities.

    The following policies to eliminate this potential loss of habitat should be included.

    a. Project specific surveys for threatened, endangered, special status, or listed plant and wildlife species; their potential habitat; and special status natural communities shall be conducted by a qualified biologist or botanist, during the appropriate season, to determine the presence or absence of the above.

    b. If threatened, endangered, special status, or listed species are found to be present, the appropriate state, federal, or local agency shall be contacted to assist in the determination of what regulations apply and what mitigation will be necessary.

    c. Compliance and implementation of all state, federal, or local agency regulations and mitigation shall be required.

If the DFG can be of further assistance, please contact Mr. Dale Whitmore, Associate Wildlife Biologist or Mr. Jerry Mensch, Environmental Services Supervisor, telephone (916) 355-7030.

Sincerely,

Bruce Burnyeat

for James D. Messersmith
Regional Manager

cc: Mr. Ron Bertram
Department of Fish and Game
Rancho Cordova, California

Mr. Jerry Mensch
Department of Fish and Game
Rancho Cordova, California

RESPONSE C

State Department of Fish and Game

1. Since the only water courses within the study area are roadside ditches and man-made drainage canals, the 25-foot setback is deemed adequate by the County.

2. County policy does include full mitigation compliance with Federal Clean Water Act section 404 requirements and State Fish and Game code 1603 permitting. The County does not require mitigation of wetlands that are considered less than significant under Clean Water Act threshold criteria, ie., areas which are less than one acre and therefore exempt from section 404 permitting.

3. Stormwater drainage system improvements are identified in mitigation measures 23 through 29, and do include detention basins and landscaping. Mitigation number 27 has been revised as shown below to include designs to meet requirements of the County's National Pollutant Discharge Elimination System (NPDES) permit, including construction of BMPs for filtering pollutants.

Mitigation 27: The owner shall submit to the Public Works Department for review and approval drainage plans and calculations for the proposed project which are prepared by a registered engineer ~~for the proposed project to determine the quantity of increased drainage runoff~~ which quantify the amount of increased drainage run-off from the project. Said plans shall be submitted and approved prior to recordation of the Final Map. Projects that will increase downstream drainage flow will not be approved by the County until adequate drainage facilities are completed. Initially, projects may be approved that incorporate on-site detention or retention ponds that will prevent any increase in downstream storm water runoff. Owner shall construct the drainage facilities in conformance with the plans approved by the Public Works Department and Reclamation District 784. Oil and grit separators, sediment traps, evaporation basins, slow restriction devices and/or other methods to reduce the volume of grease and oil pollutants caused from street surface runoff shall be included in the storm drain design to meet requirements of the County's NPDES permit.

4. No stream corridors exist within NASA. Mitigation measure 59, regarding possible streambed alteration permitting, has been deleted.

5. Rice land is not protected as critical wildlife habitat under any State or Federal law. The rice land within NASA does not represent "significant" acreage relative to the total rice acreage in the Sacramento Valley, and contains no unique habitat values, therefore, no significant impact to any avian species is expected from the loss of rice lands within NASA. A recommendation for finding that the NASA developments may contribute to a cumulative impact relative to regional habitat loss is presented in the "Findings of Unavoidable Impacts" section of this Final EIR.

6. The comment is noted; easement restrictions for required open-space and preservation zones is standard County policy, implemented as a part of standard Tentative Subdivision Map conditions.

7. This requirement will be implemented under mitigation measure number 60.

8. This requirement will be implemented under mitigation measure number 60.

9. No wildlife corridors exist within NASA.

10. See response to #9 above.

11. See response to #9 above.

12. Very few trees exist within the project area, and the likelihood of raptor nesting sites is low. A biological resource survey is required under mitigation measure 60, and oak tree preservation is stipulated in measure number 63.

13. No stream corridors exist within NASA. The recommendation for distance separation between wetlands and bicycle/pedestrian pathways is noted.

14. Grassland habitat within NASA is comprised of horse and cattle grazing land and rice fields. NASA properties are not adjacent to riparian or woodland habitats.

15. The biological analysis of NASA properties conducted by Dr. Kenneth Whitney concluded that there are very few biological constraints within the study area, and the presence of State and Federally listed protected species is unlikely due to the lack of suitable habitat. Mitigation measures 58 through 63 are intended to ensure compliance and implementation of all state, federal, and local regulations relative to protected plant and animal species.

State of California

Comment D

The Resources Agency

Memorandum

Date SEP 2 5 1992

To 1. Projects Coordinator
The Resources Agency

2. Mr. Larry Brooks, Director
Department of Planning and
Building Services
County of Yuba
938 - 14th Street
Marysville, California 95901

From **THE RECLAMATION BOARD**

Subject North Arboga Study Area (SCH No. 92012045)

Staff for The Reclamation Board has reviewed the draft Environmental Impact Report for the subject project and has the following comments for consideration by Yuba County.

The proposed project area consists of approximately 1,300 acres located in Yuba County about five miles south of the City of Marysville. The project area is bounded by Highway 70 on the east and by the Sacramento Northern Railroad tracks on the west. The project includes up to twelve development projects with a total of 2,500 residential units, 205 acres of industrial use and 10 to 20 acres of commercial use.

1. The draft EIR does not disclose the fact that the project area currently does not have 100-year flood protection. The Sacramento River Flood Control Project levees on the Yuba River to the north of the proposed project area and on the Feather River to the west, have structural deficiencies that were identified in studies conducted by the U.S. Army Corps of Engineers as part of the Sacramento River Flood Control System Evaluation. Please refer to the enclosed map. A project is currently being planned by the U. S. Army Corps and The Reclamation Board with participation by the Yuba County Water Agency, that would restore the levees to their original level of protection. Construction of this project is scheduled to begin in 1993 and will take several years to complete. After completion of this project, most the proposed North Arboga study area would have approximately 150-year flood protection.

2. A portion of the proposed project , subarea 5, is located almost entirely in an area where the Sacramento-San Joaquin Drainage District (The Reclamation Board) has a flowage easement. About 400 acre feet of water from the Bear River can be stored in this area. This easement was purchased by the Reclamation Board as the nonfederal sponsor responsible for obtaining lands easements and right-of-way for the construction of the Sacramento River Flood Control Project. Before the Board would approve the sale of the easement and the diversion of

flood water into other facilities, a detailed engineering study must be provided that shows the impact to the flood control system from such a diversion. The Board will require that the project proponent purchases the easement at fair market value.

For more information on our environmental review, please contact Annalena Bronson at (916) 653-9669. For more information on the permit process, contact Donald L. Jackson, at (916) 653-5726.

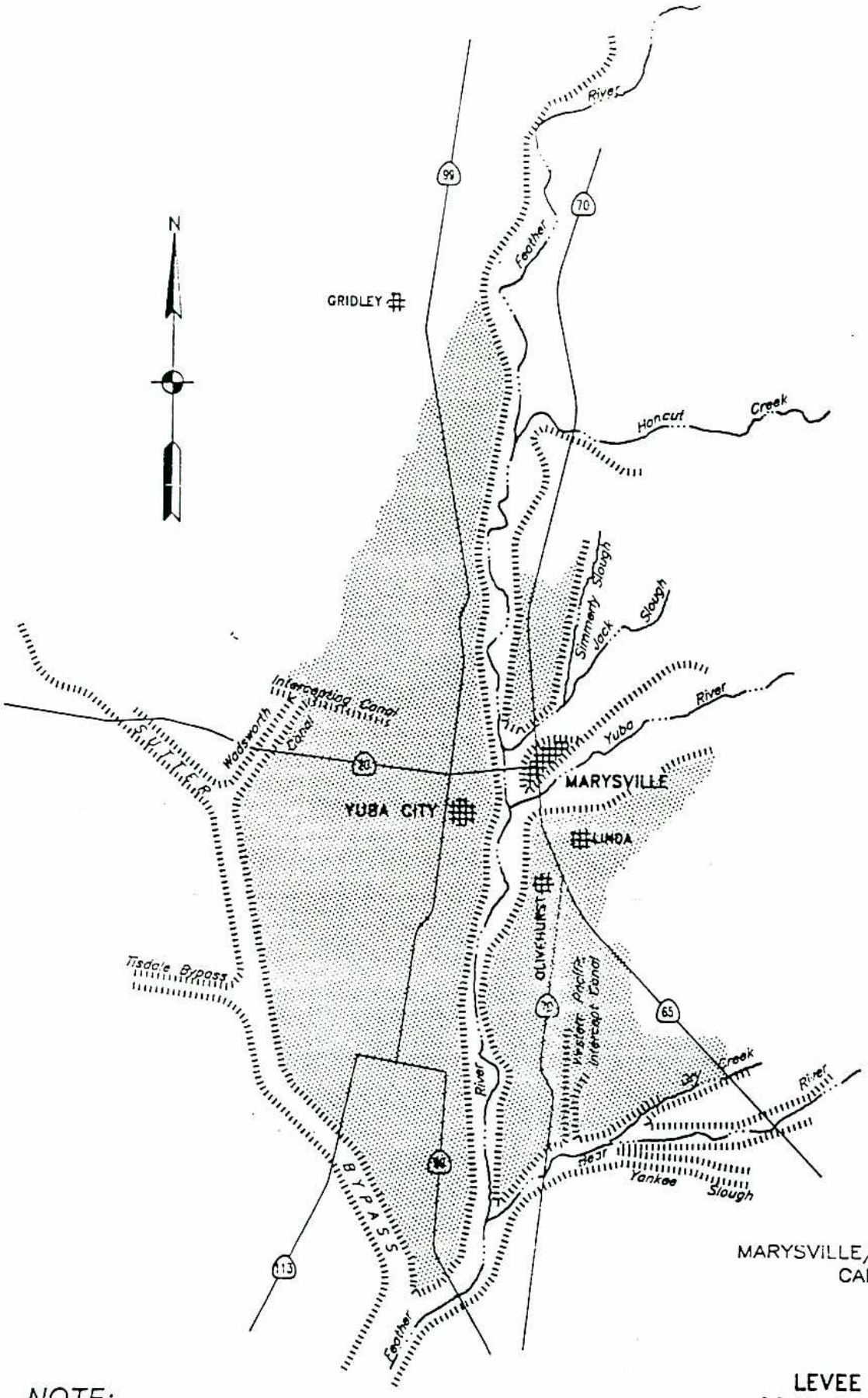
Thank you for the opportunity to comment.

Rodney A. Mayer

for Raymond E. Barsch
General Manager
(916) 653-5434

Enclosure

cc: Office of Planning and Research
1400 Tenth Street
Sacramento, California 95814



MARYSVILLE/YUBA CITY AREA
CALIFORNIA

LEVEE BREACHING
100-YEAR FLOODED AREA

NOTE:
About 130,000 acres of land landward of the project levees would be flooded due to potential levee breaks.

SACRAMENTO DISTRICT, CORPS OF ENGINEERS
NOVEMBER 1989

FIGURE 21

RESPONSE D

California Resources Agency, The Reclamation Board

1. According to Mike Smith, Consulting Engineer for Reclamation District 784, the information conveyed in the Reclamation Board's comment letter was unknown at the time the report was prepared, and is not reflected in Federal Emergency Management Agency mapping for the County.

It is the County's policy to rely upon the FEMA designation in evaluation of flood hazard, and this is reflected in the drainage analysis and related mitigation measures identified in the EIR.

The condition of the levees and the Reclamation Board's position regarding inadequacy for minimal 100-year flood protection is acknowledged. Levee enhancement projects are in final planning stages, and funding has been provided by the Yuba County Water Agency. It is anticipated that the levees will be repaired by the time actual development within NASA takes place.

2. Mitigation measures 26 and 27 provide the means to satisfy the Reclamation Board's requirements pertaining to approval of sale of the flood inundation easements and required drainage plans.

92107/7E800

RECLAMATION DISTRICT NO. 784
1594 BROADWAY ROAD
MARYSVILLE, CA 95901-9632

MEMORANDUM

TO: Yuba County Planning - Larry Brooks & Jim Manning
FROM: Reclamation District No. 784
DATE: September 23, 1992
SUBJECT: Comments to the Draft EIR - North Arboga Study Area

The following comments have been prepared for the Draft EIR. The comments here are focused on the draft mitigation measures. Reclamation District No. 784 is concerned that unless the mitigations reflect the suggested changes required, drainage could be adversely affected, and regional drainage improvements may not be provided for and, further, that operation and maintenance could become extensive. Our comments are as follows:

Mitigation No. 23 - No comment

1. Mitigation No. 24 - It may not be possible for Reclamation District No. 784 to provide service to some of the areas encompassed within the North Arboga Study Area; therefore, the District could not annex these areas. It is recommended that Mitigation No. 24 be rewritten as follows; "All lands not presently in Reclamation District No. 784 shall apply for annexation to the District during the development process. If Reclamation District No. 784 cannot serve these areas, then another entity such as a County Service District shall be formed for operation and maintenance of drainage facilities."

Mitigation No. 25 - No comment

Mitigation No. 26 - No comment

2. Mitigation No. 27 - Taken literally, Mitigation No. 27 would allow development to occur on individual parcels through the construction of individual on-site retention and/or detention ponds. Studies have shown that a series of individual project on-site detention ponds could lead to a worsening of regional or basin wide drainage problems and actually cause an increase in regional peak flows. The mitigation measure should stress that onsite detention/retention is a temporary solution and can only be done in conjunction with the incremental development of regional drainage improvements consistent with a regional drainage master plan. The mitigation measure should also

stress that the individual onsite detention/retention basins, unless determined to be of regional benefit consistent with a master drainage plan, are to be eliminated and, further, that use of onsite facilities does not relieve said projects from contributing reasonably to regional storm drainage improvements. The mitigation should also include Reclamation District No. 784 approval of drainage plans and reports. A suggested rewording of the mitigation is as follows:

"The owner shall submit for review and approval by the Public Works Department and Reclamation District No. 784 drainage plans and calculations prepared by a registered civil engineer for the proposed project. Said plans and calculations shall address the impact of the proposed project for 2, 10, and 100 year, 24-hour storm events. Project drainage improvements shall be developed consistent with a regional drainage master plan. Initially, projects may be approved that incorporate on-site detention or retention ponds. Use of such ponds shall be considered temporary measures and shall only be allowed to remain on a permanent basis if determined to be of a regional benefit consistent with a regional drainage master plan. Use of on-project temporary detention or retention ponds shall not eliminate the project's responsibility for financial contribution to required regional drainage improvements."

3. Mitigation No. 28 - Add Reclamation District No. 784 as an approving body for landscaping plans in drainage facility areas.

4. Mitigation No. 29 - This mitigation should be eliminated. We feel, the intent of No. 29 is now addressed in the rewording of Mitigation No. 27. Currently, No. 29 conflicts with No. 27 and both mitigations could lead to extreme regional drainage problems and excessive operation and maintenance costs.

Thank you for the opportunity of commenting on the Draft EIR. The District Manager and District Engineer would gladly meet with the planning staff to discuss these issues.

RESPONSE E

Reclamation District No. 784

1. Mitigation 23 has been deleted in favor of the revised Mitigation 27 (see response 2 below).

Mitigation 24 has been revised as follows:

Mitigation 24: All lands not presently in Reclamation District No. 784 must be annexed into the district, provided the district allows the annexation, ~~during the development process and~~ prior to recordation of final maps.

2. Mitigation 27 has been revised as follows:

Mitigation 27: The owner shall submit to the Public Works Department for review and approval drainage plans and calculations for the proposed project which are prepared by a registered engineer ~~for the proposed project to determine the quantity of increased drainage runoff~~ which quantify the amount of increased drainage run-off from the project. Said plans shall be submitted and approved prior to recordation of the Final Map. Projects that will increase downstream drainage flow will not be approved by the County until adequate drainage facilities are completed. Initially, projects may be approved that incorporate on-site detention or retention ponds that will prevent any increase in downstream storm water runoff. Owner shall construct the drainage facilities in conformance with the plans approved by the Public Works Department and Reclamation District 784. Oil and grit separators, sediment traps, evaporation basins, slow restriction devices and/or other methods to reduce the volume of grease and oil pollutants caused from street surface runoff shall be included in the storm drain design to meet requirements of the County's NPDES permit.

3. Mitigation 28 has been revised as follows:

Mitigation 28: Detention basin and drainage corridor areas shall be landscaped to meet with approval of the County of Yuba and Reclamation District No. 784. Landscaping shall consist of grass or other ground cover approved by the Public Works Department and Planning and Building Services Department.

4. Mitigation 29 has been deleted in favor of the revised measure 27 (see response 2 above).

Comment F

FEATHER RIVER
AIR QUALITY MANAGEMENT DISTRICT
(Yuba and Sutter Counties)
463 Palora Ave., Yuba City, CA 95991 (916) 634-7659 (FAX 634-7660)

To: Yuba County Department of Planning and Building Services

From: Dave Mehl, APC Specialist

Date: September 14, 1992

Re: EIR for North Arboga Study Area

The District has reviewed the Environmental Impact Report for the North Arboga Study Area and would like to see the following issues addressed in the Environmental Impact Report:

1) Include possible mitigation measures for household emisisons, other than heating (i.e. burning of residential wastes, gasoline powered lawn mowers, etc.)

As a matter of information, for the project, there is a possibility of health hazard/nuisance from the project being in the vicinity of the industrial area on Feather River Boulevard, e.g. Sithe Energies and All Pure Chemical. This should be considered for safety and health reasons.

RESPONSE F

Feather River Air Quality Management District

1. All County lands are provided with garbage collection services, reducing the likelihood that residential wastes will be burned by new home buyers in NASA. The urban nature of the development should further preclude the likelihood that residents will burn residential waste.

Air emissions from gasoline powered landscaping equipment (mowers, etc.), and activities such as outdoor cooking are too limited, seasonal, and variable to be accurately estimated. Compared to agricultural burning, vehicle emissions, and home heating, such sources make an insignificant contribution to the total emissions within the basin. It is also noted that emissions from these minor sources are not identified in any way in the October 1992 Draft Air Quality Element prepared by the Feather River Air Quality Management District.

HATA

HUB AREA TRANSIT AUTHORITY

Serving Marysville, Sutter County, Yuba City and Yuba County

August 27, 1992

RECEIVED

Mr. Karri Campbell, Associate Planner
Yuba County Planning Department
938 14th Street
Marysville, CA 95901

Re: North Arboga Study Area Draft EIR

Dear Karri:

Thank you for the opportunity to review and comment on the Draft EIR for the North Arboga Study Area (NASA). This letter reiterates and expands on my letter of February 4, 1992 regarding the scope and content of this EIR.

1. The references to HATA on pages 55 and 58 do not identify our daily Sacramento commuter services or the January 1993 implementation of fixed route service. While the study area is largely outside of HATA's current Dial-A-Ride service boundary, the location and the level of development being considered would ultimately lead to its inclusion in the service area for both Dial-A-Ride and fixed route service. In addition, this project will generate a significant number of work trips to the Sacramento area, thereby impacting the capacity of HATA's commuter service. Because of the limited capacity of HATA's existing Dial-A-Ride and commuter services, and because the level of fixed route service will be limited as well, the development of the study area and the greater South Yuba County Area will certainly affect the provision of public transit service. This cumulative impact should be noted in both the Public Services and Transportation Sections of the EIR.

2. Regarding the mitigation measures in the Draft EIR, Mitigation 36-B, which does mention the development of a Yuba County Transportation Systems Management (TSM) ordinance and plan, should also address the provision of transit vehicles. I am pleased to see that a park and ride lot at McGowan and Highway 70 (Mitigation 39) is being recommended in the Draft EIR. I would encourage its construction early in the development of South Yuba County prior to the establishment of travel patterns. As stated in February, an analysis of the projected employment market is necessary to determine the need for additional commuter service as a result of the development of South Yuba County. The results of such an analysis would be used to determine the per unit cost of commuter vehicles and the need and size of park and ride facilities.

1612 Poole Blvd. • Yuba City, CA 95993 • (916) 674-7882

I would be happy to discuss these comments with you in more detail. Please give me a call if you have any questions.

Sincerely,

Keith E. Martin
Manager

KEM/am

RESPONSE G

Hub Area Transit Authority

1. This project will contribute to a cumulative need to expand HATA's commuter transit service. Project generated tax revenues will provide some increased funding. Together with user fees set by HATA to recover costs for providing service, the cumulative impact should not be significant. Active participation of project residents in the regional commuter transit service may enhance the viability of the system by improving ridership rates.

2. Mitigation measures 37 and 39 have been revised to provide for funding and HATA involvement in design of the park-and-ride lot. The measures have been revised as follows (new text underlined, deletions shown with strike-out):

Mitigation 37: An area-wide funding mechanism must be established for the improvements identified in mitigation measures 31 through 36 above, and 39 below, in the form of a traditional acquisition assessment district or a Mello-Roos community facilities district encompassing all development proposals that will receive benefit. The funding mechanism must be established, and each subject property must agree to full participation, prior to recordation of final maps. ~~When implemented by Yuba County, the NASA area should participate in the local funding program to mitigate the MEA's cumulative impacts.~~

Mitigation 39: An appropriate site near the McGowen / Highway 70 interchange should be identified by Department of Planning and HATA staff for development of a park-and-ride lot. HATA staff must also identify the acreage and improvements required to create an operational park-and-ride lot. ~~A per-unit based fee can be assessed for all new development to cover the costs of development of the lot.~~

7 SEPT 92 1

JAMES MARING
YUBA COUNTY
PLANNING DEPARTMENT

DEAR JIM;

AS WE DISCUSSED DURING THE 2 SEPT 92 PLANNING COMMISSION MEETING, MY COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE NASA AREAS FOLLOW:

1. THE VOLUME REQUIRES EDITING TO CORRECT NUMEROUS TYPO'S, OMISSIONS AND INCORRECT REFERENCES. FOR EXAMPLE THE LAST PARAGRAPH PAGE vii
2. THERE IS NO RATIONAL PROVIDED FOR SELECTION OF A 100' SETBACK TO MITIGATE POTENTIAL HEALTH HAZARDS/EFFECTS OF ELECTROMAGNETIC RADIATION FROM POWER LINES. (MITIGATION 7)
3. WOULD IT BE PRACTICAL TO USE THE 200' SET BACK AREA FROM THE OPUD PONDS FOR LIGHT INDUSTRY SUCH AS WAREHOUSING OR COUNTY EQUIPMENT STORAGE/MAINTENANCE? IF THIS AREA IS USED FOR A PARK, WOULD THIS APPLY TO THE DEVELOPERS REQUIREMENT UNDER MITIGATION 16 TO DEDICATE PARKLAND.
4. MITIGATION 25 REQUIRES FLOOD PROOFING OF ALL STRUCTURES DEVELOPED IN AREAS SUBJECT TO FLOODING. DOES THIS MEAN THAT CONSTRUCTION WITHIN THE 100 YR FLOOD PLAIN WILL BE PERMITTED?

5. MITIGATION 30 REQUIRES RECONSTRUCTION AND REALIGNMENT OF MCGLINCY ROAD THROUGH THE ELLA AVE INTERSECTION. SINCE THE STUDY DEFINES THE CONDITIONS AS AN "EXISTING TRAFFIC HAZARD", WHY SHOULD THE DEVELOPERS, AND IN TURN THE NEW RESIDENTS, HAVE TO PAY FOR ITS CORRECTION?

6. MITIGATION 36A. REFERS TO CIRCULATION SYSTEM IMPROVEMENTS IN TABLE 10. TABLE 10 CONTAINS CUM DAILY TRAFFIC VOLUME

7. THE SECOND PARAGRAPH OF PAGE XX REQUIRES THE COUNTY TO ADOPT A STATEMENT OF OVERRIDING CONSIDERATION FOR THE ADVERSE IMPACT TO AIR QUALITY. IF THIS REQUIREMENT IS VALID WILL IT BE APPLIED TO ALL FUTURE PROJECTS IN THE COUNTY WITH UNMITIGATED IMPACT TO AIR QUALITY?

8. MITIGATIONS 38 & 39 LAY BURDENS ON NEW BUSINESSES IN THE AREA. THE LAST PART OF MITIGATION 38 COMMENCING WITH ... INCLUDING COORDINATION OF CARPOOLS ... LISTS SEVERAL REQUIREMENTS THAT ARE AN INTRUSION INTO HOW THE BUSINESS IS OPERATED. THESE WILL WORK AGAINST ATTRACTING NEW INDUSTRY.

9. MITIGATIONS 45, 46 & 47 ARE MICROMANAGEMENT ITEMS TO'S FOR ROAD NOISE MITIGATION. THEY SHOULD BE REPLACED WITH A MITIGATION SPECIFYING THE MAX ACCEPTABLE NOISE LEVEL AS WAS DONE

FOR AIRPORT NOISE IN MITIGATION 49.

10. THE PARAGRAPH ON SENSITIVE SPECIES, PAGE XXV, REFERS TO THREE SPECIES LISTED ABOVE. I COULD NOT FIND THE REFERENCES LISTED.

11. THE MITIGATION 59 REQUIREMENT TO OBTAIN A STREAMBED ALTERATION PERMIT FOR CONSTRUCTION WITHIN THE 100 yr FLOODPLAIN, ~~WHICH~~ "IF REQUIRED", WOULD APPEAR TO BE EITHER A NEW REQUIREMENT OR AN WAIVING. IF IT IS A NEW, REAL REQUIREMENT, IT SHOULD BE THOROUGHLY DISCUSSED AND JUSTIFIED IN THE FINAL REPORT. IF IT IS NOT A REAL REQUIREMENT IT SHOULD BE DELETED.

12. THE FISCAL ANALYSIS GENERALLY CONCLUDES THAT THE NEW DEVELOPMENT WILL GENERATE SUBSTANTIALLY MORE REVENUE THAN COST FOR THE COUNTY. IT THEN STATES THAT THIS DIFFERENTIAL IS BASED ON PROVIDING SERVICES AT A "RURAL LEVEL" RATHER THAT AT THE "URBAN LEVEL" THE NEW DEVELOPMENT WILL LIKELY DEMAND. THIS SUBSTANTIAL QUALIFICATION SEVERELY UNDERMINES THE USEABILITY OF THE ANALYTICAL RESULTS. IF PRACTICAL THE ANALYSIS SHOULD INCLUDE AN ALTERNATIVE SCENARIO BASED ON "URBAN SERVICE LEVELS".

IN ADDITION IT IS POSSIBLE OR PROBABLE THAT THE NEW COUNTY RESIDENTS RESULTING FROM THIS DEVELOPMENT WILL

CONTAIN A SUBSTANTIALLY LOWER PERCENTAGE OF THOSE REQUIRING PUBLIC ASSISTANCE THAN CURRENTLY EXISTS IN THE COUNTY. SINCE PUBLIC ASSISTANCE IS A MAJOR DRIVER FOR BOTH COST & REVENUE FOR THE COUNTY, WAS THIS POSSIBILITY EXPLORED?

FINALLY THE FEES PER UNIT, PROJECTED AT 10,399 PLUS THE COSTS OF ADDITIONAL COUNTY INFRASTRUCTURE AND ROADS WILL LAY A HEAVY BURDEN ON RESIDENTIAL DEVELOPMENT IN THE COUNTY THAT WILL INEVITABLY IMPEDE SUCH DEVELOPMENT.

William F. Beck
PLANNING COMMISSIONER
YUBA COUNTY
5TH DISTRICT

RESPONSE H

Commissioner William H. Back, County of Yuba

1. The document has been reviewed for editorial changes and clerical errors.

2. Finds regarding the potential health hazards from electromagnetic fields generated by overhead powerlines are contradictory. Adverse health effects that have been studied include various forms of cancer (particularly among children), leukemia, and reproductive problems. At this time the biological evidence is considered to be inconclusive[1,2]. The recommended 100-foot setback from right-of-way was based upon a common standard used communities in northern California, and is considered prudent planning with respect to an unknown hazard.

The only policy relative to powerlines in California was adopted in 1990 by the Department of Education. That policy recommends minimum distances between new schools and the edges of rights-of-way of transmission lines of 100-feet for 100-110 kV lines, 150 feet for 220-230 kV lines, and 250-feet for 345 kV lines[2]. It is emphasized in the reference cited that these distances were not based on specific biological evidence.

Mitigation measure number 7 has been revised as follows:

Mitigation 7: A minimum ~~lot-line~~ building setback of 100 feet from right-of-way is required for development of human-occupied structures beside the ~~high-voltage~~ powerline easements which parallel State Highway 70 and extend east-west from Highway 70 paralleling the alignment of Ella Avenue. This requirement applies to powerlines mounted on steel towers, and not to wood-pole mounted lines.

(References:

1. *Status Report of Current Biological, Medical, and Engineering Research and Significant Study Results Regarding Potential Human Health Effects Associated With Power Frequency Electric and Magnetic Fields*; Power Plant and Environmental Review, Maryland Department of Natural Resources, Frederick, Maryland. September 1990; 73 pages.

2. *Electric and Magnetic Fields: Measurements and Possible Effects on Human Health from Appliances, Powerlines, and Other Common Sources*; Special Epidemiological Studies Program, California Department of Health Services, Berkeley, California. 1990; 13 pages.)

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3. Park sites must be acceptable to the County, determined in context for individual developments, size and design, surrounding land uses including potential nuisances.

Lands bordering the sewage ponds may be suitable for M-3 zoning, under which all uses require a Conditional Use Permit (Zoning Chapter 12.56, Yuba County Zoning Ordinance).

It is possible that some light industrial uses can be compatible with residential development, for example, mini-storage warehousing or similar operations.

4. Developers must obtain an Elevation Certificate based upon a survey of individual lots. Building pads for houses must be raised above the 100-year floodplain.

5. The Arboga Road alignment is a poorly designed road pattern, but is an insignificant problem for current traffic levels. Development within NASA will substantially increase traffic on Arboga Road, increasing the accident hazard at the poor alignment through the Ella Avenue intersection. For this reason, the burden of mitigation is properly assigned to developments that would create the hazardous traffic levels, and that would benefit most from safety improvements to the road alignment.

6. A production error was made in the use of the Cumulative Traffic Volume Table as Table 10. The correct table is shown on the following page herein, and was contained in the draft EIR, Appendix 6, page 276 ("*South Yuba County Circulation Facilities Needed Under Cumulative Development*").

7. The recommended finding regarding contribution to significant cumulative impacts is based upon modeling results of estimated vehicle emissions relative to significance thresholds used by the Sacramento Metropolitan Air Quality Management District (SMAQMD), (Table 12, page 79, draft EIR).

Significance must be evaluated on a project-specific basis. Projects that do not exceed the threshold levels, and particularly those which conform to adopted General Plan and zoning land use designations, should be found to have no significant contribution to regional air quality impacts.

8. The trip reduction measures identified in mitigations 38 and 39 target businesses with 25 or greater employees only, and are intended to encourage private sector assistance in helping to meet the County's long term air quality goals. The carpool coordination could be satisfied with a bulletin board designated for ridesharing notices. Flexible work schedules are recommended if feasible for a particular industry, and are not mandatory.

TABLE 10

SOUTH YUBA COUNTY CIRCULATION FACILITIES
NEEDED UNDER CUMULATIVE DEVELOPMENT

	DESCRIPTION	QUANTITY	UNIT COST	COST
1.	SR 70 / Feather River Interchange	1	$ 8,000,000	$ 8,000,000
2.	SR 70 / Algodon Interchange	1	$ 8,000,000	$ 8,000,000
3.	Arboga Road Extension to Feather River Blvd Interchange (4 lane Major Road)	30,000 lf	$ 250 / lf	$ 7,500,000
4.	New SR 70 Frontage Road from Plumas-Arboga Road to Algodon Road Interchange (4 lane Collector Road)	12,000 lf	$ 225 / lf	$ 2,700,000
5.	Plumas-Arboga Road Extension from Feather River Blvd to Arboga (4 lane Collector Road)	5,200 lf	$ 225 / lf	$ 1,170,000
6.	Country Club Drive Extension from Feather River Blvd to Arboga Road (2 lane Collector)	10,000 lf	$ 200 / lf	$ 2,000,000
7.	Algodon Road between Arboga Road and SR 70 (6 lane Major Road)	2,000 lf	$ 300 / lf	$ 600,000
8.	Feather River Blvd adjacent to SR 70 Int. (4 lane Major Road)	1,500 lf	$ 250 / lf	$ 375,000
9.	Feather River Boulevard from Country Club Drive to Third Bridge (4 lane Major Road)	25,000 lf	$ 125 / lf	$ 3,125,000
10.	McGowan Parkway Widening from Arboga to SR 70 (4 lane Major)	5,300	$ 325 /lf	$ 1,722,500
11.	Modifications to SR 70 / McGowan Pkwy Interchange	1	$ 4,000,000	$ 4,000,000
12.	Arboga Road widening No. of Plumas-Arboga. (4 lane Collector)	6,500 lf	$ 150 / lf	$ 975,000
13.	McGowan Parkway from Feather River Blvd to Arboga Road (New 4 lane Road)	5,000 lf	$ 250 / lf	$ 1,250,000
14.	Widening and overlaying Mary Ave and George Ave (4 Lanes)	8,300 lf	$ 120 / lf	$ 996,000
15.	Traffic Signals	14	$ 125,000 ea	$ 1,750,000

TOTAL ALL CIRCULATION COSTS	$44,163,500
TOTAL SOUTH STUDY AREA TRIP GENERATION	244,364 trips
EXAMPLE COST PER TRIP	$ 180.73
EXAMPLE COST PER DWELLING UNIT	$ 1,725

KDA

9. Mitigation 45 has been deleted under the assumption that virtually all new units will be equipped with central heating and air conditioning systems. Measures 46 and 47 have been revised as follows:

Mitigation 46: Exterior walls facing the highway or railroad tracks shall be designed and constructed to meet a Sound Transmission Control Rating of 34. ~~wood frame structure with enhanced insulation in cavities. Wood or stucco finish should be applied over wood or gypsum sheathing. Gypsum wall board 0.5 inch thick, attached with resilient channels, shall be used on interior wall faces and ceilings, or equivalent method to meet STC requirements.~~ Proposed design standards shall be submitted and approved by the Planning and Building Services Director prior to issuance of building permits.

Mitigation 47: ~~Double-pane~~ Windows ~~with~~ shall have a minimum Sound Transmission Control (STC) rating of 34 ~~shall be used~~ on all wall sides facing towards the highway or railroad tracks. ~~Windows on these sides should comprise less than 25 percent of the wall area.~~ Sliding glass doors and other doors facing towards the highway should have a minimum STC rating of 34.

10. The comment identifies a typographical error in the Executive Summary of the Draft EIR. The listed species are identified in the Biological Resources section of the draft EIR text, page 103; (Giant garter Snake, Valley Elderberry Longhorn Beetle, and Tricolored Blackbird).

11. Mitigation measure 59 referring to the possible need for Streambed Alteration agreements has been deleted since no stream channels cross the study area other than roadside ditches and the Reclamation District No. 784 drainage canals.

12. The fiscal analysis modelling measures expected changes based upon existing service cost and revenue data, and cannot accurately account for an anticipated change in levels of service to meet changing urban demands in rural areas.

Fees are required to upgrade services to urban levels that will be expected by new subdivision residents, and to ensure that costs are not subsidized by the County. Based upon independent study of service functions, expansion needs, and estimated costs for service expansion to meet the needs of new development, the County has recently adopted an ordinance establishing development impact fees, covering general government, public facilities, and schools (*Ordinance 1117, Ordinance adding Chapter 13.10 to Title 13 of the Yuba County Ordinance Code Relating to County and School District Public Facilities Fees, 25 August 1992*; County of Yuba Board of Supervisors). Per unit fees are lower than estimated in fiscal analysis prepared for the draft EIR.

Centex Homes
CENTEX REAL ESTATE CORP.
NO. CALIFORNIA DIVISION
A subsidiary of Centex Corporation
listed on the New York Stock Exchange.

September 23, 1992

Mr. Larry F. Brooks
Director
Department of Planning & Building Services
County of Yuba 938 14th Street
Marysville, CA 95901

Re: Draft Environmental Impact Report (DEIR) for the North Arboga Study Area (July 2, 1992)

Dear Mr Brooks:

We have reviewed the above cited DEIR; in general we find it to be thorough and accurate. We do, however, have a few concerns which we hope will be addressed in the final Environmental Impact Report (FEIR):

1] There are several mitigation measures which require specific designs or setbacks to guard future residents against nuisances (primarily sound) from adjacent roadways, and railroads. These measures include Mitigation 45, 46, 47, 48, and 51. In these cases it would be better to establish a performance criteria and let the home builder (in conjunction with the planning and building department) determine the appropriate design.

2] Mitigation 7 requires a set-back to a lot-line. A more appropriate measure would be for a set-back to a structure. This would allow better flexibility in site design and avoid the creation of remnant ("no mans" land) parcels.

3] Mitigation 18 states that the landscape and lighting district will "... provide for acquisition of parkland and park improvements... as well as maintenance". If the developments are to provide parks or pay in-lieu fees (Mitigation 16) then the eventual homeowners in the LLD will be "double-taxed".

1855 Gateway Blvd., Suite 650, Concord, CA 94520, (510) 827-8100 • Fax (510) 827-8110

4] Mitigation 55. We request that this mitigation be eliminated all together. First of all the "deed clause of the seismic risk associated with the Sierra Foothills region" should be removed. We believe that this will unfairly handicap future residents in trying to finance or re-finance their home. Many property owners in areas of California considered to have greater seismic risk do not have this deed clause and therefore financial institutions (without knowledge of relative seismic risks) may unfairly refuse to lend on properties within NASA, due to this deed clause. In regard to bolting the foundation this is already required in UBC and is governed by the Building department. Better systems may be devised to achieve the same performance in the future.

We are hopeful that our comments are constructive and we look forward to the FEIR.

Very truly yours,
CENTEX REAL ESTATE CORPORATION
Northern California Division

Alan R. Hyden
Director of Forward Planning

ARH/kdh

cc: Ralph Walker
Sean O'Neil

RESPONSE I

Centex Homes

1. Mitigation 45 has been deleted under the assumption that virtually all new units will be equipped with central heating and air conditioning systems. Measures 46, 47, 48 and 51 have been revised as follows:

Mitigation 46: Exterior walls facing the highway or railroad tracks shall be designed and constructed to meet a Sound Transmission Control Rating of 34. ~~wood frame structure with enhanced insulation in cavities. Wood or stucco finish should be applied over wood or gypsum sheathing. Gypsum wall board 0.5 inch thick, attached with resilient channels, shall be used on interior wall faces and ceilings, or equivalent method to meet STC requirements.~~ Proposed design standards shall be submitted and approved by the Planning and Building Services Director prior to issuance of building permits.

Mitigation 47: ~~Double-pane~~ Windows ~~with~~ shall have a minimum Sound Transmission Control (STC) rating of 34 ~~shall be used~~ on all wall sides facing towards the highway or railroad tracks. ~~Windows on these sides should comprise less than 25 percent of the wall area.~~ Sliding glass doors and other doors facing towards the highway should have a minimum STC rating of 34.

Mitigation 48: For all residential development, a 100-foot ~~lot-line~~ building setback is required from the edge of the railroad tracks, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the ~~Public Works~~ Planning and Building Services Director.

Mitigation 51: All lots fronting on arterial roadways shall be separated from the roadway by a solid block masonry wall or combination wall and berm. Said wall or wall/berm combination (barrier) shall not be less than six feet in height. The design of the barrier shall be subject to review and approval of the Planning and Building Services Director and shall be constructed prior to issuance of building permits.
~~Minimum lot-line setbacks of 25-feet shall be required from the edge of right-of-way along all arterials, and a solid block or masonry wall will be placed at the lot-line to shield residences from the road. Alternatively, the setback could be increased and the barrier eliminated. Barrier design shall be subject to review and approval of the Planning Director. The wall shall be constructed by the owner/ applicant prior to map recordation. Structures over one (1) story in height shall be constructed to limit interior levels to a maximum of 45 dB.~~

2. Mitigation 7 has been revised as follows:

Mitigation 7: A minimum ~~lot-line~~ building setback of 100 feet from right-of-way is required for development of human-occupied structures beside the ~~high-voltage~~ powerline easements which parallel State Highway 70 and extend east-west from Highway 70 paralleling the alignment of Ella Avenue. This requirement applies to powerlines mounted on steel towers, and not to wood-pole mounted lines.

3. The reference to park land acquisition in mitigation 18 is an error and has been corrected as follows:

Mitigation 18: The owner shall annex into or support the formation of a Landscape and Lighting District prior to recordation of the Final Map. The District shall provide for ~~the acquisition of parkland and~~ park improvements including the installation of landscaping and park equipment, bike paths, sidewalks, irrigation, and lighting as well as maintenance of parks and the landscaped recreation/ floodway corridors along arterial and collector streets.

4. Mitigation measure 55 has been deleted.

Comment J

LAND DEVELOPMENT SERVICES, INC.
CIVIL ENGINEERING
LAND SURVEYING
PLANNING

4240 ROCKLIN RD., #10
ROCKLIN, CA 95677
(916) 624-1629
(916) 624-1620

September 16, 1992

Larry Brooks, Planning Director
Yuba County Planning Dept.
938 14th Street
Marysville, Ca 95901

RE: E.I.R. North Arboga Ranch

Gentlemen:
I have reviewed the draft E.I.R. for the Project and have the following comments:

The document is well organized but appears to be somewhat lacking in the baseline technical data that was outlined in the scope of work.

I may have not thoroughly understood the scope, but I was under the impression that the document would be a Master Plan document and E.I.R. and Implementation Plan.

I envisioned a much greater depth and analysis of the infrastructure and technical data.

However I do want to concentrate my comments on the mitigations and the implementation of the mitigations.

Mitigation #1:
Seems to be appropriate land use consistent with Airport Commission Policy.

1) Mitigation #2:
a) **Suggestion** that the safety zone #2 be shown on a map (such as page 85) that indicates the limit of this safety zone.

b) Request that the area in the safety zone #2 be general planned and zoned to allow 2 units per acre which is consistent with the land use policy set by the Airport Commission Policy. The areas outside of zone #2 which is now RRE zoned would be allowed to develop to the R-1 standards or 4-6 DUA.

W.E. MITCHELL P.E.
R.C.E. 23429 – L.S. 3475

c) Change the mitigation to read that portion of the RRE zone South of McGowan Parkway, West of the Western Pacific Railroad that lies within the safety zone #2 of the Airport shall be developed in conformance with the land use policy set forth in the Airport Commission Land Use Policy Plan. This portion of the RRE Zone shall be re-zoned and General Planned to allow 2 DUA.

d) The adoption of a zone for 2 units per acre should be such that the units are not clustered, but spread out within the area. A lot netting about 14,000 to 15,000 square feet with 80-90 feet front footage and adequate side yard and rear yard set backs would meet the intent of the Airport Land Use Policy and allow development at a land use intensity of 2 units per acre.

e) Add a statement that those properties presently zoned RRE which fall outside of the Safety Zone #2 shall be allowed to develop to a density of 4 to 6 dwelling units per acre on the present R-1 standard of Yuba County.

Mitigation #3 and #4:

No Comment.

2. Mitigation #5:

a) A deed is not the proper place for information as suggested in this mitigation. As a matter of clarification ,I really question this as being a mitigation and how it relates to C.E.Q.A. as mitigation of an impact.

b) A deed represents title record and should only contain data that affects the title. Farming and Agriculture activities are obvious and can be seen, such activities would be considered actual notice to a purchaser as to the written notice being suggested.

c) The Subdivision Map regulates such additional information and provides a mechanism for recordation of miscellaneous information. See Sec. 664341.2, thus Yuba County could adopt an ordinance to the effect of this section or may have such an ordinance at this time.

d) The State Department of Real Estate also prepares a Subdivision Report where such information would be proper.

e) The other device for such information if the disclosure by the Seller to any prospective purchaser.

f) It is suggested that the mitigation be modifies to read:

1. The County will adopt an ordinance or establish a policy to require all Final Maps in Yuba County to record additional information that does not effect the title of the property, either by separate document or additional map sheet.

Information regarding the County's policy or intent to protect agriculture may be included in such information when the County deems it to be appropriate.

2. The County may advise the State Department of Real Estate to include in their Subdivision Public Report, the same information regarding agriculture for all subdivisions in Yuba County where deemed appropriate.

When these documents are recorded they become part of the public record and are included in the Preliminary Title Report which is issued to any and all purchasers.

3) Mitigation #6:
Revise a portion of Mitigation #6 to read:

"Development within the Approach-Departure Zone #2 shall be limited to 2 units per acre as specified in the Airport Policy for Land Use." (The balance of the mitigation is acceptable.)

4) Mitigation #7 and #8:
Include a map indicating the high voltage lines the language of the mitigation is too broad and encompassing,all overhead lines are considered high voltage.

a) It is my understanding that this mitigation is intended to cover these larger towers and lines along Hwy. 70 corridor.

b) The mitigation should address the structural set back rather than the lot line. This would allow some use and maintenance of this strip.

In the R-1 zone the mitigation could read as follows:

A line on the Final Map shall be established 100 feet from the existing right-of-way of the High Voltage line on the Hwy. 70 corridor.

The residential structural set back shall be measured from this line for zoning purposes when such area is included in the Parcel.

The area created within the 100 foot strip may be included within the lot but shall be limited to open space yard uses for human occupying, ei. garages, recreational vehicles and or orchards or gardens but not including swimming pools.
These areas may also be used for roads, storm detention areas when so approved on a Tentative Map.

If the additional area causes the lot depth ratio to be not in conformance with the R-1 standards a variance would be recommended with the approval of the tentative map.

5)Mitigation #9:

This mitigation should be revised to reflect the same comments and proposed mitigation in Mitigation Comment #8.

This 200 foot could be included in the lot with certain restriction of its use. The property owner would maintain the area.

If this area was used for Storm Drain or some acceptable public purpose a mechanism would be required to maintain the area.

As I envision this mitigation strip of open space would be left, if the developer could not sell or convey the parcel it would most likely end up on the delinquent tax roll.

6)Mitigation #10:

This mitigation is not really a mitigation and such information has no place in a deed. One again I would suggest the same provisions of an additional Final Map sheetor separate document as provided in suggested in Mitigation #5 of this comment.

Mitigation #11 and #12:

No Comment.

7)Mitigation #13:

The school district could be reviewing this document and should be requested to identify the sites that they may want to reserve or acquire.

This would enable the planning of this area to be more comprehensive than the developer by developer approach meeting with the school.

Mitigation#14:
No Comment.

Mitigation #15 thru #31:
No Comment.

8) Mitigation #32:

The widening of Arboga North of McGowan Parkway should be done by those industrial users in the Airport or a county wide traffic fee. The impacts of this project area does not warrant the full obligation of mitigating this potential impact that most likely will be caused by industrial users affiliated with the Airport.

9) Mitigation #33:

This impact most likely will occur during the PM Peak Hour and will not occur until 90% of the project is completed. A per unit fee should be established and collected at building permit issuance.

10) Mitigation #34:

The widening of McGowan Parkway from Olivehurst to Hwy. 70 is quite an undertaking for this area when you consider the balance of infrastructure. McGowan Parkway being a regional route should be funded by a fee placed on all building permits within the area of benefit for Mc Gowan Parkway.

11) Mitigation #35:

Once again this improvement is regional in nature and should be funded by regional fees, federal and state monies.

Mitigation #36 thru #43:
No Comment.

12) Mitigation #44:

Once again as in other mitigation specifying lot line set backs, this mitigation needs to be revised in some manner that allows the transfer of the property from the developer to a portion of the residential lot.

The mitigation set back to the structure could be established from this line. However the 100 foot could be incorporated into the lot with some restrictions of its use as specified in previous comments regarding lot line set backs.

Mitigation #45 thru #47:
No Comments.

13) Mitigation #48:

This concept of lot line set back is not workable. The area within these strips should be available for use by the residential if any. These areas may also be usable for other public uses and the wall would not apply for example detention area, strip or linear parks or roadways. Each subdivision should be allowed to design some devise that is comparable or equal to the mitigation being proposed. This mitigation in confining, unimaginative and should be written with flexible language that allows other alternatives that meet the intent of the mitigation.

14) Mitigation #49 and #50:
Part (a) of the mitigation is acceptable. Part (b) I disagree with the proposed easement unless the language of the easement includes the levels of allowable noise levels that can be generated by the source. 65-75 iedb (CNEL)

In order to meet the criteria based in part (a) of this mitigation one would most likely design to a 65- 75 db (CNEL) to achieve the interior 45 db (CNEL).

If the easement only allows up to 75 db (CNEL) then the concept is a mitigation. If not I see no reason for such an easement.

15) Mitigation #51:

Once again I feel that the objective is to mitigate sound and the 25 foot area could be used in the residential lot area. Restriction of use and set backs as discussed before or other techniques of design can be just as effective as the proposed mitigation.

Mitigation #52 and #54:
No Comment.

16) Mitigation #55:

I certainly do not object to conformity to the UBC codes adopted codes of Yuba County to meet seismic safety requirements,as a rule most residential designs are governed by wind rather than seismic loads,unless the roof is unusly heavy or the structure is long and narrow. it seem that the writer of the EIR is gropin for information to fill space.it my opinion that this proposed mitigation is trivia and should be eliminated.

I object to the inclusion of such language being required in a deed.
If such language as is being proposed throughout this documentis required to be included in the deed of the project it may cause a chilling and negative affect on financing of homes, resale of homes, and the ability to obtain insurance.

These are unique and detrimental to housing development. If the County imposes such mitigations on this area it should be uniformly applied to the entire County.

In conclusion seismic lines, building set backs, flood hazard zones, geologic mapping and archeological site are clearly identified in the subdivision map act not to be shown on a final map due to the fact that these items do not affect the title of the property.

When you construct these types of restraints into the deed which is clearly your evidence of title, you are clouding the title of the property. This is contrary to the legislative intent of the subdivision map act.
Prior to adaptation of such practices the mitigation should be reviewed by legal counsel to determine thier legality and the county staff should consider how they are going to monitor such activities.

Mitigation #56 thru #64:
No Comment.

RESPONSE J

Land Development Services, Inc.

1. Mitigation 2 has been revised as follows:

Mitigation 2: In conformance with the policies of the Airport Land Use Commission, residential development shall be restricted to a density not to exceed two (2) dwelling units per acre, net, on lands located within the Approach-Departure Zone of the Yuba County Airport. ~~That portion of the RRE zoned property that lies south of McGowen Parkway, east of Arboga Road, and west of the Western Pacific Railroad tracks should be maintained in its present zoning, permitting only low-density residential development in conformance with the airport zone restrictions.~~

2. Mitigation 5 has been revised as follows:

Mitigation 5: Pursuant to Yuba County Ordinance 11.55, a person or agent acting as an agent for the seller or lessor of real property located within the County shall provide knowledge to all potential purchasers or lessees of the right to farm and mine within the County. ~~The County will require inclusion of an informational deed clause notifying residents of the presence of nearby agricultural activities and of the County's intent to allow and protect those activities.~~

3. Mitigation 6 has been revised as follows:

Mitigation 6: No development will be permitted within the "*Clear Zone*" (Zone 1). Development within the "*Approach - Departure Zone*" (Zone 2) shall be limited to single-family residential uses which do not exceed two (2) to the acre and which adhere to all "*Overflight Zone*" (Zone 3) standards. ~~residential uses which adhere to the RRE zoning standards, and to all Zone 3 standards.~~ Development within ~~the "*Overflight Zone*"~~ Zone 3 may include residential and industrial development that does not require or utilize any steady or flashing light that could be confused with an FAA navigational signal, generate smoke, attract large numbers of birds, or otherwise create interference detrimental to the safe operation of aircraft or airport instrumentation. Installations involving hazardous materials such as above ground oil tank farms or other chemical storage are also excluded from this zone.

4. Mitigation 7 has been revised as follows to identify the specific powerlines subject to setback requirements. Measure 8 identifies standard consultation requirements with the local power utility (PG&E), and has not been changed.

Mitigation 7: A minimum ~~lot-line~~ building setback of 100 feet from right-of-way is required for development of human-occupied structures beside the ~~high-voltage~~ powerline easements which parallel State Highway 70 and extend east-west from Highway 70 paralleling the alignment of Ella Avenue. This requirement applies to powerlines mounted on steel towers, and not to wood-pole mounted lines.

5. Setback requirements for highway and railroad noise and the powerline corridor have been revised as noted above to include a building setback rather than lot-line. The County believes that the lot-line setback is the reasonable standard to apply to maximize distance separation from the odor source (sewage ponds), and the lot-line setback requirement in Mitigation 9 is confirmed. Lands bordering the sewage ponds may be suitable to satisfy parkland dedication requirements, stormwater detention pond placement, or for M-3 zoning, under which all uses require a Conditional Use Permit (Zoning Chapter 12.56, Yuba County Zoning Ordinance).

6. Mitigation 10 has been revised as follows:
Mitigation 10: ~~The County will require inclusion of an informational deed clause notifying residents of the~~ A person or agent acting as an agent for the seller or lessor of real property located within the County shall provide knowledge to all potential purchasers or lessees of the presence of the nearby sewage plant and of the County's intent to protect the existing land use.

7. Identification of school sites is premature at this time and must be based upon actual subdivision design, and timing of specific development within the plan area. The County did not want to hamper development initiatives with imposition of a phasing plan on NASA developers to accommodate school location decisions. Now that environmental and planning constraints have been identified, it would be appropriate for the developers to meet collectively with the school district to negotiate for the preferred locations and site requirements for future school sites.

8. Arboga Road within the NASA limits is in poor condition, but does not pose a significant problem for current traffic levels. Development within NASA will substantially increase traffic on Arboga Road, and will rely upon this route for local and regional circulation and access. It is the County's position that the burden of mitigation is properly assigned to developments that would create the need for improvements. New industrial users will be subject to a fee contribution for road improvements.

9. Road improvement costs can be collected as a special impact fee, by requiring the first developer to construct the improvements with establishment of an area of benefit for reimbursement, or by formation of an assessment or Mello-Roos district. The preferred mechanism will be subject to the approval of the Planning and Building Services Director and the Public Works Director prior to recordation of final maps.

10. It is the County's position that the burden of mitigation is properly assigned to developments that would create the need for road improvements. All local development that would benefit will be required to contribute fees for road improvements. As noted above, the preferred fee mechanism will be subject to the approval of the Planning and Building Services Director and the Public Works Director prior to recordation of final maps.

11. See response number 10 above.

12. Mitigation 44 has been revised as follows:

Mitigation 44: For all residential development, a 100-foot ~~lot-line~~ building setback is required from the edge of pavement of Highway 70, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the ~~Public Works~~ Planning and Building Services Director in consultation with the California Department of Transportation.

13. Mitigation 48 has been revised as follows:

Mitigation 48: For all residential development, a 100-foot ~~lot-line~~ building setback is required from the edge of the railroad tracks, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the ~~Public Works~~ Planning and Building Services Director.

14. Mitigation 49 has been revised as follows:

Mitigation 49: New single-family residences and school classrooms will be allowed in areas having airport caused noise between ~~the~~ 65 to 70 ~~75~~ db (Community Noise Equivalent Level: CNEL) provided the following criteria are met:
a) The proposed structure is constructed in such a manner so that the interior noise level does not exceed 45 db(CNEL).
b) Avigation noise easements are secured prior to issuance of building permits and as a condition of subdivision or other discretionary permit approval.

The avigation noise easements specified in item b) are standard requirements to satisfy airport land use commission review procedures.

15. Mitigation 51 has been revised as follows:

Mitigation 51: All lots fronting on arterial roadways shall be separated from the roadway by a solid block masonry wall or combination wall and berm. Said wall or wall/berm combination (barrier) shall not be less than six feet in height. The design of the barrier shall be subject to review and approval of the Planning and Building Services Director and shall be constructed prior to issuance of building permits.
~~Minimum lot-line setbacks of 25-feet shall be required from the edge of right-of-way along all arterials, and a solid block or masonry wall will be placed at the lot-line to shield residences from the road. Alternatively, the setback could be increased and the barrier eliminated. Barrier design shall be subject to review and approval of the Planning Director. The wall shall be constructed by the owner/ applicant prior to map recordation. Structures over one (1) story in height shall be constructed to limit interior levels to a maximum of 45 dB.~~

16. Mitigation 55 has been deleted.

Comment K

RECVD
9-24-92

SUBJECT: CITIZEN'S COMMENTS - NORTH ARBOGA STUDY AREA EIR

FROM: RICHARD I. WEBB
250 Anderson Ave.
Marysville, CA. 95901

DATE: September 23, 1992

The following comments relate to Project #3 - Proposal for development by Ron Ward Construction as depicted on the map on page #10 of the above named NASA EIR.

I am an active pilot and provide flight instruction using Yuba County Airport on nearly a daily basis. I have been active in aviation since 1953, first in the United States Air Force and for the past 20 years in General Aviation and feel that I can speak with authority about aviation. One of the notable things I have observed during this time is what has happened to airports during this period. Nearly every major and many minor airports I have observed over the years, have found themselves hemmed in on virtually all sides by "growth" from residential and commercial development to the point they operate with many restrictions on the safe operation of aircraft. Sacramento Executive Airport is an excellent example as to what can happen to an airport which at one time was out in the country and now is surrounded on all sides by commercial and residential development to the extent that there is considerable pressure being exerted to close the airport because of the hazards of aviation to the surrounding community - a community which knew full well that the airport was there while growth took place all around it. A review of the growth of communities surrounding airports in virtually all parts of California will show the same situation regarding airports which at one time were away from developed areas but are now surrounded by development.

1. My plea to the Yuba County Planning Commission is to take measures to not place the same limitations on aviation at the Yuba County Airport as these other communities now have as a result of growth, especially in or near the flight paths of departing and arriving aircraft. The project I have cited, is directly in line with departing and arriving aircraft at the airport. This bothers me as a pilot because it means that I will pass over this area each time I utilize the southern end of the airport for either taking off or landing. The normal runway use (determined by the prevailing wind) is to depart to the south directly over the area in question at an altitude of approximately 500 to 800 feet above the surface for most general aviation aircraft using the airport. Some aircraft may go lower and others higher depending on their performance. Presently, should an aircraft develop difficulties which would dictate a forced

landing, there is open land available to maneuver the aircraft for an emergency landing away from buildings on the south end of the airport. This development would remove some of the most desirable area to make an emergency landing without endangering structures on the ground. This is an important consideration since aircraft without power have very limited maneuvering capabilities. I predict that even though residents in this development (should you not need my warnings) were well aware of the airport and its operations, they will still complain about noise, low flying aircraft, and operations at night and will exert pressure to in some way limit aviation's full unrestricted use of the airport as we now enjoy.

The future growth of the Airport Industrial Area and Commercial development of the area could be affected if limitations are placed on aviation operations which support the new businesses (should approval be granted for this development and others which may adjoin it). I have been led to believe that one of the hopes of the County staff is that increased use of Yuba County Airport is anticipated in the future and that this use would likely bring in larger, more complex and louder aircraft. Expansion of the airport at some time in the future would be virtually impossible should this development be approved.

Please keep in mind that the airport was here first and that there is plenty of other land to develop in the MASR area and other nearby areas in Yuba County such as I see under way east of highway 70 and north of Earle road. It sure seems there is already more planned and approved development than many of us can see filled out for some time. I don't think we need to add this one to them. Don't pen in Yuba County Airport and limit what can be done in the future with this fine facility and don't limit the safe operation of aircraft.

Sincerely,

Richard E. Webb

Richard E. Webb

RESPONSE K

Richard E. Webb

1. The County does recognize the need to protect the integrity of the airport and its continued operation. Land use restrictions have been identified to limit development within the designated clear zone and approach-departure zone. Transitional land use has been recommended for the parcels adjoining the airport property to reduce land use conflicts.

While the risk of an accident involving an aircraft does exist, the frequency and likely magnitude of such an event are low, and cannot be used as a criteria to limit land use. Future development of the properties surrounding the airport has been planned by the County for decades, and all of the property within the North Arboga area (and surrounding the airport generally) has been designated in the General Plan and zoning to allow various levels of residential and industrial development. However, the County has no intention to restrict airport operations or reduce its commitment to maintaining the airport as an important component of local transportation systems and the Enterprise Zone.

The County of Yuba

YUBA COUNTY PLANNING COMMISSION

(916) 741-6419
938 14TH STREET
MARYSVILLE, CA 95901

MINUTES OF THE YUBA COUNTY
PLANNING COMMISSION MEETING
Wednesday, September 2, 1992

CALL TO ORDER
The meeting was called to order at 7:30 by Chairman Schrader with Commissioners Back, Gene Anderson and Luella Anderson present. Commissioner Parker was absent.

APPROVAL OF MINUTES
There being no corrections to the minutes of August 19, 1992, they were approved as submitted.

C. PUBLIC HEARINGS

1. CONDITIONAL USE PERMIT 91-14 (Richard Yang) - A request to operate a slaughter house/animal processing business. The project is located in the AE-40 Zone on Assessor's Parcel No. 14-290-24 at 3300 Feather River Blvd., Arboga. (Continued from 8/19/92)

Staff Report: Mr. Campbell presented the staff report reviewing previous events regarding this case and recommended denial of the project as it was staff's opinion that all of the findings that must be made for the granting of a Conditional Use Permit could not be made.

Public Hearing: Tona Hubert, 3352 Feather River Blvd., presented a petition with 79 signatures opposing the project.

Chuck Stewart, 3273 Feather River Blvd., Dale Jackson, 3328 Feather River Blvd., and Henry Jordon, 1098 Broadway spoke in opposition of the project.

Lily Enloe, 895 Broadway was concerned about odor, flies and noise; Steve Sample, 3323 Feather River Blvd., was concerned about smell; and Ordon Maynard, was concerned about flooding.

There being no further comments the hearing was closed to the public.

Action: Motion by Commissioner Schrader, seconded by Commissioner Back, and carried unanimously to deny the project.

2. TENTATIVE PARCEL MAP 90-51 (Revised) Andrew and Franziska LaBruzzo) - An APPEAL of the staff Development Committee's decision to approve the project with a condition requiring pavement for the access road. The project is located in the A/RR Zone on Assessor's Parcel No. 44-34-32 at 7845 White Oak Lane, Browns Valley. (Continue to 9/16/92.)

3. DRAFT MASTER ENVIRONMENTAL ASSESSMENT. To receive comments from individuals and agencies concerning the adequacy of the Draft Master Environmental Assessment (MEA) for:

NORTH ARBOGA STUDY AREA (NASA) - The study area includes 1,300 acres located in the southwestern region of Yuba County approximately five miles south of Marysville. The area is bound by the Sacramento Northern Railroad tracks on the west, Plumas-Arboga Road on the south, Highway 70 on the east, and Helveta Road, Clark Slough, and 11th Avenue on the north. There are several proposed subdivisions totaling 2548 lots within the study area.

The draft MEA assesses the environmental constraints and impacts to land use, public services, traffic, air quality, noise, geology, soils, biological and cultural resources. The MEA will be used to evaluate current and future development proposals within the study area.

Staff Report: Mr. Calarco presented the staff report and reviewed the MEA, explaining this public hearing is for the purpose of accepting public comments on the information presented in the Draft MEA.

1. Public Hearing: Fred Draper, property owner, objects to the way the document was presented. Specifically, statements are loosely construed. He believes that the County of Yuba is a partner in the proposed developments.

2. Clara Bean, Feather River Blvd., was concerned about roads. The levees have never been fixed since 1986.

3. Bill Mitchell, representing Ron Ward Construction, and will submit written comments. He wants setbacks set to buildings rather than lot lines. He is opposed to some of the deed restrictions recommended pertaining to avigation, sewer plant, seismic activity. He felt this information would be better presented elsewhere. He requested that an improvement phasing plan be included in the document and that a financing mechanism be included for implementing these improvements.

There being no further comments the hearing was closed to the public. The EIR will be brought back to the Commission for certification at a later date.

ADJOURNMENT
There being no further business the meeting was closed at 8:20 p.m. to the next meeting Wednesday, September 16, 1992, at 7:30 p.m. in the Supervisors Chambers, Third Floor, Courthouse, Marysville.

Larry Brooks, Secretary

LB/JM/jc

Comment L

Comment L

Public Comments, Planning Commission Hearing, 2 September 1992

1. The comment is noted. The EIR was presented in standard form, following requirements set forth in the California Environmental Quality Act as identified in the CEQA Index, draft EIR, page iv. No specific environmental issues are identified to permit further response.

2. The comment is noted. A complete traffic analysis was prepared for the EIR by KDAnderson, Transportation Engineers, and is presented in the EIR text (pp. 51-75) and in Appendix 6 (pp. 232-279). The hydrology and drainage analysis was prepared by engineering firm of M-H-M, Inc. Additional information regarding the levees was submitted by the State Reclamation Board in comments on the draft EIR. The Reclamation Board reports that the levees are inadequate for 100-year flood protection. Levee enhancement projects are in final planning stages, and funding has been provided by the Yuba County Water Agency. It is anticipated that the levees will be repaired during the next two years, prior to actual development within most of NASA being undertaken.

3. The comments are noted. These comments were elaborated upon and submitted in writing, and are responded to under "Response J" in this document.

FINAL MITIGATION IMPLEMENTATION PLAN

NORTH ARBOGA STUDY AREA (NASA)
Master Environmental Assessment
and Constraints Analysis
County of Yuba

(Final Environmental Impact Report,
State Clearinghouse No. 92012045
18 November 1992)

MITIGATION IMPLEMENTATION PLAN

NORTH ARBOGA STUDY AREA

County of Yuba

I. INTRODUCTION

As provided by the CEQA Guidelines (section 15041 (a)): *"A lead agency for a project has authority to require changes in any or all activities involved in the project in order to lessen or avoid significant effects on the environment."* State law enacted 1 January 1989 (AB 3180, adopted as Section 21081.6 of the Public Resources Code), requires that a formal Mitigation Implementation Plan be prepared prior to project approval if adverse impacts have been identified in an Initial Study or EIR, and measures have been adopted as conditions of approval to reduce the significance of impacts.

The Mitigation Implementation Plan must contain two primary components. The first is an established monitoring program to ensure that required measures are undertaken by the developer. The second is a formal reporting program to maintain a public record of the monitoring and mitigation compliance. The purpose of this plan is to ensure that mitigation measures identified in the Environmental Impact Report and adopted as conditions of approval are properly implemented. This plan has been prepared in consultation with Deputy Planning Director James Manning, Associate Planner Pete Calarco, and Associate Planner Kerri Campbell. This plan is prepared as a model for this project, and minor changes and adjustments may be required as the County's monitoring process becomes fully developed.

ORGANIZATION AND FORMAT

This monitoring/reporting program implements the mitigation measures listed in the Draft EIR for the North Arboga Study Area (State Clearinghouse No. 92012045). This program describes the requirements and procedures to be followed by the applicant and County of Yuba to ensure that all mitigation measures adopted as part of this project will be carried out as described in the EIR. The following sections are included in the monitoring/reporting program:

Policy Statements

General policies regarding mitigation monitoring and implementation are set forth, including monitoring procedures, record keeping, public access to monitoring records, fee requirements, legal remedies available for non-compliance, and a stipulation regarding compliance with future policies that may be adopted by the County.

Inventory of Mitigation Measures

A listing of all mitigation measures identified in the EIR is presented, listed sequentially and corresponding to sections in the EIR text.

Checklist Summary

For this project, the adopted mitigation measures will be implemented through various codes, ordinances, policies, standards, and conditions of approval which are satisfied either prior to grading, during construction, or through monitoring and reporting after construction is completed. A summary of mitigation measures is provided by timing of verification.

II. POLICY STATEMENTS

A. FEES & ASSESSMENTS

The applicant shall be financially responsible for the implementation of all required mitigation measures. The applicant must implement the project in compliance with the specific program developed.

A variety of costs may also be incurred on the County in the form of agency staff time and equipment committed to the monitoring program. Some costs are absorbed in the County's existing review and permitting process and will not necessarily represent new and additional commitments of County resources. County staff have evaluated costs and hourly charge rates, and a fee schedule has been adopted by the County Board of Supervisors. Under some circumstances outside consultants and engineers may be retained, with costs to be determined on the basis of a project specific bid.

B. MONITORING PROCEDURES

The monitoring program shall be implemented following project approval. All sixty-four (64) mitigation measures (as amended herein) identified in the Final EIR and adopted as conditions of approval by the County Board of Supervisors shall be implemented.

Agency responsibilities are defined to ensure that proper actions are taken to execute requirements stipulated in this monitoring program. Necessary review, approval(s), and site

confirmation by the designated agency monitor(s) will occur throughout the duration of the program. The checklist will be used to record completion of each of the required measures, and to establish a formal and publicly available record certifying implementation of mitigation measures.

The adopted mitigation measures will be implemented through compliance with various codes, ordinances, policies, standards and conditions of approval which are satisfied either 1) prior to grading, 2) during construction and verified by plan check and /or site inspection; or 3) through monitoring and reporting after construction is completed. Compliance monitoring procedures for these mitigations are summarized below.

The County of Yuba Department of Planning and Building Services will have responsibility to maintain a log of all mitigation monitoring and reporting requirements. The Planning Commission and County Board of Supervisors will have responsibility for approval of this mitigation monitoring and reporting program, and to pursue enforcement remedies in the event of noncompliance.

C. PUBLIC ACCESS TO MONITORING REPORTS

The mitigation implementation monitoring file must be maintained in a timely and orderly manner, and will be available to members of the public upon request. Copies of the file must be provided within two working days upon request, with payment of costs not to exceed actual time and duplication costs.

D. MITIGATION EVALUATION & PERFORMANCE STANDARDS

Evaluation of mitigation effectiveness will be undertaken as a part of the regular monitoring process. Evaluation will permit identification of those measures which can be reliably applied to other projects for resolving similar issues. Conversely, ineffective measures can be identified and improved or eliminated for future use.

When the effectiveness of proposed mitigation measures is uncertain the County will specify a minimum performance standard which must be met to receive approval and final certification. Properly applied performance standards will provide the County with recourse to require additional measures if recommended techniques fail to adequately mitigate significant adverse impacts. Performance bonds may also be required prior to development as insurance to the County.

Some mitigation strategies will require field measurements and professional certification. Examples include, but are not limited to water well yields, water quality testing, noise barrier performance, and storm drainage designs. Requirements for testing, and designation of certification authority between County staff, the developer's engineers, and third-party consultants will be stipulated in formal agreements as needed.

E. REMEDIES

Specific remedies and penalties are defined as part of the formal County's policy to address non-attainment of performance standards, and noncompliance with required mitigation implementation. Noncompliance may occur under at least two different circumstances:

1. Failure to meet performance standards with fully implemented measures;

2. Intentional violations and noncompliance.

Appropriate remedies will vary with determinations made in case specific circumstances, and may include any of the following:

A. Issuance of Stop Work orders.

B. Citations and fines: Depending upon jurisdiction these may be issued at County, State, and Federal levels.

C. Court issued Cease and Desist orders.

D. Forfeiture of performance bonds, and/or cash deposits.

E. Suit for damages and restitution.

F. Arrest and prosecution (extreme cases).

F. POLICY FORMULATION & DEVELOPMENT

Additional procedural guidelines and policy statements for Mitigation Implementation Plans may be developed by the County, and may include expansion of these provisions and additional elements not addressed herein. This plan does not exclude the project applicant(s) or developer(s) from participation in an expanded future program.

III. INVENTORY OF MITIGATION MEASURES

GENERAL PLAN, ZONING, & LAND USE (DEIR pp. 14-24)

Land Use Conflicts and the Enterprise Zone

Mitigation 1: The M-1 zoned land north of Buttercup Lane and McGowan Road must be maintained for industrial use. It may be desirable to rezone it to M-3, Light Industrial, to provide a more transitional land use between the airport zone and surrounding residential land uses.

Mitigation 2: In conformance with the policies of the Airport Land Use Commission, residential development shall be restricted to a density not to exceed two (2) dwelling units per acre, net, on lands located within the Approach-Departure Zone of the Yuba County Airport.

Conflicts with Agricultural Uses

Mitigation 3: A solid fence a minimum of six feet in height shall be constructed for all lots with property bordering active agricultural uses.

Mitigation 4: Owner shall record a covenant in the deeds of each parcel created by the subdivision which requires that pets be restricted to fenced yards or tethered within the limits of each parcel, and furthermore, that pets be controlled on a leash when off the owner's property.

Loss of Agricultural Land

Mitigation 5: Pursuant to Yuba County Ordinance 11.55, a person or agent acting as an agent for the seller or lessor of real property located within the County shall provide knowledge to all potential purchasers or lessees of the right to farm and mine within the County.

Airport Safety Zones and Public Safety

Mitigation 6: No development will be permitted within the "*Clear Zone*" (Zone 1). Development within the "*Approach - Departure Zone*" (Zone 2) shall be limited to single-family residential uses which do not exceed two (2) to the acre and which adhere to all "*Overflight Zone*" (Zone 3) standards. Development within Zone 3 may include residential and industrial development that does not require or utilize any steady or flashing light that could be confused with an FAA navigational signal, generate smoke, attract large numbers of birds, or otherwise create interference detrimental to the safe operation of aircraft or airport instrumentation. Installations involving hazardous materials such as above ground oil tank farms or other chemical storage are also excluded from this zone.

High Voltage Power Lines

Mitigation 7: A minimum building setback of 100 feet from right-of-way is required for development of human-occupied structures beside the powerline easements which parallel State Highway 70 and extend east-west from Highway 70 paralleling the alignment of Ella Avenue. This requirement applies to powerlines mounted on steel towers, and not to wood-pole mounted lines.

Mitigation 8: Individual owners must coordinate with PG&E prior to beginning construction to identify construction safety measures. A record of consultation with the utility shall be placed on record with the Department of Planning and Building prior to issuance of building permits.

Odor

Mitigation 9: A minimum lot-line setback of 200 feet from the existing and future OPUD ponds shall be established for residential structures, and a solid fence shall be constructed to provide odor, sight, and noise control from the sewage treatment plant. The setback area may be occupied by uses such as parks, but not including schools.

Mitigation 10: A person or agent acting as an agent for the seller or lessor of real property located within the County shall provide knowledge to all potential purchasers or lessees of the presence of the nearby sewage plant and of the County's intent to protect the existing land use.

PUBLIC SERVICES (DEIR pp. 25-50)

Schools

Mitigation 11: In addition to the fees adopted under Government Code Section 53080, the owner shall pay impact fees for construction of Marysville Joint Unified School District facilities in accordance with the adopted fee schedule as adopted by the County. Said fees shall be due prior to final building permit inspection.

Mitigation 12: Deleted

Mitigation 13: Deleted

Mitigation 14: Deleted

Parks, Recreation, and Open Space

Mitigation 15: Prior to Final Map recordation for each phase of development, the owner shall improve and dedicate recreation floodway corridors and all other landscaped setback areas in accordance with conditions of the tentative map. Improvements shall be subject to review and approval of the Director of Public Works.

Mitigation 16: Prior to Final Map recordation for each phase of development, the owner shall dedicate park land and/or pay fees in-lieu of land dedication to the County agency designated by the Director of Public Works as provided under Yuba County Ordinance Code section 11.15.661.1.

Mitigation 17: Subject to applicable conditions in (a) and (b) below, the owner shall annex into an existing Mello-Roos Community Facilities District (CFD) for schools, sewer, water, roads and their maintenance (public facilities) or pay to each entity responsible for each public facility a fee equivalent in value to the impact on these facilities that will be caused by the development (impact fees). Such impact fees shall have been established by statute or ordinance or by resolution or order of the entity imposing such fee or by law. Owner shall provide the Public Works Department written acknowledgement by each applicable entity of Owner's satisfaction of this condition.

a) In lieu of annexing into an existing CFD or paying an impact fee for one or more such public facilities, Owner shall provide an entity or entities, on terms and conditions approved by the County, to accept and maintain one or more of such public facilities described by these Conditions of Approval.

b) Condition 17 shall be waived to the extent that Owner submits to the Public Works Department a certified copy of a written agreement between Owner and the entity responsible for a public facility indicating that impact of the project will be adequately mitigated on such entity and its public facilities and further indicating that Owner and such entity jointly request that the condition herein relating to such entity and public facility by waived.

Mitigation 18: The owner shall annex into or support the formation of a Landscape and Lighting District prior to recordation of the Final Map. The District shall provide for park improvements including the installation of landscaping and park equipment, bike paths, sidewalks, irrigation, and lighting as well as maintenance of parks and the landscaped recreation/ floodway corridors along arterial and collector streets.

Mitigation 19: The owner shall submit to the Planning and Building Services and Public Works departments a residential street tree plan for review and approval prior to map recordation. Said plan shall be in accordance with the Yuba County Ordinance Code Section 12.82.40(10). Said street trees shall be planted prior to the issuance of the Certificate of Building Occupancy.

Water supply

Mitigation 20: Prior to building permit approval, the Fire Flow Requirements of the Uniform Fire Code must be met for individual land use proposals. The Fire Chief of the appropriate fire protection district shall certify the adequacy of fire flows prior to issuance of any building permits within the North Arboga Study Area boundaries. Issuance of building permits for projects within OPUD is expressly conditioned upon full participation in the District for the construction and installation of required water lines, wells and treatment facilities, and any supporting equipment required.

Mitigation 21: Water service systems for individual projects must be designed to be fully integrated into the OPUD water service system to provide looped water systems. Connection must be made to link water lines with the existing system in addition to the new wells and lines required. Final water system design will be subject to review and approval of OPUD, in consultation with the County Public Works Director.

Sanitary Sewer

Mitigation 22: Sewer service systems for individual projects must be designed to be fully integrated with OPUD designs for the area-wide sewer service system. Final sewer system design will be subject to review and approval of OPUD, in consultation with the County Public Works Director.

Stormwater Drainage

Mitigation 23: deleted

Mitigation 24: All lands not presently in Reclamation District No. 784 must be annexed into the district, provided the district allows the annexation, prior to recordation of final maps.

Mitigation 25: All development within areas subject to flooding shall provide for flood proofing of all structures pursuant to FEMA and County requirements, subject to review and approval of the Public Works Director.

Mitigation 26: Approval must be obtained from the State of California to abandon flood inundation easements, or, to obtain approval of development plans in areas where the State has inundation and flowage easement rights under the Sacramento and San Joaquin Drainage District.

Mitigation 27: The owner shall submit to the Public Works Department for review and approval drainage plans and calculations for the proposed project which are prepared by a registered engineer which quantify the amount of increased drainage run-off from the project. Said plans shall be submitted and approved prior to recordation of the Final Map. Projects that will increase downstream drainage flow will not be approved by the County until adequate drainage facilities are completed. Initially, projects may be approved that incorporate on-site detention or retention ponds that will prevent any increase in downstream storm water runoff. Owner shall construct the drainage facilities in conformance with the plans approved by the Public Works Department and Reclamation District 784. Oil and grit separators, sediment traps, evaporation basins, slow restriction devices and/or other methods to reduce the volume of grease and oil pollutants caused from street surface runoff shall be included in the storm drain design to meet requirements of the County's NPDES permit.

Mitigation 28: Detention basin and drainage corridor areas shall be landscaped to meet with approval of the County of Yuba and Reclamation District No. 784. Landscaping shall consist of grass or other ground cover approved by the Public Works Department and Planning and Building Services Department.

Stormwater Drainage (cont.)

Mitigation 29: Deleted

TRAFFIC & CIRCULATION (DEIR pp. 51-75)

Improvements currently needed.

Mitigation 30: Arboga Road must be reconstructed and realigned through the Ella Avenue intersection. Road improvement costs can be collected as a special impact fee, by requiring the first developer to construct the improvements with establishment of an area of benefit for reimbursement, or by formation of an assessment or Mello-Roos district. The mechanism shall be subject to the approval of the Planning and Building Services Director and the Public Works Director prior to recordation of final maps.

Improvements required with development of the NASA study area.

Mitigation 31: Arboga Road must be reconstructed and realigned from a point approximately 1,000 feet south of Ella Avenue to the McGowan Parkway intersection. At a minimum, Arboga Road should be widened to a four-lane roadway in the vicinity of the Ella Avenue and McGowan Parkway intersections to accommodate auxiliary turn lanes.

Implementation Schedule: This improvement would not be needed until a significant portion of the NASA area west of the railroad is built. In fact, if McGowan Parkway is extended west through the Centex Subdivision (Project 13), the "Existing plus NASA area" daily traffic volume would be reduced to a level where a four lane road is not needed. Without the McGowan Parkway extension, the roadway would need to be widened when 80% of NASA west of the railroad is built.

Mitigation 32: Arboga Road must be widened north of McGowan Parkway to provide a four-lane section. The roadway must be widened to its ultimate four-lane section with shoulders and must extend from McGowan Parkway in the south to the limits of the industrial area in the north. This widening will be approximately 2,700 feet long.

Implementation Schedule: This improvement would not be required until traffic on Arboga Road reaches 12,000 ADT. This threshold would not be reached until about 85% of the NASA area is built out.

Mitigation 33: The intersection of McGowan Parkway and Arboga Road must be reconstructed and signalized. In conjunction with the Arboga Road reconstruction noted above, the McGowan Parkway intersection should be reconstructed to provide the following configuration:

Northbound:	1 Through lane and 1 Through Plus Right Turn lane;
Southbound:	2 Through lanes and 1 Left Turn lane;
Westbound:	1 Left Turn Lane and Right Turn lane

(Estimated traffic signal cost = about $125,000.)

Implementation Schedule: Install when warrants are met. This threshold is likely to be met when about 90% of the NASA is built out.

Mitigation 34: McGowan Parkway must be widened to a four-lane section from Olivehurst Drive to SR 70.

Implementation Schedule: This improvement should be triggered by 12,000 ADT on McGowan Parkway. This threshold would likely be reached when about 50% of the NASA project is built out.

Mitigation 35: The McGowan Parkway/State Route Highway 70 interchange must be reconstructed as build out approaches.

Implementation Schedule: This mitigation would not be needed until the area is nearly built out, and may best be implemented as a cumulative mitigation.

Improvements needed under cumulative conditions.

Mitigation 36: A two part strategy should be implemented to mitigate regional impacts:

36A. A Public Facilities program, Area of Benefit or similar financing strategy should be established for the south Yuba County area, including, at a minimum the circulation system improvements indicated in Table 10 (DEIR). As indicated, these facilities are regional in nature, and either involve construction of roadways already included in the Yuba County Circulation Element or roadways which should be added.

36B. Programs and strategies to reduce trip generation and dependence on the single occupant automobile must be developed. Yuba County must provide a policy basis and Transportation Systems Management (TSM) ordinance which requires employers to implement such programs and requires

that new development include provisions for alternative transportation modes. As a part of this effort, the NASA owners must incorporate bicycle and pedestrian facilities into the project plan. In addition, the plan should include facilities, such as bus turn outs and Park & Ride Lots, which will facilitate future transit service and car pooling.

Mitigation 37: An area-wide funding mechanism must be established for the improvements identified in mitigation measures 31 through 36 above, and 39 below, in the form of a traditional acquisition assessment district or a Mello-Roos community facilities district encompassing all development proposals that will receive benefit. The funding mechanism must be established, and each subject property must agree to full participation, prior to recordation of final maps.

AIR QUALITY (DEIR pp. 76-83)

Post-Project Emissions

Mitigation 38: Industrial and commercial development with more than 25 employees will be required to prepare and implement a trip reduction and ridesharing program including coordination of carpools, and establishment of some form of flex-time work hours including staggered work schedules and compressed work weeks (ie., 4 days @ 10 hours).

Mitigation 39: An appropriate site near the McGowen / Highway 70 interchange should be identified by Department of Planning and HATA staff for development of a park-and-ride lot. HATA staff must also identify the acreage and improvements required to create an operational park-and-ride lot.

Mitigation 40: The County will require preservation of the abandoned railroad corridor that forms the southwestern NASA boundary and extends through the Plumas Lake Specific Plan area as a potential long term light-rail route to link with the Sacramento rapid transit system, or alternatively, as a future roadway or bicycle route within the south County area.

Mitigation 41: All new residential units constructed in the Study Area which are to have wood stoves and/or fireplaces shall be equipped with catalytic systems certified as meeting or exceeding EPA standards. No units which have wood burning stoves or fire places shall receive final building permit clearance until verification of compliance with this measure is made.

Construction Impacts

Mitigation 42: Dust and particulates from construction grading must be minimized by regular sprinkling of exposed soils, and curtailing grading activities on days when wind exceeds 20 miles per hour. A grading and dust control plan will be required as a part of Improvement Plan review and approval. Specific methods for dust control shall be approved by the Director of the Public Works Department and the Feather River Air Quality Management District.

Mitigation 43: An "Authority to Construct" permit must be obtained from the Yuba County Air Pollution Control District by individual owners prior to beginning development.

NOISE (DEIR pp. 84-89)

Highway Noise

Mitigation 44: For all residential development, a 100-foot building setback is required from the edge of pavement of Highway 70, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the Planning and Building Services Director in consultation with the California Department of Transportation.

Mitigation 45: Deleted

Mitigation 46: Exterior walls facing the highway or railroad tracks shall be designed and constructed to meet a Sound Transmission Control Rating of 34. Proposed design standards shall be submitted and approved by the Planning and Building Services Director prior to issuance of building permits.

Mitigation 47: Windows shall have a minimum Sound Transmission Control (STC) rating of 34 on all wall sides facing towards the highway or railroad tracks. Sliding glass doors and other doors facing towards the highway should have a minimum STC rating of 34.

Railroad Noise

Mitigation 48: For all residential development, a 100-foot building setback is required from the edge of the railroad tracks, with a minimum six-foot solid block or masonry wall at the lot line. The height and design of the wall shall be subject to review and approval of the Planning and Building Services Director.

Yuba County Airport

Mitigation 49: New single-family residences and school classrooms will be allowed in areas having airport caused noise between 65 to 70 db (Community Noise Equivalent Level: CNEL) provided the following criteria are met:

a) The proposed structure is constructed in such a manner so that the interior noise level does not exceed 45 db(CNEL).

b) Avigation noise easements are secured prior to issuance of building permits and as a condition of subdivision or other discretionary permit approval.

Mitigation 50: New hotels, motels, apartment houses, and dwelling units except single-family dwellings, will be permitted in areas having an airport caused noise between 65 to 75 db(CNEL) provided the following criteria are met:

a) The units are constructed in accordance with the noise reduction requirements set forth in the California Administrative Code, Title 24, Section 28 and in Chapter 35 of the Uniform Building Code.

b) Avigation noise easements are secured prior to issuance of building permits and as a condition of subdivision or other discretionary permit approval.

Future Arterial Road Noise

Mitigation 51: All lots fronting on arterial roadways shall be separated from the roadway by a solid block masonry wall or combination wall and berm. Said wall or wall/berm combination (barrier) shall not be less than six feet in height. The design of the barrier shall be subject to review and approval of the Planning and Building Services Director and shall be constructed prior to issuance of building permits.

Industrial / Residential Land Use

Mitigation 52: Uses on industrial parcels adjacent to the residential zone shall be limited to activities which do not include noise generation in excess of County standards for residential areas (65 dB as measured on the residential property boundary). In particular, compressors, generators, or other loud equipment that might be mounted or otherwise located along the outer side and walls of buildings should be prohibited, or located in such a way to orient away from residential properties.

Mitigation 53: Individual industrial users must minimize noise transmission to meet performance standards established by the County. Techniques may include, but are not limited to, restrictions on the duration of activities, building orientation and location, and requirements for construction of building envelopes which are properly sealed to prevent noise transmission to surrounding properties. Except for emergency equipment, public address systems, bells, or electronic signalling devices which can be heard outside of buildings will not be permitted.

Mitigation 54: The owners of residential developments adjacent to existing M-1 Industrial zoned properties shall construct a solid barrier wall along the shared boundary. The wall shall be constructed prior to issuance of occupancy permits, and shall be designed based upon a noise attenuation study prepared for the owner by a qualified engineer, subject to review and approval of the Director of Planning and Building Services.

GEOLOGY & SOILS (DEIR pp. 90-102)

Seismic Safety

Mitigation 55: Deleted

Expansive Soil

Mitigation 56: The Subdivision Map Act of the Business and Professional Code (section 11010) requires that soil conditions on all tract developments of five lots or more be studied by a registered civil engineer. The engineering study should include laboratory tests for soil expansion.

Erosion Control

Mitigation 57: Owner shall submit an Erosion and Sediment Control Plan to the Public Works Department for review and approval. The plan shall identify best management practices to be utilized during all construction phases, and landscaping or other post-construction surface stabilization measures.

BIOLOGICAL RESOURCES (DEIR pp. 103-105)

Mitigation 58: The project shall incorporate a 25-foot average nondevelopment setback buffer from the high bank of drainage ditches and swales.

Mitigation 59: Deleted

Mitigation 60: Prior to Tentative Map approval, the owners of projects 3, 8, and 13 shall cause submit a biological survey prepared by a recognized consultant which will include delineation of wetland acreage by type if any, within the owners land. Once the survey is completed, the consultant shall calculate the area of jurisdictional wetlands, if any. Said area shall be classified as pond, river, seasonal wetland, marsh, drain or other classification. If said area is between one (1) and ten (10) acres, then the owners shall complete and forward a Nationwide Permit 26 to the U.S. Army Corps of Engineers. If said area is over ten (10) acres, then the owner shall apply to the Corps for a Section 404 permit prior to development. The owner shall submit a copy of the survey and permit to the Planning and Building Services Department for review prior to map recordation.

Mitigation 61: A detailed map showing the location and quantity of vernal pools, water courses, and wetlands in the project area shall be submitted to the Planning and Building Services Director for review prior to map recordation.

Mitigation 62: The owner shall cause to prepare and submit to the Planning and Building Services Director for review and approval a complete revegetation plan which when implemented, will result in no net loss of protected (ie., one acre or greater) wetland acreage or protected wetland habitat value. Said revegetation shall be planted or bonded for prior to map recordation. A detailed revegetation monitoring plan shall also be prepared by the owner to assure compliance.

Mitigation 63: All healthy existing oak trees on the site shall be preserved and protected from changes in grading and soil moisture regimes. An arborist's report shall be prepared and submitted to the Planning and Building Services Director for review and approval prior to any removal of oak trees on the site and prior to map recordation.

CULTURAL RESOURCES (DEIR p. 106)

Mitigation 64: Should any prehistoric or historic artifacts be exposed during excavation and construction operations, work shall cease immediately and the Department of Planning and Building shall be notified. A qualified archaeologist shall be consulted to determine whether any such materials are significant prior to resuming ground breaking construction activities. Standardized procedures for evaluating accidental finds and discovery of human remains shall be followed as prescribed in Appendix K of the California Environmental Quality Act.

IV. CHECKLIST SUMMARY

The adopted mitigation measures will be implemented through various codes, ordinances, policies, standards, and conditions of approval which are satisfied either prior to grading, during construction, or through monitoring and reporting after construction is completed. A summary of mitigation measures is provided by timing of verification.

TIMING FOR IMPLEMENTATION	MITIGATION MEASURES
Prior to Tentative Map Approval	1, 2, 6, 7, 9, 26 40, 44, 48, 49, 50*, 51*, 58, 60*, 63*
Prior to Grading:	17, 27, 43, 56, 57,
During Grading:	42*, 63*, 64*
Prior to Recordation of Final Map:	15, 16, 18, 19, 21, 22, 24, 30, 31, 36A, 51*, 60*, 61, 62
Prior to Building Permits:	8, 11, 20, 25, 37, 50*, 52 53, 54,
During Construction:	3, 42*, 46, 47, 64*
After Construction:	28, 41
Prior to Occupancy:	5, 10, 38
Continuing	4, 32, 33, 34, 35, 36B, 39

* Asterisk implies that portions of the measure will require implementation during more than one development stage.