ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

Under this project the potential annual gravel extraction rate (the total of all permits) exceeds historical extraction rates. If the potential rate were to occur each year regardless of replenishment, the impact would be to lower the average elevation of the bed of the river from the mouth of the Van Duzen River to Cock Robin Island bridge and upstream on the Van Duzen and Eel River to some undetermined length. The last high flow on the Eel River to move any amount of material occurred in February of 1986. Therefore, there has been a cumulative effect of five years of gravel removal through the 1991 season.

Fishery Habitat.

As mentioned earlier in the Environmental Setting, the Eel River and its tributaries are ranked among the most significant anadromous fisheries in Northern California. Therefore, great care must be taken during the gravel extraction process to minimize potential impacts on the fishery habitat. Gravel extraction normally occurs from about May 1st through October 1st. In the past, extraction activities occurred as early as March or April in years where low flow occurred early in the season. By restricting extraction to the period May 1st through October 1st the potential for impacts on migrating fish is minimal.

The early season restriction is especially important when summer bridges are used. The young chinook salmon migration downstream, after they emerge from their gravel beds, begins in late February and March, peaks in April or May, and is completed by late July. Therefore, it is important that summer bridges be installed with great care and that water quality be maintained in the low flow channel during this period of time.

The construction of summer bridges requires minor approach fills that may encroach on the channel but must not intrude upon the low flow channel. Heavy equipment must sometimes enter the river during the bridge installation process. Early in the season this equipment could endanger the very small fingerlings that utilize the shore line to migrate downstream.

Most bridges consist of flat cars about 90 feet in length. As long as a flowing channel two feet or more in depth and 60 to 80 feet wide exists, an adequate migration route will be available for fish.

Gravel skimming operations stay clear of the low flow channels and should have no measurable impacts during the extraction period. Adverse effects such as channel braiding may result from widening and flattening of the low flow channels during skimming operations. This is the main reason for recommending a 3 percent slope away from the channel for skimming operations.

As mentioned earlier, trenching has been permitted on the assumption that it will not significantly degrade and may enhance fishery habitat. These trenches, up to 1,600 feet long in the project area and 15 feet deep parallel the existing channel on the inside of bars, and are assumed by the Department of Fish & Game, to have minor adverse impacts on fish.

Two fisheries concerns have been raised regarding trenching. The first was that during the trenching process much of the fine silt and clay drops out of the bucket as it is raised full of gravel from below water. Additional fines drain out of the wet gravel and sand when it is temporarily stockpiled next to the trench to allow the water to flow out. The concern is that there is a minor concentration of fines which would be picked up by the river when the pond berms are broken at the very start of a rise in flow of the river. This potential impact is more likely if the rise in the river is very minor, such that the normal low flow channel connected with the trench water in a manner that would destratify the pool and cause fine silts to rise up from the bottom and flow out into the low flow channel.

It takes a substantial rise in the river to break through the gravel berm separating the trench from the river. When there is a substantial rise in the flow of the Eel River the concurrent suspended sediment is so high that the fines found in and adjacent to the trench pools would have negligible effects. However, a proper monitoring program during small flow increases would provide evidence regarding this potential problem.

Another concern expressed about trenches is that when the river experiences a rise in flow the low-flow channel may become completely transferred to the trench. Then, as the river drops back down, the trench becomes the channel and the original low-flow channel gets left isolated and may ultimately dry out. Should this occur, the invertebrates that were living in the low-flow channel would be lost, and thus

would represent a loss of fishery habitat. This type of impact was observed on the Mad River. This type of potential impact is temporary as high flows carry invertebrates downstream and restock the existing habitat. The bed of the Eel River in the project area contains a high percentage of fine material filling the interstices of the larger cobbles. This tends to reduce the habitat for invertebrates and the potential for this impact on the Eel River.

It is known that summer showers such as those that occurred June 29th and 30th, 1992, can cause the lower Eel to rise and fall. The low-flow channel can become connected to the trench, thereby allowing fingerlings to get into the trench. As the river level drops, the fingerlings can become trapped in the trench. A special effort would have to be taken to remove them. The gravel operators and the DFG will be most familiar with what is happening in this regard. The River Management Program could include procedures, approved by the Department of Fish and Game, to be followed and implemented by the operator to avoid these problems.

Because gravel extraction trenches are 10 to 15 feet deep, they may provide resting pools for fish migrating upstream. However trenches are rather sterile and do not create ideal habitat. Over the memorial day weekend in May 1992, Terry Roelofs and Ron LeValley snorkeled trenches on Mad River and observed no fish using the trenches and a one inch film of fine silt covering the bed of the trenches. Other fisheries professionals have also have snorkeled the trenches as well as the length of the lower Mad. Steelhead were observed holding in natural pools and not in the trenches. A green sturgeon was reported in the trench at the Emerson Bar on the Mad River during the summer of 1992.

The bed of this portion of the river contains a high percentage of silt and sand, ranging from 22% to 59%, thereby making most of it poor habitat for fish to spawn or to spend much time in. The majority of the anadromous fish of the Eel River use the project area as a migration route for getting up and down the river. The project area, in its present condition, is of little significance to the seven species of anadromous fish as a spawning area. It is important to these fish to have a quality migration route with proper depth and clean water. Photo No. 17 shows a riffle area near Site No. 4.

Portions of the project area contain braided low-flow channels. If gravel extraction and bed lowering resulted in a deeper, confined, low-flow channel the impact on fish could be favorable. Fish migration up and down the river would be enhanced in a single deeper channel.

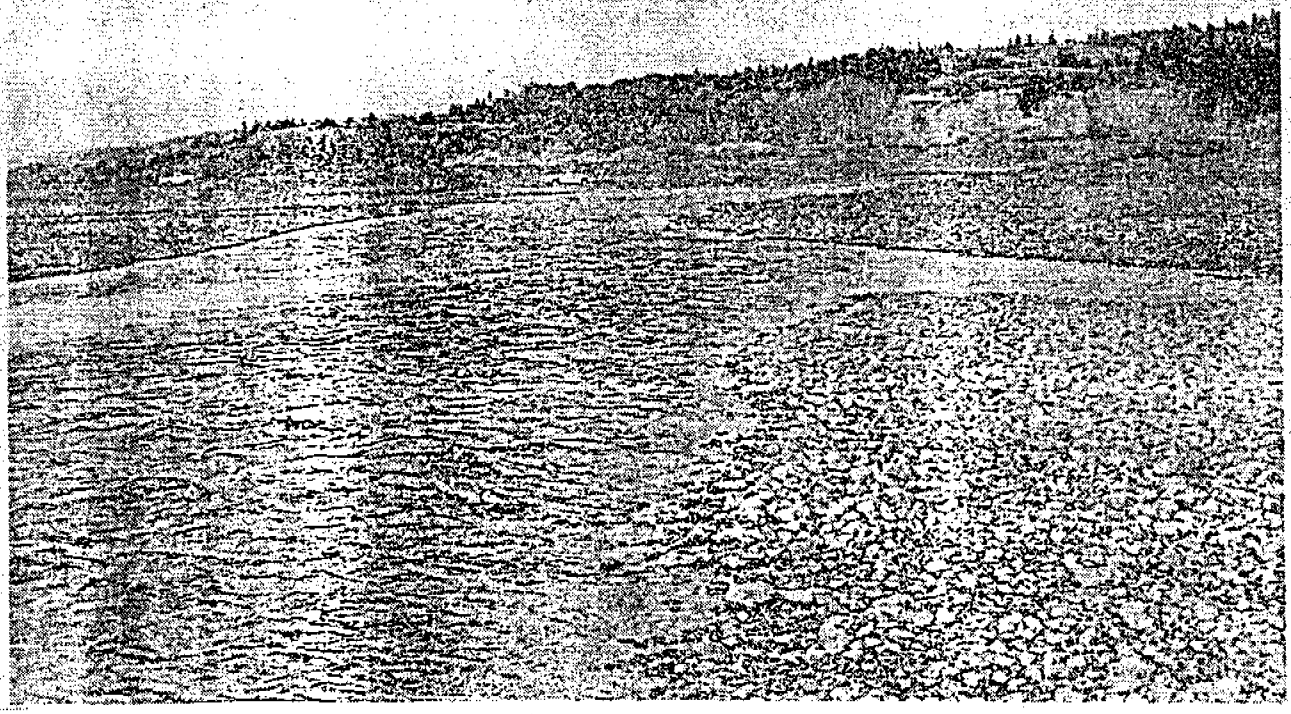

Photo #17 - View north of the low flow channel of the Eel River near site #4.

Deep pools are no longer found in the project area. It should be noted that back in 1951 Murphy & DeWitt found that steelhead remained in residence in pools and riffles below the Van Duzen River. That was in a time when some deep pools occurred below the Van Duzen River. They also observed schools of 50-100 chinook feeding in Singley and Dungan pools throughout the summer. Puckett, in 1977, found no chinook salmon in these areas after periods of downstream migration in early summer.

Green sturgeon were observed rolling in the Dungan pool in June and July by Murphy & DeWitt (1951). They also saw a few juveniles migrating downstream. The filling of this pool and others after the 1955 and 1964 floods limited the habitat available for green sturgeon in this river.

The few pools left in Lower Eel River must be maintained because salmon utilize the pools between the riffles as holding areas until there is sufficient flow from fall rains to permit passage upstream. There may be some opportunity for gravel extraction operations to create temporary pools in the project area that could benefit fisheries values.

Higgins (1992) noted in his study of the Eel River estuary that the decrease in amount of deep water habitat probably decreased substantially the survival of out migrant juvenile chinook salmon. The decrease in the tidal prism decreased suitable subtidal habitat, especially in the sloughs. The filling in of the Eel estuary has lead to less habitat and a shorter rearing time for juvenile chinook before entering the ocean. It is critical for juvenile chinook to spend extended time rearing in the estuary to a size that will enable a better chance of survival in the ocean.

A major problem has recently been identified by studies under contract to the Eel River Conservation District. Particle sizes of sediments deposited in the Eel River estuary are larger in the most recent decades than they were in the preceding 2000 years. A possible explanation for this may be that in recent decades, the Eel River watershed has been dramatically de-vegetated by logging, road construction and burning, resulting in more rapid runoff and a higher energy river system capable of carrying larger sediment particles further into the estuary. The construction of levees and bank revetment projects also confines the flow and increases the energy available to transport coarser sediment into the lower Eel. Deposits of these larger particles within the Eel River estuary in the most recent decades resist transport out to the ocean by tidal action exacerbating a build up of sediment in the estuary and subsequent loss of tidal prism.

The quality of the estuary is also very important because the annual run of mature chinook salmon enter the estuary from the ocean in late August and September and spend their time in pools below Fernbridge until the first large storm causes the river to rise so they may migrate upstream.

Therefore, any gravel and sand removal that tends to reduce deposition in the estuary should enhance the habitat available for anadromous fish and invertebrates. If the Lower Eel River were mined for several years, the decrease in bed load material moving down to the estuary would increase the tidal prism and volume of the estuary. This would increase the amount of fishery habitat and invertebrate habitat.

Bridge Safety:
The potential critical impact associated with lowering the bed would be to the integrity of the bridge piers at Highway 101 on the Van Duzen, Highway 211 at Fernbridge, and possibly at the Cock Robin Island bridge. Other facilities that could be impacted include the railroad bridge over the Van Duzen River next to Highway 101 and the Sandy Prairie Levee and Grizzly Bluff Levee.

Of interest, Dames & Moore calculated the so-called natural scour depth that would occur at cross-sections No. 12 and No. 13 during a flood with a flow of 1,250,000 cubic feet per second. The natural scour depth is the depth below the current bed at which active bedload movement occurs. Using the six methods mentioned in Table 12, originally developed by the U.S. Bureau of Reclamation in 1984, they calculated the scour depth was equal to 24.6 feet. This would lead one to conclude that flows of a slightly lesser magnitude would scour the bed down to the bottom of most of the current trenches which are about 15 feet deep. When high flows recede deposition of bedload occurs and may possibly result in little net change in bed elevation after the flood passes. Dames and Moore concluded that their gravel extraction scenario would not have an adverse effect on the safety of Fernbridge nor on the proposed ARCO pipe line crossing.

Bedload transport is difficult to predict or measure. In the absence of monitoring it is futile to attempt to measure or calculate the average amount of sediment moving into the project area. The only way to get a handle on what is happening to the river bed is to implement a monitoring program. This program will have to be funded by the gravel operators with their share being proportional to the amount of gravel they remove in a particular season.

TABLE 12
ESTIMATED NATURAL (NORMAL) SCOUR DEPTH

METHOD*	ESTIMATED SCOUR DEPTH BELOW BED (ft)
Abbot's Empirical Equation	11.7
Neill's Regime Equation	31.3 to 37.6
Lacey's Regime Equation	8 to 16
Blench's Regime Equation	31.9
Mean Velocity and Water Depth Approach	12 to 24
Competent Velocity Method	26.3
Average	24.6

*USBR, 1984. Source: Winzler & Kelly 1991

Following a few seasons of gathering monitoring data, the County Planning Department and the resource agencies with jurisdiction should be able to flexible site specific management guidelines to determine actual variable annual or periodic gravel extraction rates that can occur within the project area without damaging the integrity of the fishery habitat, other river resource values, and river morphology.

Wildlife

The main potential wildlife impacts result from the effects of gravel extraction activities on riparian vegetation and from high noise levels. There have been some past impacts on riparian vegetation from overflow of stockpiles into the vegetation. As mentioned earlier, most of the Eel River Delta (20,000 acres) was covered with trees in 1850. Following the removal of most of the trees, the actual acreage of riparian vegetation was limited to the banks of the Eel River and in some of the swales from old river meanders.

The cumulative impact over the years has resulted from the removal of portions of the riparian vegetation for some of the processing yards. The existing gravel operations do not require removal of any riparian vegetation in order to continue. All of the river access points are in place.

If the gravel extraction results in less braiding and a deeper, confined low-flow channel there could be some impacts on the riparian habitat which is so important for the wildlife of this region. The impacts on wildlife would be minor. If a narrower low flow channel became established, ephemeral riparian vegetation would grow closer to the flowing channel, thereby providing more cover for wildlife, especially when they are going for a drink.

Riparian vegetation along the current banks could be impacted. When the channel bed is lowered the adjacent groundwater table is likely to be lowered which could cause stress to adjacent riparian vegetation during the dry season. This effect could be mitigated as the riparian vegetation community expands towards the lower bed and as roots tend to follow the groundwater table.

The new operation at Site No. 12 (Arcata Readimix) may require some minor removal of riparian vegetation if turnouts need to be added along the haul road.

The new proposed operation at Site No. 13 at the mouth of the Van Duzen River would require removal of riparian vegetation only if the point of access off Highway 101 needs to be

changed or if a crushing area is to be created. These details will be covered in the supplemental EIR.

Impacts may occur to the Red Legged Frogs at Site No. 12 and the Yellow-legged Frogs at Sites No. 8 and No. 9. To assure that these candidate species are protected during future operations, the U.S. Fish & Wildlife Service Endangered Species Division recommends that the Conditional Use Permit, 1603 Streambed Alteration Agreement, Coastal Development Permit, State Lands Commission Permit and Section 404 contain a condition that the operations activities stay 150 to 200 feet clear of the ponds and embayments where these species were observed.

To protect the Western Pond Turtle, the Department of Fish & Game wardens would need to keep an eye out for habitat used by the turtle. For example, a small pond or backwater area may exist after winter flows recede. Special mitigation should be require the operator to keep 100 feet away from these types of habitat.

The other effects relate to noise levels and dust generated by heavy equipment passing to and from the river through the riparian zone to the processing yards, and the crusher and batch plants. Field observations by staff of the County Public Works Department noted that large hawks were utilizing trees in the riparian vegetation zone within a few hundred feet of a batch plant and crusher in full operation while there were much other quieter riparian areas available to them along the river.

The Prairie Falcon, if it were to use the project area, would normally be there between October 1st and May 1st and gravel extraction does not normally occur during this time period.

According to an observation made by J. Sterling the Snowy Plover, an uncommon local migrant and winter visitor, might rarely utilize the gravel bars on the Lower Eel River below Fernbridge. Their normal habitat is the ocean sand beaches where they breed, nest, and forage.

Concern was expressed that gravel and sand removal from the Eel River could lead to depletion of the beaches north and south of the Eel River mouth which would decrease the habitat of the plover. Historically there has been an over abundance of sand moving down to the mouth area as evidenced by the filling in of the estuary. The beach width is not showing any trend towards decreasing.

Osprey which are a common summer resident have been seen along the Eel River. They normally do not nest along this stretch of the Eel River. Nesting colonies have been observed in the

upper parts of Elk River and Freshwater Creek. it is not known for sure what the impact of gravel extraction would be on an osprey. The County crew that operates the crusher had the experience of an osprey nest within 700 feet of the crusher on a gravel bar at Orleans. This particular osprey insisted on fishing right next to the crushing operation.

The Cooper's Hawk is an uncommon resident normally seen in the winter time. It has been recorded in all types of woodlands. There have been no recorded sites of them breeding and nesting in and along the narrow riparian corridor along the east side of the Eel River in the project area.

The Sharp-shinned Hawk is a common migrant and winter visitor, which means it would potentially be in the area when the gravel extraction activities on the bed do not occur.

The Northern Harrier is also a common migrant and winter visitor, and prefers open habitat such as lowland pastures or marsh lands of the coastal plain. since it is a winter visitor, it would be potentially be in the project area when there is no gravel extraction occurring. As mentioned earlier, some crusher operations and batch plants run throughout the season. This has occurred mostly at Site No. 2, No. 3, No. 4, No. 5, No. 8 and No. 9. It would seem reasonable that a constant noise generated by these plants would tend to keep birds from breeding and nesting nearby.

The Golden Eagle is a rare to uncommon resident and breeder in the County and has been seen soaring over open woodlands, forests and grasslands in the inland higher ridges. Some have been observed in the coastal low lands between September and May. They have not been recorded as nesting in the riparian area in the project region. Because Highway 101 traverses along the east edge of the project area and gravel processing plants at Sites No. 2, No. 3, No. 4, No. 5, No. 8 and No. 9 tend to run year-round, it is improbable that Golden Eagles would construct a nest and breed in this area.

The Merlin is an uncommon migrant and winter visitor, but has been seen along the Eel River by Stan Harris. For the reasons mentioned previously, it is doubtful that they would select the thin riparian edge along the east bank of the Eel River in the project area.

The Common Loon is a common migrant and winter visitor. Main migrations occur in early September/October when they arrive and April through May when they leave. Fortunately gravel extraction would not normally be occurring on the river bed during most of the time that the Loon could potentially utilize pools in the Lower Eel River.

The Short-eared Owl is an uncommon to common migrant and winter visitor. They normally arrive in October and leave by early May, which means they would not normally be in the project area during the time when gravel is being extracted. Due to noise from gravel processing and batch plants during the winter season, it is probable that they would not select the riparian vegetation near these processing centers for nesting and breeding.

The Yellow-breasted Chat tends to use well developed riparian cover along streams in the summer. They could be attracted to the riparian zone on both sides of the river through the project area. It is probable that they would not select a nesting site near the processing plants because of the noise.

The Yellow Warbler is a common summer resident and breeder associated with alder, cottonwood, and willow stands in riparian areas. It is probable that they utilize the riparian areas along the west side of the project area where there is very little human activity.

The Peregrine Falcon has been observed many times on the Eel River Delta. They feed on shore birds and other water birds. They are an uncommon migrant and winter visitor. They would not nest in the riparian vegetation adjacent to the project area.

The official Spotted Owl inventory of the Department of Fish & Game was reviewed and it shows that no spotted owls have been observed in the project area on either the Eel River or Van Duzen River. If, in the future, nests or activity centers are discovered within 1/4 mile of a project site, the owls would be impacted by the noise of gravel extraction and processing equipment during the last month of their breeding season. The breeding season is March through July.

Site No. 11 operated by Tom Bess is fully permitted. Site No. 10 is a gravel extraction project proposed by Jack Noble. The U.S. Fish & Wildlife Service requires a spotted owl survey be conducted in this area in addition to any done by Pacific Lumber Company and the Department of Fish & Game. The survey can only be done February through April by a qualified biologist, following the March 1992 protocol of the U.S. Fish & Wildlife Service. This survey could be done during preparation of the supplemental environmental document for Site No. 10.

There is no historical data on populations of the 13 birds mentioned above along this portion of the Eel River. No statement can be made as to whether the gravel extraction activity has affected their numbers over time (Stan Harris, pers. comm. 1992).

Impacts on the species of mammals that have been observed in the riparian corridor through the project area would be related to noise, ground vibration and dust.

Most of the riparian area in the Lower Eel River project area is opposite Sites No. 4, No. 5 and No. 6 with the nearest point being 1,800 feet. Young riparian vegetation exists on islands in the braided section between Sites No. 3 and No. 5. The lowest quality riparian vegetation occurs along the east side of the river along Sites No. 2, No. 3 and No. 9. A small fringe of riparian vegetation occurs at Sites No. 10 and No. 11. Because of the small amount of riparian vegetation adjacent to existing operations and the amount of habitat removed from use due to noise, it was determined that impacts on wildlife from the existing projects is insignificant. Impacts on wildlife from the proposed processing plant on the west side of the river for Site No. 6 would create significant adverse effects on wildlife. However, if the west side site is used only for storage, then the impact of noise on wildlife will be much less.

Viewshed

Most of the traveling public sees a portion of the Eel River while passing over the river on Fernbridge. Because the bridge is narrow drivers must pay fairly close attention and therefore passengers are the only ones allowed a long look up and down the river. Prior to 1969 the Singley Bar operation had many stockpiles and equipment across from Site No. 1. Site No. 2, after 1969, was involved with extraction off the bar. These areas would have been most visible to those utilizing Fernbridge.

Sites No. 2, No. 3 and No. 4 are visible from the southbound lanes of Highway 101. Sites No. 2 and No. 3 have had gravel processing yards and equipment in existence for over 20 years. The processing yard at Site No. 4 is relatively new. The large stockpiles at Site No. 4 are a new visual item seen from Highway 101.

As mentioned earlier, the natural condition of the gravel bars is changed by skimming and trenching. Viewshed impacts would be experienced by those that use the river for recreation and sports fishing. The processing areas and stockpiles of Sites No. 2, No. 3, No. 4, No. 5, No. 8 and No. 9 are visible from certain parts of the river bed. The proposed processing plant for Site No. 6 next to the levee would be visible both from the river bed and Sandy Prairie Road. The stockpiles at Site No. 9 are visible from Highway 101, but they are not a prominent feature.

Operations at Sites No. 10 and No. 11 on the Van Duzen River are only visible to users of the river bed. Very little of

Site No. 11 is visible from State Highway 36. The processing plant and stockpiles only cover a couple of acres.

The most visible features of gravel extraction from the river bed are the temporary stockpiles related to the trenching operation and summer bridge. The impact of these features on sports fishermen and recreationists is difficult to assess. Regarding the Wild and Scenic Rivers Act, it is reasonable to assume that this particular stretch os the Eel River does not possess extraordinary scenic views. However, fall views are quite scenic when viewed from Fernbridge and from the top of the east bank of the river.

Archaeological Resources

Of the eight archaeological sites that were originally in the project area in the 1850's, as determined by Loud during his study in 1913, none exist today. Massive changes in river channel location have occurred along with changes in river bank. Many of the original sites were located on the bank of the original 1850 channel. Most were wiped out in the 1861/62 flood which was similar to the discharge which occurred in 1964. Therefore, the gravel removal and processing operations will not impact archaeological resources.

Flood Control

The removal of approximately 1,480,00 cubic yards per year from the project area could assist in flood control if the bed were lowered to allow the channel to carry more water before it overflowed its banks. The potential negative effect would be if the channel morphology were changed such that the river attempted to scour one bank or the other. The current approach of trenching on the inside of bars and curves may maintain the current channel in its present location for a longer period of time.

The concept of providing flood control through gravel removal should be approached carefully. It is very difficult to decide which portions of the river bed can be removed to achieve flood control without creating a multitude of significant adverse effects. For example, if it were decided to dredge a new floodway channel on the west side of the river channel opposite Site No. 3, No. 4, and No. 5, the river may, during the next large flood, following completion of the new floodway, be induced to change course and flow around the west side of the bridge at Fernbridge, adopting its pre 1861/62 channel.

The incremental benefit of flood control would be very small. A study by the Corps of Engineers in 1971 showed that levees would have to be built from the Van Duzen River to the mouth of the Eel River and a channel created by removing 40 million

cubic yards of material to provide a significant amount of flood control.

Groundwater Recharge and Water Supplies
The community of Fortuna has wells approximately 3,000 feet inland from the Eel River bed. The water levels in these wells tend to fluctuate with the change in water level of the Eel River. The current and proposed gravel extraction operation should have negligible effect on groundwater recharge and water supplies.

Traffic
The current operations generate a wide range in traffic. The Arcata Readimix operation at Site No. 12 could generate a maximum of 166 truckloads per day hauling 1660 cubic yards in 10 yard trucks. Operating from June 1st through October 1st, 5 days per week, would provide about 90 days to remove 150,000 cubic yards.The truck trips per day would equal 332. Operating from 8:00 AM to 6:00 PM would result in 33 movements per hour at the intersection of Waddington Road and Highway 211. This means a truck would leave or enter this intersection every two minutes.

Sight distance is very good at this intersection. Passenger cars would need a sight distance of at least 520 feet on Highway 211. A semi-trailer needs 700-800 feet sight distance on Highway 211. These are distances required for the truck driver turning left onto Waddington Road from Highway 211.

Highway 211 carries a traffic volume of about 4,800 vehicles per day in this vicinity and a maximum hourly volume of 670-690 vehicles per hour. The 33 truck movements per hour would effect this intersection to a minor degree and cause drivers on Highway 211 to experience a service level between A and B.

The traffic generated by Trutalli at Site No. 1 is too minor to be of any significance. His haul road is the same as that used by Arcata Readimix.

If the future contractor operating Site No. 2 chooses to move gravel out of the County by rail, the proposed removal of 200,000 yards per year from Site No. 2 by rail would generate one train per day of 30 cars each running south. If they choose to remove the gravel by barge, it would result in one train per day of 30 cars moving north to Fields Landing and off-loading the gravel with conveyor belts onto barges which would generate a few barge loads of gravel moving out of Humboldt Bay. The railroad and Humboldt Bay can easily handle the increased traffic that would be generated from Site No. 2.

Traffic from Site No. 3 would be high if the gravel went out by truck. However, most of it goes out by rail. Wes Nally

estimated about three trucks per day leave the site during construction season. Highway 101 is used as their main haul route.

Site No. 4 can generate up to 50 trucks per day. These trucks utilize Highway 101 as a haul route both north and south and enter Highway 101 at the 12th Street interchange. This interchange can easily handle this traffic load.

The Mercer-Fraser operation (site No. 5) will generate an average of 52 trucks per day and a maximum of 100 trucks per day. They are busiest from June to mid October and average some 75 trucks per day during that period. They use Highway 101 north and south. The freeway intersection is capable of handling this load of 75 trucks per day plus the 50 trucks per day from Site No. 4.

Site No. 6 (Land) is a proposed operation at the south end of Sandy Prairie Road. This is a proposed project still under review by the Humboldt County Planning Department. Traffic details are not clear, so an estimate must be made of the average number of trucks per day that would use the Sandy Prairie Road to the freeway interchange. Based on traffic generated from existing operations of similar size, it is predicted that an average of 75 trucks per day would result from this operation. This load must be added to that of Sites No. 4 and No. 5. The total average number of trucks per day from Sites No. 4, No. 5, and No. 6 equal 200. This would be 20 trucks per hour in a 10 hour day or about one truck every three minutes. The freeway intersection on Highway 101 at Sandy Prairie Road is capable of handling this total load, as is Highway 101. A service level A should still occur on Highway 101 because of the existing acceleration lanes for trucks entering Highway 101.

The operation at Site No. 7 uses Drake Hill Road and Highway 101 as a haul route. Dick Ehrhardt, the operator, estimated he generates an average of 8-10 trucks per day and a maximum of 40 trucks per day for short periods. His annual volume is 5,000 cubic yards. The maximum traffic load of 40 trucks per day in a 10 hour work period would produce 4 trucks per hour or 1 truck every 15 minutes. Sight distance required is about 500 feet for passenger vehicles and 700-800 feet for semi-trailers to avoid having a problem with a loaded gravel truck entering Highway 101 off Drake Hill Road. These site distances exist at this intersection. For trucks turning left(north), there is an acceleration lane. Slow moving trucks have an adverse effect on vehicles on Highway 101 moving along at 55-65 mph. The effect is to lower the service level to a level between A & B, which is not a significant adverse effect.

Charlie Hansen's operation at Site No. 8 uses a private graveled road from the processing yard to Highway 101. The intersection consists of Sandy Prairie Road, the private graveled road, the entrance to the restaurant and truck shop, and Highway 101. With an annual volume of 75,000 cubic yards, it is estimated that the average traffic load is about 75 trucks per day during the busy season (June to mid October). Staff of the traffic division at Caltrans are familiar with this intersection and do not currently have any serious concerns. Most of the traffic is associated with the restaurant and truck service center.

Site No. 9, Eureka Sand & Gravel, uses Fowler Lane (private road) as the haul route to Highway 101. State Highway 36 is directly opposite Fowler Lane. Rob McLaughlin of Eureka Sand & Gravel stated his operation generates 30 to 35 trucks per day on the average. In addition, the operation can include 15-20 concrete trucks per day.

Their haul routes consist of Highway 36 and 101. Caltrans' traffic division has concerns with this intersection. The aforementioned sight distances of 500 feet and 800 feet are required for passenger vehicles and semi-trailers and these sight distances do exist at this intersection. A new interchange is planned at this intersection which would alleviate present concerns. However, the new intersection is not in the 1992 State Transportation Improvement Plan. The new interchange would contain a frontage road along the west side of Highway 101 from Hansen's Truck Stop south to the Van Duzen River. All of the truck traffic from Hansen's gravel operation, restaurant, and truck stop would use this interchange.

The new proposed gravel operation by Mercer-Fraser, designated Site No. 13 in this EIR, could generate 80-90 truck per day during the busy season. The proposed haul route will be Highway 101.

Traffic generated by Jack Noble's operation is estimated to be about 30 trucks per day. The haul route would have to be either Fisher Road or River Bar Road. Both of these roads are narrow (16-18 feet) County roads that pass through agricultural lands.

The intersection of Fisher Road with Highway 36 lacks proper sight distances as does River Bar Road. The average daily traffic volume on Highway 36 at River Bar Road is about 2650. At Fisher Road it is 2000. These two intersections do not contain acceleration lanes. Further details and mitigation will be covered in a supplemental EIR to be submitted by Jack Noble.

The operation owned by Tom Bess at Site No. 11 generates about 8-10 trucks per day. The haul route is the Odd Fellows Road to Highway 36, thence north and south on Highway 36. This load of 8-10 trucks per day is insignificant. Sight distance is adequate to vehicles in the west bound lane. Vehicles travelling east are just coming out of a 90 degree curve at speeds of about 30-40 mph just before they reach the Odd Fellows Road intersection.

Vegetation

Two types of vegetational communities can be potentially impacted by the 13 gravel extraction projects. The first type consists of young annual type vegetation that grows on the gravel bar following winter high flows. There are about 2,700 acres of this type of gravel bar vegetation from the mouth of the Van Duzen to the mouth of the Eel River. Analysis of past gravel operations show the maximum areas disturbed on gravel bars from skimming to be 10 to 15 acres.

Nine out of the 11 operations on the Eel River could potentially approach that size of disturbance. This would amount to a worst case scenario of 135 acres disturbed in any one year which represents about 5% of the existing gravel bar surface. Regarding Sites No. 10 and No. 11 on the Van Duzen River, the actual percentage of the existing gravel bar vegetation disturbed would be less than 4%. Therefore, it is determined that the impact on this type of vegetation is not significant.

The second type of vegetation that may be impacted is riparian which is considered to be a more important community because of the original amount that existed in 1850 in the Eel River Delta system, very little exists today.

Of the 13 gravel extraction projects covered in this document, three are not in place. The rest of the operations have already occurred for several years. Processing yards were constructed many years ago for Sites No. 2, No. 3, No. 5, No. 8, No. 9 and No. 11.

The western processing site related to Site No. 6, owned by Elbert A. Land, is surrounded by dense riparian habitat. This application is still before the Humboldt County Planning Commission and no decision has been made with regard to it.

Historic impacts to the riparian vegetation along the east and north side of the river occurred when processing yards were constructed and river access points for equipment were constructed through the riparian zone. At Site No. 2 owned by the County, the river access roads were constructed just after acquisition of the site by the County in 1970.

One of the more recent access points constructed through a narrow fringe of riparian vegetation occurred at Site No. 4 by Canevari. In their annual negotiations of the 1603 streambed alteration agreement with the Department of Fish & Game they have been directed to stay clear of the island directly west of their site so that the 5 to 25 year old vegetation on the island would not be disturbed.

There is little or no riparian vegetation growing along the Sandy Prairie levee which runs from Site No. 5 to Site No. 8. The processing yard of Site No. 8 is entirely within the riparian zone. It was constructed between 1978 and 1980. The processing yard for Site No. 9 and stockpile area is inland of the riparian zone. They have one access point creating a corridor approximately 40 feet wide through the riparian zone to the river.

The haul road and access road to the river bar already exists for the Arcata Readimix site (Site No. 12). The haul road passes next to and through a riparian corridor along the south bank of the river.

For Site No. 13, there is a gravel access road off Highway 101 to the mouth of the Van Duzen River. It passes through some riparian vegetation. It is not known if any riparian vegetation would have to be removed. Details will be covered in a supplemental EIR under preparation by Rising Sun Enterprises.

Little or no riparian vegetation is involved with operations at Sites No. 10 and No. 11 on the Van Duzen River. At Site No. 10 Jack Noble proposes to remove 40,000 cubic yards from 80 acres of gravel bars with the removal areas being on the inside of the curve of meanders on his property. There may be some young riparian vegetation growing on these bars.

In 1989 a strip of riparian trees was removed from the upper flat river terrace at Site No. 2 by an operator under contract to Humboldt County at the Worswick site. The Department of Fish & Game considered this a violation and has attempted to have the impacts mitigated by the contractor.

There is no proposed expansion of any of the existing processing yards that are located near or in the riparian zone. Also, there are no proposed new access routes to the river bed by the existing operations. As mentioned earlier, the only operation that is proposing a processing site near an existing riparian zone is Mr. Land at Site No. 6. The impacts related to his proposal should be covered in a supplemental Environmental Impact Report (EIR) that could go into the specifics. The application indicates the western processing site may involve 40 acres. For comparison, the processing

yard at Site No. 5 covers 20 acres and has been in-place since the early 1950s. It appears the major impact from developing the western processing site would be the removal of three to five year old riparian vegetation. Based on observations of aerial photographs, it would appear the site was manually cleared right after or just before the 1986 flood. By 1988 it was being used for off-road recreational type vehicles and/or motorcycles.

Based on the analysis, it is determined that the impacts on riparian vegetation along the eastern side of the river from Fernbridge to the mouth of the Van Duzen over time has cumulatively been significant taking into account the loss of the riparian vegetation from construction of processing yards at Sites No. 2, No. 3, No. 5 and No. 8, plus the construction of the Sandy Prairie Levee from Site No. 5 to Site No. 8. Before the levee was constructed all of the riparian vegetation had been eroded from the bank of the river by the river during high flow. So a substantial amount of riparian vegetation was removed by natural causes. The east side of the river is the developed side. The width of the riparian corridor was described in the environmental setting along the east side of the river as being from about 40 to 100 feet in width from Site No. 1 to Site No. 4 where there was a bank that is riprapped to protect it from erosion.

Site No. 5 had places of about 100 foot wide riparian vegetation followed by nothing from there to Site No. 8 because of the levee. Oddly enough the amount of riparian vegetation remaining on the west bank of the river in 1991 is more than that which existed in 1940. By 1940 all of the land had been totally utilized for agricultural purposes, with the exception of the islands in the braided section of the river between Sites No. 3 and No. 7.

The one plant mentioned earlier as a species of special concern and considered rare by the California Native Plant Society, namely the dwarf flax (Hesperolinon adenophyllum), was mentioned as occurring near the mouth of the Van Duzen River near Site No. 9. According to information contained in A California Flora, by Phillip Munz, this is an annual plant normally found in Mendocino and Lake Counties on dry brushy hills, woods, chaparral, and northern oak woodlands at elevations 1,500 to 4,500 feet. It is not clear why it would be growing here nor where it would be found at this location on Sites No. 9 and No. 13. Due to periodic inundation it would seem that it would not grow on the gravel bar. As there is no proposed expansion of the processing yard by Eureka Sand & Gravel at Site No. 9, it is presumed that the potential impact on this rare plant is insignificant. The supplemental EIR for Site No. 13 may discover something further.

Department of Fish & Game staff have observed that dust, created along haul routes from the river bed to the processing yard, covers plant leaves in the riparian corridor, thereby reducing the rate of growth. This impact will probably occur along the haul route to be used by Arcata Readimix at Site No. 12, the haul route for Elbert land from the proposed western processing yard at Site No. 6, the haul route for Mercer-Fraser No. 2 at Site No. 13, and the haul route for Jack Noble if he uses the gravel road that runs west from the Site No. 10 area. These impacts though minor, will continue to occur at Sites No. 2, No. 3, No. 4, No. 5, No. 8 and No. 11. Water trucks may be used to mitigate dust problems along these gravel roads.

Water Quality

At high flow the Eel River is well known for its very turbid water. The bed of the Eel River through the project area is covered and sealed with these clays and silts intermixed with the sand and gravel. Skimming operations do not come into contact with the low flow channel and therefore have no impact on the quality of the water at low flow. The skimming operations also do not create any additional fine material to add to the higher flows when the gravel bar becomes inundated.

The trenching method brings silts or fine material from within the bed to the surface of the river bed and the bottom of the trench. When the dredged gravel is temporarily stockpiled next to the trench to allow the water to run out, some of the finer material would also be carried out and left deposited on the bed. This would tend to concentrate some additional fines into a thin layer on the bed next to the trench.

During dredging and removal of the gravel from the trench, some of the fines are agitated into suspension and run out of the bucket as the material is lifted up out of the water. These fines ultimately come to rest on the bottom of the trench thereby creating a thin layer on the bottom of the trench.

When the winter high flows occur these fines would be picked up along with all of the other fines coming down the river, and it is doubtful that these additional fines could be seen or measured. However, there could be the situation where the river came up just enough to cause the low flow channel to come into contact with the trench pool thereby potentially picking up some new fine material off the bottom of the trench should the water in the trench become destratified due to the new movement of water into the upper end of the trench and out the lower end. This phenomenon was observed in an aerial photo taken November 27, 1991 of sections of Mad River with trenches. The amount of fines moving out of the trench did

not appear significant, but is the type of phenomenon that should be carefully monitored.

The installation of approach fills for summer bridges have the potential to add some miner amounts of fine material to the water during construction. These impacts have occurred annually for many years and do not appear to cause any significant adverse effect on water quality or fishery habitat.

The processing yards generate a considerable amount of fine material from the crushing operation and cleaning operation. These fines are collected in settlement ponds which are surrounded by a berm above the 100 year floodplain. Historically, settlement ponds have been required by the Regional Water Quality Control Board. Following adoption of the Surface Mining & Reclamation Act (SMARA of 1975 and the County implementation ordinance, in 1982 settlement ponds have also been required as part of the Reclamation Plan.

Water Temperature

The effects of different extraction methods on water temperature vary. Skimming gravel off a gravel bar can create a wider flowing river when there is a small rise in the river. This spreading out of the water allows it to absorb more solar energy which raises the water temperature. In the Eel, the native species of fish generally require cool temperatures so increases in temperature may result in an adverse impact on native stocks.

Pit mining of gravel away from the low flow channel would not have any effect on the water temperature of the flowing channel.

Trench mining would tend to provide cooler water at the bottom. This water would not be available to fish until the end of the gravel extraction season when the barriers are removed. Trench mining would expose additional water surface to solar energy which might lead to slow warming of the water. The water in the trench is connected via groundwater flow to the low flow channel so temperature effects are probably minor.

Air Quality

Gravel removal by skimming creates dust particularly during the drier season. Heavy equipment transporting the gravel from the skimming site to the processing yard also generates minor amounts of dust. The trenching method would generate very little if any dust because the gravel is wet. After the gravel has drained there may be some dust raised when the gravel is removed by a front-end loader and placed in trucks. Once the material is taken to the processing yard, the gravel

crushing, segregating and sorting operation is all under permit by the North Coast Unified Air Quality Management District. Sprayers are required in some crushing operations to control dust. The resulting fine materials are washed to the settlement pond.

The batch plants for making asphalt are also under permit by the North Coast Unified Air Quality Management District.

Operation of heavy equipment would produce minor amounts of exhaust from diesel and gasoline engines.

In the summer time after the gravel bars dry out, strong winds from the northwest cause large clouds of dust and fine silts to blow upstream along the Eel River. This natural phenomenon will be aggravated by skimming operations through the removal of the top layer, often called the pavement layer, of larger rocks and gravel after the fines have been removed.

Air quality data from measurements in Eureka 15 miles north shows attainment achieved for all pollutants except for the state PM-10 standard for particulates. Gravel removal on the Eel will not impact the level of particulate matter in Eureka, but it will impact the project area during the summer.

Noise

Noise is defined as unwanted sound by the receiver. Gravel extraction involves the use of noise generating heavy equipment operating out on the river bar and crushing and processing equipment and batch plants in the yard up out of the river.

Site No. 12:

Noise impacts from the new operation proposed by Arcata Readimix are covered in their supplemental EIR. The noise generated by this operation would be caused by front end loaders or bulldozers used for skimming gravel and the trucks used for hauling to their processing yard near Mad River. The trucks will increase noise levels along Highway 101 through Eureka which has many receptors. When added to the current levels during the summer tourist season, the threshold of significance from cumulative effects may be approached. On warm days offices and businesses often have their windows open. This allows much more street noise to enter the interior thereby interrupting communication and concentration. Noise impacts from the Arcata Readimix crusher will remain at their yard on Mad River and at levels that have existed for several years.

Sites 3, 4, 5, 8, 9, & 11:

The existing noise environment generated by current operations at Sites No. 3, No. 4, No. 5, No. 8, No. 9 and No. 11 are in the realm of 75 to 85 dBA when all equipment is running.

Site No. 2:
Site No. 2 has historically had a processing plant running when large amounts of gravel were being processed. The nearest occupied structure 800 feet away would receive a level of 66 dBA at the exterior of the structure. Normal conversation takes place at levels of 60 to 63 dBA. Attenuation of noise through a standard wall of a house with the windows shut is about 20 dBA. Therefore, a person inside the house could receive a 46 dBA noise level which is noticeable, but quite low. The next nearest occupied house receives an exterior level of 60 dBA. Two other houses between 1,400 and 1,700 feet distance would also conceivably receive 60 dBA. These levels, while potentially annoying to somebody working outside the house, would be almost imperceptible inside the house.
Highway 101 is between processing Site No. 2 and some of the houses.
Noise levels generated by passenger cars on the freeway would be about 65 dBA at the edge of right-of-way, and would only be perceptible to the nearest occupied structure which is relatively close to the freeway. Truck traffic on Highway 101 has the capacity to generate much higher noise levels than passenger cars and could be as high as the gravel processing plant.

Fishermen and recreationists utilizing the river bar west of Site No. 2 would be subjected to sound levels of about 60 dBA along the west side of the river bed. If the low flow channel were along the east bank of the river and a person wished to fish that particular section while the processing plant was running, they would receive levels as high as 72 dBA. This would be too high to permit high quality passive recreation and would therefore be perceived as an annoyance and impact by people recreating in that area.

Site No. 3:
As Site No. 3 it was noted that some 64 homes were located across Highway 101 at a distance ranging from 500 to 3,000 feet away from the processing area. Noise levels are predicted between 54 and 70 dBA. These levels are tolerable inside the home, but noise levels outside the home would be an annoyance. Conversation would definitely be interrupted by any levels higher than 60 dBA. Outdoor activities would occur mostly on sunny days during the May through October time of year. Depending on the location of the low flow channel noise impacts on recreationists on the river from the processing plant at Site No. 3 would be the same as those for Site No. 2.

Site No. 4:
The processing and batch plants at Site No. 4 would generate a noise level of 70 dBA at the exterior wall of the nearest house . Again, Highway 101 is located between this operation and the occupied structures and downtown Fortuna. Depending on atmospheric conditions, it is possible that people within the town of Fortuna, which is located within a 3,000 foot radius, may hear noise generated by the plant in the realm of 54 dBA, depending on distance from the plant. Seventy to 54 dBA are noise levels tolerable to some people within densely urbanized and commercial areas between 8:00 a.m. and 6:00 p.m. The processing plant at Site No. 4 is 700 to 800 feet east of the river bank. Fishermen utilizing the low flow channel in this area would hear sound levels in the 66 dBA range which again is too high for high quality passive recreation. Fishermen still use the area as was noted on December 12, 1991.

Site No. 5:
The nearest house to the processing plant at Site No. 5 is 1,000 feet east across the freeway and two ramps. It is estimated that this house could receive a level of 64 dBA. Seventy other houses are within 2,400 feet also across the freeway and could receive levels of around 57 dBA. These levels are insignificant inside the houses but potentially annoying outside the houses. This processing plant is within 300 feet of the river bank. At times when the low flow channel is against the east bank, fishermen could receive noise levels as high as 70 dBA. Again these would be too high for someone seeking high quality passive recreation.

Sites No. 4 and No. 5 are 1,500 feet apart. When both processing plants and batch plants are running, they would generate fairly high noise levels of 70 dBA 500 feet away. These levels definitely impact the natural condition of the Eel River and decrease the quality of the environment for all users of the river and river bar in this area.
Heavy equipment operating in this area during gravel extraction would also generate noise levels of 80 dBA at 50 feet. Trenching operations would involve a drag line or similar device operating at the same location slowly moving along the bar. Skimming operations have much more movement as they cover a larger area. Bottom dump scrapers pick up a load and run up to the stockpile area, drop their load and return to the gravel bar. All of these types of activity would detract from the natural condition of the river and tend to discourage people from using the river in this area during the summer months.

Site No. 6:
The proposed gravel processing site for Site No. 6 on the east bank of the river would generate potentially high levels of 78

dBA down to about 68 dBA at the exterior wall of future structures built east of Sandy Prairie Road. This area was planned for highway commercial type businesses. The noise levels during the day may be tolerable at the exterior of some of the structures. They would not be tolerable at the exterior wall of a motel unless the motel wall was specially built with sound deadening devices. Also, the new overnight recreational vehicle park 1,600 feet from the site would receive 60 dBA levels from this processing plant. This would decrease the quality of the environment for people in the park during the day. However, it should be noted that the park is also located fairly close to the Highway 101 freeway subjecting it to levels in the same range of 60 to 70 dBA from trucks and 50 to 60 dBA from passenger cars. People utilizing the river immediately west of the processing plant proposed for Site No. 6, would be subjected to fairly high noise levels. The river bed is roughly 1,500 feet wide in this region. When the low flow channel is on the west side of the river a user would be approximately 1,000 feet away from the processing plant and receive noise levels of about 64 dBA.

If the west-side processing center is constructed at a location about 4,000 feet west of the east processing site, the large riparian area surrounding the west side of the site would be subjected to noise levels ranging from a high of 90 dBA, 50 feet from the crusher, down to 50 to 54 dBA at the outer edges. These levels would severely impact birds that are not tolerant of human activity in that it would remove one of the largest riparian areas remaining in the Eel River Delta from use. This riparian area is 13,000 feet long and roughly 2,000 feet wide.

Site No. 7:
Short-term levels of noise at Site No. 7 would occur during removal of gravel with a front-end loader or scraper. The three houses on the access road could receive single event noise levels from trucks hauling gravel from the site of about 86 dBA at 50 feet. This operation involves about 500 truck loads per year and occurs over a fairly short period of time during the summer season. These impacts are considered insignificant due to the short-term aspect.
About 3,000 cubic yards per year of gravel are removed from the river bar on the west side of this site near the end of East Ferry Road. There are no occupied structures within 11,500 feet of that removal area. Front-end loaders and trucks are used by local ranchers and the County Road crew to remove gravel from that side of the river.

Fishermen and recreationists utilizing this portion of the river would be impacted only during the gravel extraction period which may occur for two to three weeks during August or September. The impact from these gravel extraction activities

are fairly localized and of short duration. This site is 7,000 feet upstream of Site No. 6 and 3,500 feet downstream of Site No. 8.

Site No. 8:
The nine houses within 2,000 feet of Site No. 8 receive noise levels of 58 dBA at the exterior wall of the house. These same houses receive similar levels of noise from Highway 101 freeway. The main effect would be impacts on people working outside and on the west side of the houses.

Recreationists and fishermen utilizing the low flow channel when it is along the west side of the river 1,500 feet away would receive levels of 60 dBA. These levels are too high to allow for a high quality passive recreational experience on a wild and scenic river. However, this section is classified Recreational, meaning that it is subjected to noise impacts from developments along the river.

Site No. 9:
Noise levels of 70 dBA and 64 dBA are generated at the exterior wall of the two closest structures to the processing plant at Site No. 9. The riparian area is 700 feet west and would receive levels of about 67 dBA at the closest edge. The riparian area would be buffered against noise levels when stockpiles exist just west of the crusher.

Fishermen utilizing the mouth of the Van Duzen River 3,800 feet south might hear sound levels of about 50 to 52 dBA. Often there are groups of 12 to 20 pickup trucks and vehicles at the mouth of the Van Duzen with several conversations going on at levels of 60 to 62 dBA. See Photo No. 18. It is probable that the crusher noise of 52 dBA would be tolerated and barely noticeable above the other nearby noises from fishermen and their trucks. Noise levels at the low flow channel 2,000 feet west of the Site No. 9 processing plant would be roughly 58 dBA. This would not be noticeable to a lone fisherman if he were standing in a riffle which creates some background natural noise. Noise levels on the bar opposite Sites No. 8 and No. 9 during gravel extraction periods would be 70 to 80 dBA 50 feet away from scrapers, front-end loaders, and dump trucks. These levels would detract from the natural condition of the river.

Site No. 13:
Noise levels and their potential impacts from the new operation proposed on the Van Duzen River next to Highway 101 will be covered in the supplemental EIR. The fisherman mentioned above would be impacted if they were to use this area during the summer months.

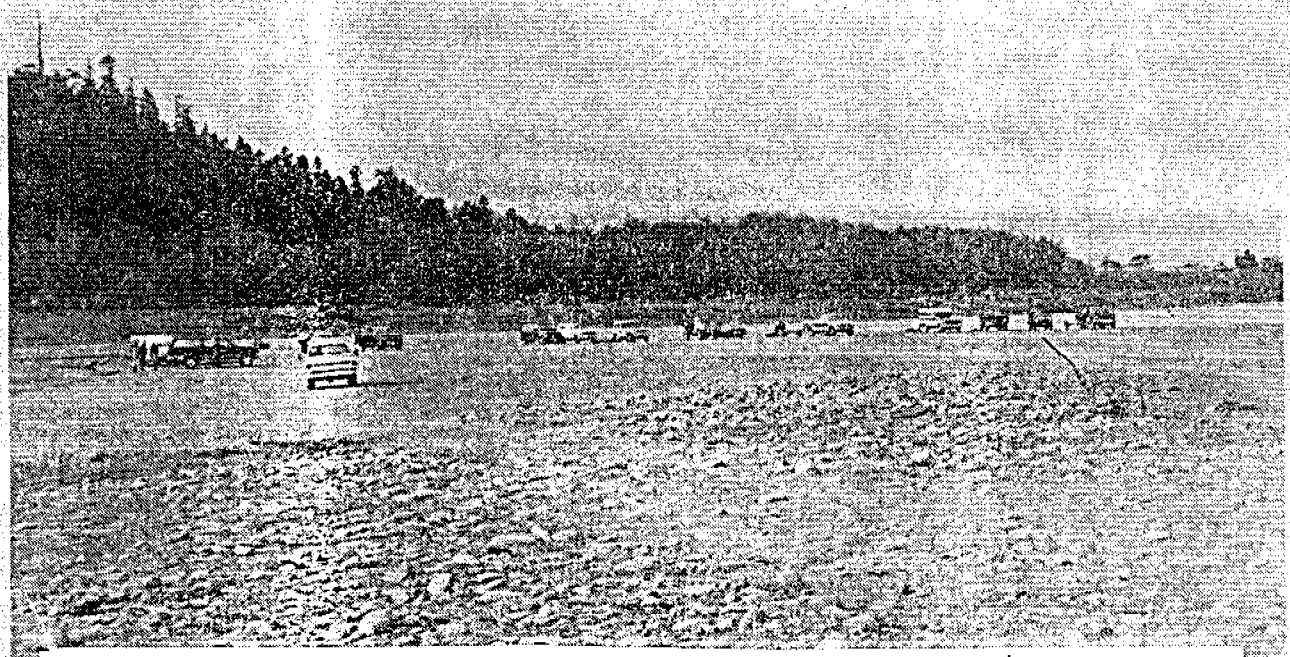

Photo #18 - View west of fishermen along the Eel River at the mouth of the Van Duzen River.

Site No. 10:
At Site No. 10 on the Van Duzen River the nearest occupied house is 1,450 feet away and would receive a level of about 60 dBA during gravel removal. There is no processing plant involved with this particular site. The next nearest house is 3,500 feet away and receives 52 dBA during gravel extraction. The 60 dBA level may be considered an annoyance and impact people working outdoors at the nearest occupied house. As this site is at the end of Fischer Road, which is utilized by fishermen for access to the river, there would be impacts to them as they pass through this area of the river.

Site No. 11:
The nearest house to the processing plant at Site No. 11 is 1,600 feet. It would receive levels of up to 60 dBA when the crusher is running. The next nearest house is 1,700 feet away and would receive about the same level. Eleven additional houses are within 2,800 feet and would receive 56 dBA level. As they are adjacent to Highway 36, they receive similar levels from vehicles utilizing the road. The nearest house, is receiving noise levels of 60 dBA level. As they are adjacent to Highway 36, they receive similar levels from vehicles utilizing the road. The nearest house, receiving noise levels of 60 dBA, is owned by Tom Bess who runs and operates the processing plant. These levels would be experienced outside his home. The impact is difficult to access. Normally owners subjected to noise from their own doing are more tolerable of the noise.

The Van Duzen River is also in the State and Federal Wild and Scenic System. This means that the State resource agencies with jurisdiction over gravel operations on this river would be subjecting proposed projects to standards appropriate for these types of rivers. The same should be said for the Eel River, which is also in the Wild and Scenic System. Reviewing agencies will be looking at proposed gravel operations with a higher standard than that for a non-designated river.

Recreation
The impacts on recreation caused by gravel extraction and processing include adverse effects on natural sound levels, esthetics of the river bed, the riparian zone, air quality from scraping operations, and accessibility to all parts of the river bar. The noise levels generated from the operation were discussed under Noise Impacts. The project area having been classified Recreational under the Wild and Scenic River System is expected to have an environment that has been altered by developments along the river banks. These types of developments are expected to generate noise levels similar to those produced by the railroad and Highway 101. Gravel processing plants tend to generate higher levels of noise than highways and railroads because of the continuous duration.

These levels obviously would have an adverse effect on the recreational quality of the project area.

During gravel extraction certain portions of the river bar are physically changed so that when viewed by a recreationists they are not natural. The unnatural man-made forms which result from gravel extraction exist only from about May through September. However, they do have an adverse effect on the river viewshed. It is noted in the State Wild and Scenic Rivers Act passed December 20, 1972, that it is the policy of the State that certain rivers which possess extraordinary scenic, recreational, fishery or wildlife values shall be preserved in their free-flowing state together with their immediate environments for the benefit and enjoyment of the people of the State. Whether the project area possesses extraordinary scenic values is in the eye of the beholder. As mentioned earlier, several developments have occurred along the east bank of the river since 1940, that detract from the original natural riparian scene.

Some of the gravel operations have provided access to the river bed for sports fishermen and recreationists. They have done this voluntarily and the owners and operators may have the option to gate off these access roads.

Near Site No. 1 the river is accessible off the north end of Sag Road. At Site No. 2 sports fishermen have used the access road from the processing yard for many years. Sites No. 3, No. 4 and No. 5 are all privately run and do not lend themselves to providing access as it would be too dangerous to allow the general public to pass directly through the gravel processing area.

The south end of Sandy Prairie Road provides vehicular access to the top of the Sandy Prairie Levee. A recreationist may walk the levee in both directions on foot and could conceivably climb down the levee to reach the river bed if they so desired.

Site No. 7 is accessible off the west end of Drake Hill Road. There is a narrow road running down the face of the levee that is utilized by sports fishermen to gain access to this portion of the river. On the west side of the river across from this point is East Ferry Road. Access off the east end of East Ferry Road is available to the river bed.

At Site No. 8 Hansen Lane runs west from the coffee shop off Highway 36 to the river. This private road provides physical access to the river bed for sports fishermen. At Site No. 9 Fowler Lane, straight opposite the end of Highway 36, runs west to the river bed past Eureka Sand & Gravel's processing area and stockpiles. This is a private road. Following

completion of gravel extraction and removal of summer bridges, they construct a large berm to ensure that the public does not accidently drive straight into the river channel.

Another access occurs off Highway 36 at the north end of the 101 southbound bridge over the Van Duzen River. A small dirt road runs west from this point through Site No. 13 straight out to the mouth of the Van Duzen River and is utilized by several sport fishermen and recreationists (see Photo No. 18 for a view of fishermen at the mouth of the Van Duzen). This access road would be significantly affected by gravel extraction operations during the summer season at Site No. 13.

At Sites No. 8 and No. 9 it may be somewhat dangerous for the general public to attempt to utilize the private roads of Hansen Lane and Fowler Lane to obtain access to the river bed at the height of gravel extraction operations.

Site No. 10 is accessible off the south end of the Fisher Road and arrives at the mouth of Yager Creek where it meets the Van Duzen River. Site No. 11 is accessible off the south end of Odd Fellows Road. These two roads provide access to a limited area of the river bed of the Van Duzen River.

Impacts on access have been experienced by a few sports fishermen when attempting to walk around a trench. Some of the trenches have been as long as 1,600 feet and are too deep to wade across and have been found a little dangerous to those trying to climb back out because of the steep side slope. Recently a rider took a horse into a trench. The horse froze up in panic and drowned. A method employed by Arcata Readimix on the Mad River may significantly reduce the risk of this type of accident. Fishermen have complained of this access impact when trying to reach the low flow channel of the river and find they have to go around a trench. This type of impact may be mitigated on a site specific basis by shortening the length of the trench when the shorter length does not interfere with the hydraulic function of the trench.

The portions of the Eel River and Van Duzen River involved in this project do not lend themselves to recreational rafting. Should this type of activity take place through the project area during gravel extraction there would be some potential adverse effects from all of the summer bridges that are necessary to provide access to the gravel bars to be used by the heavy equipment. the Department of Boating & Waterways requires clear signing to forewarn rafters of any obstructions. Most of the summer bridges have already been removed from the river bed by the time sports fishermen are utilizing drift boats. Drift boats were observed on the river between Sites No. 6 and No. 9 on December 12, 1991.