
7. MANAGEMENT PLAN

7.1 PLAN SELECTION

The County's intent expressed in this Management Plan is to be able to meet future aggregate needs using the resources that are available or could be developed in the County while recognizing that continued production from both terrace and instream sources must be regulated with standards that avoid or minimize significant impacts and promote the efficient use of the resource. The Management Plan presents policies and procedures that will result in a balanced development of the County's aggregate resources that recognizes all of these factors.

The options for quarry, instream, and terrace production presented in Chapter 6 and the combinations of options that could meet the projected demand for aggregate were examined as a basis for selecting this Management Plan. In order to manage the County's aggregate resources and achieve the goal of meeting aggregate demand while minimizing environmental impacts and land use conflicts, the Management Plan combines a number of the policy elements of the options and alternatives presented in Chapter 6 and allows all three types of aggregate mining under certain conditions. Continued reliance on the 1980 ARM Plan, one of the alternatives considered, does not solve the problems that have been experienced with terrace reclamation or instream gravel operations. On the other hand, reliance only on quarries to meet all of the County's needs appears unrealistic at this time because of the lack of proven availability of sufficient high-quality resources to meet projected demand. The Plan thus continues the "mixed-source" strategy adopted in the 1980 ARM Plan but firmly redirects future aggregate production to hardrock quarries.

The major new features of this Plan include:

- Increased incentives to stimulate quarry production from existing and new sources, particularly for PCC and other "high quality" uses.
- Continued instream extraction for flood and erosion control with more protection for fisheries, wildlife habitat, and adjacent uses.

- Stricter short and long-term limitations on terrace mining.
- Stronger support for recycling of aggregate products and reduction of aggregate demand.
- Review and amendment of aggregate specifications to increase use of quarry materials while assuring product quality.
- A major shift in terrace mining reclamation from required agricultural restoration to a combination of recreation, wildlife habitat, and agricultural reclamation, including accelerated reclamation of existing pits which have not been adequately reclaimed.
- More comprehensive operation and reclamation standards for all mining.
- Addition of a road mitigation program and fee.
- Addition of a fee on Russian River terrace and instream mining for impact mitigation programs.
- Increased monitoring of mining activities and reclamation progress.

The Management Plan incorporates some of the elements of the environmentally superior alternative identified previously in Chapter 6. It attempts to stimulate quarry production so that terrace production can be terminated after ten years. Instream mining, in the form of gravel bar skimming, will continue to be allowed at levels which balance the rate of aggradation and degradation. It will also be allowed to protect adjacent uses from flooding and bank erosion, but the revised standards will further reduce and minimize the effects on channel levels, vegetation, wildlife, and fish. The Management Plan also advocates reducing the overall demand for Sonoma County aggregate by encouraging the use of recycled materials and alternative sources.

While quarry production has increased since the development of the 1980 ARM Plan, it is not adequate to supply all of the existing needs, particularly the needs for PCC. The County actions proposed in the Management Plan will be needed to stimulate the expansion of existing quarries and their production and to develop new ones. One idea proposed for further consideration is that the requirements for aggregate could be changed so that quarry sources are used in place of instream and terrace sources. While the performance specifications discussed in Chapter 2 do not necessarily prevent the use of quarry rock, the existence of plentiful and less expensive alluvial resources means that these sources are selected for uses where quarry rock could work as well. Changing the preference for alluvial sources will continue to take time, and the County will need to take the lead in this effort by changing its purchasing practices and establishing policies to require more use of quarry rock and make it more competitive.

The Management Plan provides enough mining sites and aggregate resources that future demands for aggregate uses can be met through the year 2010 and beyond. The demand projections in Chapter 3 indicate that the 1991 to 2010 demand for all Sonoma County aggregate will range from a low of 75 MT (million tons) to a high of 175 MT. The projected demand range for construction-grade aggregate for the same period is 52 to 118 MT. Using a moderate estimate of future demand, the Management Plan anticipates the following needed production from 1991 through 2010 :

Construction grade aggregates = 75 MT

Other aggregate materials = 35 MT

Total aggregate needed = 110 MT

It should be emphasized that these figures are estimates of long-term demand, not definite production requirements. The Management Plan recognizes that actual demand and production during this period may be more or less than estimated, depending upon a number of factors, including regional growth, development standards, aggregate recycling and reuse, market trends, and permit approvals.

The Plan anticipates that the long-term demand will be supplied primarily from existing and new quarries. Instream mining will supply a consistent but low portion of the demand for high quality materials. Terrace mining will supply a smaller portion of the long-term demand than in the past because terrace operations will be terminated in ten years. Terrace resources will be allocated very cautiously for a limited time to meet needs for PCC and high-quality uses until quarry sites are explored, permitted and developed as a replacement source.

As a result of the Plan proposals and the moderate demand estimates, the Plan anticipates the following demand and production quantities:

	<u>Construction Grade</u>	<u>Non-Construction Grade</u>	<u>Total</u>
Quarries	47 MT	35 MT	82 MT
Instream	8 MT	0	8 MT
Terrace	<u>20 MT</u>	<u>0</u>	<u>20 MT</u>
Total	75 MT	35 MT	110 MT

Given the uncertain nature of the market in the future, the potential for increasing the production from quarries, and the potential for increased use of recycled and substitute materials, the Management Plan provides for sufficient production to meet the range of identified needs. The satisfaction of demand for PCC and other high-quality uses will be further assured by the Management Plan provisions to periodically re-evaluate supply and demand factors and management policies as necessary.

All mining activities result in environmental impacts and can create land use conflicts. Often, these impacts can be reduced or fully mitigated, but aggregate operations generate some significant impacts that cannot be entirely avoided or reduced to non-significant levels. The Management Plan incorporates mitigation measures identified in the Program EIR in the form of mining and reclamation standards and other policies and implementing actions. These measures will reduce characteristic environmental impacts to acceptable levels wherever feasible. Environmental review of specific mining and reclamation proposals on individual sites may result in imposition of additional measures to mitigate site-specific impacts not addressed in the Program EIR.

7.2 GOALS AND OBJECTIVES

The goal of the ARM Plan is to meet the County's need for aggregate while minimizing environmental impacts and land use conflicts in a manner consistent with the requirements of CEQA, SMARA and State Mineral Resource Management policies. Within this context, and to the maximum extent feasible, the ARM Plan's specific objectives are the following:

Objective 1. Assist existing quarry operations to increase production for high-quality uses in an environmentally sound manner.

Objective 2. Facilitate new or expanded quarry operations at designated sites or at other locations with resources which can meet the needs for aggregate in an environmentally sound manner.

Objective 3. Provide for terrace resources to meet the needs for high quality uses for a ten-year period and terminate terrace mining at the end of that period.

Objective 4. Manage instream resources on a sustained yield basis for high quality uses in a manner which reduces bank erosion, maintains flood flow capacities protects adjacent uses, and minimizes impacts on fisheries, vegetation and wildlife

Objective 5. Continue and expand monitoring programs so that more information is available for future decisions about terrace and instream impacts and alternative management policies and approaches.

Objective 6. Reevaluate gravel extraction methods and production periodically to assess options which would further reduce environmental impacts and land use conflicts or better meet the County's aggregate needs.

Objective 7. Change specifications, standards and practices where possible so that quarry rock will be more competitive with instream and terrace sources.

Objective 8. Reduce the need for additional aggregate through utilization of recycled and substitute materials, changes in development standards, and other means possible.

Objective 9. Encourage the retention of locally produced aggregate for use within Sonoma County.

7.3 COUNTYWIDE REQUIREMENTS

There are a number of specific County requirements for mining and reclamation activities which are applicable to all quarry, instream, and terrace operations. The following summarizes the more important Countywide standards for mining and reclamation which will be added to Chapter 26A of the County Code. These standards shall apply to all aggregate operations and related activities conducted in unincorporated portions of the County pursuant to approved mining permits and reclamation plans.

OPERATING STANDARDS

1. The hours of operation for all aggregate operations shall be limited to 6:00 a.m. until 10:00 p.m. Monday through Friday and 6:00 a.m. to 4:30 p.m. on Saturdays, except as specified below for instream operations. Mining at other times or on federal holidays will be prohibited unless specially set forth as a use permit condition. Conditions of approval may further limit the hours of operation to reduce noise levels or mitigate other site specific project impacts.
2. All operations shall be conducted to reduce noise to acceptable levels at nearby sensors. The maximum acceptable noise levels for all aggregate operations are the standard contained in the Noise Element of the General Plan or any regulations adopted to support and enforce those standards. More stringent noise controls may be required as a permit condition when local circumstances warrant additional protection of adjacent uses.
3. All operations shall ensure the security of the site, protect the public, and prevent trespassing through the use of fencing, gates, warning signs, site patrols, and similar methods.
4. All operations shall minimize alterations to natural drainage systems. Stormwater shall not be accumulated on site unless necessary to control flooding, erosion, or siltation in adjacent and downstream watercourses. All operations shall incorporate the "best management practices" into the Storm Water Pollution Prevention Plan required by the

RWQCB. Operations along stream channels shall obtain the appropriate permits and comply with the requirements of Ordinance 3836R, the RWQCB, CDF&G, SLC, and the Corps.

5. All operators shall be required to develop a truck driver education program which includes posting details on preferred haul routes and informing drivers of procedures established to reduce public conflicts. Operators will also be required to monitor driver compliance and respond to complaints about gravel trucks.
6. All access roads and entrances to aggregate operations from public roads shall be paved or otherwise surfaced to prevent aggregate or other materials from being deposited onto the public right-of-way. All public and private haul routes shall be maintained as necessary to prevent dust. New entrances to public roads are required to have encroachment permits from the County or Caltrans. All roads to be used for site access should have sufficient width, shoulders, pavement strength, and other features necessary to adequately mitigate the traffic impacts of proposed operations. Public access roads shall meet the design requirements of the General Plan and related standards. Traffic levels on public access roads shall not exceed the acceptable levels identified in the General Plan.
7. All operations shall provide off-street parking sufficient to accommodate customers, employees, and all mining equipment.
8. All operations shall manage hazardous materials and hazardous wastes in compliance with the requirements of the Uniform Fire Code, the Uniform Building Code, the County Public Health Department, local fire protection agencies, the NSCAPCD and the BAAQMD, the RWQCB, and the California EPA. Hazardous materials and wastes are to be removed from all mining areas within the 100-year flood plain by November 1 of each year. Each mining site where hazardous materials are used or hazardous wastes are stored is required to have a Spill Prevention and Countermeasure Plan as part of the use permit.
9. All operations and equipment used in the extraction, processing, or transportation of aggregate materials shall comply with the air quality regulations of the NSCAPCD or the BAAQMD.
10. All operations shall have procedures for identifying and protecting items of archaeological, paleontological, and historical value. These procedures shall also require notifying the appropriate parties if any items of value are identified and implementing the retrieval and review measures established by those parties. The requirements for these procedures are specified in Chapter 8, Section 15, "Cultural Resources."
11. All aggregate operations are required to contribute to the Aggregate Road Mitigation Program to pay for the industry's fair share of mitigating cumulative traffic impacts on the County road network. Annual mitigation fees based on production will be established to pay for maintenance to County roads used as haul routes. The amount of the mitigation fee and the road improvements to be performed shall be reviewed and approved annually by the Board of Supervisors. The administration of this mitigation program is discussed in section 7.7.

Each use permit will also contain the specific additional steps the operator will carry out to mitigate local traffic and road impacts which are not addressed by the Countywide Aggregate Road Mitigation Program. Upgrading of haul routes may be required as a permit condition in order to carry truck weights and prevent traffic hazards. Upgrading may be timed to correspond to mining phases or production and may be financed with revenue bonds.

12. Where vested rights determinations for existing aggregate operations have been made, no new use permit shall be required unless a "substantial change" in operations occurs. A substantial change is defined as an increase of 25 percent or more in the amount of aggregate production or importation in a calendar year compared to the average for the previous five calendar years or any change in operations which creates new, significant environmental impacts.
13. All operations are subject to the requirements of Chapter 26A of the County Code, including reimbursement of the County's costs for carrying out the monitoring and mitigation activities set forth in this Plan.
14. Operators shall obtain any and all permits and approvals required by other agencies having jurisdiction over the mining operations and shall provide copies to the County.
15. Nighttime lighting shall be located and designed to minimize off-site glare.

RECLAMATION STANDARDS

1. All aggregate operations shall have approved reclamation plans with the following contents required by SMARA:
 - Names and addresses of the operator and persons designated as an agent.
 - Anticipated quantity and type of materials to be mined.
 - Proposed initiation and termination dates for the project and each phase.
 - Maximum anticipated depths and elevations of mining.
 - Description of mining plan and a schedule of when reclamation will be initiated.
 - Maximum rates of production.
 - Proposed processing operations, importing of materials, and haul routes for importing and distribution.
 - Legal description of the lands that will be affected by the operation.
 - Description of the proposed or potential uses of the site after reclamation.
 - Description of the manner of reclamation, including how contaminants will be controlled, mining wastes will be disposed of, and affected streambed channels and streambanks will be rehabilitated to reduce erosion and sedimentation.
 - Assessment of the reclamation plan's effect on future mining in the area.
 - Statement that the applicant accepts responsibility for reclaiming the mined lands.
 - Other information required by the County about how the site will be reclaimed to a condition suitable for other beneficial uses.
2. Reclamation shall begin as soon as possible during the mining process and in all cases shall be completed within the schedule stated in the approved reclamation plan.

3. Reclamation shall reduce to levels of risk acceptable to the County all hazards to public health and safety, including unstable slopes, dangerous equipment, toxic substances, water pollution, disease vectors, and access to adjacent properties.
4. Final grading and drainage shall be designed to prevent future discharge of sediment above pre-mining levels.
5. All mined lands will be revegetated. Revegetation methods shall be appropriate to the topographic, soil, and climate conditions of the site and shall incorporate shrubs and trees native to the area. The natural regrowth of riparian vegetation shall be encouraged on disturbed areas adjacent to streams and water bodies. The standards contained in the 1992 Revegetation Technical Report available at the Planning Department will be applied where applicable. All revegetation will be inspected at least once a year by the County and the need for additional planting will be determined at that time.
6. Mined slopes shall have soil added where needed to support the type of revegetation proposed. Topsoil, overburden, aggregate processing sediment, and other native earth materials from the site and surrounding area shall be used to the maximum extent feasible in this process.
7. All mining operators and owners responsible for the reclamation of mined lands shall submit effective financial assurances to the County to ensure the completion of approved reclamation activities including all required revegetation. The content and form of the assurances shall meet SMARA and State requirements. The amount of the assurance shall be sufficient to cover all costs associated with reclamation and may be adjusted annually to reflect phasing or progress of mining and reclamation activities. Financial assurances shall not be released until the County determines in writing that the required reclamation has been completed.
8. All reclamation plans and activities shall comply with reclamation standards adopted by the SMGB.
9. All surface mining operations are subject to the reclamation standards and other requirements of Chapter 26A of the County Code.

7.4 QUARRY MANAGEMENT PROGRAM

The main objective of the quarry management program is to increase quarry production to provide a full range of uses and replace terrace sources as the primary supply for future construction aggregate. Meeting this objective recognizes that past production trends and use patterns need to change and that quarry products must be able to achieve a large market share. The approach chosen to achieve this objective is a combination of regulatory incentive aggregate standards, and stricter limitations on competing alluvial sources with more severe environmental impacts.

7.4.1 Location and Approval

Seven new quarry sites and expansion areas for most existing quarries are set forth on Figures 5-1 through 5-28, but this designation is not required to apply for or receive approval of a quarry operation nor does it signify automatic approval of all future mining proposals. All designated new quarry sites and potential expansion areas will be protected from incompatible uses by being considered in the review of all nearby development proposals. Uses which would be incompatible with future quarry development on designated sites shall not be permitted unless the public benefits of the proposed use outweigh the public benefits of the potential quarry development. The non-designated "Potential Quarry Resource Areas" mapped on Figure 5-29 are shown for informational purposes only and do not restrict other uses allowed by zoning in those areas or on adjacent lands nor will the development review process consider potential quarry resources in these undesignated areas.

Quarries are permitted in three resource and agricultural General Plan land use categories: RRD, DA and LEA. Approval of a use permit, reclamation plan and MR overlay zoning is required for all quarry development, except that, in the RRD, DA, and LEA zoning districts, a use permit and reclamation plan but the MR zoning overlay is not required for small isolated quarries that are less than 5 acres, produce less than 5,000 cubic yards or 7,500 tons per year, and do not include crushing or batching operations. Quarry operations are also allowed with approval of a use permit and reclamation plan in the PQP General Plan designation and PF zoning where such operations are compatible with allowed public uses.

Permit expiration dates will be set in each individual permit up to but no longer than 20 years. All quarry approvals will require environmental review to determine whether or not they are within the scope of the Program EIR. Some site-specific impacts which may result from development of the designated quarry sites are described in general terms in Chapter 9. Quarry mining and related uses are allowed on land under Williamson Act contract, provided that such sites are reclaimed to agricultural use as soon as mining has ceased and ancillary uses do not continue beyond the mining.

7.4.2 Operating Standards

To the maximum extent feasible, all quarry sites shall be screened visually from public roads and uses with topographic features, berms, and shrubs and trees native to the area. The maximum

allowable working slopes of the mine face are to be approved by a Certified Engineering Geologist or a Registered Geotechnical Engineer and specifically stated in the use permit. Any variation from the slope requirements of section 3502 (b)(3) of the State Reclamation Guidelines shall be specifically justified in the reclamation plan. Benches in slopes are required every 25 to 30 vertical feet for access and drainage control. Working slopes must eventually conform to final reclaimed slopes and topography. Drainage plans and facilities must minimize slope erosion and off-site sedimentation. Quarries in or near fault zones may be conditioned to incorporate additional geotechnical measures to insure worker and public safety.

Mining operations, stockpiles, and processing operations are to be set back a minimum of 25 feet from the MR zone boundary, the property boundary, and road easements and rights-of way, whichever is the most restrictive. The minimum allowed setback for quarry mining operations from stream banks and critical habitat areas designated in the General Plan is 100 feet. A minimum 200-foot setback is also required from General Plan residential designations. All quarry applications are to be reviewed to establish additional setback requirements as necessary to minimize environmental impacts and land use conflicts. If valuable wildlife habitat would be affected by a proposed quarry development, avoidance, replacement or other mitigation will be required to reduce habitat impacts to a less-than-significant level.

With approval of a use permit, quarry operations may include the manufacture of concrete and asphalt products and the processing and sales of raw, processed, or recycled earth materials and aggregate products. Importation of such materials may be included as ancillary uses allowed with the use permit. Existing quarries may import a maximum of 25 percent of the aggregate materials processed or sold in each calendar year without obtaining a new use permit. This limit does not apply to materials brought to quarries for recycling.

All quarry sites must have adequate water supplies to support the operation. Sites located in Sonoma County Water Zones III and IV will require analysis of the proposed water use, evaluation of the adequacy of the water supply, and mitigation of effects on water resources and nearby water users.

Each quarry operation shall be inspected by the County at least once every 90 days during the mining operations. As a condition of permit approval, quarry operators may be required to monitor, survey, or report on depth and grades of excavation, groundwater levels, water use

revegetation, and other subjects in addition to the annual reports to be submitted to the County and the State.

7.4.3 Reclamation

Post-mining uses are limited by the zoning and the General Plan designation applied to the site. Except on lands under Williamson Act contract, a use permit and reclamation plan can allow importation, processing, recycling, and sale of aggregate materials to continue beyond the end of mining. Reclamation plans for quarry sites under Williamson Act contract must provide for reclamation of the site to agricultural use. Native soils shall be stockpiled, maintained and used to the maximum extent feasible in site reclamation. A geotechnical analysis by a Certified Engineering Geologist or Registered Geotechnical Engineer, based on the requirements set forth in the State Reclamation Guidelines, is required to demonstrate the long-term stability of all final slopes and the slope configuration needed to ensure the safety and revegetation appropriate to the end use of the mined land. As the slopes are cut, periodic inspections shall be undertaken to observe the rock material exposed and adjust the final reclamation contours as needed.

Quarry sites shall be reclaimed and revegetated with planting grass mixtures approved by the SCS and with shrubs and trees native to the area. Mining activities shall be planned so that reclamation is an ongoing activity, thus shortening the duration of habitat loss. Slopes and benches shall be regraded and have soil added as necessary to the surface to restore pre-existing conditions as much as possible. The reclamation approach also needs to take into account the special qualities of each site. The change in topography and the requirement for reclamation offer the possibility that reclamation of some portions of the quarry sites could increase local biotic diversity as compared with the pre-mining condition. This potential exists because earth-moving equipment could create physical habitats that are unique or less common than those that existed on the site prior to mining or that exist in the vicinity of the quarry.

7.5 **INSTREAM MANAGEMENT PROGRAM**

The major objectives for instream operations are to :

- Maintain a balance between aggradation and degradation that reflects the natural recharge of aggregate. This will be accomplished by managing production to remove only the net accumulation of aggregate within the channel and by regulating the location, extent, depth, and frequency of gravel extraction.
- Provide high-quality aggregate materials.

- Maintain or increase the flood flow capacity of stream channels and reduce the potential for bank erosion.

The accomplishment of the above objectives will consider protection of habitat for fisheries and wildlife, adjacent uses, and the groundwater characteristics of the adjacent terraces.

7.5.1 Location and Approval

Instream aggregate extraction may be permitted in the four resource and agricultural General Plan land use categories : RRD, DA, LIA, and LEA. All instream operations require approval of a use permit and reclamation plan and environmental review to determine whether or not they are within the scope of the Program EIR.

Multi-year instream operations are allowed only in designated portions of the Alexander Valley Reach of the Russian River, Big Sulphur Creek, Austin Creek, Sonoma Creek, and the Gualala River. The designated areas are shown on Figures 7-1 through 7-8. Designations are based upon natural characteristics, previous mining activities, ownership, access, and adjacent land use.

New permits in designated instream areas will have a stated time limit of up to ten years and require approval of MR overlay zoning. The permit term for an instream mining operation may be set longer than five years only where there have been no significant violations of operating standards by the applicant on the site or adjacent sites within the past five years.

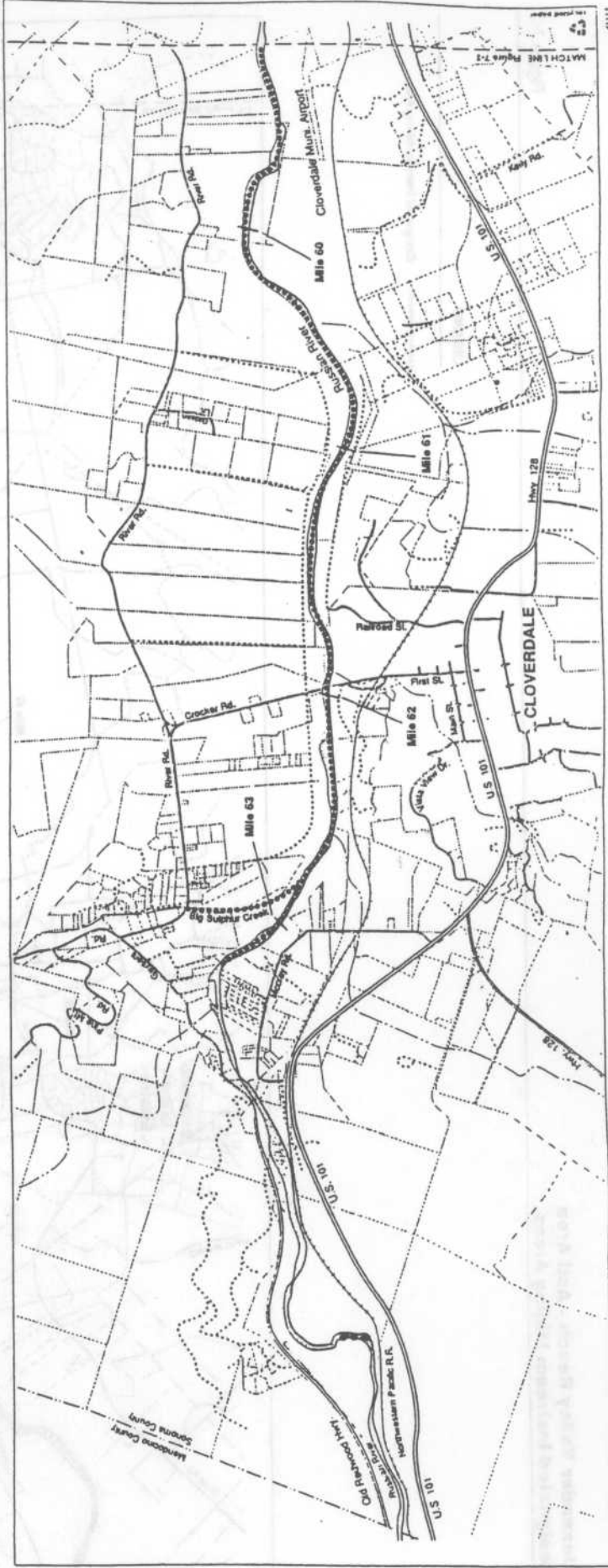
Approval of permits for instream aggregate extraction in non-designated stream sectors requires that, based on available information, a finding is made that a significant potential benefit to flood control, bank protection, public water supply, fisheries, recreation, or riparian and aquatic habitat will result from the proposed extraction. Permits in undesignated areas may not allow extraction more than once in three calendar years in any location, and a new permit is required each time mining is to take place. Instream operations are allowed on Williamson Act contracted lands if mining and processing take place only on lands not suitable for agriculture.

**Alexander Valley Reach - Cloverdale Area
Designated Instream Mining Areas**

Figure 7-1

LEGEND

----- Designated Instream Mining Area

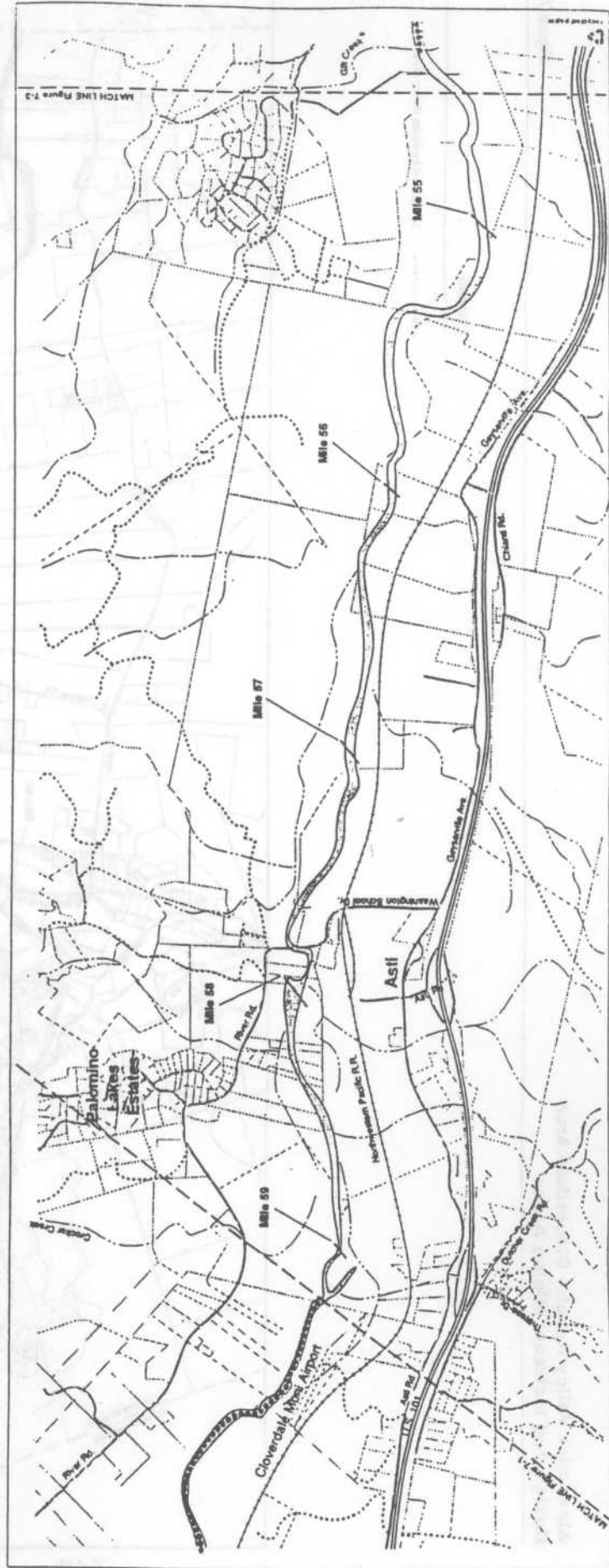


**Alexander Valley Reach - Asti Area
Designated Instream Mining Areas**

Figure 7-2

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----- Designated Instream Mining Area

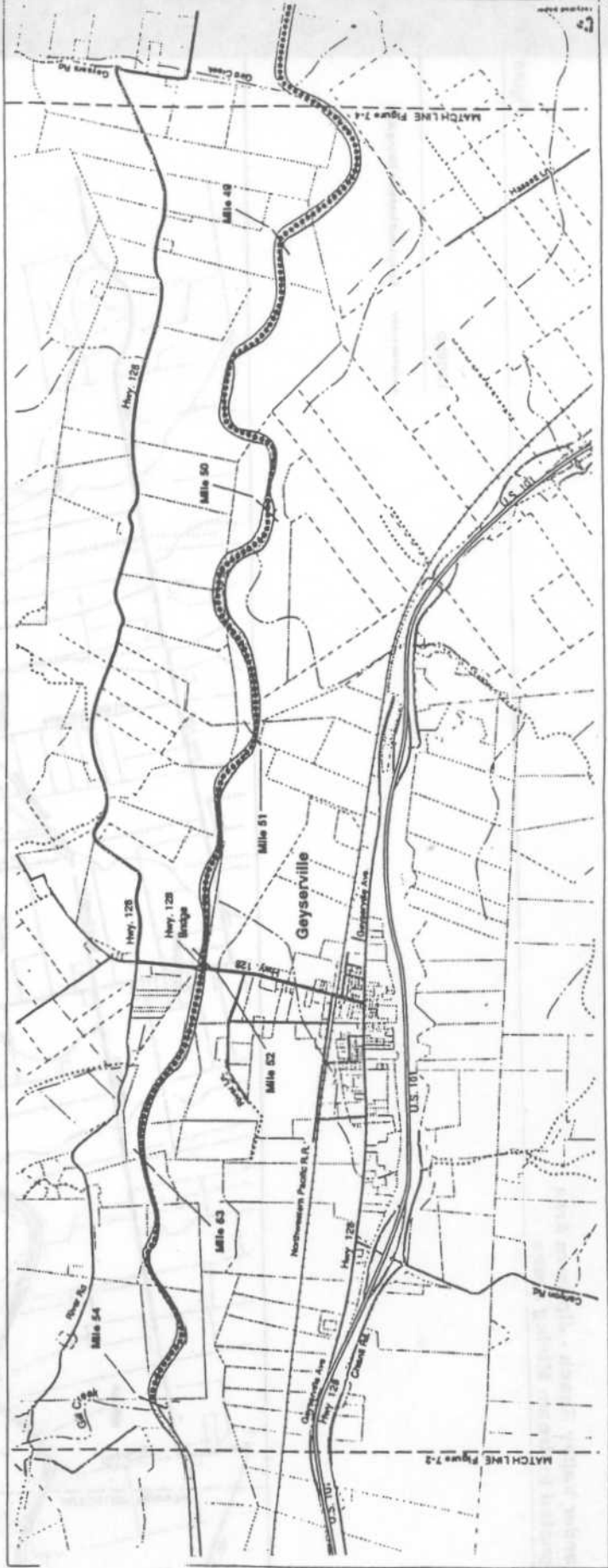


**Alexander Valley Reach - Geyserville Area
Designated Instream Mining Areas**

Figure 7.

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----- Designated Instream Mining Area

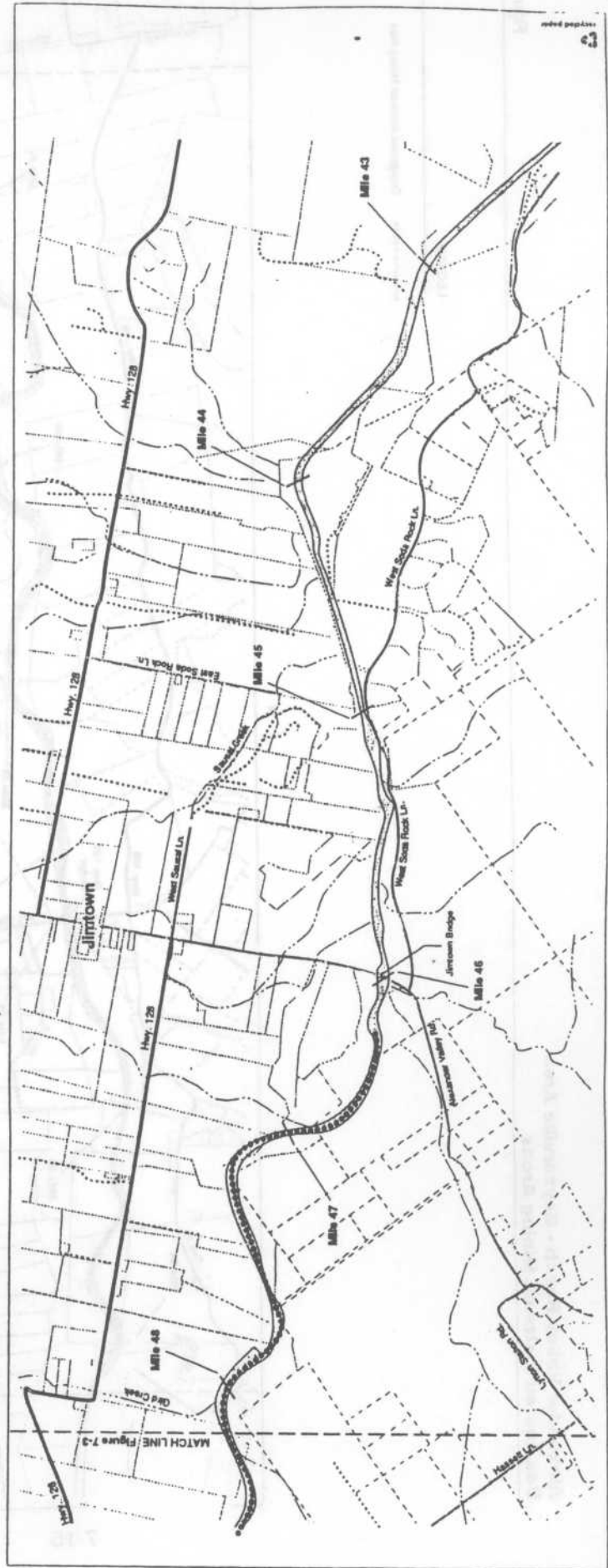


**Alexander Valley Reach - Jimtown Area
Designated Instream Mining Areas**

Figure 7-4

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----- Designated Instream Mining Area



Designated Instream Locations on Big Sulphur Creek

Figure 7-5



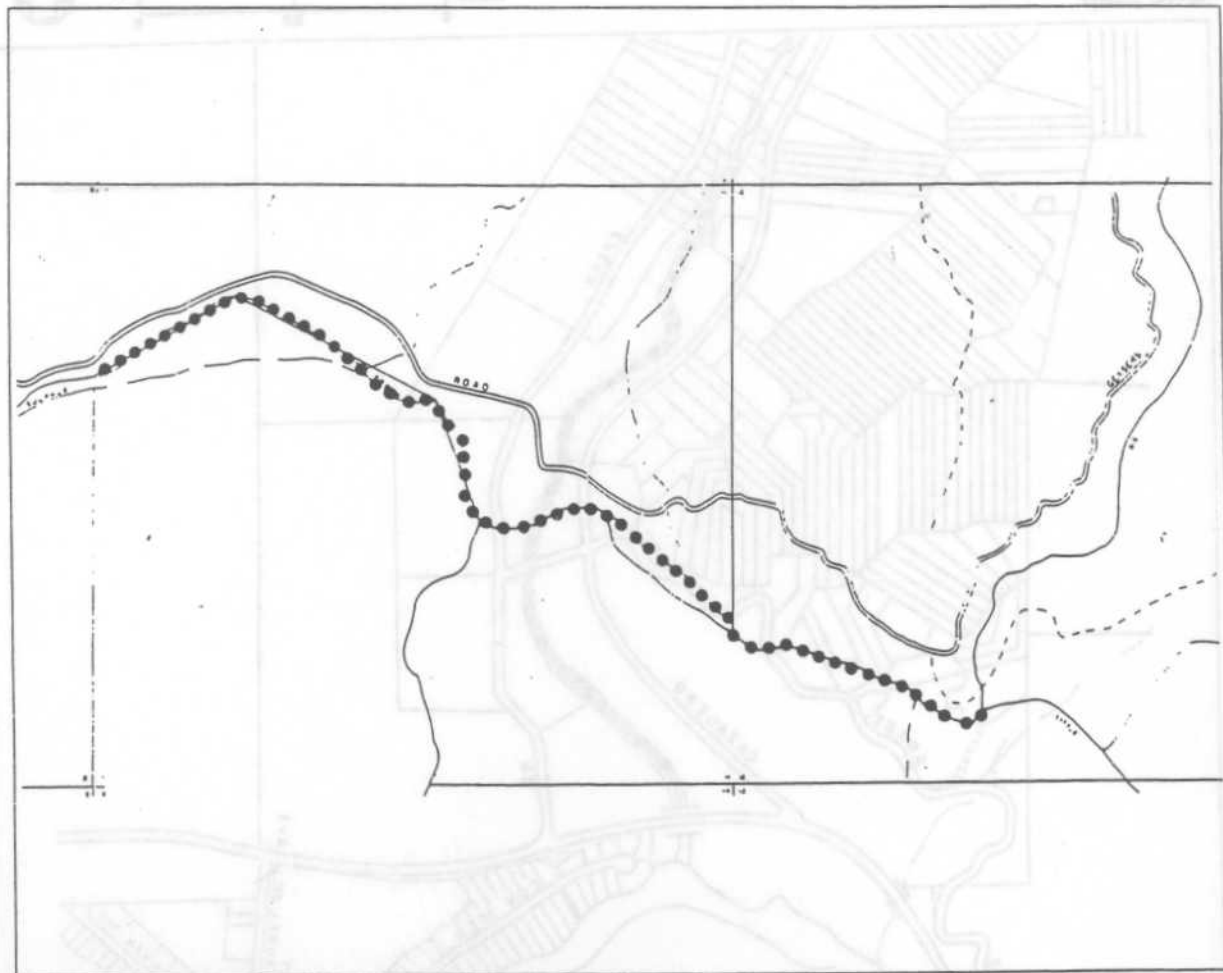
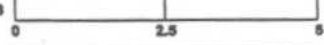
Site Map

Vicinity Map

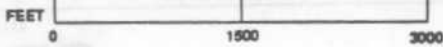


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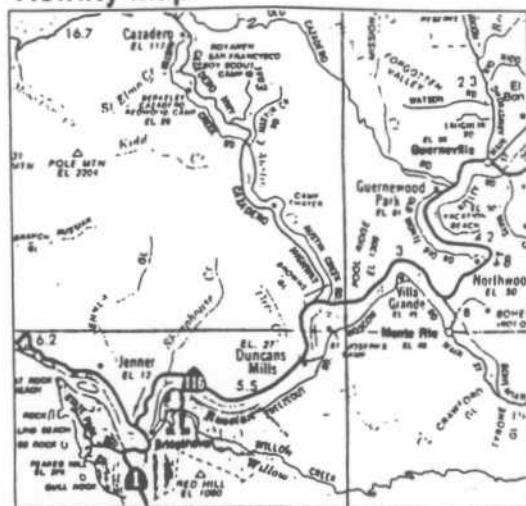


Designated Instream Locations on Austin Creek

Figure 7-6



Vicinity Map

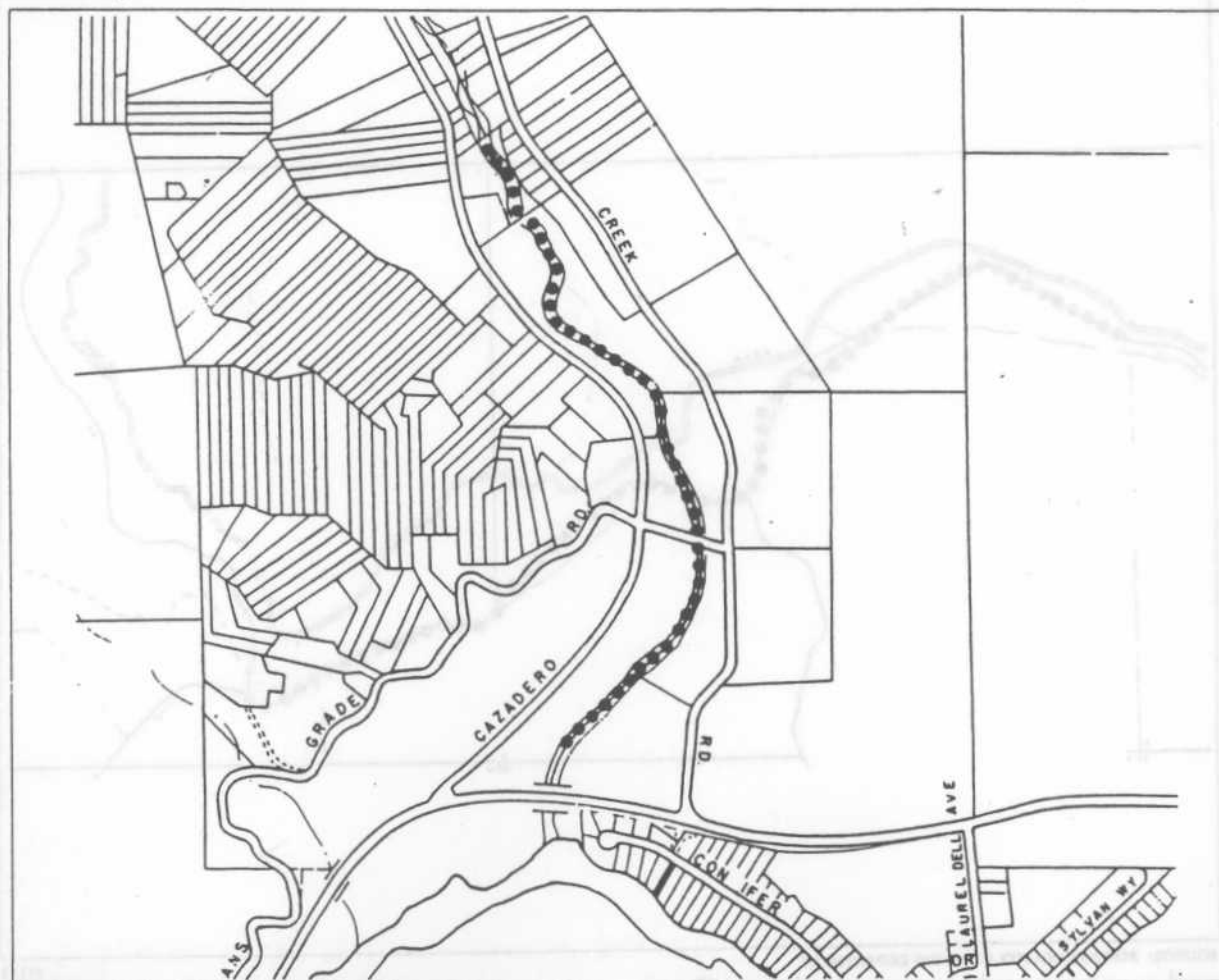


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Site Map



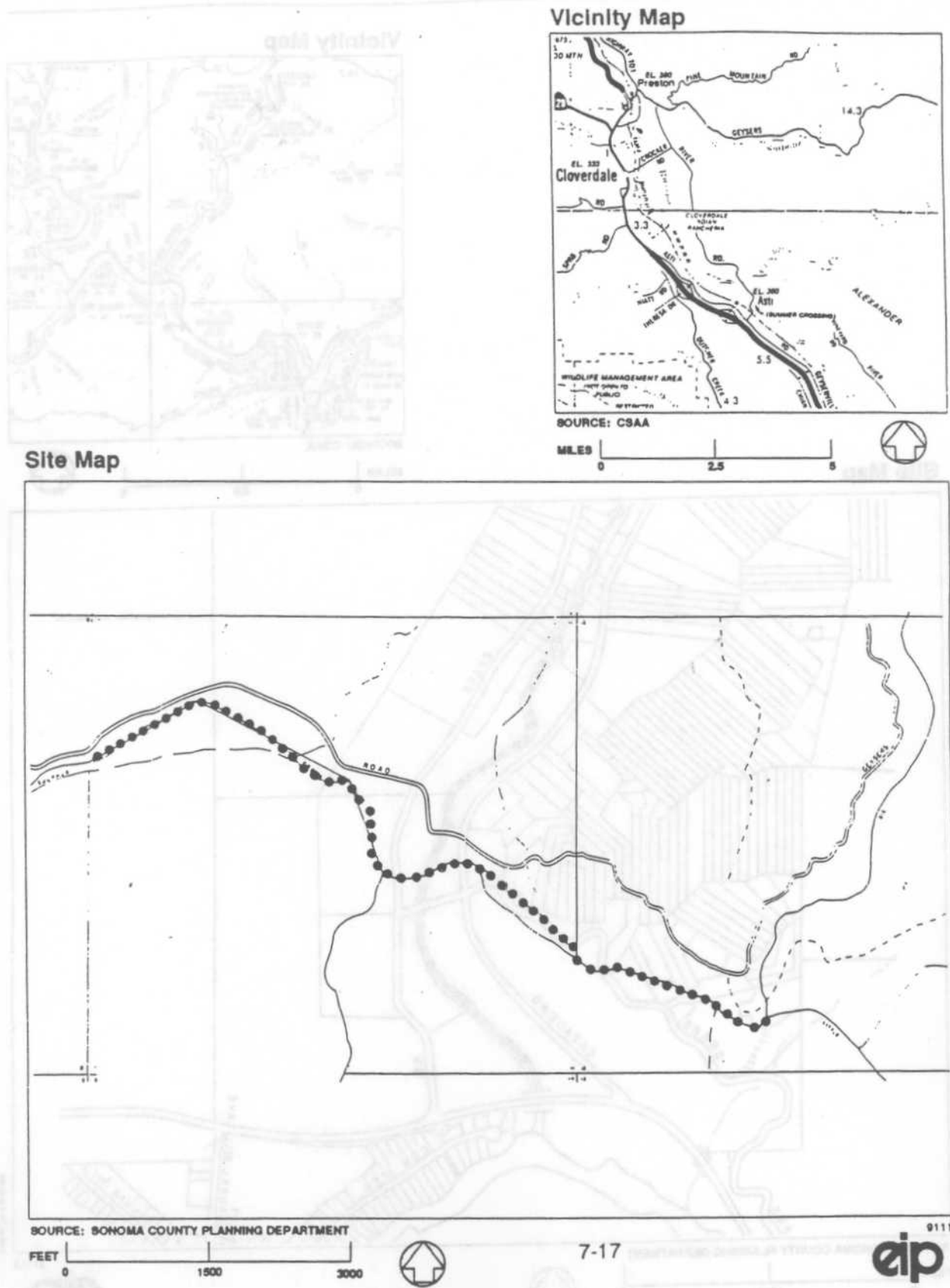
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Designated Instream Locations on Big Sulphur Creek

Figure 7-5



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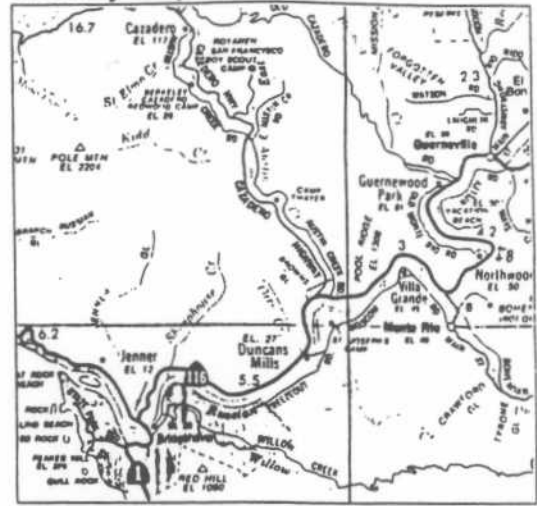
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Designated Instream Locations on Austin Creek

Figure 7-6



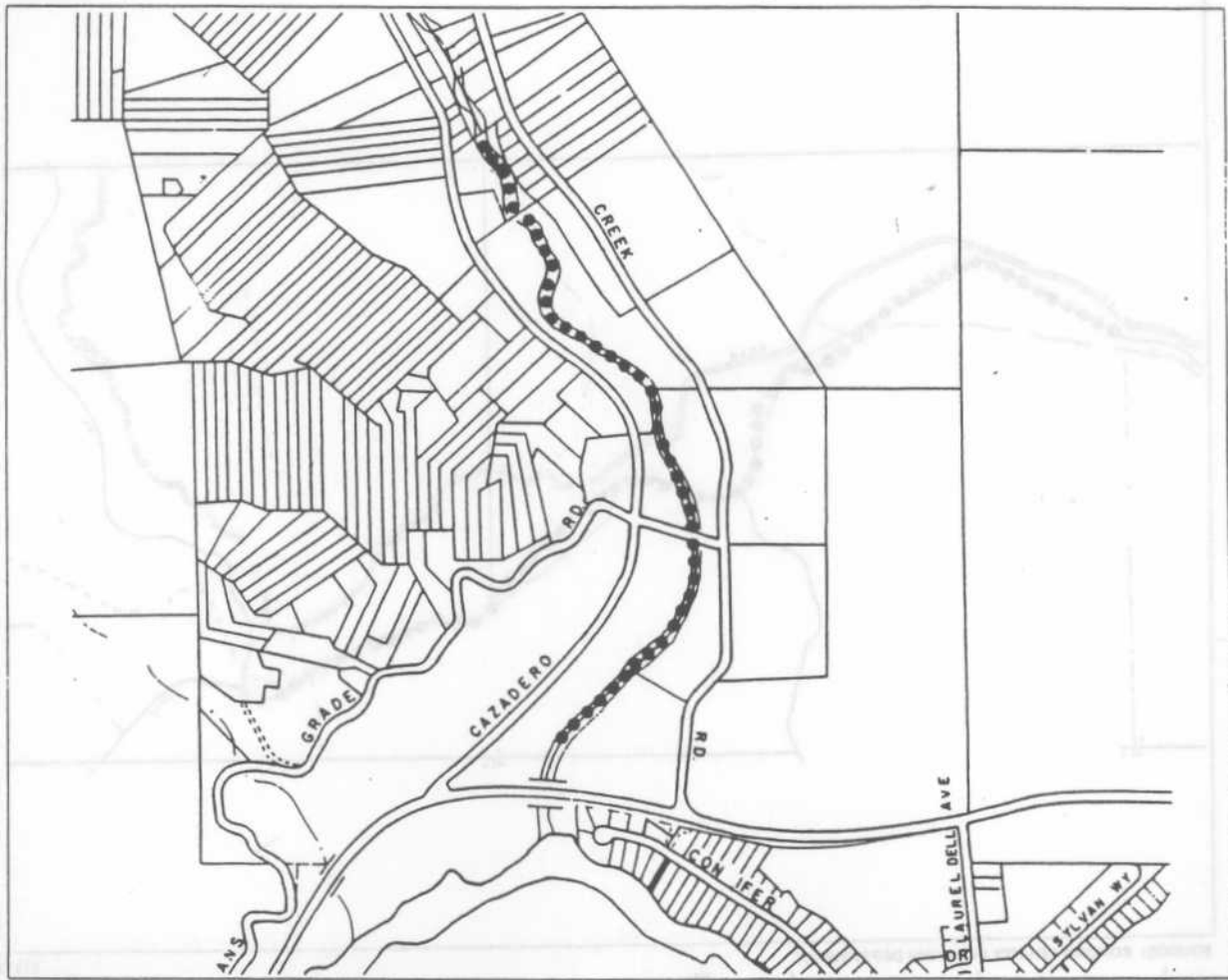
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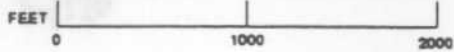
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Site Map



SOURCE: SONOMA COUNTY PLANNING DEPARTMENT

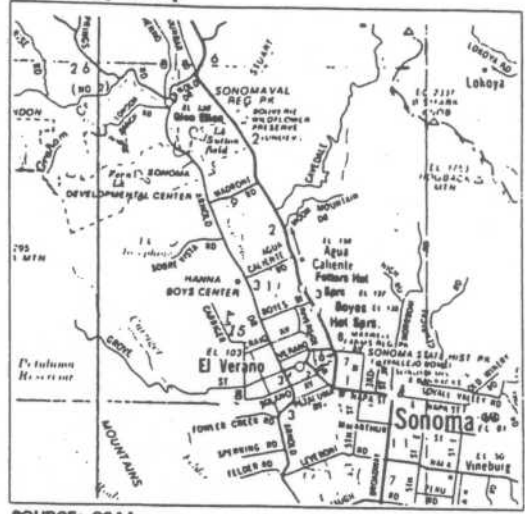


**Designated Instream Locations
on Sonoma Creek**

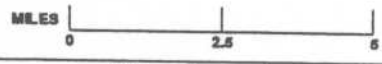
Figure 7-7

Figure 7-8

Vicinity Map



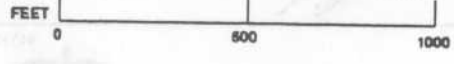
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SOURCE: SONOMA COUNTY PLANNING DEPARTMENT



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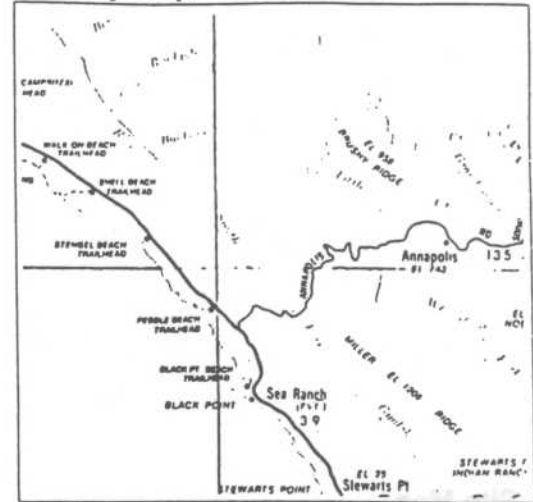


Designated Instream Locations on Gualala River

Figure 7-8



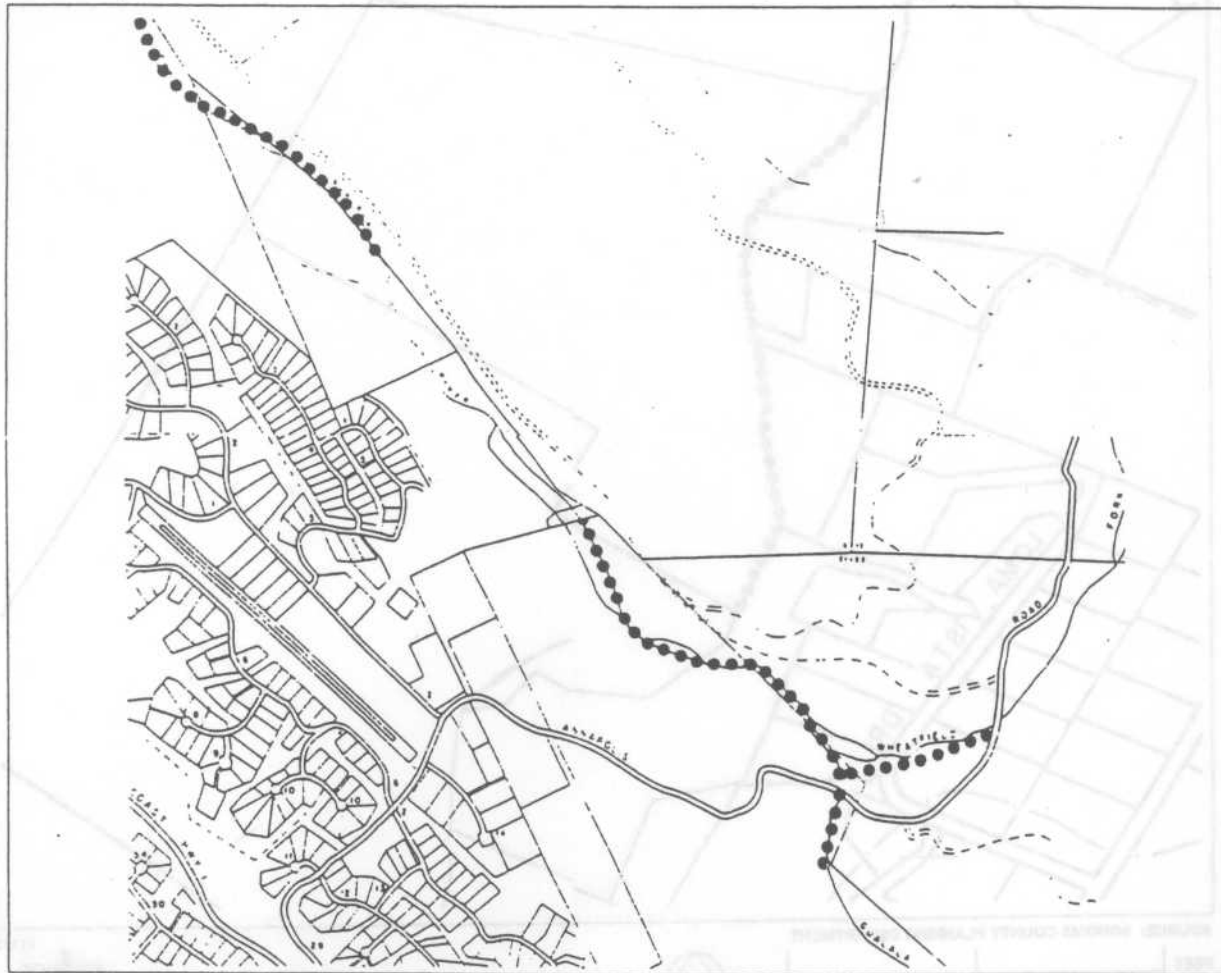
Vicinity Map



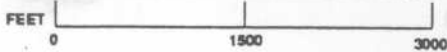
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Site Map



SOURCE: SONOMA COUNTY PLANNING DEPARTMENT



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While recognizing that vested rights do exist and may be exercised, the Management Plan does not allow any new permits for gravel removal within the channel of Dry Creek or the Middle Reach of the Russian River due to past channel degradation. Monitoring of channel conditions in the Middle Reach will continue in order to provide the data necessary to future management decisions. The streamway concept described in Chapter 6 and Appendix H may be implemented in the Middle Reach through County approval of an aggregate mining permit and reclamation plan with appropriate mitigation of the impacts stated in Chapter 6 and other potential impacts identified during environmental review of a streamway project. Gravel may also continue to be removed periodically from the channel overlying the water supply intakes of the Sonoma County Water Agency and other municipal water purveyors to maintain the design withdrawal rate.

7.5.2 Operating Standards

The operating standards developed for instream gravel extraction are based upon the following specific objectives:

- Protection of instream biologic resources and the riparian corridor.
- No net long-term downgrading of the channel.
- No reduction in the flood capacity of the channel.
- Minimum interference with the location and shape of the channel.

Instream aggregate extraction will occur through the process of gravel bar skimming. Mining will not be allowed in the water, below the water level, or below a 2 percent minimum cross-section slope from the water level at the edge of the flowing stream. Where two or more distinct channels exist on a site, the maximum 2 percent grade shall be measured from the water level of each channel. Where a minimum low water flow is not maintained in a stream and the stream goes dry in some years, the minimum levels and grades shall be measured either from the water level on July 1 or from one foot above the thalweg. If the operators elect to measure from the water level on July 1, they will be responsible for a survey tying cross-sections to clearly marked benchmarks or survey controls and recording the water level and flow rate.

All mining and grading shall minimize the potential for entrapment of fish when water levels change, and the disturbed portions of gravel bars shall be graded at the end of the mining season so that there are no areas where water can pool. Cuts in gravel bars at property lines or the edge of the mining activities shall be no steeper than 2 horizontal to 1 vertical in slope.

After extraction has taken place on a permitted site for the first time pursuant to a multi-year permit, extraction in subsequent years shall be limited to prevent lowering of the channel profile. Based on data from the required cross-sectional surveys, the Planning Department will determine if any aggradation or degradation has taken place since the initial mining. Where aggradation is clearly shown by the cross-sectional profile of the channel to have occurred, additional mining will be allowed to remove only the amount of gravel deposited following the previous mining. Where significant degradation has occurred, gravel removal will not be permitted.

Instream gravel mining is limited to the period from June 1 to November 1, unless an earlier start date is acceptable to the CDF&G as specified in the permit. No instream mining operations will be allowed on Saturday, Sunday, or federal holidays, but processing may be allowed on Saturdays outside the ordinary high water mark.

Where canoes or other boats commonly traverse the stream, channel crossings require the use of raised structures so that the bridge span is a minimum of 4 feet above the water line and at least 8 feet wide. All crossings shall be located so they can be readily navigated and to have clear upstream approaches and downstream exits to provide safe boating conditions. Crossings shall be adequately signed upstream to inform boaters and to identify portage options if necessary. Crossings shall be placed to minimize turbidity and flow impairment and reduce pooling and the blockage of fish. Where crossings are required to pass shad, the span shall be at least 20 feet long.

Stockpiles on gravel bars shall not be visible from designated scenic highways. Stockpile areas shall be specified in the use permit and shall minimize disruption of riparian cover. Stockpiles and all mining related equipment shall be removed from within the ordinary high water channel by November 1 of each year. Aggregate processing operations require a minimum 200-foot horizontal setback from low water and 15 feet from ordinary high water. No asphalt or concrete plants are allowed within the ordinary high water area. Stockpiles, processing operations, and ancillary uses located within the 100-year floodplain between November 1 and June 1 shall be designed and operated to prevent on-site and off-site damage from floods.

Following consultation with CDF&G, retention of existing riparian vegetation along the low flow channel and other significant stands of riparian vegetation shall be required by the County except where necessary to accommodate an access road. All instream mining operations require

approval of a streambed alteration agreement with CDF&G and a Section 404 permit from the Corps. All crossings require approval of a County permit according to the requirements of Ordinance 3836R and a Streambed Alteration Agreement from CDF&G. Approval by the SLC must be obtained for mining on sovereign lands owned by the State.

Russian River: The standards applied to gravel bar skimming in the designated sectors of the Russian River are intended to reduce the overall extraction to more closely match the estimated recharge of gravel and maintain a distinct, non-braided low-flow channel in the same location. The upstream portion of each gravel bar, as shown on Figures 7-9 and 7-10, shall not be mined or disturbed, except where a study, as described below, indicates that this technique would not be the best management approach for a particular site. The upstream bar area where mining is not permitted is defined as the portion of the bar from the upstream end to the point where the bar is widest, measured from the low-flow channel to the outer bank.

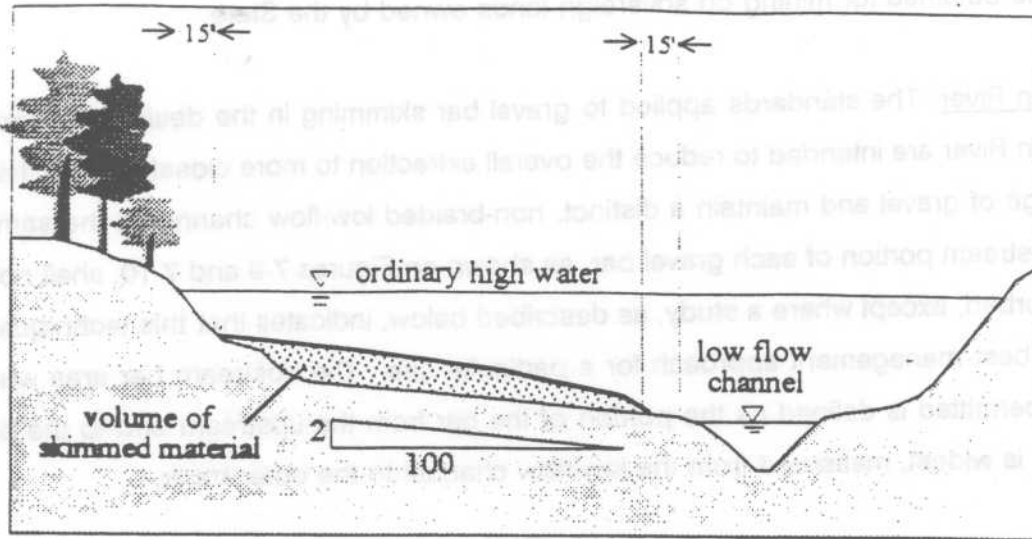
Each applicant for an mining permit to remove gravel from an entire gravel bar or any portion of the upstream half of a gravel bar, as described above, shall submit a study prepared by qualified County-approved expert(s). The study shall, at a minimum, include the following information:

1. Assessment of the proposed project site and river channel within one-quarter mile upstream and downstream of the site ("assessed areas") as to the present conditions relative to low-flow channel form and stability, flood flow capacity, channel degradation or aggradation, and lateral bank erosion.
2. Identification of all land uses along the river banks, including mining activities or operations, within the assessed areas, any erosion to outer banks which has occurred in the last five years, and the potential for future erosion.
3. Vegetation types, sizes, and locations within the assessed areas.
4. Fishery-habitat characteristics and quality within the assessed areas.
5. Recommendations for setbacks, buffers, or other management practices needed to maintain stability of the low-flow channel, maintain or increase the existing flood-flow capacity, and minimize lateral bank erosion within the assessed areas. Under no circumstances shall the recommended buffer zone(s) cover more than one-half of the gravel bar(s) within the project site.
6. Comparative analysis of the level of environmental mitigation and benefit which would be achieved if the upstream half of each gravel bar on the project site was left intact.

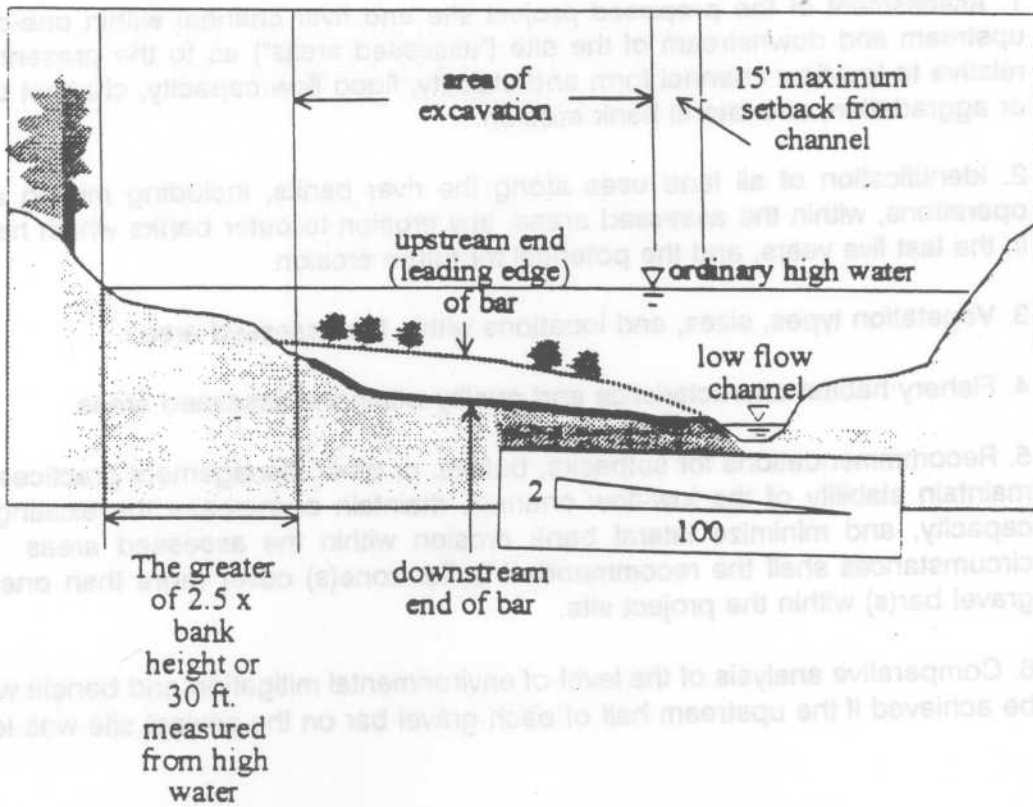
Existing and Proposed Instream Gravel Operations - Alexander Valley

Figure 7-9

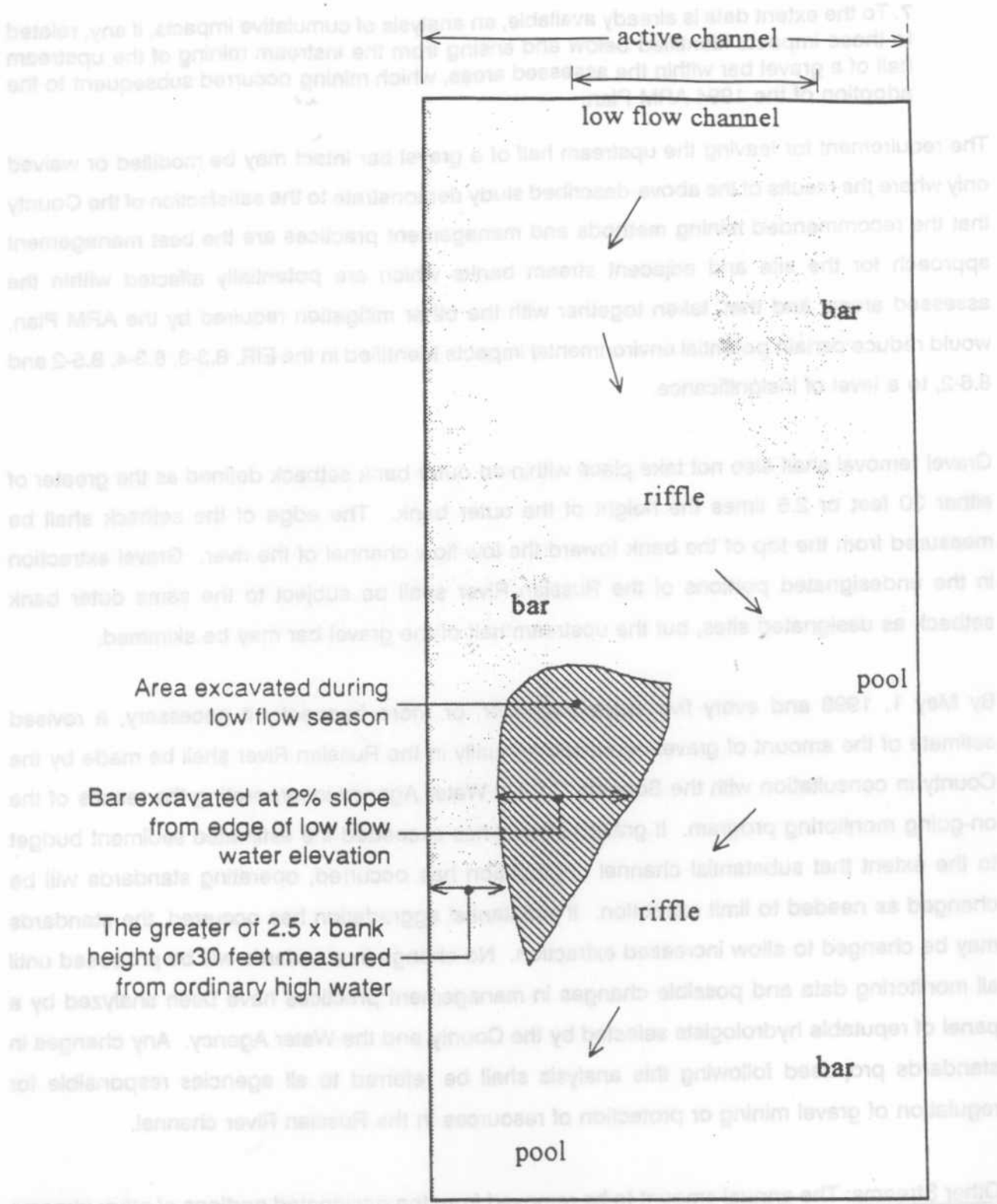
EXISTING ARM PLAN



PROPOSED ARM PLAN



Management Plan



SOURCE: PHILIP WILLIAMS & ASSOCIATES



7. To the extent data is already available, an analysis of cumulative impacts, if any, related to those impacts identified below and arising from the instream mining of the upstream half of a gravel bar within the assessed areas, which mining occurred subsequent to the adoption of the 1994 ARM Plan.

The requirement for leaving the upstream half of a gravel bar intact may be modified or waived only where the results of the above-described study demonstrate to the satisfaction of the County that the recommended mining methods and management practices are the best management approach for the site and adjacent stream banks which are potentially affected within the assessed areas, and that, taken together with the other mitigation required by the ARM Plan, would reduce certain potential environmental impacts identified in the EIR, 8.3-3, 8.3-4, 8.5-2 and 8.6-2, to a level of insignificance.

Gravel removal shall also not take place within an outer bank setback defined as the greater of either 30 feet or 2.5 times the height of the outer bank. The edge of the setback shall be measured from the top of the bank toward the low-flow channel of the river. Gravel extraction in the undesignated portions of the Russian River shall be subject to the same outer bank setback as designated sites, but the upstream half of the gravel bar may be skimmed.

By May 1, 1998 and every five years thereafter, or more frequently if necessary, a revised estimate of the amount of gravel deposited annually in the Russian River shall be made by the County in consultation with the Sonoma County Water Agency incorporating the results of the on-going monitoring program. If gravel removal has exceeded the estimated sediment budget to the extent that substantial channel degradation has occurred, operating standards will be changed as needed to limit extraction. If substantial aggradation has occurred, the standards may be changed to allow increased extraction. No change in standards will be proposed until all monitoring data and possible changes in management practices have been analyzed by a panel of reputable hydrologists selected by the County and the Water Agency. Any changes in standards proposed following this analysis shall be referred to all agencies responsible for regulation of gravel mining or protection of resources in the Russian River channel.

Other Streams: The annual amount to be removed from the designated portions of other streams will also be based on natural replenishment. By May 1, 1998, the County in consultation with the Sonoma County Water Agency will establish the minimum absolute elevations for extraction. All permits in the other designated areas issued after that date will state minimum absolute

elevations for extraction. Gravel removal shall not take place within 15 feet from the outer bank along streams other than the Russian River.

Monitoring and Mitigation: Site inspections will be conducted a minimum of once every 60 days by the County during the mining operations. Before July 1 of each year in which instream mining takes place, underwater cross-sections shall be prepared at a minimum of every 400 feet for each area proposed for extraction as well as one location 400 feet upstream and 400 feet downstream of the area to be mined. Each spring and fall aerial photography will be developed by the County for the Russian River from the Wohler Bridge area to Mendocino County. Above-water cross sections will be prepared from the aerial photography in permitted and proposed mining areas. The number of annual surveyed under-water cross sections in that area will be increased so that there is an average of at least one fixed location per half mile of river, including locations used annually by the Sonoma County Water Agency and mining operators. Surveyed cross-sections shall be prepared for the Crocker Road, Geyserville and Jintown Bridges over the Russian River and shall include sections at the upstream face of each bridge, one bridge length downstream, and one bridge length upstream. The amount of materials which can be removed from any permitted instream mining site may be limited by the County on the basis of monitoring data to achieve the objectives of this Plan.

Where multi-year instream permits are approved or renewed along the Alexander Valley Reach, operators shall be required to monitor groundwater levels in existing or new wells outside the ordinary high water mark at a minimum spacing of one every half mile of river. The wells can be located on either side of the river within 500 feet of skimming sites, and the water level shall be monitored a minimum of four times a year. Monitoring of selected riparian and aquatic habitat along the river will be conducted annually by the County.

A Russian River Gravel Mitigation Fund will be established with mitigation measure fees from instream and terrace operations along the Russian River. The mitigation measure fees will be used for mitigation of cumulative impacts of gravel mining on fisheries, riparian habitat, water supply systems, recreational opportunities, flood control, channel degradation, and bank erosion. The mitigation programs are discussed further in section 7.7.

7.5.3 Reclamation

After mining has been completed, all bars shall be revegetated by natural processes with plants native to the area. Reclamation plans for instream operations shall describe where and how plantings using shrubs and trees native to the area will supplement the natural revegetation process along banks, on haul roads, and in processing areas.

7.6 TERRACE MANAGEMENT PROGRAM

The major objective of the terrace management program is to allow sufficient terrace mining acreage to supply only PCC and other high quality uses for a ten-year period while quarry resources are explored, permitted and developed. This limitation is intended to reduce the loss of agricultural land consumed by terrace mining and to minimize the potential for other environmental impacts and land use conflicts.

7.6.1 Location and Approval

Terrace mining will only be allowed within the designated portion of the Middle Reach area, as shown on Figure 7-11, located south of the Town of Windsor wells east of the Russian River and generally north of the well locations west of the river. New mining requires the approval of MR overlay zoning, a use permit, and a reclamation plan. All mining permits and reclamation plans require environmental review to determine whether or not they are within the scope of the Program EIR. Procedures shall be developed and implemented to give the Board of Supervisors original jurisdiction over review of a master reclamation plan when it is submitted independently of a use permit application. Terrace mining permits may be approved for lands under Williamson Act contract only if the site will be reclaimed to plant crops within three years after the beginning of mining operations, or the Williamson Act contract is cancelled, or the contract is rescinded and replaced with an open space easement.

All terrace mining approved pursuant to this Plan shall cease after a ten-year period, which shall commence and run as follows :

With respect to terrace mining on the east side of the Russian River, the ten years shall commence on the effective date of the first use permit issued for terrace mining on that side of the river following adoption of this Plan. Similarly, the ten-year period for terrace mining on the west side of the Russian River shall commence on the effective date of the first use permit issued for terrace mining on that side of the river following adoption of this Plan.

Middle Reach Terrace Mining Areas

Figure 7-11

LEGEND

MINING DESIGNATIONS

- Proposed Designated Terrace Mining Area
- 1980 ARM Plan (As amended in 1985)
- 1987 State Mining and Geology Board

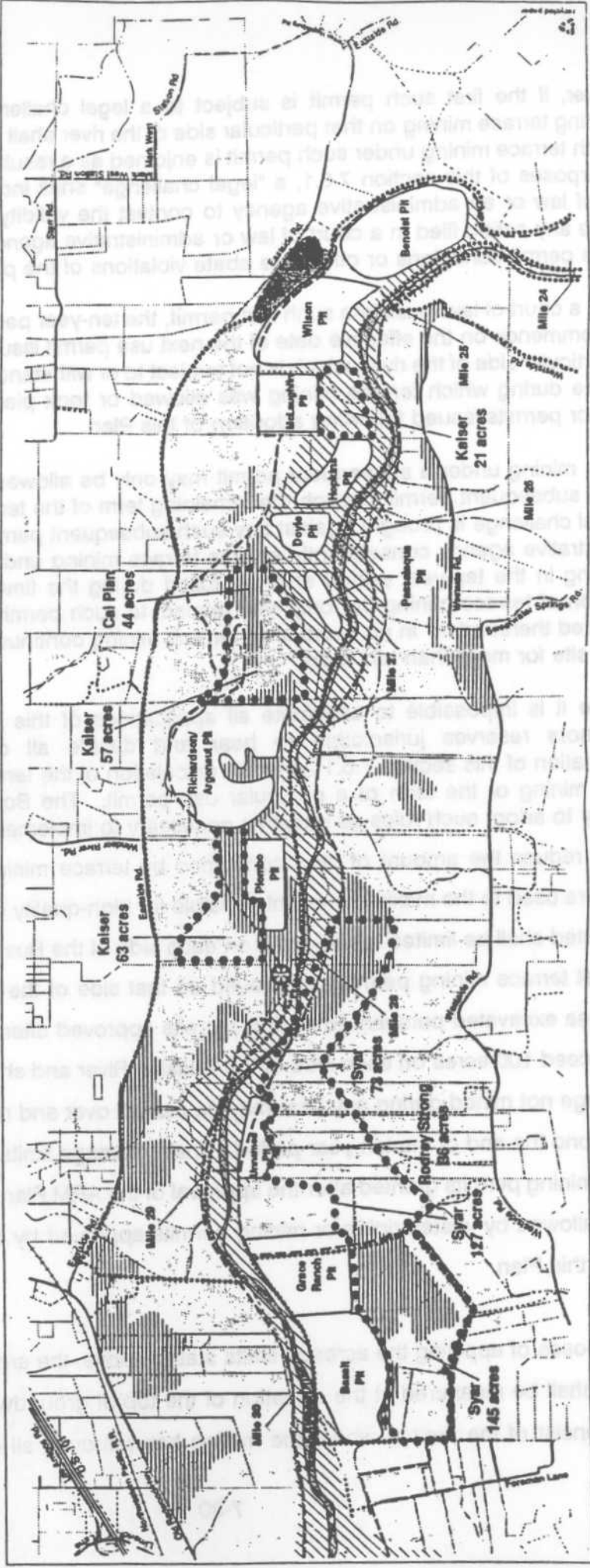
SOILS

- Class I or II
- ▨ Class III or IV
- ▩ Class V or VI
- ▧ Class VII or VIII

⊕ Location of Windsor Water District Wells

Proposed Acreage Designated	597 acres
Mining Ownership	451 acres
Currently in Vineyards	501 acres
Class I & II Soils	363 acres
Class III & IV Soils	188 acres
Class V & VI & VII & VIII Soils	46 acres

Northwest Sector		Southeast Sector	
Syar	145 acres	Kaiser	63 acres
Syar	92 acres	Kaiser	57 acres
Syar	73 acres	Kaiser	21 acres
	310 acres		141 acres
Frost Ranch	66 acres	Cal Plan	44 acres
Strong	36 acres	TOTAL	185 acres
TOTAL	412 acres		



However, if the first such permit is subject to a legal challenge, the ten-year period governing terrace mining on that particular side of the river shall be tolled during any time in which terrace mining under such permit is enjoined as a result of such legal challenge. For purposes of this section 7.6.1, a "legal challenge" shall include an action filed in a court of law or an administrative agency to contest the validity of the permit, but shall exclude any action filed in a court of law or administrative agency by a public agency to enforce permit conditions or otherwise abate violations of the permit or applicable law.

Should a court of law invalidate such first permit, the ten-year period for all terrace mining shall commence on the effective date of the next use permit issued for terrace mining on that particular side of the river, which is not subject to or withstands legal challenge, minus any time during which terrace mining was allowed or took place pursuant to the prior permit or permits issued following adoption of this Plan.

Terrace mining under a subsequent permit may only be allowed from the effective date of such subsequent permit through the remaining term of the ten-year period. However, if a legal challenge is brought against any such subsequent permit, and a court of law or administrative agency consequently enjoins terrace mining under such permit, the time remaining in the ten-year period shall be tolled during the time of such court-ordered cessation of terrace mining but only with respect to such permit and the terrace mining authorized thereunder. In no event shall terrace mining continue under the same permit on any site for more than ten years.

Because it is impossible to anticipate all applications of this provision, the Board of Supervisors reserves jurisdiction to hear and decide all disputes regarding the interpretation of this section 7.6.1 as to the calculation of the ten-year period allowed for terrace mining or the term of a particular use permit. The Board shall also have the authority to adopt such rules as it deems necessary to implement this section.

In order to reduce the amount of land consumed by terrace mining and assure that terrace resources are used to the maximum extent possible for high-quality construction aggregate, the area excavated shall be limited to ten acres on each side of the Russian River during each year after the first terrace mining permit is approved on that side of the river, as delineated above. The total area excavated pursuant to mining permits approved after adoption of this ARM Plan shall not exceed 100 acres on each side of the Russian River and shall not exceed 200 acres in total. Acreage not mined during any year may be carried over and mined in a subsequent year but not beyond the end of the ten-year period. These acreage limits apply to all terrace mining allowed by mining permits granted after the approval of the ARM Plan but do not apply to terrace operations allowed by vested rights or mining permits approved by Sonoma County before the adoption of this Plan.

For the purposes of applying the acreage limits stated above, the area(s) excavated in any year on any site shall be measured at the elevation of the top of groundwater on May 1 of that year and shall consist of the area(s) where the mining has removed all earth materials above that

elevation. Required above-water slopes and other mined areas above that elevation shall not be included in the determination of excavated acreage. The total acreage excavated in a year or ten-year period and the method for calculating such totals do not modify in any way the groundwater protection standards and wildlife habitat standards stated in this chapter.

7.6.2 Operating Standards

Groundwater Protection: Groundwater levels that drop may affect pumping costs and water yield and may cause some shallow wells to dry out. The following standards are designed to mitigate the potential long-term adverse groundwater effects of terrace operations. The development and reclamation of terrace pits which involve gravel removal below the top of the groundwater at any time shall conform to the following standards:

1. The maximum area of a new pit will be limited to 20 acres measured at the pre-mining surface.
2. The minimum distance between the edge of any new pit and any other new or existing pit will not be less than 450 feet, as measured at the pre-mining surface. Leaving unmined gravel areas between pits will allow groundwater to flow more freely through the terrace mining area.
3. A 450-foot buffer will also be left between new pits and the Russian River. This setback, to be measured from the edge of pit excavation on the original ground surface to the ordinary high water mark of the river, will allow the continued flow of water between the aquifer and the river.
4. No deep-pit terrace mining shall take place more than 2,000 feet from the ordinary high-water mark of the river. This limitation will reduce the potential for blocking groundwater flow into and along the edge of the Middle Reach aquifer.
5. Gravel may be extracted to the full depth of the upper gravel deposit, but the blue clay layer or underlying strata may not be mined because reduction in their thickness could result in a greater exchange of flows between the poor quality lower aquifer and the high quality upper aquifer. The transmissivity of the upper aquifer is so high that removal of the gravel deposits will have little effect on the interchange of flows between the aquifers.
6. Deep-pit terrace mining shall not take place on opposite sides of the river at any point where mining sites are directly across from each other.
7. Terrace mining operations and reclamation plans which do not meet all of the categorical standards above may not be approved unless it is determined that the proposal would not result in a drop in the water table at any point on adjacent properties of more than one foot. This determination shall be based upon an analysis of potential groundwater impacts using the MODFLOW computer model or similar model of equal or better analytical capability. The analysis shall assume the worst combination of existing and planned pit permeability, water extraction by agricultural and municipal wells, and cumulative effects since the baseline condition reported in Chapter 4, section 4. The 450-foot setback from the river specified in standard #3 above cannot be reduced regardless of the results of MODFLOW analysis.

Handling of Top Soil: Top soil that is removed from the mining area will be stockpiled and protected for future use. All soils shall be used to reclaim mined sites to crop production, enhance crop production on nearby lands, or otherwise be used in the surface treatment conducted as part of the approved reclamation plan. Each use permit application for terrace mining will include a soils report and the steps that will be used to remove, store and reuse the soils. The application will also include a full description of how the physical and nutrient properties of the soil will be maintained and protected until it is returned for productive use.

Screening and Setbacks: Visual screening of the terrace pits and mining equipment from public roads and uses will be required using shrubs and trees native to the area and berms to the extent feasible. Mining excavation and stockpiles of extracted aggregate are to be set back a minimum of 50 feet from the MR zone boundary, property boundary, and public roads. Stockpiles are also to be set back a minimum of 300 feet from the ordinary high water mark of the river. Screening, crushing, and other processing activities are to be set back a minimum of 200 feet, measured from the nearest point, from the MR boundary, the property boundary, and public roads and a minimum of 300 feet from the ordinary high water mark of the river. Mining excavation shall be set back 450 feet from the ordinary high water mark of the river.

Flood Protection and Levees: Stockpiles, processing operations, and ancillary uses located within the 100-year flood plain between November 1 and June 1 shall be designed and operated to prevent on-site and off-site damage from floods. A 450-foot setback is required between new terrace pits and the river to minimize the risk of the river channel being diverted into or through the terrace pits in major floods. In order to prevent levee failure and channel diversion, approval of a reclamation plan for any existing terrace pit which is located within 450 feet of the river requires a levee stability study performed by qualified engineers, geologists and/or hydrologists. The study shall address the following subjects:

- Channel cross-sections and longitudinal profile.
- Stream flow volumes, levels and meander dynamics at different flood frequencies.
- Size depth, slope, and mining history of adjacent pits.
- Seasonal variations in adjacent groundwater levels.
- Potential for seismic groundshaking and liquefaction.
- Description of existing levee or separation materials, dimensions and vegetation.
- Past and current erosion, bank instability and levee failure.
- Potential for future erosion, bank instability and levee failure, including risk factors for various portions of the levee during bankfull or flood events.

- Recommended measures to reduce risk factors to stated levels. The study shall specifically consider the feasibility and effectiveness of the following measures and others:
 - Reducing steepness of slopes on stream side of pits.
 - Construction of engineered levees.
 - Paving, screening, riprap or other covering of stream banks and overflows.
 - Planting of small and medium-size vegetation on all slopes.
 - Other bio-technical bank stabilization techniques.
 - Installing pipes through levees to equalize water levels without sudden overtopping.
 - Monitoring for bank erosion and problem identification.
 - Providing access for vehicles and equipment for maintenance and repair.
 - Developing emergency response and repair procedures.
 - Maintaining a source of funds for maintenance and repair.

Ancillary Uses: With a use permit, terrace operations may include processing and sales of raw, processed, or recycled earth materials and aggregate products, excluding the manufacture and batching of concrete and asphalt products. Importation of aggregate materials from approved sites under control of the same operator may be allowed with a use permit. No more than 10 percent of materials processed or exported from any terrace site in any calendar year, except materials to be recycled, shall be imported from outside the designated terrace mining area.

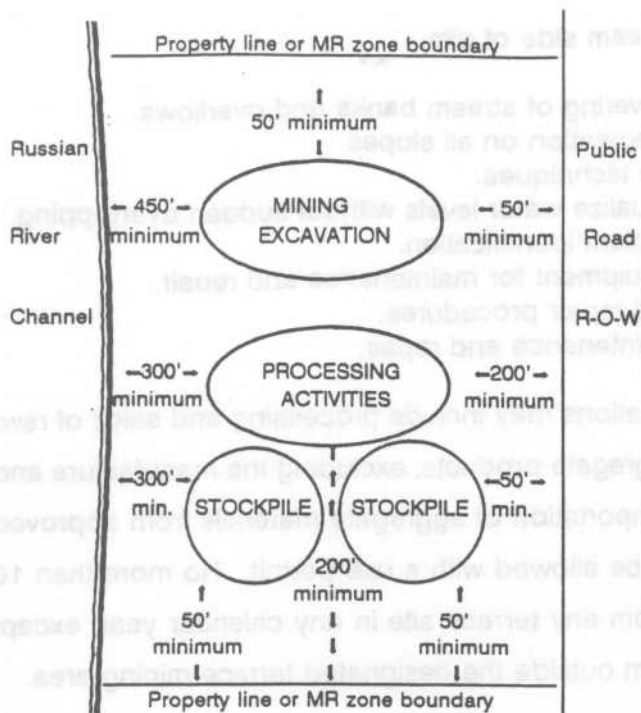
Monitoring and Mitigation: Aerial photographs for the purpose of monitoring terrace operations will continue to be taken by the County in the spring and the fall. The ground coverage of the photographs will include the entire area designated for terrace operations. Monitoring of the Middle Reach aquifer will be conducted by the PRMD and SCWA at the expense of the mining operators. Groundwater levels in each terrace pit and in the monitoring wells in the terrace mining area will be measured at least four times a year. The Board of Supervisors shall receive an annual report on such data and monitoring, plus at least one interim report. This information shall provide a basis for future decisions. Site inspections will be conducted a minimum of once every 60 days by the PRMD during the mining operations. Additional monitoring requirements may be imposed in order to verify satisfactory completion of approved reclamation.

All terrace operations shall be subject to mitigation measure fees for the Russian River Gravel Mitigation Fund and mitigation programs described in sections 7.5.2 and 7.7. These programs will avoid, reduce or compensate for cumulative impacts of gravel mining on agriculture, fisheries, riparian habitat, water supply systems, recreational opportunities, flood control, channel degradation, and bank erosion. In agricultural areas adjacent to past and future terrace mining sites, the mitigation fees may be used to purchase open space easements.

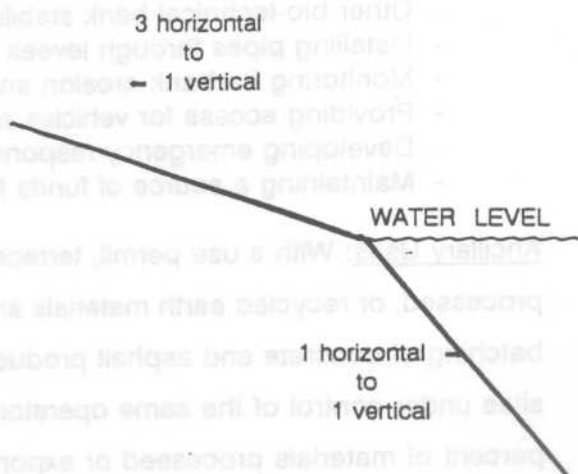
Design Standards for Terrace Pits

Figure 7-12

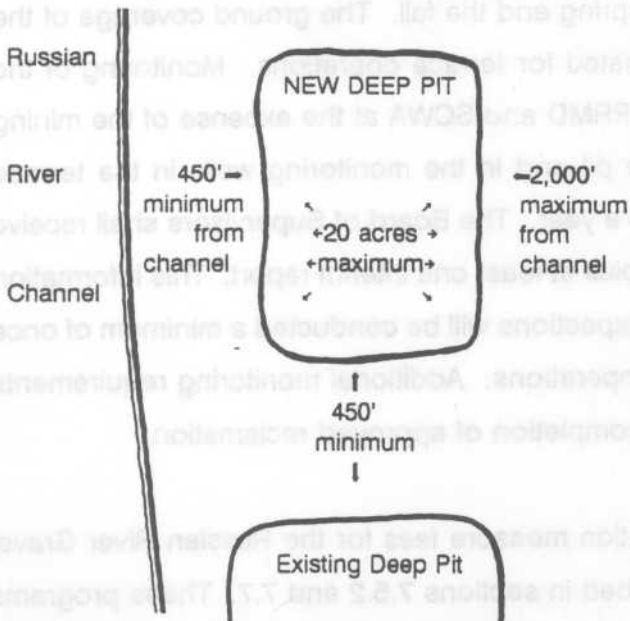
SETBACKS FOR MINING AND PROCESSING



MAXIMUM SLOPES

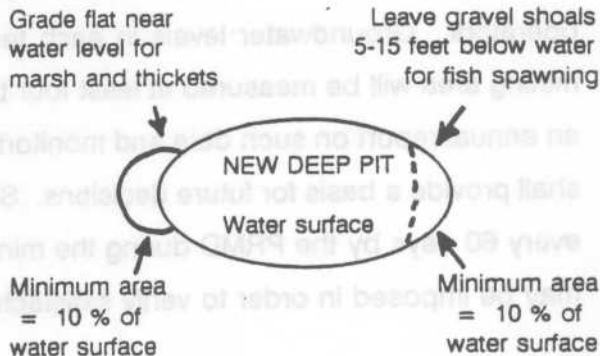


GROUNDWATER PROTECTION STANDARDS



Distances and areas to be measured from edge of excavation in pre-mining surface and from ordinary high-water mark of Russian River channel.

WILDLIFE HABITAT STANDARDS



7.6.3 Reclamation

Priorities: In the event that restoration to the pre-mining use is not feasible, reclamation to provide wildlife habitat is the highest priority. Future use of water from the pits to support neighboring agricultural uses is a desired component for all terrace reclamation plans. The potential for development of public recreational use shall be considered and incorporated in the reclamation plans for the Kaiser South pit area.

Reclamation of existing pits as soon as possible is a high priority. In order for new mining permits to be approved, the operators must demonstrate timely performance of the approved reclamation activities for existing pits. To achieve that objective, the following terrace reclamation policies shall be in effect:

1. On the west side of the Russian River, no new permits shall be approved until the Planning Department has determined in writing that reclamation of the Basalt, Grace Ranch and Phase 2 Pits has been performed in accordance with approved reclamation plans and schedules.
2. On the east side of the Russian River, a maximum of 10 acres may be approved by the County if the applicable operator has submitted revised reclamation plans for the Wilson, Benoist, McLaughlin, and Richardson/Argonaut Pits and, if approved, begun reclamation work pursuant to the approved reclamation plans. No additional mining permits shall be approved until the reclamation plans for the existing pits have been approved and the Planning Department has determined in writing that reclamation has been performed in accordance with approved reclamation plans and schedules.

Benefits: County approval of each terrace reclamation plan requires a finding that the design features of the plan will provide the maximum public benefit consistent with the applicable post-mining use. Because of the value of this area's resources to the public and the unavoidable impact on agriculture, minimal reclamation of terrace mining sites to simply prevent hazards and impacts is not sufficient. The design and implementation features of each reclamation plan must assure the highest feasible level of production, value, or effectiveness for the applicable post-mining use.

This section describes the potential public benefits and environmental impacts of each of the allowed reclamation options and provides methods and criteria for maximizing benefits and

minimizing impacts. The statement of standards is not intended to be a comprehensive or exclusive list. Reclamation plans may include other design features or methods which provide more public benefit and/or impact mitigation.

Completion: Reclamation plans for new terrace mining sites shall be designed to complete reclamation activities concurrently with the mining activities to the maximum extent feasible. Grading of final slopes and placement of soil shall take place at the end of the mining season in areas where the mining is complete. Planting of vegetation and other activities in the approved reclamation plan shall be completed within one year of the cessation of mining.

The operator shall submit an annual progress report on all activities related to the implementation of the reclamation plan. The owner or operator of an unreclaimed terrace pit shall also submit yearly cross-section profiles of the pit to indicate the depth of mining, water, and fill. Where an approved reclamation plan is later found to be infeasible by the County, a revised plan must be approved before any mining resumes on the site, and the originally approved financial assurances shall be maintained until the revised reclamation plan and new financial assurances are submitted and accepted.

Depending upon the future use specified in an approved reclamation plan, the Planning Department's determinations regarding completion of the reclamation shall be dependent upon the written approval of the following agencies:

- a. California Department of Fish and Game for wildlife habitat reclamation.
- b. Sonoma County Agricultural Commissioner for agricultural reclamation.
- c. Sonoma County Regional Parks Department for reclamation for public recreational use.

Wildlife Habitat: With proper design, the water and land features created by terrace mining and reclamation can be made into very productive habitat for fish, birds, and other wildlife. This use has the added benefit of restoring or replacing the many acres of riparian vegetation and natural habitat in the Middle Reach area consumed in the past by mining and agricultural uses. Where reclamation to wildlife habitat is proposed, a habitat restoration plan will be required to create and maintain conditions appropriate for species that have been historically found in the Middle Reach area. The plan shall set forth the specific types of habitat, describe how revegetation will take place, and present the other methods that will be utilized to enhance terrestrial and aquatic

habitat. Reestablishing natural riparian conditions is the preferred type of wildlife habitat, particularly on sites within 1,000 feet of the Russian River.

In order to promote healthy, sustainable habitat conditions, the margins and slopes of the pit should be graded and contoured pursuant to the following standards unless the habitat restoration plan presents evidence that a different configuration is needed to achieve a desired habitat condition and the change is approved by the County following consultation with CDF&G or unless it is not feasible to grade an existing pit in the required manner. Areas above groundwater should be graded to a slope of no steeper than 3 horizontal to 1 vertical except that areas along the margin of the pit equivalent to at least 10 percent of the open water area should be graded flat to allow cottonwood and willow thickets to form on the land and/or freshwater marsh to form in the water. These zones should be from 5 feet below to 5 feet above early spring water level and should occupy all corners and coves of the water surface.

An additional area offshore equivalent to at least 10 percent of the open water area should be 5 to 15 feet below early spring water level and have some surface irregularity and changes in depth. Gravel shoals should be developed in these areas to create additional fish spawning habitat. The flat marsh/wooded thicket areas along the pit margin should drop abruptly to a depth of five feet or more in order to allow fish to keep mosquitos under control. Along other portions of the pit margin not adjacent to marsh and thicket areas, the underwater surface shall drop to 5 feet or more within 15 feet of the shore. The aquatic environment shall provide proper food, cover, temperature, oxygen and other conditions for successful fishery habitat.

All plantings of shrubs and trees should consist of native stock derived from areas along the Russian River in Sonoma County, preferably from within 5 miles of the area to be reclaimed. Reclamation plans shall specify the native species to be accommodated by the restoration plan. The revegetation program will need to reflect the fluctuation of the groundwater table in the grading of the site and the selection and location of plant materials. Successful completion of a revegetation program requires a 80 percent survival rate after a period of five years of plants capable of self-regeneration, unless different criteria are recommended by CDF&G.

All grading and site preparation shall be timed to allow revegetation to be completed during the optimal planting season. The habitat restoration plan shall contain specific measures to incorporate the available topsoil from the site into the design as needed for vegetation survival.

All slopes, benches, and berms shall be graded to the final slopes set forth in the habitat restoration plan with no more than 1 foot variation in relief. Slopes below the water level will meet the minimum standards set forth in the State Reclamation Guidelines.

The habitat restoration plan will contain provisions to control erosion of slopes and sedimentation of the pit. It will address how drainage from adjacent areas will be controlled and how all slopes will be benched, terraced, or otherwise protected. There shall be no gully wash or rill erosion allowed on graded slopes. All planting areas previously packed down by mining equipment or vehicles shall be ripped and scarified prior to resoiling or replanting.

Agricultural Uses: Reclamation of terrace mining sites to plant crops or other agricultural uses provides substantial public benefit because it avoids a significant long-term impact where proposed mining sites are currently in and designated for agricultural production. The topsoil from terrace mining sites shall therefore be used for surface treatment and reclamation to productive agricultural use of terrace mining sites. Topsoil remaining after agricultural reclamation may also be utilized to support approved reclamation to wildlife habitat or recreation. Topsoil to be used in agricultural reclamation shall be stored, protected, and treated to limit loss of nutrients and to maintain or enhance the ability to support crop production.

Where reclamation to plant crops is proposed, it shall be deemed successfully completed when the County Agricultural Commissioner determines that adequate survival and economic feasibility has been demonstrated. Achieving this standard requires that appropriate climatic conditions and an adequate water supply are available for the agricultural use and that the site drainage and the elevation of the ground surface above groundwater are both designed to prevent root damage and support the growth of a wide range of plant crops. Each reclamation plan proposing reclamation of terrace mining sites to agricultural uses shall include a business plan and analysis of economic feasibility which contains criteria for determining successful completion of the reclamation efforts. Results of previous or existing agricultural reclamation plan efforts shall be considered as part of the review of proposed reclamation plans.

Shallow mining with agricultural reclamation is identified in Chapter 6 as the environmentally superior option, but it is not mandated by the 1994 ARM Plan because the amount of gravel removed would be much less than from deep pits, substantial additional land would be required to produce a given amount of gravel, this type of reclamation is not yet proven feasible in this

area, not all terrace mining sites are prime agricultural land, and other post-mining uses of terrace pits also have distinct public benefits. For these reasons, shallow mining above groundwater is therefore subject to the annual and long-term acreage limitations stated earlier and will only be considered as part of a deep-pit terrace mining project on land abutting the deep pit.

Reclamation with Additional Fill: Importing of earth materials from off-site sources, including topsoil from other mining sites and the return of fine sediments from aggregate processing, may be necessary where reclamation to agriculture or other land-based use is proposed for a terrace pit which would be too deep to allow refill and reclamation by using on-site topsoil only. The combination of deep pits with imported fill permits more gravel to be removed while still allowing agricultural reclamation but also generates new concerns about fill materials from some sources affecting groundwater quality. Where a terrace mining site is reclaimed by refilling a pit with processing sediments or any fill from off-site sources, the following standards shall apply:

1. No pollution or contamination of groundwater quality would occur based on application of federal and State drinking water standards.
2. The fill operation would be approved by the RWQCB.
3. Environmental review would be conducted of the removal, transport, storage, and deposition of off-site earth materials used for refill.
4. No significant impact could occur to the levels of nearby groundwater and wells based upon use of the MODFLOW computer model or similar model of equal or better analytical capability.
5. Ponding of surface water would not occur after periods when the flood plain is inundated.

Aquaculture : The raising of fish and shellfish does not require the extensive land areas used by plant crops but is nonetheless considered to be an agricultural use by the General Plan. However, the feasibility of aquaculture in the terrace pits is not known at this time. Consequently, approval of this type of reclamation is permitted only where consistent with reclamation of adjacent pit areas and clearly demonstrated to be technically and economically feasible. Project design shall control surface drainage and groundwater flow into and out of the pits, including flood overflow from the river, to protect the aquaculture operation, water quality, natural existing fisheries, and adjacent properties. The reclamation plan must include a complete description of the related processing, storage, transportation, and other land-based features of the aquaculture operation and any non-aquacultural uses proposed. This type of reclamation will be deemed completed when the aquaculture operation has been fully operational for two years. Because

aquaculture is unproven in this area, the reclamation plan must specify the contingencies and alternative uses that will be implemented if the aquaculture operation is found to be technically or economically infeasible within two years. Financial assurances provided by the operator must be sufficient to cover the costs of the contingency alternatives in the reclamation plan. If an aquacultural reclamation plan has been permitted for any terrace pit, its success must be demonstrated before a similar aquaculture project will be approved for any other site.

Water Supply: The abundant groundwater resource in the Middle Reach area is tapped by numerous agricultural wells and partially by the large wells of the Sonoma County Water Agency and Town of Windsor located adjacent to the Russian River. Because terrace reclamation has the potential to affect future groundwater flows and levels, reclamation plans must consider and avoid impacts on wells in the area. The conservative groundwater protection standards in section 7.6.2, including MODFLOW analysis, maximum area, and minimum separation, will prevent these impacts, but if additional mitigation is required for a specific reclamation plan, it may include an additional setback between the pit and the wells or transfer of ownership or control of the pit to the owner of the wells after mining.

Removal of large quantities of sand and gravel also increases the water storage capacity and the ease of access to the water resources if the pits are not refilled. This creates the opportunity to go beyond mitigation of potential impacts by using terrace pits to provide an additional water source or storage reservoir for nearby users and water systems. The County encourages creative use of such opportunities to enhance the water supply facilities and systems in the Middle Reach area. If supplying water to neighboring agricultural properties is proposed for a site, it may be appropriate to transfer the post-mining ownership of the site to the owners of those properties or to an irrigation district or other independent entity. Similarly, for pits located close to public water supply wells, reclamation plans should consider transferring post-mining ownership to the water purveyor. Before the approval of any terrace reclamation plan which proposes such a transfer of ownership or any off-site use of the water in the pit by parties other than the mining operator and site owner, all affected parties must agree in writing to the legal arrangements and water quality protection proposed in the reclamation plan. In any case, water supply development is considered as an added benefit or feature in conjunction with other post-mining uses allowed and is not considered to be a primary use or sufficient reclamation by itself.

Recreation Facilities and Activities: The water-based recreational opportunities associated with the lakes created by terrace mining and their proximity to the Russian River have long been recognized. The Regional Parks Department has previously expressed a need for and interest in public recreation facilities in this area. The Open Space map in the General Plan designates two general locations for future public parks in the terrace mining area, one west of Windsor River Road and the other near Wohler Bridge. The Open Space map also designates the Russian River as a Waterway Trail where recreational boating is to be facilitated and adjacent hiking trails can connect urban areas, parks, and the waterway.

The only recreational uses which could be allowed with a use permit by the present LIA General Plan designation and zoning in the terrace mining area are game preserves, horse stables, fishing and hunting clubs, and golf courses. Development of public recreational facilities by the County would therefore require changing the General Plan land use designation to Public / Quasi-Public and changing the zoning to PF Public Facilities as part of the approval process for a park master plan.

The Management Plan identifies the Kaiser South terrace pit area, including the Wilson, McLaughlin and Benoist pits and Kaiser's processing plant site, as an appropriate location for future public recreation use. The site is well located to serve the region, connect with other publicly-owned lands, and, most importantly, minimize conflicts with the valley's prime vineyard operations. Recreational development of this area will depend upon close cooperation between the operator and the County Regional Parks Department. Transfer of ownership will require a written agreement specifying the responsibilities of each party.

County approval of a reclamation plan for the Kaiser South area shall consider the effects of the proposed mining, grading and reclamation on the potential for future public recreational development of the site. The Board of Supervisors shall direct the Sonoma County Regional Parks Department to prepare a needs assessment, site evaluation, and feasibility study for development of a regional park on the Kaiser plant site, McLaughlin Pit, Wilson Pit, Benoist Pit and adjacent properties, but this requirement is not intended to delay or prevent the approval of reclamation plans for mined lands and the completion of reclamation in accordance with approved reclamation plans. If a park appears feasible, a project design, financing plan, and environmental analysis and determination shall be prepared for Board review and approval. The net County costs of park-related activities shall be reimbursed by the Recreation Enhancement

Program funded by the Russian River Gravel Mitigation Fund. The Regional Parks Department shall consult with nearby property owners and residents and other interested parties in public meetings during both the initial site evaluation and environmental analysis for the project.

Wastewater Storage: Several cities near the Russian River place treated sewage effluent in ponds for evaporation, filtering by the surrounding sand and gravel deposits, and further treatment by biological processes. The only site where this is done in the Middle Reach terrace mining area is the old Basalt pit used by the City of Healdsburg for many years. Monitoring thus far has not found any significant water quality impacts connected with this use. Any reclamation plan for this pit shall serve to protect and maintain the City of Healdsburg's ability to continue to use the pond for wastewater storage in accordance with applicable water quality standards. The processing sediments which have been piped into this pit may be removed to enlarge effluent storage capacity and provide fill for agricultural reclamation of other mined areas as long as the transfer of sediments meets the standards for imported fill stated above. No other terrace mining site may be used for storage or disposal of effluent from public sewage treatment systems unless the Board of Supervisors finds that the proposal is the environmentally superior alternative being considered, will meet applicable water quality standards enforced by the Regional Water Quality Control Board, and will avoid significant impacts on nearby groundwater and surface water.

Unfilled Pits: Unless previously specified in this Chapter, the following standards shall apply where a pit will not be refilled above groundwater level and will be left as open water :

- The potential for levee failure and/or diversion of the river channel into the pit shall be minimized.
- No pollution or contamination of groundwater quality shall occur based upon federal and State drinking water standards.
- No significant impact shall occur to the levels of nearby groundwater and wells based upon use of the MODFLOW computer model or similar model of equal or better analytical capability.
- Sedimentation from erosion of adjacent slopes shall be minimized.
- Where human uses of a reclaimed pit are proposed, these shall be minimized in and adjacent to marsh areas and riparian habitat where wildlife is abundant.
- Final pit slopes below the water level shall not be steeper than 1 horizontal to 1 vertical.

7.7 MITIGATION AND MONITORING PROGRAM

The extraction, processing, reclamation, mitigation, and other aspects of aggregate mining operations will be monitored on an on-going basis by the Sonoma County Permit and Resource Management Department (PRMD) and qualified personnel under their direction and supervision. The monitoring activities undertaken shall include but not be limited to the following:

- Field inspections, interviews, photographs, mapping, surveys, and measurements.
- Written reports by operators or their representatives.
- Collection and analysis of data from operators and other agencies.
- Investigation and documentation of complaints.
- Abatement and punishment of violations.
- Calculation and collection of fees and payments.
- Reports to the Planning Commission, the Board of Supervisors, and other agencies.
- Review and revision of the ARM Plan and related regulations.
- Development and implementation of mitigation procedures and guidelines.
- Supervision, administration, and clerical support related to above activities.

Compliance with permit conditions, operation standards, and reclamation plans will be monitored during periodic site inspections of each mining operation by PRMD staff. Each active quarry operation will be inspected at least once every 90 days during the mining season. Each active instream and terrace operation will be inspected at least once every 60 days during the mining season.

Each operator shall submit annual reports to the County on the extraction, importation, recycling, production, and distribution of aggregate materials for each operation or site. The report will be made on a form supplied by the County. These reports are in addition to and separate from any reports required by CDMG or any other agency. Reports and data on individual operations will be considered proprietary and confidential unless such confidentiality is waived by the operator.

Procedures to secure compliance with permit requirements, mining standards, and reclamation standards are stated in Chapters 26 and 26A of the County Code. Chapter 26 contains procedures for revocation or modification of use permits and abatement of nuisances, and provides the authority for stop-work orders, citations, and penalties for violations. The permittees, owners, and operators of aggregate mining operations and the responsible parties stated in

approved reclamation plans shall be responsible for observation and compliance with the requirements of the ARM Plan and the County Code. Whenever PRMD staff becomes aware that responsible parties are not complying with these requirements or conditions of approval, staff shall notify the responsible parties. Where compliance has not been secured within 30 days, staff shall issue citations and/or arrange for correction of deficiencies by a third party and to charge the total costs of such correction to the responsible parties and/or their financial assurances. Upon making a finding of public danger or emergency or serious threat to life and property, PRMD staff shall require the operator to stop work until such conditions no longer exist. The amounts of citations and fines imposed for non-compliance should reflect the amounts of aggregate and profit gained from the violation and/or the significance of the related environmental impacts.

By July 1 of each year, the PRMD will provide an Annual Report to the entire Planning Commission and Board of Supervisors on problems and successes in implementing the ARM Plan, production and exporting for the previous year, possible future changes in demand and production, the results of the previous year's monitoring program, status of the mitigation funds and any proposed fee changes and fund expenditures, status of efforts to develop additional quarry sites and aggregate sources outside Sonoma County, status of terrace reclamation plans, and significant enforcement problems and needs. By May 1, 1998 and every two years thereafter, the PRMD, with the assistance of the Sonoma County Water Agency, will prepare a report on the estimated sediment replenishment for the Russian River incorporating the results of the on-going monitoring program. Monitoring of instream and terrace operations will also include aerial photographs, biological monitoring, and groundwater monitoring as described as operating standards in sections 7.4.2, 7.5.2, and 7.6.2 above.

The costs of the monitoring activities shall be funded by aggregate operations through a system of annual fees charged for each fiscal year. The total annual costs billed to all operations for the monitoring activities described above shall not exceed \$200,000 for any fiscal year unless the Board of Supervisors determines otherwise following a public hearing. The aggregate monitoring program shall include an administrative system which, to the maximum extent possible, records all monitoring activities related to each mining and reclamation site and charges fees to operators to completely reimburse those costs. All monitoring costs which are not directly attributable to specific sites, such as the annual report, revisions to the ARM Plan and related regulations, and

general administration of the monitoring program, shall be allocated and billed to operators in proportion to the site-specific costs incurred and billed.

Mitigation Programs and Fees: In addition to and separate from the monitoring activities and fees presented above, aggregate operations are subject to two types of fees for mitigation of environmental impacts, including the cumulative impact of past, present, and future mining. The general Countywide mitigation fund and fee system established by the 1980 ARM Plan is discontinued and replaced by the more specific mitigation measure fees described herein.

First, a Russian River Gravel Mitigation Fund is to be established with mitigation measure fees imposed on instream and terrace gravel mining operations along the Russian River. This fund will be used for the following mitigation programs and activities which are required in the environmental impact analysis in Chapter 8.

1. Agricultural Support Program:
 - A. Develop agricultural irrigation systems in the Middle Reach area.
 - B. Acquire open space easements on agricultural lands surrounding the designated terrace mining area.
2. Recreation Enhancement Program:
 - A. Provide access and facilities for boating and fishing along the Russian River.
 - B. Develop and implement plans for a County park in the terrace area east of the river.
3. Flood Protection Program:
 - A. Provide ongoing monitoring and repair services for levees adjacent to terrace pits.
4. Stream Restoration Program:
 - A. Protect and restore eroded streambanks.
 - B. Plant vegetation along channel, on eroded banks and on disturbed sites.
 - C. Remove obstructions to fish passage and spawning.

The amounts of the mitigation measure fees to be charged to a particular mining operation are based on determinations and formulas which consider the approximate costs of adequate mitigation and the nature and extent of the project's impacts in the above-mentioned areas.

Mitigation measure fees are calculated on a basis to satisfy the following legal requirements:

1. Requirement under CEQA that the amount charged be sufficient to fully fund the programs identified in the EIR as necessary to mitigate the impacts.
2. Requirement that the exaction be "roughly proportional" to the impact of the project.

Fees are charged to gravel mining operators for mining and/or reclamation activities allowed by County approval of mining permits and reclamation plans. Mitigation measure fees will be calculated and charged initially on terrace mining operations at the time of approval of a mining permit and/or reclamation plan and must be paid to PRMD before any approved mining or reclamation commences. Mitigation measure fees will be calculated and charged each spring on instream mining operations on the basis of the mining operations and site characteristics during the previous calendar year and must be paid within 60 days of billing. Fee determination formulas may be varied at time of project approval only where the applicant adequately demonstrates either cost data or other reasoning to support a change or if the applicant will be otherwise funding or conducting the program activity.

The cost determinations, exaction formulas, and fee amounts to be charged will be incorporated in a resolution to be adopted by the Board of Supervisors. Within six months of the adoption of the resolution, PRMD shall present a report to the Board which reviews the status of the mitigation activities and possible changes, evaluates the cost determinations, exaction formulas and fee amounts, and recommends adjustments in programs and fees to assure their adequacy. In preparing the report, PRMD shall consult with the gravel mining operators, responsible public agencies, and other parties involved or interested in the mitigation measure programs and shall notify them of a public hearing to be held when the Board considers the report. Adjustments in the mitigation measure programs and fees may be approved by the Board by adoption of a resolution.

In 1996 an annual review process will be initiated to maintain the adequacy of the mitigation measure programs and fees. The PRMD will prepare a report to the Planning Commission and Board of Supervisors by July 1 of each year on how the mitigation fund has been used and what disbursements are recommended for the coming year. The report shall be distributed to all interested parties, considered by the Planning Commission at a public hearing, and transmitted to the Board of Supervisors along with the public testimony at the hearing and recommendations from the Planning Commission and staff. Proposals from public agencies and private parties for use of the mitigation funds will be considered in the report if received by the PRMD by April 1. Adjustments in the mitigation measure programs and fees may be approved by the Board by adoption of a resolution.

Second, all mining operations shall be subject to an annual Countywide mitigation measure fee based on the estimated annual truck traffic generated by the operation. The Aggregate Road Mitigation Fund will be used for improvements and maintenance on aggregate haul routes and related planning and administration by the Department of Public Works. In addition, new mining operations may be assessed initial or annual charges for reimbursement of the costs of specific off-site improvements to public roads used as access or haul routes by the operation if such improvements are a condition of approval and mitigation measure for the project. The levels and uses of these fees will be recommended to the Board of Supervisors in the annual report to be prepared by the PRMD in consultation with the Public Works Department.

7.8 IMPLEMENTATION

Several actions will be required by the County after adoption of this Plan in addition to the review of individual permits and reclamation plans and the mitigation and monitoring efforts previously described. They include the following one-time actions to be initiated soon after Plan adoption:

- Initiation of changes in the surface mining ordinance, Chapter 26A of the County Code:
 - Reflect adopted standards for mining and reclamation.
 - Update provisions on financial assurances, reclamation, inspections, and reports to conform to changes in SMARA.
 - Expand provisions on enforcement to include stop work orders and fines based on amount of aggregate removed and/or impacts .
 - Modify procedures for review of master reclamation plans for terrace sites.
- Initiation of changes in the zoning ordinances, Chapters 26 and 26C of the County Code:
 - Allow short-term gravel bar skimming with a use permit in RRD, LIA, DA and LEA zones.
 - Allow small isolated quarries with a use permit in RRD, LEA and DA.
- Request to the SMGB to consider the ARM Plan in future classification and designation of regionally significant aggregate resources.
- Report to the Board of Supervisors analyzing the benefits, costs, and feasibility of possible actions which could reduce the need for sand and gravel from instream and terrace sources and reduce the overall demand for aggregate. The report shall include recommended actions. In preparing the report, the PARM shall consult with an Aggregate Task Force composed of representatives of the County Public Works and Public Health Departments; Sonoma County Water Agency; aggregate mining operators; the construction industry; Caltrans; incorporated cities; adjacent counties; and other interested parties. Possible actions or changes to be analyzed in the report shall include but not be limited to the following:
 - Reducing differences in specifications between agencies within Sonoma County.
 - Reducing required sand equivalent levels.
 - Increasing the required percentage of crushed rock in road base.
 - Revising purchasing practices to support the increased use of quarry materials.
 - Revising standards for recycled materials.

- Changes in development standards which reduce aggregate needs.
(To be coordinated with implementation of Housing Element policies and programs to reduce housing development costs.)
- Report to the Board of Supervisors within 180 days of Plan adoption re-evaluating the adequacy and functioning of the Aggregate Road Mitigation Fund, Russian River Gravel Mitigation Fund, and the associated mitigation measure fees and activities.