

APPENDIX A

**FINDING OF NO SIGNIFICANT IMPACT AND
FINAL SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
APRIL 1998**

BLUE DIAMOND DETENTION BASIN

BLUE DIAMOND WASH

CLARK COUNTY, NEVADA

Los Angeles District

U.S. Army Corps of Engineers

December 2002



DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT, CORPS OF ENGINEERS

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FINDING OF NO SIGNIFICANT IMPACT

BLUE DIAMOND DETENTION BASIN

**Las Vegas Wash and Tributaries
(Tropicana and Flamingo Washes)
Clark County, Nevada**

I have reviewed the attached Supplemental Environmental Assessment (SEA) that has been prepared for the Blue Diamond Detention Basin portion of the Las Vegas Wash and Tributaries (Tropicana and Flamingo Washes), Clark County, Nevada project. Significant environmental resources potentially affected by the proposed action include topography, geology, and soils, mineral resources, land use, air quality, water resources, vegetation and wildlife, fisheries, cultural resources, recreation, esthetics, and socioeconomics. In accordance with 40 CFR § 1508.13, information in the SEA, particularly regarding the project description and background, compliance with applicable regulations, and project benefits, impacts, and mitigation measures is incorporated herein by reference. The long-term beneficial impact of the overall project would be the reduction of flood damages. I have determined that the proposed action will not have a significant impact upon the existing environment or the quality of the human environment. Therefore, preparation of a Supplemental Environmental Impact Statement is not required.

2 APRIL 1998
Date


Robert L. Davis
Colonel, Corps of Engineers
District Engineer

**U. S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT**

FINAL

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

BLUE DIAMOND DETENTION BASIN

**Las Vegas Wash and Tributaries
(Tropicana and Flamingo Washes)
Clark County, Nevada**

March 1998

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

BLUE DIAMOND DETENTION BASIN

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SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

BLUE DIAMOND DETENTION BASIN

CHAPTER 1 - LOCATION

1.01 General. - The project study area is located in Clark County in southern Nevada, and is located in the southwestern and central portions of the Las Vegas community. The Blue Diamond Detention Basin will be located on a natural wash approximately 10.5 miles southwest of downtown Las Vegas. See plate 1 for map of the overall study area. Plate 2 shows the Blue Diamond Detention Basin in detail.

CHAPTER 2 - PROJECT BACKGROUND

2.01 General. - This Supplemental Environmental Assessment (SEA) amends the U.S. Army Corps of Engineers Feasibility Report and Final Environmental Impact Statement (FR/FEIS) for Las Vegas Wash and Tributaries, Tropicana and Flamingo Washes, Nevada, dated October 1991. In addition, Supplemental Environmental Assessments (EA's) and Findings of No Significant Impact (FONSI's) have been prepared, as noted in the following tabulation.

SUMMARY OF ENVIRONMENTAL ASSESSMENTS/FINDINGS OF NO SIGNIFICANT IMPACT PREVIOUSLY PREPARED OR UNDER PREPARATION

Project Feature	Title of EA/FONSI	Date
Red Rock Detention Basin	Alternative Disposal Sites	January 1994
Red Rock Detention Basin	Red Rock Dam Modifications and Summerlin Stockpile Disposal Site	February 1995
Red Rock Detention Basin	Desert Sportsman's Disposal Site	October 1995
Las Vegas Wash (Tropicana and Flamingo Washes) Project	Recreation Report	June 1996
Tropicana Detention Basin	Tropicana Detention Basin and Outlet Channel	June 1996

Project Feature	Title of EA/FONSI	Date
Tropicana Detention Basin	Optional Disposal Site	July 1996
Flamingo Diversion Channel and Lower Blue Diamond Channel	Flamingo Diversion Channel and Lower Blue Diamond Channel	September 1996
Blue Diamond Beltway Channel	Blue Diamond Beltway Channel (Sections 7A and 7B) and Upper Blue Diamond Channel	September 1997
Red Rock Beltway Channel	Upper Red Rock Channel Red Rock Beltway Channel and Lower Red Rock Complex	October 1997
Blue Diamond Detention Basin	Blue Diamond Detention Basin	March 1998

The only significant changes that have been made to this portion of the overall project as originally proposed in the Feasibility Report and EA/FONSI's is the dam location. The dam has been changed from an off-line basin with a diversion structure to an on-line structure located about 6,500 feet (1.23 miles) upstream of the original (Feasibility Report) location. The recommended Blue Diamond Detention Basin is similar in concept and function and is not substantially different in location than the Feasibility design. Information documented in the FEIS and previously prepared EA/FONSI's remains current except as noted.

CHAPTER 3 - NEED FOR PROPOSED MODIFICATION

3.01 General. - The Las Vegas Valley is currently one of the most rapidly expanding urban areas in the country. The project area, west of the city, is undergoing accelerated development and is expected to be fully developed within the foreseeable future, even without a flood damage reduction project. Most of the existing urbanized areas, as well as developing areas, lie within a basin that is highly prone to flooding. Flash floods caused by severe summer thunderstorms cause severe damage to commercial developments, which include casinos, residential areas, and public facilities, such as roads and utilities. Studies conducted by the U. S.

Army Corps of Engineers (Corps) have indicated that only a comprehensive combined drainage and detention system would provide appropriate protection to the alluvial fan (project area) as well as commercial and residential developments further downstream. Since preparation of the FR/FEIS and EA/FONSI's, the location of the dam has been refined. The dam has been changed from an off-line basin with a diversion structure to an on-line structure located about 6,500 feet (1.23 miles) upstream of the original (Feasibility Report) location. The recommended Blue Diamond Detention Basin is similar in concept and function and is not substantially different in location than the feasibility design.

CHAPTER 4 - PROJECT DESCRIPTION

4.01 Overall Project Description. - The project description remains the same as that for the plan tentatively selected for implementation that is described and evaluated in the FR/FEIS for Las Vegas Wash and Tributaries, Tropicana and Flamingo Washes, Nevada, dated October 1991. The plan comprises a comprehensive system of detention basins, debris basins, lateral collector channels and primary channels. The system is designed to intercept and divert floodflows in the project area into detention basins, from which flows would be released at nondamaging rates downstream. The Corps' proposed plan is the National Economic Development (NED) plan and would provide 100-year flood protection to the area.

4.02 Authorized Blue Diamond Detention Basin. - Blue Diamond Dam is an off-channel structure just north of the Blue Diamond Wash channel and Blue Diamond Road, or about 7.5 miles west of the I-15 Freeway on Blue Diamond Road. The main embankment would be comprised of roller compacted concrete (RCC) with a maximum height of about 49 feet at its highest point. The basin would have a capacity of 2,300 acre-feet at the 100-year water surface; and 4,050 acre-feet at the crest of the dam, of which 200 acre-feet would be for the accumulation of sediment. The crest of the dam (elevation 2869 feet above mean sea level) is about 6,524 feet long, and is designed to reduce a 100-year flood with a peak inflow of 12,300 cubic feet per second (cfs) to an outflow of 180 cfs. The outlet would consist of an unguated 30-inch diameter reinforced concrete conduit, located under the main embankment near the center of the dam.

A diversion dike with a maximum height of about 15 feet, would be constructed across Blue Diamond Wash to divert flows to the excavated inlet channel for the reservoir. The diversion dike would have a low flow outlet to the natural channel below the structure to maintain the existing habitat downstream.

The excavated inlet would consist of a 900 foot-long reinforced concrete trapezoidal channel having a depth of 13 feet, an invert width of 100 feet, and side

slopes of 1 vertical on 2.5 horizontal; and a 2,675 foot-long unlined trapezoidal channel with a bottom width of 200 feet and side slopes of 1 vertical on 4 horizontal. The maximum depth of the unlined channel would be 13 feet, and would gradually decrease as it daylight into the reservoir. The design capacity of the inlet would be designed to convey the peak discharge of the 100-year flood of 12,300 cfs. Flows in excess of the design capacity of the inlet would flow over the diversion dike into the existing Blue Diamond Wash. To provide access across the inlet works, and also to restrict peak inflow into the reservoir to the 100-year flow of 12,300 cfs, a bridge, which will also act as a skimmer, would be constructed across the channel. Flows in excess of the 100-year flow would cascade over the channel bank into the existing wash.

4.03 Blue Diamond Detention Basin (Recommended). - The dam embankment will be roughly horseshoe shaped and will consist of an earth embankment 4,872 feet long with a height ranging from 55 feet above the adjacent downstream ground surface to ground level at both ends. The crest elevation will be 2,975.72 feet. It will be constructed with materials obtained from the required basin excavation upstream of the dam. The dam will have a 20 foot wide crest with 2 percent cross slopes downward from the centerline. The crest will function as a maintenance road accessible from the south via Blue Diamond Road and an unimproved road from the north. The upstream slope (1V on 2.5H) will be protected by 1.5 foot riprap. Riprap will also cover and protect the downstream slope.

The spillway will be constructed through the dam embankment. The alignment of the spillway centerline is perpendicular to the axis of the dam embankment. The spillway crest shape will be elliptical with a vertical upstream face (ogee). The downstream face will be stepped, with a slope of 1V to 2H.

The intake structure will have an open rectangular section, 25 feet in length measured along the centerline, and the inside width will vary from 25 feet to 14 feet. The walls will vary in height from 0 to 10.25 feet. A steel bulkhead with a 2.5 foot by 2.5 foot high opening will be included. A trashrack, consisting of structural steel members and pipe, will be constructed to prevent large size debris from entering the intake structure and clogging the conduit. Access will be provided. A 6.5 foot deep cutoff wall will be provided at the upstream end of the invert.

The outlet works conduit will be comprised of a reinforced concrete square box with an inside width and height of 4.5 feet and a length of 240 feet. Waterstops will be installed at the joints.

The outlet structure will be located at the downstream end of the outlet works conduit. It will be comprised of reinforced concrete and have a rectangular section 16.5 feet in length measured along the centerline. The inside width will be 10 feet.

The head wall will be 12 feet wide and 11 feet high. The walls will vary in height from 11 feet to 5 feet.

An environmental by-pass channel, as committed to in the EIS, is incorporated into the design of the Outlet Works. It will release at least the first 50 cubic feet per second (cfs) from the detention basin to the natural wash downstream following a large storm event.

4.04 Changes to the Feasibility Report Plan. - The Blue Diamond Detention Basin will be constructed essentially as presented in the FR/EIS with the exception that the dam has been relocated. The dam has been changed from an off-line basin with a diversion structure to an on-line structure located about 6,500 feet (1.23 miles) upstream of the original (Feasibility Report) location. The recommended Blue Diamond Detention Basin is similar in concept and function and is not substantially different in location than the Feasibility design. Information documented in the FEIS and previously prepared EA/FONSI's remains current except as noted.

CHAPTER 5 - ALTERNATIVES CONSIDERED

5.01 Alternatives Considered. - Numerous alternatives were considered and eliminated prior to completion of the Feasibility Report and FEIS and numerous alignments of the channels were considered subsequent to completion of the FR/FEIS. Most of the alternatives were not economically justified. No further alternatives are being studied as part of this action.

CHAPTER 6 - AFFECTED ENVIRONMENT

6.01 General. - This section contains discussions of environmental resources within areas that would be affected by the construction of the Blue Diamond Detention Basin. This SEA amends the 1991 FR/FEIS, which for the existing environment is still current. As noted in Chapter 4, above, the only changes from the project as originally proposed in the FR/FEIS is the change in the areal location of the dam and basin. A description of the existing environment at the site is provided in the following paragraphs.

6.02 Topography, Geology, and Soils. - The project area for the Blue Diamond Detention Basin lies within and adjacent to the Las Vegas Valley of southern Nevada. Elevations range from approximately 1,800 to 2,400 feet in the valley to 11,912 feet at Charleston Peak. The Las Vegas Valley extends in a northwest-southeast direction with the Spring Mountains to the west; the Pintwater,

Desert, Sheep, and Las Vegas Mountains to the north; and Frenchman Mountain to the east. The valley drains toward the south, and then easterly, through Las Vegas Wash to Lake Mead. The upper boundaries of the alluvial apron occur at approximately 4,500 feet and are marked by a noticeable change in slope. The lower boundaries of the aprons are less well defined, but occur at an average elevation of 2,400 feet. Paleozoic and Mesozoic sedimentary rocks make up the mountain ranges. Soils in the project area are formed on alluvial fans and alluvial fan remnants. Alluvial fans are covered with soils of very deep gravelly to fine sandy loamy materials. Alluvial fan remnants exhibit shallow to very shallow loamy soils. Locally the alluvial materials may be firmly cemented with calcium carbonate (caliche) at the surface and along the active washes. The topography of the area around the Blue Diamond Detention Basin is essentially flat desert floor. Additional information may be found in the EIS, Chapter 3.

6.03 Mineral Resources. - In general, mineral resources are broadly classified as either metallic or as nonmetallic minerals. Economic deposits of metallic minerals within Clark County consist of zinc, lead, gold, silver, copper, and manganese. Nonmetallic minerals, especially gypsum, limestone, sand, and gravel, which are used primarily for building materials, dominate economic demand for mineral supplies in Clark County. There are no active mining claims in the immediate vicinity of the current location of the Blue Diamond Detention Basin. (There are several valid, but inactive, mining claims within the lands to be acquired for the basin; however, these will be cleared up prior to project construction.) Additional information may be found in the EIS, Chapter 3.

6.04 Land Use. - The predominant land use within the project area is open vacant land, with some rural desert homesteads, newly built private homes, apartment complexes, and rapidly expanding industrial and commercial developments. Immediately to the east of the project area extends the Interstate 15 major commercial/industrial corridor and hotel/casino strip. Land within the project area is currently undergoing rapid development and is ultimately expected to be fully developed, with predominately residential developments. The land use immediately adjacent to the Blue Diamond Detention Basin is undeveloped desert land. Additional information may be found in the EIS, Chapter 3.

6.05 Air Quality. - In Clark County, stable atmospheric conditions, low mixing heights, and light winds common during nighttime and morning hours provide opportunities for contaminants to accumulate as emissions are produced. Atmospheric dispersion of pollutants generally improves by mid-afternoon. The Environmental Protection Agency considers carbon monoxide accumulation to be the most important air pollution problem in the Las Vegas area, primarily because of the number of days on which the standard is exceeded. In Las Vegas Valley, carbon monoxide (CO) is produced most often by incomplete combustion of fuel in

automobiles. Due to meteorological conditions, which are typified by low-level temperature inversions and calm or light winds, the highest CO concentrations are measured during the winter months. Another issue of concern in the Las Vegas Valley is PM10 air pollution. Particulates, particularly combustion particles and fugitive dust, having a diameter of 10 microns or less, are commonly referred to as PM10. These particulates, because they are small enough to be inhaled, constitute a public health hazard when ambient concentrations exceed certain levels. On January 8, 1993, the U. S. Environmental Protection Agency reclassified the Las Vegas Valley Nonattainment Area from "moderate" to "serious" for PM10. Construction activities could be a major source of PM10 emissions (e.g., fugitive dust) within the Las Vegas Valley and Clark County as a whole. Additional information may be found in the EIS, Chapter 3.

6.06 Water Resources. - The project area is generally arid in nature. Natural drainage paths are generally ephemeral in nature, conveying surface flows only in response to storm events. Precipitation over the area is infrequent and totals to a yearly average of only 4.4 inches. Much of this rainfall, however, occurs as short duration, high intensity late summer storms. High intensity rainfall events produce rapid runoff and "flash" flooding of downslope areas, especially if the storm cell is moving in the downslope direction. The mountain region tributary to the project area generates large volumes and rates of runoff due to its steep slopes, lack of vegetation, and low permeability. Sediment movement can be extensive during major flows, and can even be quite significant during one or more minor flows. Lateral channel migration can occur and sediment deposition can occur, reducing channel conveyance capacity and widening the floodplain.

The water quality for storm water runoff is, with the exception of turbidity, most likely a function of human activity in the tributary areas. As the watershed is developed, the occurrence and concentrations of contaminants associated with rural and urban areas can be expected to increase in storm water runoff. Additional information may be found in the EIS, Chapter 3.

6.07 Vegetation and Wildlife. - Except as otherwise noted, information on biological resources is based on the Final Fish and Wildlife Coordination Act Report (Final CAR), dated October 1991, from the U. S. Fish and Wildlife Service (FWS); and previous Corps environmental evaluations prepared for the project, one in 1985, and a supplement prepared in 1988. The Final CAR may be found in Appendix B of the EIS. Complete plant and animal species lists are provided in Appendixes A through D of the Final CAR. The primary plant communities affected by construction of the Blue Diamond Detention Basin are the creosote bush scrub community and the Mojave desert wash scrub community. These habitat communities are discussed in the following subparagraphs. Additional information may be found in the EIS, Chapter 3.

a. Vegetation. - Creosote bush scrub is the most common vegetation type in the Las Vegas Valley and in the Mojave Desert below 3,000 feet. In the project area it is found west of the city of Las Vegas to the base of the slopes of the Spring Mountains. Highly disturbed remnants remain on some undeveloped lots within the city limits. This scrub type is characterized by widely spaced shrubs with an average vegetative cover of 19.7 percent on transects conducted within the project area (see Final CAR). Dominant species are creosote bush (Larrea tridentata) and burro-bush (Ambrosia dumosa). Other shrubs characteristic of this habitat type include Shokley goldenhead (Acamptopappus shockleyi), four-wing saltbush (Atriplex canescens), Fremont dalea (Dalea fremontia), brittle-bush (Encelia farinosa), Mormon tea (Ephedra nevadensis), wild buckwheat (Eriogonum fasciculatum), rattany (Krameria parvifolia), wolf-berries (Lycium spp.), spiny menodora (Menodora spinescens), cottontop cactus (Echinocactus polycephalus), barrel cactus (Ferocactus acanthodes), beavertail cactus (Opuntia basilaris), teddy bear cholla (Opuntia bigelovii), and at higher elevations, Mohave yucca (Yucca schidigera). Common herbaceous species include desert mallow (Sphaeralcea ambigua), yellow paper daisy (Psilostrophe cooperi), matchweed (Gutierrezia sp.), desert marigold (Baileya multiradiata), (Stephanomeria exigua), rigid spiny herb (Chorizanthe rigida), and desert trumpet (Eriogonum inflatum). Much of the substrate in the creosote bush scrub community west of Las Vegas is characterized by highly calcareous soils with well-developed pavements. Many sites have developed petrocalcic layers (caliche). Common plant associates in these areas may include shadscale (Atriplex confertifolia), ratany, Mormon tea, and wolf-berries. Pencil cactus (Opuntia ramosissima) is known in the Mojave Desert only from this type of vegetation, and it occurs frequently in the project area.

Mojave desert wash scrub or desert riparian habitat (riverine intermittent streambed under the National Wetland Inventory Classification System) is low, scrubby habitat that, in relatively undisturbed areas, is characterized by catclaw acacia (Acacia greggii), quail bush (Atriplex lentiformis), Emory baccharis (Baccharis emoryi), desert willow (Chilopsis linearis), Mojave croton (Croton californicus var. mohavensis), Nevada ephedra (Ephedra nevadensis), mesquite (Prosopis juliflora), marigold (Baileya spp.), and cheese bush (Hymenoclea salsola). This habitat type is found throughout the project area in larger washes and sandy arroyos, but in developed areas it generally consists of remnants and is highly disturbed. Additional information may be found in the EIS, Chapter 3.

b. Wildlife. - Vertebrate fauna found in creosote bush scrub include species adapted to low desert environments and conservation of water. Because of the scarcity of surface water, only one amphibian species is able to utilize the ephemeral scattered pools of water that develop after rainstorms. The Great Plains toad (Bufo cognatus) may inhabit creosote bush scrub, although it was not observed during field visits. The most common species of reptiles in this habitat include the

zebra-tailed lizard (Callisaurus draconoides), side-bloched lizard (Uta stansburiana), desert horned lizard (Phrynosoma platyrhinos), and western whiptail (Cnemidophorus tigris), and such snakes as the coachwhip (Masticophis flagellum), glossy snake (Arizona elegans), gopher snake (Pituophis catenifer), and the Mojave rattlesnake (Crotalus scutulatus). The desert tortoise (Gopherus agassizii) is found here and is further discussed under Sensitive Species, paragraph 6.08 d., below.

Birds of creosote bush scrub include turkey vulture (Cathartes aura), red-tailed hawk (Buteo jamaicensis), Gambel's quail (Callipepla gambelii), greater roadrunner (Geococcyx californianus), Say's phoebe (Sayornis saya), horned lark (Eremophila alpestris), common raven (Corvus corax), verdin (Auriparus flaviceps), blue-grey gnatcatcher (Polioptila caerulea), logger-head shrike (Lanius ludovicianus), Abert's towhee (Pipilo aberti), and black-throated sparrow (Amphispiza bilineata). Many other species are either summer or winter residents (Appendix B of the Final CAR).

Mammals characteristic of creosote bush scrub include black-tailed jackrabbit (Lepus californicus), white-tailed antelope squirrel (Ammospermophilus leucurus), desert woodrat (Neotoma lepida), pocket mice (Perognathus spp.), kangaroo rats (Dipodomys spp.), coyote (Canus latrans), kit fox (Vulpes macrotis), and desert cottontail (Sylvilagus audubonii). A complete list is provided in Appendix D of the Final CAR.

Fauna associated with upland habitats described above are found in desert riparian habitat with a variety of other species attracted there in part by the more diverse flora. Honey mesquite and desert willow are particularly important to wildlife. The leaves of the mesquite are grazed by insect herbivores, and the abundant, energy-rich flowers provide an important resource for other insect species. Many birds forage on the insects and a variety of vertebrates on the fruit and seed pods. Desert willow attracts many insects, and this species is used extensively by birds for foraging and nesting. Reptiles found in desert riparian habitat include zebra-tailed, side-blotched, and desert horned lizards and speckled rattlesnake (Crotalus mitchellii). Desert tortoises often construct burrows in the banks of desert washes, and may forage in these areas because of the likelihood of a higher concentration of desert annuals, particularly during drier years.

Birds found in this habitat include several raptors, Gambel's quail, mourning dove, greater roadrunner, four species of hummingbirds, and many passerines, in particular the ash-throated flycatcher, verdin (Auriparus flaviceps), blue-grey gnatcatcher, cactus wren (Campylorhynchus brunneicapillum), phainopepla, Lucy's warbler (Vermivora luciae), Abert's towhee, and white-crowned sparrow.

Mammals that use desert riparian habitat include the kit fox which uses larger washes as travel corridors and may construct dens in the banks of washes, desert cottontail and black-tailed jackrabbit, little pocket mouse (Perognathus longimembris), long-tailed pocket mouse (P. formosus), cactus mouse (Peromyscus eremicus), and coyote (Canus latrans). Additional information may be found in the EIS, Chapter 3.

c. Sensitive Plant Species. - The sensitive plant species discussed in this section are those that are legally protected and/or are Federal Candidates for listing as endangered species (see table 5 in the Final CAR and the FWS letter of October 6, 1994 in Appendix A). Legally protected species are those that are listed by the State of Nevada as critically endangered and all plant species under the state's cactus and yucca law. The latter protects all cacti and yucca plants from removal or possession. Federal Candidates are those taxa currently under consideration for listing as endangered or threatened, but they receive no protection under the Endangered Species Act of 1973. Because of the highly disturbed nature of the habitat within the Blue Diamond Detention Basin area, no sensitive plants are expected to occur within the project area. Additional information may be found in the EIS, Chapter 3.

d. Sensitive Wildlife Species. - The sensitive wildlife species discussed below are those that are legally protected (listed as Threatened or Endangered), are Federal candidates for listing as Threatened or Endangered species, and listed as sensitive species in Region 1 by the FWS, or appear on the National Audubon Society's 1986 Blue List as avian species whose numbers are in decline (see table 6 in the Final CAR).

The southwestern willow flycatcher (Empidonax traillii extimus), currently listed as Endangered, inhabits dense riparian, streamside vegetation. There is no suitable riparian habitat within or near the project area for the southwestern willow flycatcher.

The American peregrine falcon (Falco peregrinus anatum), is a Federal and State listed Endangered species. It has been considered a very rare migrant and occasional winter visitor to southern Nevada. One pair has nested since 1985 at Lake Mead. Several young birds were released in the City of Las Vegas at the Hilton Hotel and Casino in 1989. Individuals can be expected to occasionally forage over the entire project area.

The desert tortoise (Gopherus agassizii) is a Federally listed Threatened species that historically occupied a variety of desert plant communities in southeastern California, southern Nevada, western and southern Arizona, southwestern Utah, and through Sonora and northern Sinaloa, Mexico. Although it remains in most of these areas at the present time, populations have become

fragmented and appear to be declining over most of its range. It is currently considered a rare species by the State of Nevada. The desert tortoise or its sign was found in the majority of the Las Vegas Valley area west of urbanized Las Vegas, and within the Blue Diamond Detention Basin area (see the Final CAR, Appendix B). Within the Blue Diamond Detention Basin, there is about 197 acres of tortoise habitat that may be impacted (see paragraph 7.07, below).

No other sensitive wildlife species are expected to occur within the project area. A Formal Consultation, under Section 7 of the Endangered Species Act, was completed for the desert tortoise for the overall project. See the FEIS, Appendixes D and E for the Biological Assessment and Biological Opinion, respectively. Additional information may be found in the EIS, Chapter 3.

6.08 Fisheries. - All of the watercourses within the project area are intermittent streams, and as such no fishery is present.

6.09 Cultural Resources. - The first archeological evidence of human occupation in southern Nevada consists of artifacts in association with extinct mammals at Tule Springs near Las Vegas. These date to about 13,000 years ago and mark the beginning of the Tule Springs period, which lasted until about 6,000 years ago. The few sites that can be assigned to this period are located near ancient water sources. Following a brief hiatus, the Corn Creek-Gypsum period began about 5,000 years ago. Milling stones, which were used for seed processing, first appear in archeological assemblages dating to this period.

By the subsequent Big Springs period, beginning about 1,450 years ago, irrigation agriculture, in addition to hunting and gathering of wild plants, was practiced in the Las Vegas Valley, and permanent settlements were established near springs. Ceramics and other southwestern Pueblo traits document the presence of the Virgin Anasazi people. During the same time period, the ancestors of the historic Southern Paiute, a Numic-speaking Great Basin people, occupied southern Nevada. By about A.D. 1150, the Virgin Anasazi pueblos had been abandoned, but the Southern Paiute continued to occupy the region until the time of white contact. Today their descendants live on the Moapa Indian Reservation and in the Las Vegas Indian Colony.

The record of European and American exploration in the region begins with the expeditions of Jedediah S. Smith in 1826 and Antonio Armijo in 1829-1830. After Fremont's expedition of 1844, which followed the cutoff from the Muddy River to Las Vegas Springs, the Old Spanish Trail was established across this region. Mormon colonization of southern Nevada began in 1855 with the establishment of a mission and fort on Las Vegas Creek. This was abandoned by the Mormons after two years, but the buildings were used by later settlers. By 1915 there were at least

twelve large ranches in the Las Vegas Valley. Clark County was annexed by the State of Nevada in 1864. The town of Las Vegas was established in 1905 to service the railroad, which, when completed two years later, linked southern Nevada with Los Angeles and Salt Lake City. The town remained small until the 1930s, when growth was stimulated by construction of Boulder Dam and the institution of legalized gambling.

The Corps completed a records and literature search in the preliminary stages of project planning in 1986. In 1990, a field evaluation was conducted by a Corps archeologist. No sites were found within the Blue Diamond Detention Basin project area. Because of the highly disturbed nature of the area, no cultural sites are expected to occur within the project area. Additional information may be found in the EIS, Chapter 3.

Previous coordination with the Las Vegas District BLM archeologist, Keith Myhrer, indicated that no survey would be necessary since the site has been highly degraded. The entire Las Vegas Valley has been surveyed multiple times and the majority of the surveys were negative. The BLM prepared a document, Las Vegas District Class I Cultural Resource Report 5-2121, *Proposal to Limit Archeological Survey in Las Vegas Valley, Southern Nevada*, by Keith Myhrer, Area Archeologist, April 1991, justifying discontinuing surveys of parcels less than two hundred acres in size. The Nevada State Office of Historic Preservation, by letter dated May 15, 1991, agreed. The size and location of the Blue Diamond Detention Basin area meets the stipulations for Section 106 exemption outlined in CR 5-2121.

6.10 Recreation. - Recreation facilities in the Las Vegas Wash project area of Clark County are heavily used, and with projected population growth, the Las Vegas metropolitan area and Clark County are in urgent need of additional public recreational facilities. Basic facilities such as multi-use parks with picnicking areas, hiking/walking and bicycling trails are in demand. Additional information may be found in the EIS, Chapter 3.

6.11 Esthetics. - The Las Vegas Valley is visually dominated by open desert which is surrounded by mountain ranges on all sides. Urban development occurs on the desert floor and is centralized within the valley. The vertical elements of the downtown and the Strip act as focal points for the surrounding urban and rural areas. The visibility is open due to the gently sloping terrain and relatively consistent building height. The mountain ranges act as a constant backdrop for urban and rural viewers, thus providing scenic vistas of the desert landscape. The downtown is compact with primarily older architecture, while the Strip is more spread out with contemporary designs that extend southward down Las Vegas Boulevard. The homogeneous character of the urban development provides middleground views for the outlying areas. The rural development establishes the fringe of the urban core

and filters out into the open undeveloped desert basin. The emphasis on landscape treatment is minimal to none in the downtown and Strip areas due to the lack of open space. However, the urban development includes introduced landscape vegetation that contrast with the native character of the rural and natural areas. There are significant urban features and planned landscape areas which are visually apparent within the surrounding urban development. These elements are generally high activity areas such as urban malls, convention facilities, golf courses, and country clubs. The emphasis on design and landscape enhancement increases the visual character of these developments. The Las Vegas Valley area includes two major transportation corridors, which traverse the desert in north to south, and northwest to southeast directions. The linear features provide strong viewer orientation to distant scenic vistas and the downtown core. The elevated sections allow for more of the valley to be seen in panoramic views. The intersection of these highways is located in the central core of the urban development adjacent to the downtown. The existing visual character of the Blue Diamond Detention Basin project area is poor due to the highly disturbed nature of the area, the impact of gypsum mining adjacent to the project area, and the interspersed development and vacant lots. Additional information may be found in the EIS, Chapter 3.

6.12 Socioeconomics. - Growth in the Las Vegas Valley area of Clark County, Nevada is occurring at a phenomenal rates. Its location relative to other metropolitan centers such as Los Angeles, Phoenix, and Salt Lake City, its warm climate, and its relative affordability have made the area attractive to increasing numbers of residents. The current population (1993 estimate) of Clark County is estimated to be approximately 919,388 persons, with about 95 percent concentrated in the urbanized metropolitan area of Las Vegas. Projections of future population in Clark County vary widely, ranging from 816,000 to 1,069,430 persons in the year 2000. Population growth has been most rapid in the areas in and adjacent to the project area.

High rates of employment growth have been associated with the high population growth rates. The County's largest single employer is Nellis Air Force Base, employing approximately 12,000 military and civilian personnel. Hotel and Gaming is the largest industry, accounting for 88,100 jobs in 1987, or 31 percent of the total. Retail trade is also a strong component of the local economy, accounting for 49,800 jobs in 1987, or 18 percent of the total. The annual unemployment rate in Clark County for 1988 is projected to be approximately 5.5 percent, one of the lowest in the nation. Between 1980 and 1988 the unemployment rate varied from a high of 10.9 percent in 1982 to the current low of approximately 5.5 percent. The unemployment rate has decreased steadily since 1982.

Expansion of the housing stock has been driven by the area's population growth. Currently, several large subdivisions are under construction. The housing

market is strong and is expected to remain so in the near future. Approximately 48 percent of Las Vegas residents live in single family dwellings and approximately 71 percent of Las Vegas residents own their homes. Preference for the single family dwelling is expected to continue. The median home price in Las Vegas is in the range of \$90,000 to \$120,000. The majority of the new homes are within large subdivisions and there is a large supply of affordable housing. Residential land prices in the valley range from approximately \$35,000 to \$75,000 per acre for parcels with utilities available and ready for development. Commercial land prices range from approximately \$6.50 to \$15.00 per square foot for parcels with utilities in established areas, while industrial land prices range from approximately \$3.50 to \$5.00 per square foot. Most residential land in the valley is purchased in large parcels for subdivision development. Commercial properties are generally within "strip developments" along main streets and development of industrial lands generally is limited to industrial parks. Development is occurring throughout the metropolitan portion of the valley.

CHAPTER 7 - ENVIRONMENTAL EFFECTS

7.01 General. - As noted previously, this supplemental environmental assessment (SEA) amends U.S. Army Corps of Engineers 1991 FR/FEIS for Las Vegas Wash and Tributaries, Tropicana and Flamingo Washes, Nevada, dated October 1991. Relatively few changes have been made to the project as originally proposed in the Feasibility Report. Information that was documented in the FEIS is still current unless otherwise noted. All environmental commitments (FEIS, Table 10) will continue to be complied with. Since preparation of the FR/FEIS, and the other EA/FONSI's (paragraph 2.01, above), refinements on the location of the Blue Diamond Detention Basin have been made. The analyses of the impacts associated with these changes is provided in the following paragraphs. Construction of the Blue Diamond Detention Basin would permanently impact about 185.97 acres and temporarily impact about 10.91 acres of desert tortoise habitat.

7.02 Topography, Geology, and Soils. - Construction of the Blue Diamond Detention Basin would affect the topography, geology, and soils of the site. Use of the site would modify the site topography by creating a flood control basin. The only change from the Feasibility Report/EIS is the areal location of the dam. The dam has been changed from an off-line basin with a diversion structure in the stream channel, to an on-line structure. These impacts of the two alternative designs are comparable between the two sites, and any impacts of the change are considered to be insignificant and no additional mitigation is proposed. Other impacts on topography, geology, and soils are still as documented in the FR/FEIS.

7.03 Mineral Resources. - The proposed location for the Blue Diamond Detention Basin would have no impact on mineral resources. Other impacts on mineral resources are still as documented in the FR/FEIS.

7.04 Land Use. - Construction of the Blue Diamond Detention Basin will have no additional effect on land use. It will transfer the land use impacts, as identified in the FR/FEIS, to the revised areal location of the dam. Other impacts on land use are still as documented in the FR/FEIS.

7.05 Air Quality. - Construction of the Blue Diamond Detention Basin will have no additional effect on air quality. It will transfer the air quality impacts, as identified in the FR/FEIS, to the revised areal location of the dam. Other impacts on air quality are still as documented in the FR/FEIS.

7.06 Water Resources. - Revising the location of the Blue Diamond Detention Basin will not further affect water resources. Other impacts on water resources are still as documented in the FR/FEIS.

7.07 Vegetation and Wildlife. - Because of the highly disturbed nature of the FR/FEIS location of the Blue Diamond Detention Basin as well as the revised location, the impacts to vegetation and wildlife are considered to be comparable between the sites, as noted below.

R The vegetation in the Blue Diamond Wash proper, is good quality Mojave Desert Wash scrub, which extends upstream (west) of Durango Road and includes both the original diversion site and the proposed on-line damsite. The vegetation within the area that would have been impacted by construction of the diversion structure (diversion site) is Mojave desert wash scrub or desert riparian habitat (riverine intermittent streambed under the National Wetland Inventory Classification System) and lines both sides of the relatively narrow channel at this point in a continuous strip of good quality vegetation. Upstream, approximately 1.23 miles from the diversion site, at the proposed location for the on-line structure (on-line site), the channel is considerably wider, and the stream channel is braded with large areas of creosote bush scrub within the channel itself. The Mojave Desert Wash scrub lines a number of the channels, but only a thin strip of vegetation occurs there. The quality of the vegetation at the on-line site (particularly with regard to supporting migratory bird species) is not as good as the diversion site.

R A comparison of the two sites is shown in the following tabulation of permanently impacted area:

Site	Riparian (Acres)	Upland (Acres)	Bare Channel (Acres)	Total (Acres)
Diversion Site	2.56	0.00	16.14	18.70
On-Line Site	3.68	15.71	5.11	24.50

R Taking into consideration the habitat quality difference between the sites, it is assumed that the quality of the habitat at the diversion site is very good (and could support migratory bird species populations) and would have a relative Habitat Suitability Index of about 0.90. The habitat at the on-line site is more open and would only support about two thirds of the populations of migratory birds as the diversion site, a relative Habitat Suitability Index of about 0.6 would be appropriate. Utilizing these assumptions, a relative comparison of the two sites is shown in the following tabulation:

Site	Area (Acres)	Habitat Suitability	Habitat Units
Diversion Site	2.56	0.9	2.304
On-Line Site	3.68	0.6	2.208

R As can be seen from the above comparison, the two sites are comparable, from a habitat suitability comparison.

R Because the vegetation types of the two sites (diversion site and on-line site) are essentially the same, with the lower (diversion site) having more dense habitat and the upper (on-line site) being more open, wildlife would be expected to be essentially the same, except for absolute numbers. The amount of desert wash scrub within the sites is shown in the tabulations provided above. The mitigation that the Service recommended in the Final Coordination Act Report will be implemented, as noted in the Final EIS.

Construction of the Blue Diamond Detention Basin would permanently impact about 185.97 acres of desert tortoise habitat and temporarily impact about 10.91 acres of desert tortoise habitat. Payments into the tortoise mitigation fund would be made prior to construction as required by the Biological Opinion.

7.08 Fisheries. - There is no change in this element as originally evaluated in the FR/FEIS.

7.09 Cultural Resources. - No impacts to cultural resources are expected to occur in the Blue Diamond Detention Basin site. Other impacts on cultural resources are still as documented in the FR/FEIS.

7.10 Recreation. - The impacts on recreation are still as documented in the FR/FEIS.

7.11 Esthetics. - The impacts on esthetics are still as documented in the FR/FEIS.

7.12 Socioeconomics. - There is no change in this element as originally evaluated in the FR/FEIS.

CHAPTER 8 - COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

8.01 Relationship of Plans to Environmental Protection Statutes and Other Environmental Requirements. - Compliance with applicable laws, regulations, and Executive Orders is outlined below.

- a. National Historic Preservation Act of 1966, as Amended. - The project is in compliance. There is no change in compliance from the FEIS.
- b. Fish and Wildlife Coordination Act. - The project is in compliance. There is no change in compliance from the FEIS.
- c. Endangered Species Act, as Amended. - The project is in compliance. The project will not affect the continued existence of any Endangered or Threatened species. There is no change in compliance from the FEIS.
- d. National Environmental Policy Act. - The project is in compliance. This Supplemental Environmental Assessment has been prepared in accordance with the National Environmental Policy Act.
- e. Clean Air Act. - The project is in compliance. The contractor will be responsible for complying with all applicable Federal, State, and local laws and regulations concerning air quality.
- f. Clean Water Act, as Amended. - The project entails discharge of dredged or fill material into waters of the United States. Information on the project's compliance may be found in the FEIS.
- g. Farmland Protection Policy Act. - No change from the original FEIS.

- h. Federal Water Project Recreation Act. - No change from the original FEIS.
- i. Rivers and Harbors Act. - No change from the original FEIS.
- j. Executive Order 11988, Floodplain Management. - No change from the original FEIS.
- k. Executive Order 11990, Protection of Wetlands. - No change from the original FEIS.

8.02 Environmental Protection Statutes and Other Environmental Requirements Found to be Not Applicable. - The following laws and Executive Orders were found to be not applicable to this project:

Coastal Zone Management Act
 Estuary Protection Act
 Marine Protection, Research, and Sanctuaries Act
 Watershed Protection and Flood Prevention Act
 Wild and Scenic Rivers Act

CHAPTER 9 - COORDINATION

R 9.01 General. - Formal coordination with the following agencies has taken place: Advisory Council on Historic Preservation; Department of Energy; Department of Health and Human Services; Department of Housing and Urban Development; Federal Emergency Management Agency; National Oceanographic and Atmospheric Administration; U. S. Bureau of Land Management; U. S. Bureau of Reclamation; U. S. Department of the Interior; U. S. Environmental Protection Agency; U. S. Fish and Wildlife Service; U. S. Forest Service; U. S. Geological Survey; U. S. National Park Service; U. S. Natural Resources Conservation Service; Nevada Department of Conservation and Natural Resources; Nevada Department of Environmental Protection; Nevada Department of Transportation; Nevada Division of Wildlife; Nevada Division of Water Resources; Nevada State Historic Preservation Officer; Clark County; City of Las Vegas; Sierra Club; and, TORT Group.

R Comments on the draft EA were received from the U. S. Department of Interior, Fish and Wildlife Service. A copy of the letter is provided in appendix B. A summary of the comments and the Corps' responses are provided in the following subparagraph.

R a. U. S. Department of the Interior, Fish and Wildlife Service. - The U. S. Department of Interior, Fish and Wildlife Service, in their letter of December 8, 1997, had the following specific comments:

(1) **COMMENT:** "We have reviewed the draft Supplemental Environmental Assessment (SEA) for the Blue Diamond Detention Basin portion of the Las Vegas Wash and Tributaries, Clark County, Nevada, project. The document does not adequately address the impacts to biological resources of construction of the detention basin at its new location. The Fish and Wildlife Coordination Act Report prepared by our agency for this project in August 1991 indicated the plant community in Blue Diamond Wash was good quality Mojave desert wash scrub, particularly in the three mile stretch downstream from the original proposed detention basin site. The new site is about 1.23 miles upstream of that location. Therefore, there is no adequate description of biological resources for the new site except that it is "highly disturbed." No information is provided on the extent of desert wash vegetation at the new site."

RESPONSE: As indicated, the vegetation in the Blue Diamond Wash is good quality Mojave Desert Wash scrub, which extends upstream (west) of Durango Road and includes both the original diversion site and the proposed on-line damsite. As noted in the draft SEA, the vegetation within the area that would have been impacted by construction of the diversion structure (diversion site) is Mojave desert wash scrub or desert riparian habitat (riverine intermittent streambed under the National Wetland Inventory Classification System) and lines both sides of the relatively narrow channel at this point in a continuous strip of good quality vegetation. Upstream approximately 1.23 miles upstream of the diversion site, at the revised location for the on-line structure (on-line site), the channel is considerably wider, and the stream channel is braded with large areas of creosote bush scrub within the channel itself. The Mojave Desert Wash scrub lines a number of the channels, but only a thin strip of vegetation occurs there. The quality of the vegetation at the on-line site (particularly with regard to supporting migratory bird species) is not as good as the diversion site.

A comparison of the two sites is shown in the following tabulation of permanently impacted area:

Site	Riparian (Acres)	Upland (Acres)	Bare Channel (Acres)	Total (Acres)
Diversion Site	2.56	0.00	16.14	18.70
On-Line Site	3.68	15.71	5.11	24.50

Taking into consideration the habitat quality difference between the sites, we will assume that the quality of the habitat at the diversion site is very good (and could support migratory bird species populations) and would have a relative Habitat Suitability Index of about 0.90. The habitat at the on-line site is more open and would only support about two thirds of the populations of migratory birds as the diversion site, we have a relative Habitat Suitability Index of about 0.6. A relative comparison of the two sites is shown in the following tabulation:

Site	Area (Acres)	Habitat Suitability	Habitat Units
Diversion Site	2.56	0.9	2.304
On-Line Site	3.68	0.6	2.208

As can be seen from the above comparison, the two sites are comparable, from a habitat suitability comparison. This analysis does not attempt to analyze the riparian habitat component for mitigation purposes. Riparian mitigation for the overall project will be addressed in a future report on Riparian Habitat Mitigation. Likewise, impacts and analysis of the Blue Diamond Wash downstream of Blue Diamond Dam will be analyzed in a future Design Memorandum and Environmental Assessment addressing the entire channel from Blue Diamond Dam to the Southern Beltway Channel.

(2) **COMMENT:** “The draft SEA also states that impacts to vegetation and wildlife are considered to be comparable between the sites. It is not clear how impacts to wildlife will be comparable if the vegetation types are different, even if the habitat is disturbed. We are interested in knowing the amount and species of desert wash scrub shrubs in the portion of the wash to be affected by the detention basin. This information should be provided in the final SEA. We again recommend that our mitigation recommendation for Blue Diamond Wash, as stated in our Final Coordination Act Report for the project, be implemented.”

RESPONSE: As seen above, the vegetation types are essentially the same, with the lower (diversion site) having more dense habitat and the upper (on-line site) being more open. With the vegetation types being essentially the same, except for density, wildlife would be expected to be essentially the same, except for absolute numbers. The amount of desert wash scrub within the sites is shown in the tabulations provided with Response #1, above. The mitigation that the Service recommended in the Final Coordination Act Report will be implemented, as committed to in the Final EIS.

(3) **COMMENT:** “The SEA does not provide information on how modification of the stream channel with an on-line detention basin will affect sediment

movement to downstream areas except to state that the impacts are comparable between the two sites. It is not clear how these impacts could be considered similar when the detention basin likely will trap sediments and impede their movement for an additional distance of 1.23 miles. Sediment movement is important to the ecology of a desert riparian system, and this issue should be discussed in the final SEA.”

RESPONSE: The structures at either location would have identical effects downstream of the structure. Either structure would trap all sediment originating upstream of the structure and both are designed to accommodate all sediment over the 100-year life of the project. As committed to in the Final EIS, either structure would provide a minimum flow (the first 50 cfs) downstream to maintain the vegetation within the channel. As the 50-cfs flow is considered to be a non-damaging flow, either structure will protect the existing vegetation from removal by high velocity flows. It is anticipated that the vegetation downstream of either alternative location would increase both in areal extent and density. The eastward limit of the good quality vegetation (as well as identifiable stream channel) occurs at (the extension of) Durango Road in either case. In addition, development is/will be occurring eastward of (the extension of) Durango Road. The following tabulation shows the linear amount of stream channel and vegetation to be preserved under each alternative.

Site	Riparian Area (Mi. Of Stream Channel)
Diversion Site	1.14 Miles
On-Line Site	2.37 Miles

As noted in Response #1, above, impacts and analysis of the Blue Diamond Wash downstream of Blue Diamond Dam will be analyzed in a future Design Memorandum and Environmental Assessment addressing the entire channel from Blue Diamond Dam to the Southern Beltway Channel.

(4) **COMMENT:** “Of additional concern is coordination with our Las Vegas Sub-Office on desert tortoise and other sensitive species. We recommend you contact them as soon as possible to resolve any issues related to this new site.”

RESPONSE: Concur. On-going coordination with your Las Vegas Sub-Office will be continued, particularly with regard to the desert tortoise and other sensitive species, to resolve any issues related to this new site.

(5) **COMMENT:** “We appreciate the opportunity to comment on this supplemental environmental assessment. If you have any questions, please contact Mary Jo Elpers at (702) 784-5227.”

RESPONSE: Comment noted.

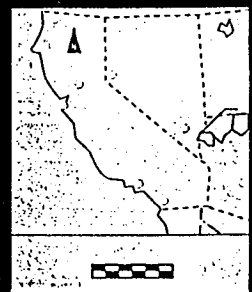
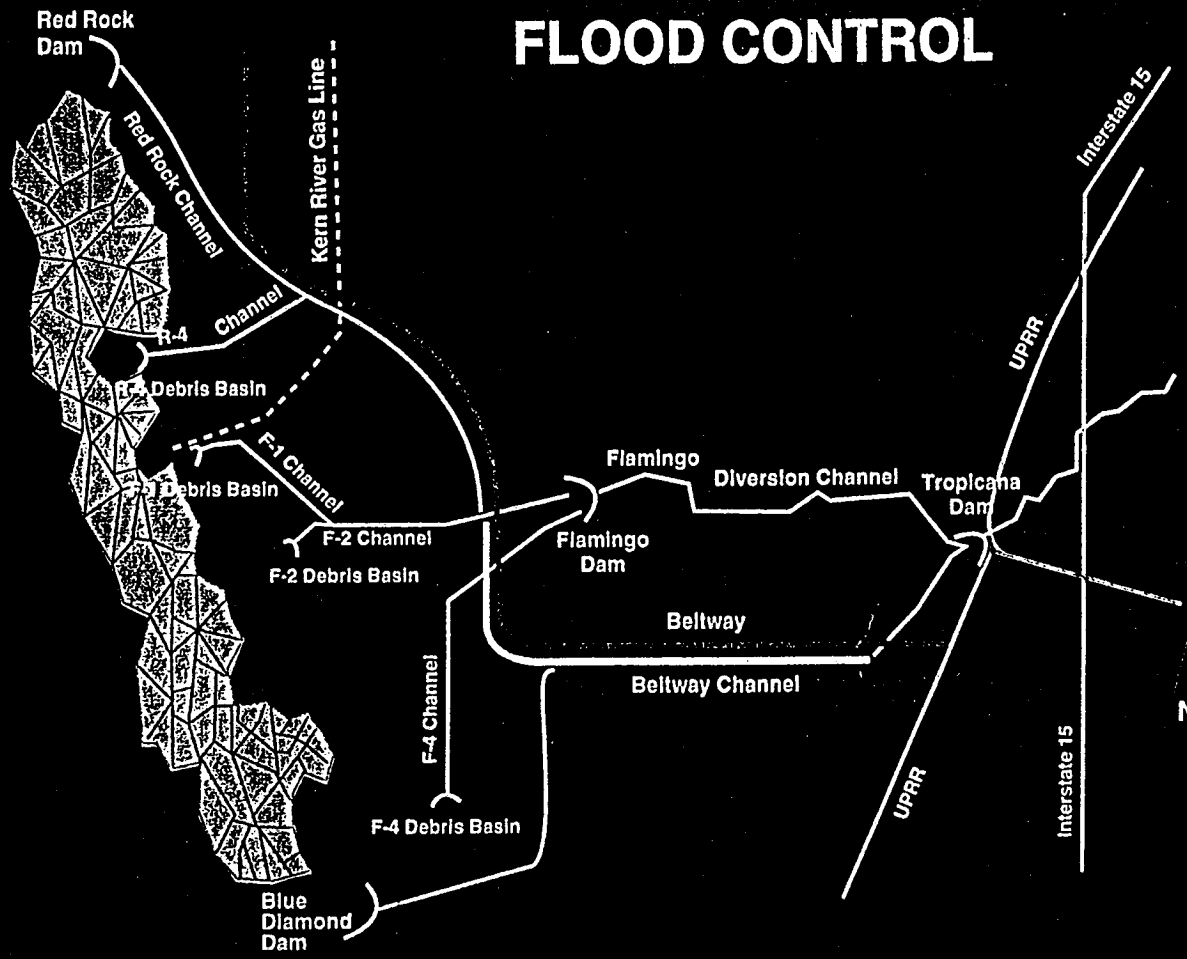
CHAPTER 10 - LIST OF PREPARERS

10.01 List of Preparers. - The following people were primarily responsible for preparing or reviewing this assessment:

<u>Name</u>	<u>Expertise</u>	<u>Experience</u>	<u>Role in Preparing Assessment</u>
<u>Preparation</u>			
Stuart Brehm	Civil Engineer	21 yrs. Corps	Project Manager
Ronald MacDonald	Forester/ Senior Ecologist	22 yrs. Corps	SEA Preparation, Environmental Coordinator
John Minassian	Civil Engineer	6 yrs. Corps	Engineering Manager
<u>Review</u>			
Steve Dibble	Archeologist	10 yrs. Corps	Archeology Review
Nedenia Kennedy	Environmental Protection Specialist	9 yrs. Corps	Review Responsibility as Chief, Environmental Support Section
Ruth Villalobos	Outdoor Recreation Planner	17 yrs. Corps	Chief, Environmental Resources Branch

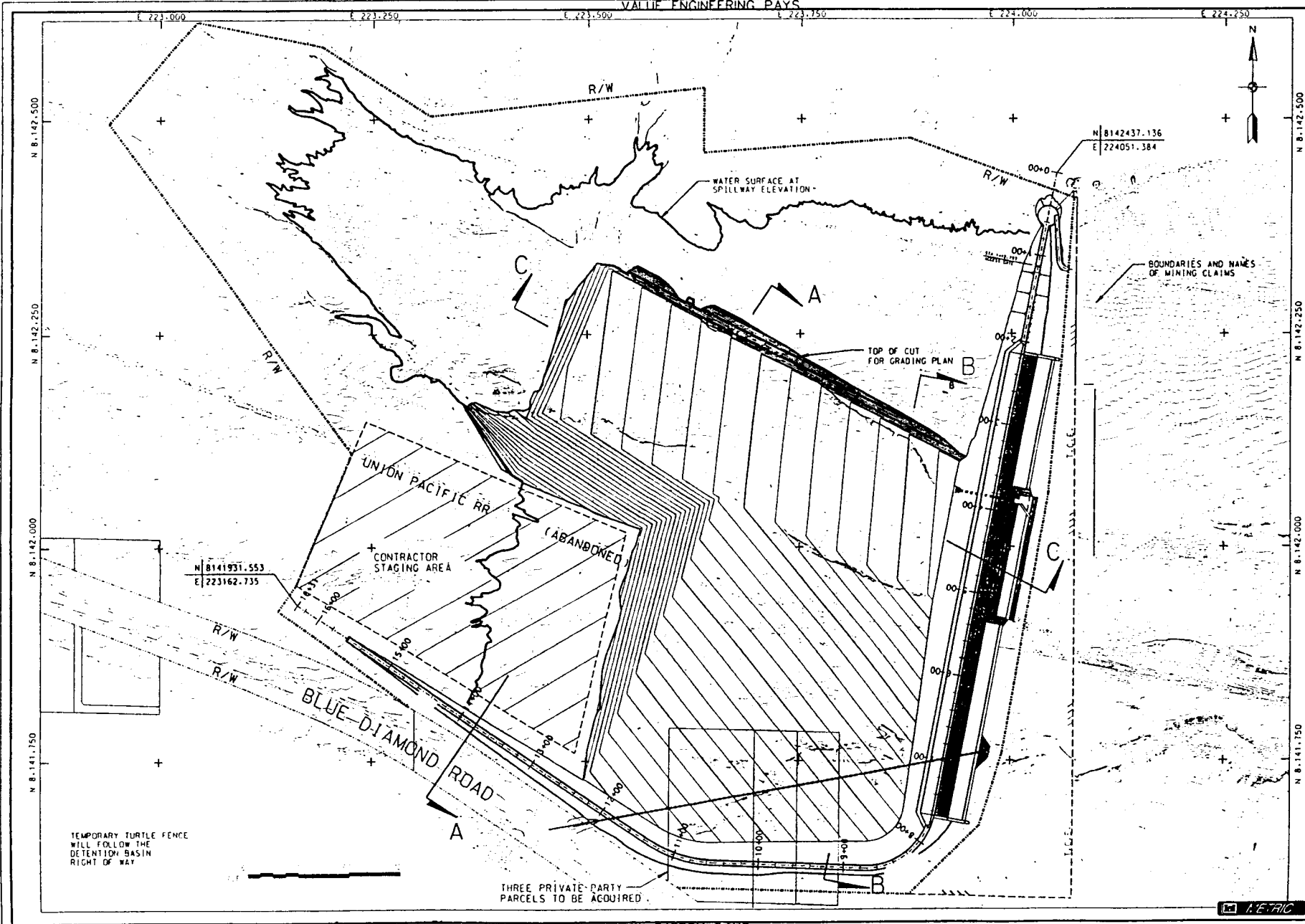
PLATES

TROPICANA AND FLAMINGO WASHES, NV FLOOD CONTROL



- LEGEND**
- Beltway
 - Beltway Channel
 - Proposed Channel
 - Gas Line
 - Existing Wash
 - Underground Channel

VALIIE ENGINEERING PAYS



<p>PLATE 2</p> <p>DESIGN MEMORANDUM DRAWINGS</p>	
<p>TROPICANA AND FLAMINGO WASHES FLOOD CONTROL PROJECT</p> <p>BLUE DIAMOND DETENTION BASIN</p> <p>GENERAL PLAN</p>	
<p>SCALE:</p> <p>AS SHOWN</p>	<p>DESIGNED BY: [Blank]</p> <p>CHECKED BY: [Blank]</p>
<p>DATE:</p> <p>1968</p>	<p>PROJECT NO: 64-00000-10-0002</p> <p>SHEET NO: 2</p>
<p>U.S. ARMY ENGINEER DISTRICT</p> <p>LOUISIANA DISTRICT OFFICE</p> <p>CORPS OF ENGINEERS</p> <p>ROBERT A. HALL, D.E.</p>	

SAFETY PAYS



APPENDIX A
METRIC CONVERSION FACTORS

Conversion Factors, Non-SI to SI Units of Measurement

Non-SI units of measurement used in this report can be converted to SI units as follows:

Multiply	By	To Obtain
acres	4,046.873	square meters
acre-feet	1,233.489	cubic meters
feet	0.3048	meters
gallons (U.S. liquid)	3.785412	liters
inches	2.54	centimeters
miles (U.S. statute)	1.609347	kilometers
pounds (mass)	0.4535924	kilograms
square miles	2.589998	square kilometers
yards	0.9144	meters

APPENDIX B

PERTINENT CORRESPONDENCE

U. S. Department of Interior,
Fish and Wildlife Service

December 8, 1997



United States Department of the Interior

FISH AND WILDLIFE SERVICE
RENO FISH AND WILDLIFE OFFICE
4600 KIETZKE LANE, SUITE 125C
RENO, NEVADA 89502-5055

December 8, 1997
File No. COE 3-2

Colonel Robert Davis, District Engineer
U.S. Army Corps of Engineers
Los Angeles District
Post Office Box 532711
Los Angeles, California 90053-2325

Attention: Mr. Ronald MacDonald

Dear Colonel Davis:

We have reviewed the draft Supplemental Environmental Assessment (SEA) for the Blue Diamond Detention Basin portion of the Las Vegas Wash and Tributaries, Clark County, Nevada, project. The document does not adequately address the impacts to biological resources of construction of the detention basin at its new location. The Fish and Wildlife Coordination Act Report prepared by our agency for this project in August 1991 indicated the plant community in Blue Diamond Wash was good quality Mojave desert wash scrub, particularly in the three mile stretch downstream from the original proposed detention basin site. The new site is about 1.23 miles upstream of that location. Therefore, there is no adequate description of biological resources for the new site except that it is "highly disturbed." No information is provided on the extent of desert wash vegetation at the new site.

The draft SEA also states that impacts to vegetation and wildlife are considered to be comparable between the sites. It is not clear how impacts to wildlife will be comparable if the vegetation types are different, even if the habitat is disturbed. We are interested in knowing the amount and species of desert wash scrub shrubs in the portion of the wash to be affected by the detention basin. This information should be provided in the final SEA. We again recommend that our mitigation recommendation for Blue Diamond Wash, as stated in our Final Coordination Act Report for the project, be implemented.

The SEA does not provide information on how modification of the stream channel with an on-line detention basin will affect sediment movement to downstream areas except to state that the impacts are comparable between the two sites. It is not clear how these impacts could be

APPENDIX C
PROJECT MAILING LIST

Betty Burge
TORT Group
5157 Poncho Circle
Las Vegas, NV 89119

Alan O'Neil
U. S. National Park Service
601 Nevada Highway
Boulder City, NV 89005

City of Las Vegas
Planning Department
400 E Stewart Avenue
Las Vegas, NV 89101

U. S. Fish and Wildlife Service
4600 Kietzke Lane
Building C125
Reno, NV 89502

City of Las Vegas
Planning & Development
400 E Stewart Avenue
Las Vegas, NV 89101

Regional Environmental Officer
U. S. Department of the
Interior, PSW Region
600 Harrison St., Suite 515
San Francisco, CA 94107-1376
Natural Resources Conservation
Service
2357A Renaissance Drive
Las Vegas, NV 89119

NV Div. of Water Resources
555 E. Washington Ave.
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Las Vegas, NV 89119

Regional Forester
Region 4, Forest Service
324 25th Street
Ogden, UT 84401

Director, Office of
Ecology & Conservation
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500 S. Grand Central Parkway
Las Vegas, NV 89155

Bureau of Land Management
Nevada State Office
P. O. Box 12000
Reno, NV 89520-0006

Clark County Commissioners
500 S. Grand Central Parkway
Las Vegas, NV 89155

U. S. Fish and Wildlife Service
1500 North Decatur Blvd., # 01
Las Vegas, Nevada 89109

Clark County Planning
Commission
500 S. Grand Central Parkway
Las Vegas, NV 89155

David Cowperthwaite
NV Div. of Env. Protection
333 W. Nye Ln., Room 138
Carson City, NV 89710

Glenn Trowbridge
CC Parks & Recreation
500 S. Grand Central Pkwy
Las Vegas, NV 89155

Clark County Regional Flood
Control District
301 E Clark Avenue, Suite 301
Las Vegas, NV 89101

U. S. Bureau of Land
Management
ATTN: Mark Chatterton
4765 Vegas Drive
Las Vegas, NV 89108-2135
EIS Coord, Fed. Activ. Br (P-5)
EPA, Region IX
75 Hawthorne Street
San Francisco, CA 94105

U. S. Bureau of Reclamation
P. O. Box 61470
Boulder City, NV 89006-1470

City of Las Vegas
Office of the Mayor
400 E Stewart Avenue
Las Vegas, NV 89101

Clark County
Comprehensive Planning
500 S. Grand Central Parkway
Las Vegas, NV 89155

Dave Brickey
Sierra Club
Las Vegas Group
P. O. Box 19777
Las Vegas, NV 89132
U. S. Forest Service
Las Vegas Ranger District
2881 S. Valley View, Suite 16
Las Vegas, NV 89102

U. S. Geological Survey
6770 S. Paradise
Las Vegas, NV 89119

State Historic Preservation
Officer
Historic Preservation Office
100 Stewart St.
Carson City, NV 89710
Director, Western Division of
Project Review, ACHP
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Golden, CO 80401

State Conservationist
Natural Res. Conservation Service
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Reno, NV 89511
FEMA, Region IX
Disaster Resp. and Recovery
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San Francisco, CA 94129

Office of Environmental Quality
Department of Housing and
Urban Development
Washington, DC 20410

Dept. of Health & Human Svcs.
Room 537F, Humphrey Bldg.
200 Independence Ave., SW
Washington, DC 20201

NV Dept. of Transportation
1263 S. Stewart Street
Carson City, NV 89712

Mr. M. J. Manning
Clark County Dept. of Public
Works (ATTN: Mike Land)
500 S. Grand Central Pkwy
Las Vegas, NV 89155

Division of NEPA Affairs
Dept. of Energy, RM 4G064
100 Independence Ave., SW
Washington, DC 20230

Office of Environmental Project
Review
Dept. of the Interior, Rm 4241
18th and C Streets, NW
Washington, DC 20240
Nevada Division of Wildlife
P. O. Box 10678
Reno, NV 89510

Federal Emer. Mgt. Agency
500 C Street, SW, Room 713
Washington, DC 20472

Division of Water Resources
123 W Nye Lane
Capitol Complex
Carson City, NV 89710

Department of Conservation
and Natural Resources
123 W Nye Lane
Capitol Complex
Carson City, NV 89710

APPENDIX B

**CHAIN OF CORRESPONDENCE FOR APPROVAL OF THE
BLUE DIAMOND DETENTION BASIN STANDING INSTRUCTIONS**

BLUE DIAMOND DETENTION BASIN

BLUE DIAMOND WASH

CLARK COUNTY, NEVADA

Los Angeles District

U.S. Army Corps of Engineers

December 2002



DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
333 MARKET ST.
SAN FRANCISCO, CALIFORNIA 94105-2197

CESPD-MT-E

27 NOV 2002

MEMORANDUM FOR Commander, Los Angeles District, ATTN: CESPL-ED-HR

SUBJECT: Approval -Blue Diamond Detention Basin Standing Instructions to the Project Operator for Water Control

1. The South Pacific Division, Water Management Team previously conducted policy compliance and quality assurance review of the subject document and provided review comments via E-mail to Ms. Cynthia Wong, of the Reservoir Regulation Section.
2. Approval of this document is given with the proviso that the SPD comments are included in the final version of the Standing Instructions for Blue Diamond Detention Basin. Once completed, a copy should be provided to this office.
3. In the future, Dr. Checks should be used as the tool for reviewing all Water Control related documents. If you have any questions, please do not hesitate in contacting Ms. Theresa Mendoza of my staff at (415) 977-8106.

FOR THE COMMANDER:

A handwritten signature in black ink that reads "Marda Q. Stothers".

MARDA Q. STOTHERS
Chief, Engineering & Construction Division

Wong, Cynthia M SPL

From: Mendoza, Theresa A SPD
Sent: Monday, December 02, 2002 10:47 AM
To: Wong, Cynthia M SPL
Subject: RE: Blue Diamond SI- QA Review Comments

thanks....



-----Original Message-----

From: Wong, Cynthia M SPL
Sent: Monday, December 02, 2002 10:44 AM
To: Mendoza, Theresa A SPD
Cc: Meneses, Melvin M SPL
Subject: RE: Blue Diamond SI- QA Review Comments

Terry,

I have incorporated all of your required changes to the final document. A copy of the final version of the Standing Instructions for Blue Diamond Detention Basin will be sent out to your office this week.

-Cynthia

-----Original Message-----

Wong, Cynthia M SPL

From: Mendoza, Theresa A SPD
Sent: Wednesday, November 27, 2002 11:11 AM
To: Wong, Cynthia M SPL
Subject: RE: Blue Diamond SI- QA Review Comments

Good morning Cynthia:

I'm working on the approval letter today. It will contain a statement that approval is given with the proviso that comments/changes are incorporated. I also need to make a correction to what I had E-mailed you yesterday. Please see the change in red bold text below. Thanks...TERRY -----Original Message---

[Mendoza, Theresa A SPD] -----Original Message-----

From: Mendoza, Theresa A SPD
Sent: Tuesday, November 26, 2002 3:24 PM
To: Wong, Cynthia M SPL
Cc: Bigornia, Boniface G SPD; Sing, Edward F SPD
Subject: Blue Diamond SI- QA Review Comments

Cynthia:

I work with Boni Bigornia, in SPD Water Management and was asked to conduct a QA review of the Blue Diamond Standing Instructions (SI) that was provided to SPD. Here are a few minor review comments/editing:

<u>Page</u>	<u>Para</u>	<u>Current Text</u>	<u>Change</u>
iv	Preface Para 1	NAVD be consistent with all reference survey controls	change to "NAVD88" to
I-3	3	3. <u>Project Operating Constraints</u>	change to para
4.		<u>Project Operating Constraints</u> ; para 3 already exists	
I-4	4	4. <u>Project Operation and Maintenance</u>	change to para
6.		<u>Project Operation and Maintenance</u> to follow paragraph number sequence	
T-1	Table I-1	South Pacific Division (415) 977-8101 due to recent retirement of WMT leader.	x8101 out of service Change to Chief, Engineeri
&	Division, South	(415) 977-8031 until position is permanently filled	Pacific Division
T-2	Table I-2	top box - Hydrologist specify which entity hydrologist is being referred to....SPL, NWS???	Recommend that title

Hope these comments are useful to you. Do not hesitate in contacting me if you have questions. Thanks...TERRY MENDOZA (415) 977-8106



DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT, CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

CESPL-ED-HR

13 November 2002

MEMORANDUM FOR Commander, South Pacific Division, CESPDMT-E

SUBJECT: Blue Diamond Detention Basin Standing Instructions to the Project Operator for Water Control

1. Enclosed are three copies of the draft Blue Diamond Detention Basin Standing Instructions to the Project Operator for Water Control. Also inserted in the front of each copy are the following: (1) the District Engineer's Quality Control Certification, (2) the Programmatic and Supplemental Quality Control Plans, (3) the Review Comments and Responses. This package is being sent for your policy compliance review and quality assurance, and if everything is satisfactory, Division approval.
2. If there are any questions, please contact Cynthia Wong of the Reservoir Regulation Section at (213) 452-3560.

FOR THE COMMANDER:

A handwritten signature in black ink that reads "Joseph B. Evelyn".

JOSEPH B. EVELYN, P.E.
Chief, Hydrology and Hydraulics Branch

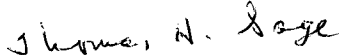
Encl

MEMORANDUM FOR Commander, Los Angeles District

SUBJECT: Quality Control Certification, Blue Diamond Detention Basin, Standing Instructions to the Project Operator for Water Control

1. Reference: CESP-D-R-1110-1-8, Quality Management Plan of Directorate of Engineering and Technical Services, dated 26 May 2000.
2. The subject Quality Control Certification is submitted for your review and approval. If there are any questions, please contact Ms. Cynthia Wong, Reservoir Regulations Section, at (213) 452-3560.

Encl


ROBERT E. KOPLIN, P.E.
Chief, Engineering Division

**US ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
DISTRICT ENGINEER'S QUALITY CONTROL CERTIFICATION**

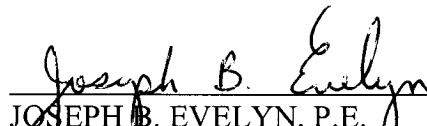
Blue Diamond Detention Basin
Standing Instructions to the Project Operator for Water Control

COMPLETION OF QUALITY CONTROL ACTIVITIES

Los Angeles District, Engineering Division has completed the Standing Instructions to the Project Operator for Water Control for Blue Diamond Detention Basin, Las Vegas, Nevada. Certification is hereby given that all quality control activities defined in the Quality Control Plan appropriate to the level of risk and complexity inherent in the project have been completed. Documentation of the quality control process is enclosed. An independent review of the report has been completed. The report has been reviewed for technical and functional adequacy and has been revised in response to the local sponsors, Clark County Regional Flood Control District and Clark County Public Works.

for 
BONIFACE BIGORNIA
Independent Technical Review Manager


9 Oct. '02
(date)


JOSEPH B. EVELYN, P.E.
Chief, Hydrology and Hydraulics Branch

10-10-02
(date)

QUALITY CONTROL CERTIFICATION

As noted above, all issues and concerns resulting from technical review of the product have been resolved. The report may be transmitted to Clark County Regional Flood Control District and Clark County Public Works.

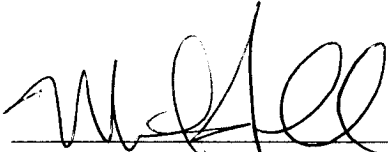

ROBERT E. KOPLIN, P.E.
Chief, Engineering Division

10/11/02
(date)



RUTH VILLALOBOS
Chief, Planning Division

10/21/02
(date)



GEORGE L. BEAMS, P.E.
Chief, Construction-Operations Division

30 OCT 02
(date)



STEPHEN E. TEMMEL
District Counsel

31 Oct 02
(date)




RICHARD G. THOMPSON
Colonel, Corps of Engineers
District Engineer

31 OCT 2002
(date)

MEMORANDUM FOR RECORD


SUBJECT: Supplemental Quality Control Plan (QCP) for the Blue Diamond Detention Basin
Standing Instructions to the Project Operator for Water Control, Las Vegas, NV

The subject Quality Control Plan, enclosed with this memorandum, has been reviewed and approved by the undersigned Engineering Division Branch Chiefs, and is hereby approved by the Chief, Engineering Division in accordance with the Los Angeles District Quality Management Plan.




JOSEPH B. EVELYN, P.E.
Chief, Hydrology and Hydraulics Branch

9/19/02
(date)



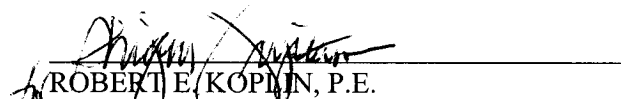
ABBAS T. ROODSARI, P.E.
Chief, Geotechnical Branch

9/20/02
(date)



THOMAS H. SAGE, P.E.
Chief, Design Branch

9/20/02
(date)



ROBERT E. KOPLIN, P.E.
Chief, Engineering Division

9/20/02
(date)

Encl

MEMORANDUM FOR RECORD

SUBJECT: Supplemental Quality Control Plan (QCP) for the Blue Diamond Detention Basin Standing Instructions to the Project Operator for Water Control, Las Vegas, NV

1. Objective. This document supplements the programmatic QCP as specified in CESPL-R-1110-1-8, *Quality Management Plan*, and establishes the specific in-house quality control (QC) and review procedure for the Blue Diamond Detention Basin Standing Instructions to the Project Operator for Water Control.

2. Description of Document. The Blue Diamond Detention Basin Standing Instructions to the Project Operator for Water Control (SI) presents instructions to ensure the efficient and safe operation of the project at all times. The SI includes instructions to the Project Operator during normal conditions and emergency conditions. Blue Diamond Detention Basin is part of the Las Vegas Wash and Tributaries (Tropicana and Flamingo Washes) drainage system. Blue Diamond Detention Basin is designed and constructed by the Corps of Engineers to control the 100-year computed probability runoff on Blue Diamond Wash. When the project is turned over to the local sponsors, they will accept ownership and operation and maintenance responsibilities for the dam. The primary responsibility for the dam safety and operation lies with the owners and local sponsors of Blue Diamond Detention Basin.

3. Local Sponsor. The local sponsors consist of Clark County Public Works and Clark County Regional Flood Control District. The sponsors will be responsible for executing the SI.

4. Production Team. The following team members contributed to the development of the Standing Instructions.

<u>Discipline</u>	<u>Team Member</u>	<u>Office</u>
Team Leader	Melvin Meneses	CESPL-ED-HR
Reservoir Regulation	Cynthia Wong	CESPL-ED-HR
Hydrology	Jody Fischer	CESPL-ED-HH
Design	Paul Underwood	CESPL-ED-DB

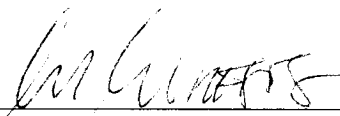
5. Independent Technical Review. The following members performed an independent technical review and provided written comments to the Review Team Leader for response coordination and back-check responses.

<u>Discipline</u>	<u>Team Member</u>	<u>Office</u>
Water Management/ Review Team Leader	Boni Bigornia	CESPD-CM-B
Project Management	Kevin Inada	CESPL-PM-C
Construction Operations	Ted Masigat	CESPL-CO-OE
Construction	Robert Caskie	CESPL-CO-AV
Environmental	Alex Watt	CESPL-PD-RQ
Hydraulics & Hydrology	Joseph Evelyn	CESPL-ED-H
Soils Design	George Nahapetian	CESPL-ED-GD
Office of Counsel	Stephen E. Temmel	CESPL-OC
Local Sponsor	Stephen Roberts	Clark County Regional Flood Control District
Local Sponsor	John Cantanese	Clark County Public Works
Local Sponsor	Gil Suckow	Clark County Public Works

6. Administrative Duties. The ITRT Leader is normally responsible for the administrative duties associated with the review procedure and resolution of issues. For the Blue Diamond SI, since the ITR Leader is assigned from outside of the Los Angeles District, the Production Team Leader performed these duties, which include the development of this supplemental QCP. This is in accordance with paragraph 5.c of SPL’s current Programmatic QCP for Water Control Documents.

7. Document To Be Reviewed. Draft Blue Diamond Standing Instructions to the Project Operator for Water Control.

8. Quality Control Certification. At the completion of the Standing Instructions, the District will execute the District Engineer’s Quality Control Certification in accordance with CESPD Regulation 1110-1-8, *Quality Management Plan*.




 Melvin Meneses
 Production Team Leader

MEMORANDUM FOR RECORD

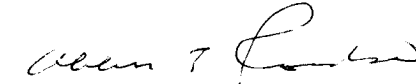
SUBJECT: Approval of the Programmatic Quality Control Plan for Water Control Documents

The subject Quality Control Plan, enclosed with this memorandum, has been reviewed and approved by the undersigned Engineering Division Branch Chiefs, and is hereby approved by the Chief, Engineering Division in accordance with the Los Angeles District Quality Management Plan.



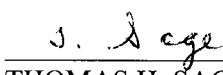
JOSEPH B. EVELYN, P.E.
Chief, Hydrology and Hydraulics Branch

9/18/02
(date)



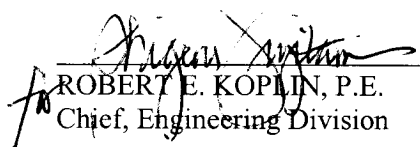
ABBAS T. ROODSARI, P.E.
Chief, Geotechnical Branch

9/18/02
(date)



THOMAS H. SAGE, P.E.
Chief, Design Branch

9/20/02
(date)



ROBERT E. KOPLIN, P.E.
Chief, Engineering Division

9/25/02
(date)

Encl

**U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT**

PROGRAMMATIC QUALITY CONTROL PLAN

WATER CONTROL DOCUMENTS

1 April 2002

1. References:

- a. ER 1110-1-12, Quality Management, Engineering and Design, 1 June 1993.
- b. EC 1165-2-203, Technical Policy Compliance Review, 15 October 1996.
- c. CESPD-R-1110-1-8, Quality Management Plan of Directorate of Engineering and Technical Services, 26 May 2000.
- d. CESPL-ED Memorandum, Subject: Engineering Division Policy Memorandum No. 5, Development of Quality Control Plans, 8 October 1997.

2. Objective. The objective of this Programmatic Quality Control Plan (QCP) is to describe a quality control process that will result in a quality water control document that specifies an operation of a water control facility that meets all its project purposes. This QCP establishes a process to be followed by the production team, along with a system of reviews and coordination that will help insure that the team's efforts are properly directed. This QCP addresses both quality control, which deals with the study process, and quality verification, which deals with the review process. This QCP presents the appropriate level of independent technical review (ITR) of Water Control Management (WCM) Studies to ensure that they are consistent with project authorizing documents, applicable engineering regulations, policies, guidance, sound technical practices of the disciplines involved, and the needs of the local sponsor(s) as appropriate. Quality Control includes the verification of assumptions, methods, procedures, and data used in the production of the document. It also includes verification of the alternatives evaluated, appropriateness of the data used, and the reasonableness of the results.

3. Applicability. This programmatic QCP is applicable to all water control documents outlined in Section 6 of this QCP. These documents will be developed by or under the direction of the Los Angeles District Reservoir Regulation Section.

4. Supplemental QCP. An Independent Technical Review Team (ITRT) Leader will prepare a brief Supplemental QCP each time a document covered by this programmatic QCP is prepared or undergoes a major revision. The supplemental QCP will describe the document being prepared or revised, will list the local sponsors of the associated project(s) and will list the members of a Production Team and an ITRT assigned to the work. The Production Team, ITRT and ITRT Leader concepts are described in Section 5 of this QCP. Appendix A contains a template of a Supplemental QCP. A memorandum will be prepared by the ITRT Leader that routes the Supplemental QCP through each branch chief in Engineering Division for concurrence by the branch chiefs and then to the Chief, Engineering Division for final approval.

5. Quality Control Activities. Technical review of water control documents will be accomplished in accordance with the CESPL-ED Quality Management Plan. Three types of reviews will be carried out; a “production team” review, a "supervisory" review, and an “independent technical” review.

The production team review, the supervisory review and the independent technical review will be conducted in a “seamless” manner. Intermediate products will be technically reviewed during development before they are integrated into the overall document. Technical section chiefs and/or senior personnel will be responsible for providing an overview/peer check of major assumptions, analytical approaches, and significant calculations throughout the study effort. Additionally, the production team members will consult with their ITR team counterpart during the study effort to discuss assumptions, procedures, and/or significant calculations to resolve any significant comments prior to the final ITR.

While the production team and supervisory reviews may be conducted on an informal basis, the consultations with the ITR team counterpart will be documented, with copies forwarded to the ITRT Leader. In the course of executing the work, the Production Team members and supervisory staff should be promptly advised of any significant developments that adversely affect the quality, schedule, or cost of producing the document.

a. Production Team Review. A specific production team will be established for each water control document. The leader of the Production Team will be a member of the Los Angeles District Reservoir Regulation Section. The Production Team Leader will request the services of other disciplines and will arrange for their funding, as necessary. The section chief in charge of these disciplines will designate production team members and if appropriate, review team members for their portion of the document. If the Production Team Leader wishes to assign staff from outside of the district, this will be coordinated with the section chief of the corresponding discipline prior to any work taking place.

All members of the production team will review the entire internal draft water control document. The main purpose of this overall review is to discover and resolve any inconsistencies or contradictions among the sections in the document produced by the various disciplines.

b. Supervisory Review. The supervisor of each production team member, in order to assure the quality of the technical subproduct for which she/he is responsible, will review the team member's subproduct. All or part of this review may be delegated to another member of the supervisor's staff at the supervisor's discretion. The supervisory review will address all aspects of the subproduct, including its conformance to the project authorizing document, applicable technical policy and guidance as well as to the proper selection and application of technical criteria. The supervisory review will also include a thorough check of calculations and results. Within the Reservoir Regulation Section, supervisory reviews will be performed by the Production Team Leader’s work group leader, if there is one, as well as by the Section Chief, and by the Hydrology and Hydraulics Branch Chief.

c. Independent Technical Review. The ITRT will be composed of members from each discipline necessary for the development of the water control document. The members will be work group leaders and/or journeymen level engineers in the technical area being reviewed. In the case of the Water Control Independent Technical Review, the Los Angeles District Reservoir Regulation Section will consult with the South Pacific Division (SPD) Water Control Center (WCC), in determining the ITRT member for water control. The ITRT member for water control may be from within the Los Angeles District, from the SPD WCC, or from the water control function in another district. Generally, the ITRT member for water control will be the ITRT Leader, however, if the ITRT member for water control is assigned from outside the Los Angeles District, the Production Team Leader will handle the administrative duties of the ITRT Leader.

The sponsors will be afforded the opportunity and will be encouraged to participate in the independent technical review. The ITRT team leader will coordinate the sponsors' involvement.

Review schedules will be prepared during the development of each document. Each ITRT member will prepare memoranda documenting their seamless review consultations and final ITRT comments, which will become part of the ITRT's records. All comments will be addressed and appropriate changes incorporated into the document.

d. District Engineer's Quality Control Certification. At the conclusion of the ITR, the Los Angeles District will execute the District Engineer's Quality Control Certification. This certification will be prepared and signed by the ITRT Leader. It will then be routed to and signed by the Reservoir Regulation Section Chief, the H&H Branch Chief, the Engineering Division Chief and finally by the District Engineer. The draft document and the Quality Control Certification will then be submitted to the SPD WCC for Policy Compliance Review and Quality Assurance. A model of this certification can be found within Appendix H of CESP R 1110-1-8.

6. Water Control Documents. This Programmatic QCP applies to the following water control documents:

- a. Water Control Manuals (for individual water control projects)
- b. Master Water Control Manuals
- c. Interim Water Control Plans During Construction
- d. Preliminary Water Control Plans
- e. Final Water Control Plans
- f. Standing Instructions to Project Operators for Water Control
- g. Drought Contingency Plans
- h. Initial Reservoir Filling Plans

7. Scope of Independent Technical Review. Specifics of the ITR will involve the following:

- a. Compliance with established policies, principles, and procedures.
- b. Adequacy of the scope, content, and organization of the technical documentation.
- c. Appropriateness of all assumptions and methods

- d. Appropriateness data presented
- e. Consistency
- f. Accuracy
- g. Comprehensiveness

8. Conflict Resolution Procedures. Specific issues raised in the ITR will be documented in a comment, response, action required, and action taken format. Any disagreements will be brought to the attention of the appropriate functional chief to facilitate resolution of any unresolved technical disagreements between the production team and review team counterparts.

Issues that cannot be resolved between the Production Team and the ITRT will be raised to senior district and SPD staff for resolution. Frequent informal contact, by telephone or meetings, will be maintained on a routine basis by individuals and by small groups of team members. Should issues arise concerning Corps of Engineers policy or technical criteria that cannot be answered at the District or SPD level, HQUSACE advice will be sought. If necessary, Issue Resolution Conferences or other appropriate meetings will be arranged.

9. Policy Questions. Policy issues, if any, will be resolved through SPD.

10. Revisions to the Programmatic or Supplemental QCPs. This programmatic QCP will be updated as necessary to reflect changes in Corps or SPD policy or procedures. The Supplemental QCP will be updated if there are changes in the staff available for the Production or Review Teams. Changes to the ITR member for water control will be coordinated with the SPD WCC.

11. Division Policy Compliance Review and Quality Assurance. The SPD WCC shall perform the Division Policy Compliance Review and Quality Assurance in accordance with CESP Regulation No. 1110-1-8, Subject: Quality Management Plan, dated 26 May 2000 Appendix D. A flowchart of the entire process for producing a water control document is furnished as Appendix B to this document.

12. Filing of the Water Control Management Quality Control Documents. This programmatic QCP, QCP supplements, and SPD approvals will be kept on file within the Los Angeles District Reservoir Regulation Section.

APPENDIX A

CESPL-ED-HR (1110)

[date]

MEMORANDUM FOR RECORD

SUBJECT: Supplement to the Los Angeles District Programmatic Quality Control Plan for Water Control Documents dated 22 January 2002 for the [Project] [Document]

1. This Supplement provides the product description, identifies the local project sponsor, and lists the Production and Independent Technical Review Team (ITRT) members for the [preparation/revision] of the [project] [document].

2. [Describe the purpose of the document]

3. The local sponsor for this document is [name of owner, operator and/or local sponsor].

4. The production team for this document is as follows:

<u>Discipline</u>	<u>Team Member</u>	<u>Office</u>
[list the discipline]	[name of team member]	[org code ie: CESPL]

5. The ITRT for this document is as follows:

<u>Discipline</u>	<u>Team Member</u>	<u>Office</u>
[list the discipline]	[name of team member]	[org code]

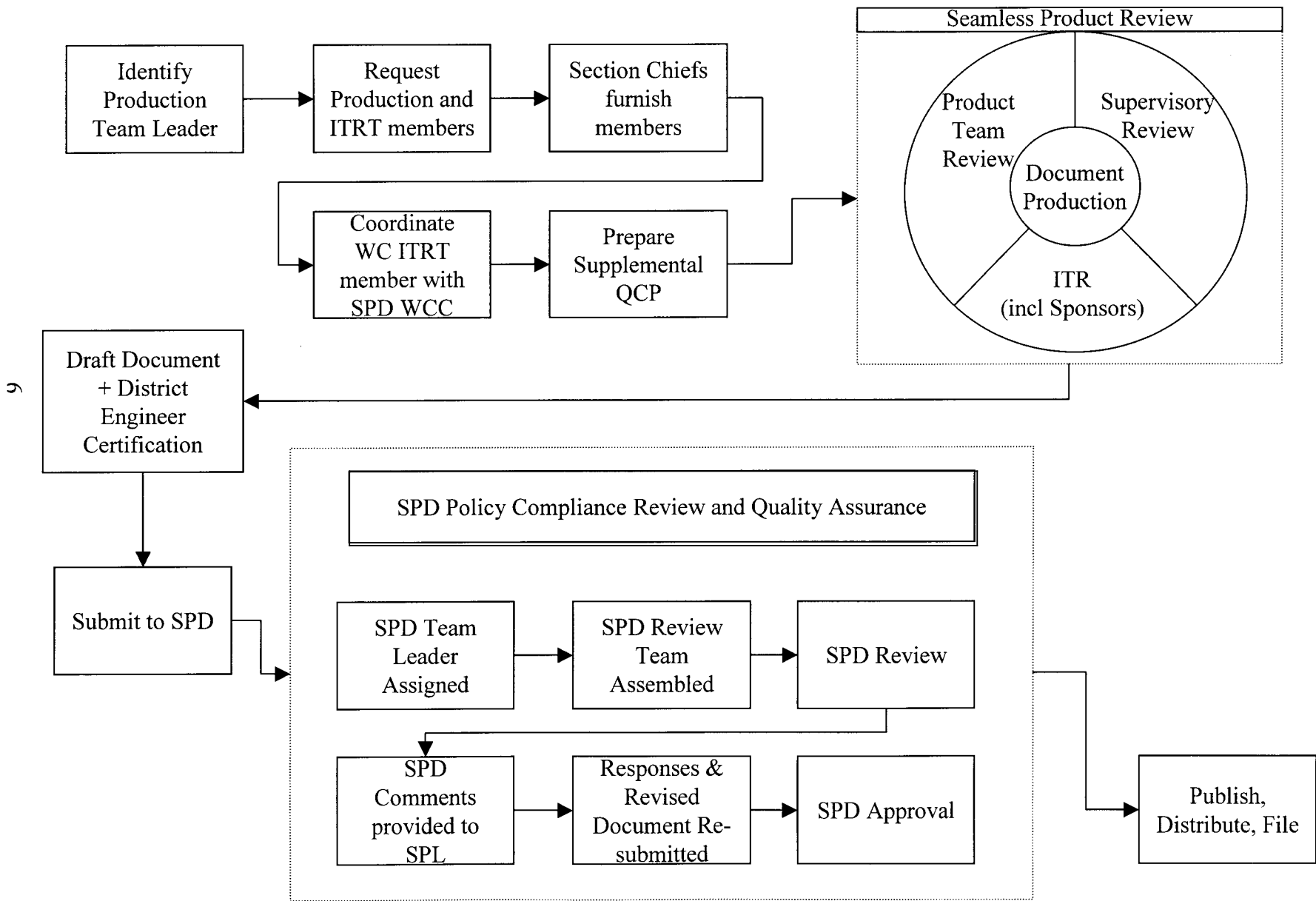
The ITRT member for water control has been coordinated with [name] of the South Pacific Division Water Control Center (SPD WCC).

6. The document to be reviewed will be the internal draft [project] [document].

7. When the ITR process is complete the Los Angeles District will execute the District Engineer's Quality Control Certification in accordance with CESP Regulation 1110-1-8, Quality Management Plan. The draft document and the certification will then be submitted to the SPD WCC for Policy Compliance Review and Quality Assurance.

NAME
Independent Technical Review Team Leader

Appendix B Los Angeles District Programmatic Quality Control Process for Water Control Documents



**REVIEW COMMENTS AND RESPONSES
TO
BLUE DIAMOND
DRAFT STANDING INSTRUCTIONS
FOR THE PROJECT OPERATOR FOR WATER CONTROL**
Dated August 2001

The review comments and responses are presented in the following order:

1. Corps of Engineers
 - CESPD-CM-B
 - CESPL-PM-C
 - CESPL-CO-AV

2. Local Sponsors
 - Clark County Regional Flood Control District
 - Clark County Public Works

Corps of Engineers
Comments and Responses

Response to comments from CESP-D-CM-O, B. Bigornia dated 30 August 2001, on draft Blue Diamond Standing Instructions.

1. Use a continuous underlining of all headings.

Response: *Concur. Headings have been revised.*

2. Sec. I.A.2, Para 2. Include a copy of the signed '98 FONSI in the report.

Response: *Concur. '98 FONSI is included.*

3. Sec. I.A.3. Show the location of the Basin Bypass Conduit on Plate 1.

Response: *Do not concur. The location of the Basin Bypass Conduit should not be located on Plate 1 as suggested due to the scale of the map. The Basin Bypass Conduit is located under the entire basin and is shown in proper detail on plates 3b and 3c.*

4. I.B.1. Normal Conditions. What would be deemed a major storm event with large volume of storm runoff?

Response: *We propose to send a monitor if the weather service predicts a rainfall total of 1inch in 24-hours as a start. As project experience is gained, the Project Operator shall determine the conditions necessary to send a monitor to the project site. Section was modified as such.*

5. I.B.1. Include in the report the phone number of the NWS office that would be needed to determine a 'major storm'.

Response: *Concur. NWS phone number and website are included in the report.*

6. Table I-1. Change the SPD information to 415 977-8101. Also, there is no longer a pager number.

Response: *Concur. Phone number has been revised. Pager number has been deleted.*

7. Section II. Data Collection and Reporting. Include copies of the reference SPL forms #403 in the report.

Response: *Concur. Forms #403 are included in Section II, Data Collection and Reporting of the report.*

Response to comments from CESPL-PM-C, K. Inada dated 22 December 2001 on draft Blue Diamond Standing Instructions.

1. Please provide a copy of this report to Rob Caskie, Con-Ops, for his review comments.

Response: *Concur. Review was requested and comments were received from Rob Caskie.*

2. Specify a level in the basin at which sediment must be removed during annual checks. In addition, indicate a time at which it should be removed (i.e. prior to May) (page I-4, para. 5)

Response: *The paragraph on page I-4 has been revised. The Project Operator is responsible for the maintenance of the reservoir storage capacity once sediment accumulates to a maximum amount of 89.59 ac-ft (110,508 m³). The Project Operator must clean-out the accumulated sediment deposits during the non-flood season, or once the sediment accumulation exceeds more than 89.59 ac-ft (110,508 m³).*

3. Show how the SPL Emergency Operations office is included in our organization (T-1) and in the associated narratives.

Response: *Do not concur. SPL Emergency Operations is part of our organization, but is not involved in making Reservoir Operations decisions, and therefore is not included in Table I. SPL Emergency Operations' involvement is contained in the document entitled "Emergency Action Plan for Blue Diamond Detention Basin, US Army Corps of Engineers, Los Angeles District", dated November 2000.*

Response to comments from CESPL-CO-AV, R. Caskie dated 23 January 2002, on draft Blue Diamond Standing Instructions.

1. Harvey Beverly performed an as-built survey of the Blue Diamond Detention Basin and also determined the capacity at spillway crest elevation. You may want to obtain this information and utilize this info in the report. The basin actually ended up having a capacity greater than designed so we put back some material into the basin that was originally excavated (removed) by the Contractor (about 15 acre feet from what Harvey calculated was put back into the basin).

***Response:** We obtained the as-built survey from Harvey Beverly; however, upon discussions with Tom Sage, Kevin Inada, and Paul Underwood, we are using the final design storage volume table since the local sponsors are required to restore the detention basin back to final design conditions. This supersedes the storage table in the Blue Diamond Detention Design Memorandum dated April 1998.*

2. I don't know whose responsibility it is to create reporting forms, I know the Sponsor has to provide the reports, but blank form examples for reporting events pertinent to this facility may ensure that we get the info in the format that we want the info from the Sponsor. Do we normally include blank reporting forms? Looking at the Table of Contents it would appear that this issue would be Appendix 2, which I don't see.

***Response:** Concur. Forms #403 which are used for annual operation and maintenance reporting are included in Section II, Data Collection and Reporting of the Standing Instructions.*

Local Sponsors
Comments and Responses

Response to comments from Clark County Regional Flood Control District dated 14 January 2002, on draft Blue Diamond Standing Instructions.

1. Pertinent Data Tables. Change 100-year peak inflow to read 13,800 cfs rather than 138,000 cfs. Probable maximum flood (PMF) peak inflow and outflow values (146,588.3 cfs) are equal, however spillway design discharge (144,500 cfs) indicates there is attenuation of PMF event. On metric Pertinent Data Table, spillway design discharge and PMF inflow and outflow values all equal 4,105.94 m³/s, which is 145,000 cfs in English units, which does not agree with English Pertinent Data Table. Determine correct spillway design discharge and PMF peak inflow and outflow values, and be consistent in Pertinent Data Table, text, and figures. Explain why elevation of spillway maximum water surface (2973.74 ft/906.40 m) does not agree with PMF peak elevation (2972.61 ft/906.05 m). Values listed elsewhere in report should be reflected in Pertinent Data Tables. Resolve these and other discrepancies describe herein.

Response: The 100-year peak inflow was changed to read 13,700 cfs, rather than 13,800 cfs. The PMF peak inflow values were both changed to 144,000 cfs, which shows no attenuation of the PMF event. PMF and RDF routing values, which differ from the values in the previous draft SI and in the DM, were taken from the results of revised HEC1 runs that were made after the DM was printed. These routings are not documented in any report, but they were done using the project's as-built features (top of dam elevation, spillway crest elevation, outlet works configuration), adjusted drainage area (due to the construction of the basin by-pass), and the adjusted storage and area relationships (from the changed grading plan). An explanation of this departure from the DM values is explained in the added "Preface" of the current draft SI. The Preface also explains why the as-built crest elevation differs from the revised PMF maximum elevation.

2. Section I.A.1. District is listed as Project Operator and keeper of Standing Instructions. In accordance with Project Cooperation Agreement, Corps will turn project over to CCPW, who will be responsible for inspection, maintenance, and operation of facility. District will provide funds to CCPW to inspect, maintain, and operate facility. Clarify appropriate responsible local agencies. Provide CCPW with copy of Standing Instructions.

Response: Concur. Text has been revised to have CCPW responsible for inspection, maintenance, and operation of facility. District will provide funds to CCPW to inspect, maintain, and operate facility. CCPW was also provided with a copy of draft Standing Instructions to review, and a copy of the approved SI will also be provided.

3. Section I.A.3. Detention basin storage capacity is listed as 2030 acre-feet. Total storage capacity is 2268 acre-feet according to Pertinent Data Table and Design Memorandum – Blue Diamond Detention Basin dated April 1998, and 2382 acre-feet according to Plate 18. Resolve discrepancies or clarify that storage volume of 2080 acre-feet is for clear water only.

Response: See response to comment #1. The design storage capacity of the detention basin is 2313 ac-ft (2,852,791 m³). This supersedes the storage table in the Blue Diamond Detention Basin Design Memorandum, dated April 1998. The design storage capacity includes an allowance of 238 ac-ft (293,571 m³) for sediment deposition during the RDF and 89.59 ac-ft (110,508 m³) for antecedent sediment storage.

Flood Control	2,742,283 m ³	2223 ac-ft
Antecedent Sediment Storage	110,508 m ³	89.59 ac-ft
Gross Capacity at spillway crest	2,852,791 m ³	2313 ac-ft

Note: Flood control includes 238 ac-ft (293,571 m³) for sediment deposition during the RDF.

4. Section I.A.3, Embankment. Continue outline numbering system on project components within body of report. Coordinate values of embankment crest elevation and maximum height above streambed with Pertinent Data Table.

Response: Concur. Numbering system for the project components within body of report have been continued.

5. Section I.A.3, Outlet Works. In addition to clogging, trash rack prevents damage to outlet conduit from large debris. Please include this purpose in trash rack description.

Response: Concur. Added to trash rack description.

6. Section I.A.5. Corps states that Project Operator is required to remove sediment accumulation annually and after each major storm event. Standard practice for other District-funded facilities is to remove sediment once it accumulates to a pre-determined level, such as the crown of sediment berm. Please confirm with CCPW District’s understanding of their maintenance procedure to remove sediment when level reaches crown of sediment berm in Blue Diamond Wash Detention Basin.

Response: The Project Operator is responsible for the maintenance of the reservoir storage capacity once sediment accumulates to a maximum amount of 89.59 ac-ft (110,508 m³). The Project Operator must clean-out the accumulated sediment deposits during the non-flood season, or once the sediment accumulation exceeds more than 89.59 ac-ft (110,508 m³).

7. Section B.2. Identify “SPL” and provide name, title, address, and/or phone number of contact.

Response: Concur. “Los Angeles District” has been added to identify “SPL”. The 24-hr phone number of the Reservoir Operations Center, (213) 452-3623, has been added. Names, phone numbers, etc. are in SPL’s annual publication titled, “Instructions for Reservoir Operations Center Personnel (The Orange Book)”. SPL will send copies of the Orange Book to both CCPW and CCRFRD prior to the flood season of each year.

8. Section II. Clarify that District, not Project Operator, owns, operates, and maintains flood threat recognition system (gages), however, CCPW (Project Operator) will be responsible for monitoring site during a storm event. District is unaware of a stream gage down stream of outlet works. Refer to District website at www.CCRFCD.org for map of gage locations.

Response: *Concur. Clarification has been added that the District owns, operates, and maintains flood threat recognition system (gages) and CCPW (Project Operator) will be responsible for monitoring the project site during a storm event. Stream gage note from figure has been removed. The District's website with gage locations has been added to the Standing Instructions for reference.*

9. Table I-2. Provide Chain of Command for CCPW, Project Operator, in Table. Include District's role as owner of flood threat recognition (gages).

Response: *Table I-2 was modified to show the response implementation plan only and not chain of commands of both agencies. CCPW is indicated as Project Operator and CCRFCD as owner of flood threat recognition system (gages).*

10. Tables I-3 through I-6. Tables are reportedly taken from Design Memorandum-Blue Diamond Detention Basin dated April 1998, or revised based on As-Built information. However, values conflict with information provided in Pertinent Data Table. Resolve the following discrepancies:

- a. Tables I-3 and I-3a. Detention basin area at spillway crest is greater in table than given in Pertinent Data Table.
- b. Tables I-4 and I-4a. Detention basin storage capacity at spillway crest is greater in tables than given in Pertinent Date Table.
- c. Tables I-5 and I-5a. Outlet works discharge rate at 100-year peak flood elevation is slightly greater in tables than in Pertinent Data Table.
- d. Tables I-6 and I-6a. Outlet works discharge rate at maximum water surface elevation is less in tables report in Section I.A.3, Outlet Works.

Response: Also see response to comment #1. Tables I-3 and I-4 have been updated to reflect final design storage and area values. This supersedes the Design Memorandum Blue Diamond Detention Basin dated April 1998. Tables I-5 and I-6 were updated to reflect the final design conditions.

11. Plate 18. Basin capacity at spillway crest is 2382 acre-feet on figure and 2268 acre-feet on Pertinent Data Table. Please verify total capacity at spillway crest. If actual basin capacity is 2382 acre-feet, 352 acre-feet is available for sediment storage, which is 114 acre-feet more that debris yield produced by 100-year storm event. Therefore,

additional sediment storage is available to allow CCPW to perform standard maintenance procedures as described in Comment 6. PMF peak flowrate is given as 146,588.3 cfs on Pertinent Data Table. Resolve discrepancies.

Response: *Also see response to comment #1. The final design storage capacity of the detention basin is 2313 ac-ft (2,852,791 m³). This supersedes the storage table in the Blue Diamond Detention Basin Design Memorandum, dated April 1998. The design storage capacity includes an allowance of 238 ac-ft (293,571 m³) for sediment deposition during the RDF and 89.59 ac-ft (110,508 m³) for antecedent sediment storage.*

12. Plates 22 and 22a. Maximum pool elevation on figures agrees with spillway elevation of maximum water surface, but not PMF peak elevation on Pertinent Data Table. Resolve discrepancies.

Response: *See response to comment #1.*

13. Plates 23 and 23a. On Plate 23, correct drainage area, maximum storage, maximum stage, and maximum outflow to match Pertinent Data Table and Plate 18. On Plate 23a. Correct maximum storage and maximum stage to match Pertinent Data Table and Plate 18.

Response: *See response to comment #1. Plate was updated.*

14. Plates 24 and 24a. On Plate 24, correct drainage area, maximum inflow, maximum storage, inflow volume, and maximum stage to match Pertinent Data Table and Plate 18. On Plate 24a, correct maximum storage, inflow volume, and maximum stage to match Pertinent Data Table and Plate 18.

Response: *See response to comment #1. Plate was updated.*

15. Plate 25. Remove stream gage note from figure.

Response: *Concur. Stream gage note from figure has been removed.*

Response to comments from John Cantanese, Clark County Department of Public Works dated 5 March 2002, on draft Blue Diamond Standing Instructions.

1. Page I-1. “Background and Responsibilities”, A-1. General Information; in addition, a copy of the Standing Instructions need to be referenced to Clark County Department of Public Works (CCPW) which Owns, Operates and Maintains the Detention Basin Facility.

Response: Concur. Revision made as suggested.

2. Page I-2. “Background and Responsibilities”, A-1. Spillway; Reference that the spillway is constructed with Roller Compacted Concrete.

Response: Concur. Revision made as suggested.

3. Page I-4. “Background and Responsibilities”, A-5. “Project Operations and Maintenance”; Page I-2 references a sediment berm. In the last paragraph it is noted that no additional storage volume is allocated for sediment. This does not appear to be consistent.

Response: The sediment berm is not designed in conjunction with allocation of sediment storage. Its only purpose is to prevent the intake structure from clogging during storm events only, as stated in section I.A.3c. Also, note that we stated in the initial draft of the SI that there is no allowance for sediment, however, it was discovered there was an additional 89.59 ac-ft (110,508 m³) of extra storage that was agreed to be used for antecedent sediment deposition (see preface of the revised SI). Section I.A.5, Project Operation and Maintenance, and other sections of the SI were revised to reflect these changes.

4. Page II-2. “Data Collection and Reporting”; Designation of the Project Operator needs to be established. Is Clark County Public Works the lead on record keeping and monitoring? Clark County Maintenance Management Division should be designated as the lead entity.

Response: Paragraph was modified to state that the Project Operator, Clark County Public Works is required to provide the Corps of Engineers, Los Angeles District with the year’s record of detention basin water surface elevation, inflow and outflow data. The Project Operator may choose internally designate the Clark County Maintenance Management Division as lead entity on record keeping and monitoring.

5. Page III-1, This detention basin is planned to be a multi-functional facility. How are the future public recreational facilities being incorporated into these standing instructions. Should the final design of the future recreational facilities be included within this document.

Response: *It is not necessary at this time to include the future public facilities in the document since the dam supposedly will perform the same way with or without the development. In addition, such public facilities will be designed so they will not have an impact to the performance of the project.*

Response to comments from Gil Suckow, Clark County Department of Public Works dated 25 February 2002, on draft Blue Diamond Standing Instructions.

1. Page ii. The gross capacity at the dam spillway crest is 2268 acre feet while the 100-year flood (Design Flood) inflow volume is 2370 acre feet. Is this correct?

Response: See “Preface” of the revised SI. The design storage capacity of the detention basin is 2313 ac-ft (2,852,791 m³). This supersedes the storage table in the Blue Diamond Detention Basin Design Memorandum, dated April 1998. The design storage capacity includes an allowance of 238 ac-ft (293,571 m³) for sediment deposition during the RDF and 89.59 ac-ft (110,508 m³) for antecedent sediment storage.

Flood Control	2,742,283 m ³	2223 ac-ft
Antecedent Sediment Storage	110,508 m ³	89.59 ac-ft
Gross Capacity at spillway crest	2,852,791 m ³	2313 ac-ft

Note: Flood control includes 238 ac-ft (293,571 m³) for sediment deposition during the RDF.

2. Page I-4. Last paragraph under item 5. Is there no additional sediment storage?

Response: See “Preface” of the revised SI. Page I-4 has been modified. Based on the final design of the BDDDB, there is 89.59 ac-ft available for antecedent sediment storage.

3. Page II-1. Last sentence in the first paragraph. It would appear that the Regional Flood Control District Hydrologist would be better able to prepare any meteorological information.

Response: The last sentence in the first paragraph has been revised to, “The Project Operator shall also obtain data from the Clark County Regional Flood Control District Hydrologist and the National Weather Service regarding hydrometeorological conditions.”

4. Page T-3. The crest elevation shown on page ii is 1966.24 with the area at dam spillway 111.5 acre. The table indicates an area of 114.2. Is there an apparent error in the data being presented?

Response: The area table on page T-3 has been updated with the final design and page ii has also been updated. The area at dam spillway is 116 ac on both pages. This supersedes the area table in the Blue Diamond Detention Basin Design Memorandum, dated April 1998. Also see “Preface” of the revised SI.

5. Page T-4. The crest elevation is correct, but there appears to be some inconsistency with the storage area data listed on page ii.

Response *The storage table on page T-4 has been updated with the final design and page ii has also been updated. This supersedes the storage table in the Blue Diamond Detention Basin Design Memorandum, dated April 1998. Also see “Preface” of the revised SI.*

6. Page T-5. The peak discharge information on page ii appears inconsistent. The data in the table is 216 cfs and the information on page ii is 212.9.

Response: *The discharge values on page T-5 have been updated with the final design values. On Table T-5, the peak discharge at spillway crest elevation is 218 cfs and the RDF Routing’s, peak outflow is 218 cfs at maximum stage of 2966.14 ft (see plate 24). Also see “Preface” of the revised SI on why the spillway crest elevation is higher than the RDF routing’s maximum elevation.*

7. I am requesting that the sediment information for a ten-year and twenty-five year storm be provided in the manual and the appropriate formula for the calculation for any year sediment load.

Response: *Per a telephone conversation between Ms. Jody Fischer of the Corps, Hydrology and Hydraulic Section and Mr. Gil Suckow in February 2002, Mr. Suckow accepted that only the average annual debris and the 100-yr sediment would be provided. This information is included in the Standing Instructions on page I-2. According to the Sediment and Debris Yield results (Reference: Blue Diamond Detention Basin Design Memorandum, Hydrology Appendix, Page A1-7), the 100-year computed probability debris yield estimate for Blue Diamond Detention Basin is 293,571 m³. The average annual sediment yield is 19,571 m³/yr (1/15 of the 100-year computed probability debris yield).*

Response to comments from Gil Suckow, Clark County Department of Public Works dated 27 February 2002, on draft Blue Diamond Standing Instructions.

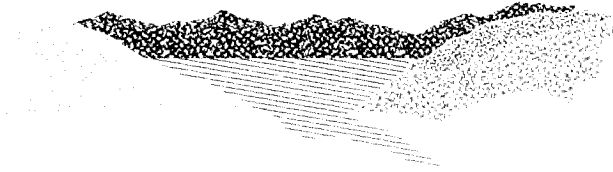
1. Page 1-5. Item 2. Please clarify who is the Project Operator. What does SPL stand for? The SPL Reservoir Operations Center is not specifically identified and listed in Table I-1. The sentence “In addition, the Clark County Department of Public Works will post...” appears to be confusing in relation to the project operator. Please Clarify. Perhaps a list of definitions is appropriate.

Response: *Text in Section I.A.1 has been revised to clarify that the Project Operator is CCPW. SPL stands for the Los Angeles District. This has also been clarified in the text. The sentence “In addition, the Clark County Department of Public Works will post...” has been revised to read, “In addition, the Project Operator will post...”*

2. Page T-2. I am requesting that the table be revised to more accurate conditions. Accordingly, I have asked Tim Sutko, RFCDD Hydrologist, to revise the Table and will forward the corrections to you.

Response: *Table I-2 was modified to show the response implementation plan only and not chain of commands of both agencies and includes the revisions as suggested by Tim Sutko.*

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT



Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

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January 14, 2002

Mr. Matt Shun
U.S. Army Corps of Engineers
Los Angeles District
P.O. Box 2711
Los Angeles, CA 90053-2711

Re: Standing Instructions to the Project Operator for Water Control – Blue Diamond Detention Basin

Dear Mr. Shun:

Clark County Regional Flood Control District (District) reviewed draft *Standing Instructions to the Project Operator for Water Control – Blue Diamond Detention Basin, Blue Diamond Wash, Clark County, Nevada* dated August 2001. Blue Diamond Detention Basin is a feature in the Tropicana and Flamingo Washes project, a cost share project between the U.S. Army Corps of Engineers (Corps), District, and Clark County Department of Public Works (CCPW). The following comments are offered for your consideration as the project proceeds.

1. Pertinent Data Tables. Change 100-year peak inflow to read 13,800 cfs rather than 138,000 cfs. Probable maximum flood (PMF) peak inflow and outflow values (146,588.3 cfs) are equal, however spillway design discharge (144,500 cfs) indicates there is attenuation of PMF event. On metric Pertinent Data Table, spillway design discharge and PMF inflow and outflow values all equal 4,105.94 m³/s, which indicates no attenuation of PMF event. In addition, conversion of 4105.94 m³/s is 145,000 cfs in English units, which does not agree with English Pertinent Data Table. Determine correct spillway design discharge and PMF peak inflow and outflow values, and be consistent in Pertinent Data Table, text, and figures. Explain why elevation of spillway maximum water surface (2973.74 ft/906.40 m) does not agree with PMF peak elevation (2972.61 ft/906.05 m). Values listed elsewhere in report should be reflected in Pertinent Data Tables. Resolve these and other discrepancies described herein.
2. Section I.A.1. District is listed as Project Operator and keeper of Standing Instructions. In accordance with Project Cooperation Agreement, Corps will turn project over to CCPW, who will be responsible for inspection, maintenance, and

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT

Mr. Matt Shun
January 14, 2002
Page 2

operation of facility. District will provide funds to CCPW to inspect, maintain, and operate facility. Clarify appropriate responsible local agencies. Provide CCPW with copy of Standing Instructions.

3. Section I.A.3. Detention basin storage capacity is listed as 2030 acre-feet. Total storage capacity is 2268 acre-feet according to Pertinent Data Table and *Design Memorandum – Blue Diamond Detention Basin* dated April 1998, and 2382 acre-feet according to Plate 18. Resolve discrepancies or clarify that storage volume of 2080 acre-feet is for clear water only.
4. Section I.A.3, Embankment. Continue outline numbering system on project components within body of report. Coordinate values of embankment crest elevation and maximum height above streambed with Pertinent Data Table.
5. Section I.A.3, Outlet Works. In addition to clogging, trash rack prevents damage to outlet conduit from large debris. Please include this purpose in trash rack description.
6. Section I.A.5. Corps states that Project Operator is required to remove sediment accumulation annually and after each major storm event. Standard practice for other District-funded facilities is to remove sediment once it accumulates to a pre-determined level, such as crown of sediment berm. Please confirm with CCPW District's understanding of their maintenance procedure to remove sediment when level reaches crown of sediment berm in Blue Diamond Wash Detention Basin.
7. Section B.2. Identify "SPL" and provide name, title, address, and/or phone number of contact.
8. Section II. Clarify that District, not Project Operator, owns, operates, and maintains flood threat recognition system (gages), however, CCPW (Project Operator) will be responsible for monitoring site during a storm event. District is unaware of a stream gage downstream of outlet works. Refer to District web site at www.CCRFCD.org for map of gage locations.
9. Table I-2. Provide Chain of Command for CCPW, Project Operator, in Table. Include District's role as owner of flood threat recognition system (gages).

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REGIONAL FLOOD CONTROL DISTRICT

Mr. Matt Shun
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Page 3

10. Tables I-3 through I-6. Tables are reportedly taken from *Design Memorandum – Blue Diamond Detention Basin* dated April 1998, or revised based on As-Built information. However, values conflict with information provided in Pertinent Data Table. Resolve the following discrepancies:
 - a. Tables I-3 and I-3a. Detention basin area at spillway crest is greater in tables than given in Pertinent Data Table.
 - b. Tables I-4 and I-4a. Detention basin storage capacity at spillway crest is greater in tables than given in Pertinent Data Table.
 - c. Tables I-5 and I-5a. Outlet works discharge rate at 100-year peak flood elevation is slightly greater in tables than in Pertinent Data Table.
 - d. Tables I-6 and I-6a. Outlet works discharge rate at maximum water surface elevation is less in tables than reported in Section I.A.3, Outlet Works.
11. Plate 18. Basin capacity at spillway crest is 2382 acre-feet on figure and 2268 acre-feet on Pertinent Data Table. Please verify total capacity at spillway crest. If actual basin capacity is 2382 acre-feet, 352 acre-feet is available for sediment storage, which is 114 acre-feet more than debris yield produced by 100-year storm event. Therefore, additional sediment storage is available to allow CCPW to perform standard maintenance procedures as described in Comment 6. PMF peak flowrate is given as 146,588.3 cfs on Pertinent Data Table. Resolve discrepancies.
12. Plates 22 and 22a. Maximum pool elevation on figures agrees with spillway elevation of maximum water surface, but not PMF peak elevation on Pertinent Data Table. Resolve discrepancies.
13. Plates 23 and 23a. On Plate 23, correct drainage area, maximum storage, maximum stage, and maximum outflow to match Pertinent Data Table and Plate 18. On Plate 23a, correct maximum storage and maximum stage to match Pertinent Data Table and Plate 18.

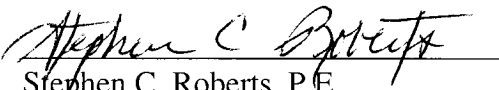
C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT

Mr. Matt Shun
January 14, 2002
Page 4

14. Plates 24 and 24a. On Plate 24, correct drainage area, maximum inflow, maximum storage, inflow volume, and maximum stage to match Pertinent Data Table and Plate 18. On Plate 24a, correct maximum storage, inflow volume, and maximum stage to match Pertinent Data Table and Plate 18.
15. Plate 25. Remove stream gage note from figure.

If you have any questions regarding District comments on this project, please give me a call.

GALE WM. FRASER, II, P. E.
General Manager/Chief Engineer

BY: 
Stephen C. Roberts, P.E.
Engineering Manager

SCR/jar

cc: Kevin Inada, COE
Tom Sage, COE
Rob Caskie, COE
John Catanese, CCPW

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Department of Public Works

500 S Grand Central Pky • PO Box 554000 • Las Vegas NV 89155-4000
(702) 455-6000 • Fax (702) 455-6040

M.J. Manning, Director • E-Mail: mjm@co.clark.nv.us

March 5, 2002

Cynthia M. Wong
U.S. Army Corp of Engineers
Los Angeles District
P.O. Box 532711, CESPL-CO-O
Los Angeles, CA 90053

USACOE BLUE DIAMOND DETENTION BASIN FLOOD CONTROL FACILITY STANDING INSTRUCTIONS TO THE OPERATOR FOR WATER CONTROL

Dear Ms. Wong:

Clark County Department of Public Works has completed review of the Draft Standing Instructions to the Project Operator for the Water Control Blue Diamond Detention Basin. The following corrections and comments are offered for your consideration:

- Page I-1, "Background and Responsibilities", A-1. General Information; in addition, a copy of the Standing Instructions need to be referenced to Clark County Department of Public Works (CCPW) which Owns, Operates and Maintains the Detention Basin facility.
- Page I-2, "Background and Responsibilities", A-1. Spillway; Reference that the spillway is constructed with Roller Compacted Concrete.
- Page I-4, "Background and Responsibilities", A-5. " Project Operations and Maintenance"; Page I-2 references a sediment berm. In the last paragraph it is noted that no additional storage volume is allocated for sediment. This does not appear to be consistent.
- Page II-2, "Data Collection and Reporting"; Designation of the Project Operator needs to be established. Is Clark County Public Works the lead on record keeping and monitoring? Clark County Maintenance Management Division should be designated as the lead entity.
- Page III-1, This detention basin is planned to be a multi-functional facility. How are the future public recreational facilities being incorporated into these standing instructions? Should the final design of the future recreational facilities be included within this document?

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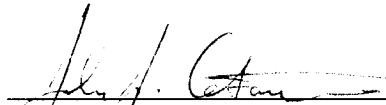
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THOM REILLY, County Manager

On October 23, 2001, Jim Farley with the USACOE conducted the Blue Diamond Detention Basin dam safety and periodic inspection class which included a field inspection at the dam site. Items of concerns were addressed and repairs were pointed out. Were these repairs made and incorporated in the "AS-BUILT" record drawings provided? Were the sponsors provided a back check of the list of concerns and corrections?

Included with this submittal are the comments provided by Gil Suckow with Public Works Maintenance Management Division, dated February 25 and 27, 2002. Please call Mr. Suckow at (702) 455-7540 for any questions or comments regarding his review.

If you have any questions or comments, please call the undersigned at (702) 455-6616.

M.J. MANNING
DIRECTOR OF PUBLIC WORKS

BY: 

JOHN J. CATANESE
Associate Engineer

JJC:cf

Attachments

cc: Kevin Inada, U.S. Army Corps of Engineers, Los Angeles
Tom Sage, U.S. Army Corps of Engineers, Los Angeles
Huma Nisar, U.S. Army Corps of Engineers, Los Angeles
Gale Wm. Fraser II, Clark County Regional Flood Control District
Tim Sutko, Clark County Regional Flood Control District
Cameron Harper, Manager, Maintenance Management
Gil Suckow, Maintenance Management
Denis Cederburg, Manager, Design Engineering

MEMORANDUM

M. J. MANNING
DIRECTOR

Department of Public Works

TO: JOHN CATANESE, ASSOCIATE ENGINEER, DESIGN ENGINEERING

FROM: GIL SUCKOW, PRINCIPAL ENGINEERING TECHNICIAN, MAINTENANCE MANAGEMENT DIVISION

SUBJECT: STANDING INSTRUCTIONS TO THE PROJECT OPERATOR FOR WATER CONTROL BLUE DIAMOND DETENTION BASIN

DATE: FEBRUARY 25, 2002

Provided are review comments for the above mentioned project:

1. Page ii. The gross capacity at the dam spillway crest is 2268 acre feet while the 100 year flood (Design flood) inflow volume is 2370 acre feet. Is this correct?
2. Page I-4. Last paragraph under item 5. Is there no additional sediment storage?
3. Page II-1. Last sentence in the first paragraph. It would appear that the Regional Flood Control District Hydrologist would be better able to prepare any meteorological information.
4. Page T-3. The crest elevation shown on page ii is 1966.24 with the area at dam spillway 111.5 acre feet. The table indicates a volume of 114.2. Is there an apparent error in the data being presented?
5. Page T-4. The crest elevation is correct, but there appears to be some inconsistency with the storage area data listed on page ii.
6. Page I-5. The peak discharge information on page ii appears inconsistent. The data in the table is 216 cfs and the information on page ii is 212.9.
7. I am requesting that the sediment information for a ten-year and twenty-five year storm be provided in the manual and the appropriate formula for the calculation for any year sediment load.

Should you have any questions or concerns, or wish to discuss my comments further, please let me know.

GS:djt

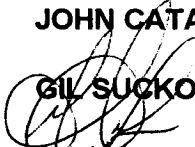
cc: Denis Cederburg
L Cameron Harper

MEMORANDUM

M. J. MANNING
DIRECTOR

Department of Public Works

TO: JOHN CATANESE, ASSOCIATE ENGINEER, DESIGN ENGINEERING

FROM:  GIL SUCKOW, PRINCIPAL ENGINEERING TECHNICIAN, MAINTENANCE MANAGEMENT DIVISION

SUBJECT: STANDING INSTRUCTIONS TO THE PROJECT OPERATOR FOR WATER CONTROL
BLUE DIAMOND DETENTION BASIN – ADDITIONAL COMMENTS

DATE: FEBRUARY 27, 2002

Provided are review comments for the above mentioned project:

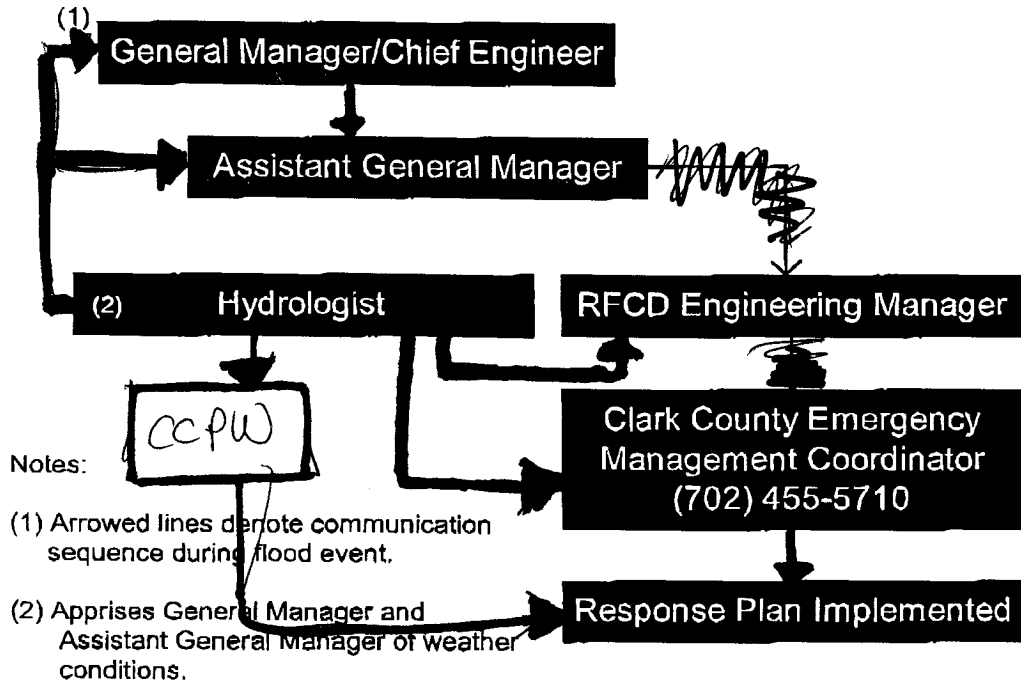
1. Page 1-5. Item 2. Please clarify who is the Project Operator. What does SPL stand for? The SPL Reservoir Operations Center is not specifically identified and listed in Table I-1. The sentence "In addition, the Clark County Department of Public Works will post..." appears to be confusing in relation to the project operator. Please Clarify. Perhaps a list of definitions is appropriate.
2. Page T-2. I am requesting that the table be revised to more accurately reflect actual conditions. Accordingly, I have asked Tim Sutko, RFCD Hydrologist, to revise the Table and will forward the corrections to you.

Should you have any questions or concerns, or wish to discuss my comments further, please let me know.

GS:djt

cc: Tim Sutko
Denis Cederburg
L. Cameron Harper

**Table I-2
Chain of Command for Clark County Flood Control District
Response Plan Implementation at Blue Diamond Detention Basin**



For more information or questions, please contact agency personnel at (702) 455-3139.