COVER SHEET

MANAGING COMPLIANCE WITH ENVIRONMENTAL PERMIT CONDITIONS ON A 45-MILE PIPELINE IN CALIFORNIA: PROBLEMS AND SOLUTIONS

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Abstract. The Nacimiento Water Project (NWP) in San Luis Obispo County included 45 miles of pipelines, pump stations, and five construction contracts. Work began in August 2007 and was completed in late 2010. Employing different construction techniques, crossing over multiple streams and rivers, federal and local jurisdictions, and habitat for six endangered species, the NWP required the full suite of environmental permits. In this paper NWP Project Management and the Environmental Team review the design and construction phases and describe the principle issues confronted. For the design phase, the authors note the importance of early briefing of the agencies on the upcoming project. In the construction phase, the NWP team was careful in staffing the construction management group to integrate environmental and engineering specialists as early as possible. The significant issue confronted in the first months of construction, and one commonly encountered, was starting construction before all of the permits were complete, in this case because of very recent and numerous cultural resource discoveries.

In what the authors call "Permit Compliance and the Real World" we provide an overview, and specific examples of, addressing day-to-day changes in design and unanticipated discoveries of natural and cultural resources, and the total cost of compliance during the duration of the project. Lastly, we offer "Tools for Project Success." Chief among these was the use of a compliance instrument called the Master Compliance Table, a single source for alerting and updating project crews on what permitting issues applied to each segment. Also important was maintaining communication with the agencies during construction, and also knowing what decisions can and should be made by the project compliance staff. The authors conclude that projects of this size and scope are challenging, but an organized and coordinated program, one that starts far in advance of construction and yet is designed to adapt to frequent changes, can maintain schedule and contain costs. We conclude with a case study: encountering a Native American burial site on a National Guard training base.

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INTRODUCTION AND PROJECT BACKGROUND

Nacimiento Reservoir is located entirely within San Luis Obispo County, California (County), just south of the Monterey County border. It was built by Monterey County Flood Control and Water Conservation District (now Monterey County Water Resources Agency) in 1958 for the purposes of abating seawater intrusion in the groundwater aquifers of the Salinas River Valley. The reservoir has a storage capacity of 377,900 acre-feet and is owned and operated by Monterey County Water Resources Agency. In 1959, the San Luis Obispo County Flood Control and Water Conservation District (District) entered into an agreement with Monterey County Flood Control and Water Conservation District to secure rights to 17,500 acre-feet of water per year from Nacimiento Reservoir. At the time of this agreement, the District was merely planning for future water demands and had no feasible means of accessing or distributing this entitlement. The District contemplated and proposed means and methods of utilizing this water entitlement at various times over the following 40 years, but none came to fruition. The County experienced a severe drought in the late 1980's and early 1990's which significantly affected the primary water supply (mainly groundwater) for both municipalities and agricultural businesses. The District began another series of studies in the mid-1990's to distribute Nacimiento water within the County as a supplemental water supply. This time, the participating water agencies realized the time had come for Nacimiento water to be the next affordable water resource within their water portfolio.

The District's Board of Supervisors approved the Final Environmental Impact Report (Marine Research Specialists, 2004) for the Project in January 2004. This approval directed District staff to move forward with executing agreements with local water agencies, permitting, designing, financing, constructing and operating the Project. A project of this magnitude takes several years to coordinate and complete because of all the complexities involved. The Project's schedule is presented in Figure 1, below, illustrating the five phases of effort, including the environmental clearance (under the California Environmental Quality Act [CEQA]), design, bidding, construction, and operation. This paper will present discussions that center on the design and construction phases of the Project.

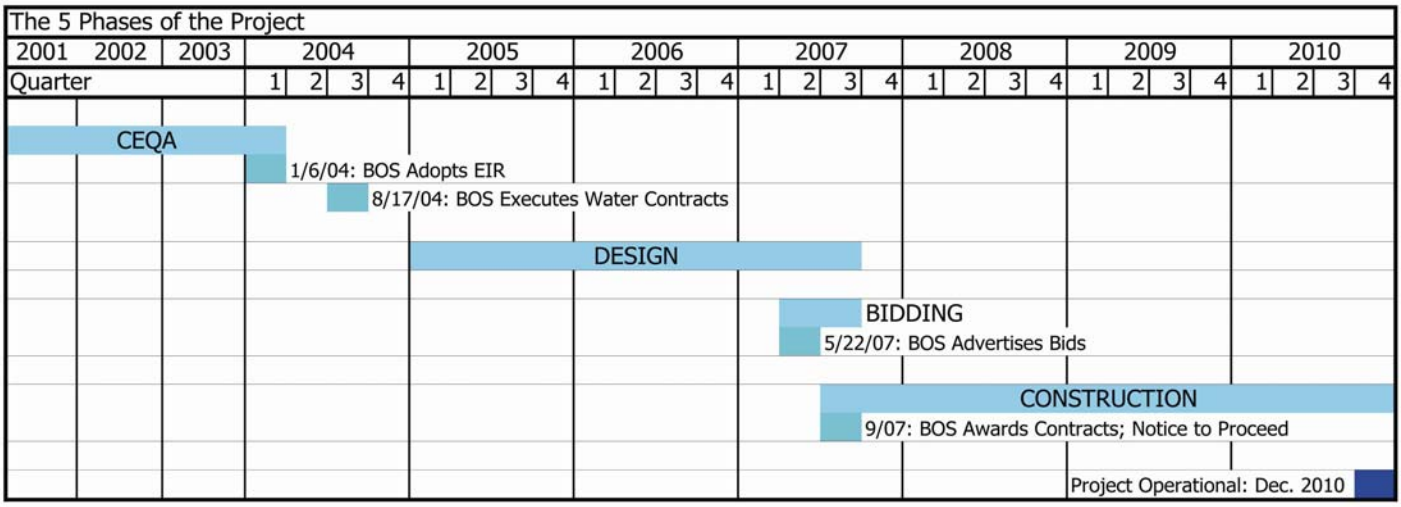

Figure 1 – Nacimiento Water Project Schedule

The Project is a raw water transmission facility created to deliver 15,750 acre feet of water per year from Nacimiento Reservoir to various communities within the County. The rest of the District's entitlement (1,750 acre-feet) is left in the Reservoir for lakeside

use. The Project generally consists of a multi-port intake structure, three pump stations, three storage tanks, 45 miles of pipeline, four turnouts, a control center, and a Supervisory Control and Data Acquisition (SCADA) and Project control system. Its estimated cost was $176-million, including design, construction, construction management, environmental permitting, and right-of-way (ROW). Figure 2 is a generalized map of the Project.

Figure 2 – Nacimiento Water Project Map

DESIGN AND BIDDING PHASE

The design phase of the Project was between 2005 and 2007, and bidding of the five construction contracts that together make up the Project was conducted between May and August, 2007. The District's resources were too limited to spare any staff to administer the Project's Design and Construction Phases; therefore, in April 2005, the District hired a full-time management level civil engineer, the Nacimiento Project Manager, to oversee the Project from the Design Phase through the beginning of the Operation Phase. The District then contracted for the following professional services during the Design, Bidding, and Construction Phases: Management (Project Engineer), Financial Services, Right-of-Way (acquisition, legal and appraisals), Engineering, Construction Management (which includes environmental compliance monitoring), and Environmental Permitting and Compliance. Five construction contractors were hired to execute the building of the Project during the Construction Phase. Figure 3 below presents the organization chart of the entire Project through the Design, Bidding and Construction Phases. During the Design Phase, the Project Team essentially comprised services provided by consultants, which were affectionately known as the "Army of Consultants" by the Nacimiento Project Manager.

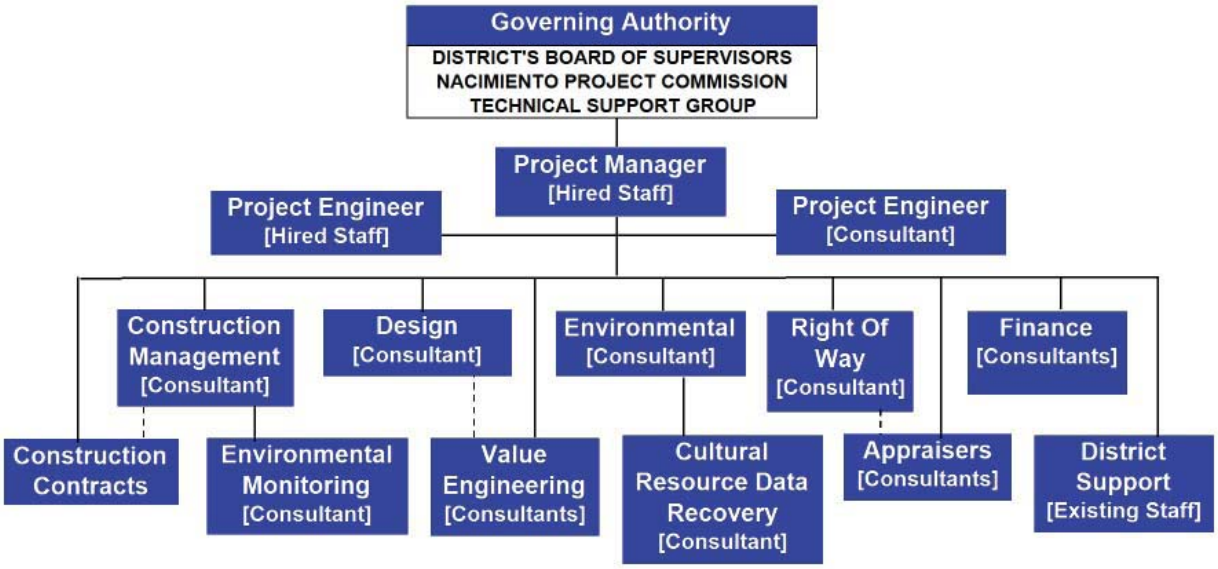

Figure 3 – Project Organization during Design, Bidding and Construction Phases

It is important to note that Permitting and Compliance services were hired well in advance of construction and early in the Design Phase. The consultant's prediction of one year to acquire all necessary permits was accurate. Protection measures needed to be developed for listed and protected species including least Bell's vireo, vernal pool fairy shrimp, San Joaquin kit fox, rare plants, bald eagle, nesting birds, steelhead, and California red-legged frog. Other sensitive resources included state and federal jurisdictional waters (over 70 stream crossings). Sensitive cultural resources were almost as extensive: Previous investigations for the Project identified 50 cultural resource sites along the pipeline route (Gibson and Parsons, 1996) – but it was assumed all could be avoided. Cultural survey work prior to initiating construction found 11 sites which could not.

PROJECT PERMITS AND REGULATORY OVERSIGHT

Project permits and agreements included but were not limited to:

Federal

- United States Fish and Wildlife Service (USFWS) Biological Opinion
- National Marine Fisheries Service (NMFS) Concurrence Letter
- U.S. Army Corps of Engineers (USACOE) Clean Water Act (CWA) Section 404 permit and Memorandum of Agreement for cultural resources

State

- Historic Preservation Officer Section 106 consultation and concurrence
- State Regional Water Quality Control Board RWQCB CWA Section 401
- Department of Fish and Game Stream Alteration Agreements

The complex multi-agency oversight was compounded by the pipeline's route across a National Guard training base (Camp Roberts), with its own unique set of rules and regulations and the requirement that the project have coverage under both state and federal environmental analysis laws, i.e. both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

EXPEDITING THE PERMITS

In spring 2005, the permitting, cultural, and biological staff visited the length of the Project ROW and produced a Project *Constraints Analysis* to determine those resources which would be most sensitive to impact, i.e., could delay the permitting process. Permitting tends to move along a "critical path," and this early reconnaissance allowed the team to get the most difficult permitting endeavors started first. They identified vernal pool fairy shrimp, with known locations in the ROW (and coincidentally on the military base), an active nest site for the endangered least Bell's vireo (see Figure 4,

below), and the threatened steelhead trout, which is present in the area's perennial streams and at certain times of the year in seasonal tributaries. The team developed an animated aerial overhead projection, effectively a flyover of the ROW with all of the resources labeled. Presentations were made to both the USFWS and NMFS, at their offices in Ventura and Santa Rosa respectively. To avoid agency hesitation to engage at this very early point in the process, it was made clear to the regulators that this would be a brief, 15 minute presentation for information purposes only. Nothing was asked of them at that time, but the exposure to the Project, its landscape, and the Project staff made it more likely that the NWP would be treated more expeditiously and the permit application submittals read with greater familiarity.

Figure 4. The least Bell's vireo was observed at the North Salinas River Crossing.

The most basic principle of the permitting strategy was to minimize or avoid impacts wherever possible. This is something that can be done with the flexibility inherent in a pipeline project: a single site with an immoveable footprint can be a greater challenge. However, the approach needs very robust data on the locations of sensitive resources for

the avoidance promise to be credible. In-depth plant and animal surveys were begun early in the permitting year. With design proceeding concurrently, the results of the surveys were useful to the Design Team -- for example, knowing where to narrow the ROW to 30 feet in sensitive plant habitat. With the resources accurately mapped, the precise amount of impact could be calculated by full-time construction monitors in the field when avoidance was not possible, which increased the level of confidence of state and federal regulators in the accuracy of the information provided. This strategy carried with it a calculated risk, however. Avoidance of a resource can expedite the process, but it can be very hard to re-negotiate with the agencies if the Project finds, after construction begins, that avoidance is infeasible (see the story of Sam the Trout, below).

CONSTRUCTION PHASE

The Project entered the Construction Phase on August 28, 2007, when the District's Board of Supervisors approved the bid for the first four of five construction contracts. The bidding process results are presented in Table 1. The environmental permits were

Table 1. Nacimiento Water Project Construction Bidding

Construction Contract Name	Contractor	Bid Value
Spec 1 – Intake	James W. Fowler Company Dallas, Oregon	$20.8 million
Spec 2 – Facilities	Mountain Cascade Inc. Livermore, California	$25.6 million
Spec 3 – Pipeline North	Teichert Construction Sacramento, California	$38.4 million
Spec 4 – Pipeline Central	Whitaker Contractors Inc. Paso Robles, California	$22.7 million
Spec 5 – Pipeline South	Southern California Pipeline Construction Co. Tustin, California	$16.3 million

obtained prior to bidding the construction, and these permits were incorporated into the construction documents in several ways. A set of environmental plans were created as aerial images showing the features of the Project and populated with shading that represented specific environmental mitigation measures that were mandated in the Project's Final Environmental Impact Report (FEIR) and the environmental permits. A narrative of the environmental mitigation requirements was provided in the General Requirements of the Project's specifications. And finally, each permit was reproduced in the appendix of the construction documents. This linking of bid documents and compliance requirements, something not universally practiced, is made possible by the early start on permitting, and by having the environmental group part of the organization from the earliest possible point in time. Designs are developed consistent with both engineering and environmental priorities. They are vetted and cross checked. But making them part of the construction contracts puts a legal obligation on the contractors to know, understand, and follow the environmental, as well as the design specifications.

Environmental Team Structuring and Staffing. The Project's environmental compliance and reporting tasks were contracted to a single consultant who organized the archaeological, biological, and paleontological monitoring efforts. The Environmental Team was led by an Environmental Project Manager who interfaced with the Project's management personnel and when appropriate, regulatory staff on behalf of the District. The environmental field supervisor acted as the in-field task leader for environmental compliance, working alongside the Contractors to understand the construction schedules,

coordinate the appropriate resource monitors, and address day-to-day compliance issues as they arose.

The integration of the environmental specialists into the Construction Management Team was critical to the Project's success and was reinforced by their attendance at the Contractors' weekly progress meetings, planning sessions to resolve constructability issues related to environmental constraints, and frequent communication at all levels. The team provided responses to Contractor questions and submittals as requested by the Construction Management Team.

The Nature of Construction – Solving Issues Unresolved in the Design Phase. Perhaps the most profound challenge to the start of construction came in early December 2007 when the Project was faced with pipeline contractor mobilization in early January 2008 without a Memorandum of Agreement (MOA). This agreement, required under the Corps of Engineers 404 Nationwide permit, dictated the Project's treatment of cultural resources and their protection.

The Project developed a "Plan B" approach, which subdivided the 45-mile alignment into three categories: areas of known cultural resources, areas that had a potential to have buried resources, and those which had a low potential for cultural resources. The Project proposed that work could begin in areas that had a low potential for cultural resources. The other areas (with known or potential for buried resources) would be avoided by the Contractors until the MOA had been signed by the multiple signatories. By subdividing

the Project in this way, work could proceed outside of culturally sensitive areas, avoiding a suspension of work and demobilization by the Contractors.

The USACOE archaeologist agreed to the approach and pipeline mobilization went forward in early January 2008. The last signatory signed the MOA in March 2008; as pre-construction archaeological investigations were conducted and concluded at each segment, the area was made available to the Contractors.

OVERCOMING OBSTACLES

Permit Compliance and the Real World. Often, once a Project has received the regulatory permits and authorizations, the communication between the Project and the regulatory agencies dwindles to the required pre-construction notifications and report submissions. Given the high-profile of the Project, the Management Team agreed internally to give informal updates to the agency representatives on the Project's progress. These updates between the Environmental Team and the District to regulatory staff served to maintain a positive relationship, and when situations required notification and consultation, the agency representatives did not require lengthy reminders of the Project's components and environmental commitments.

The current regulatory environment governing sensitive resources is not organized to facilitate projects during construction, especially when unanticipated resources are discovered. As such, the Project must be prepared to find a design solution, when needed, rather than wait for a permit amendment or agency concurrence. For cultural

resources, a Project's Archaeological Research Design and Treatment Plan (ARD/TP) provides an action plan to help address cultural resources as they are encountered. For biological resources, there is not a comparable mechanism.

Sam The Trout. The Letter of Concurrence from NMFS enabled the Project to go forward without a lengthy consultation on the listed steelhead. It was predicated on the determination the Environmental Team had made that all 70 crossings of seasonal streams would occur when these tributaries to steelhead habitat would be dry. This was true for all but one, a tributary to the steelhead-bearing Santa Margarita Creek, where, during the summer of 2008, the creek was found to be live, that it supported a bathtub-

Figure 5. Sam's Place

sized pool, and that the pool contained steelhead, the largest of whom was fondly named "Sam the Trout" after the County's storm water protection mascot "Sammy the Steelhead." Figure 5 is a photograph of the small pool located downstream of a 36-inch culvert where Sam was found to be living. The pipeline's design called for an open cut-and-cover trench installation through this region of the stream. Crossings of other perennial streams avoided impacts by boring under the waterways, with a biological

monitor on the lookout for any problems, but there was no authority granted to the Project to physically move fish out of harm's way. This was considered "harassment" under the broad definitions of the Endangered Species Act, since the fish could be harmed during any rescue attempt. So the most obvious solution was illegal. The next alternative was to play by the rules established for the live crossings—bore underneath the stream. However, on September 9, the fisheries monitor advising a crew preparing to begin the bore concluded that dewatering the bore shaft would also drain the pool. The District contacted NMFS both formally and informally and was told in March, 2009 that the removal of a culvert blocking fish passage might have some merit as a trade-off for the risk to the fish, provided that extensive studies of the hydrology of the stream were performed. With time running out before the construction season for the stream crossing began, the District went back to the engineers, who designed a suspended crossing for the pipeline by placing the pipe within a large diameter steel casing that bridged across the stream (see Figure 6).

Figure 6. – Pipe Bridge over "Sam-the-Trout's" Habitat

The unanticipated Sam was observed early, both the permitting specialists and agencies contacted appropriately, and the engineers faced with a challenge they overcame with a

simple and elegant solution. If the plan for beginning construction within culturally safe areas (described as "Plan B," above), illustrates a flexible and reasonable way for regulator and proponent to accommodate both resource and the Project, Sam the Trout illustrates the opposite. However elegant the solution, it took a year to reach.

THE COST ASSOCIATED WITH THE PROJECT'S ENVIRONMENTAL COMPLIANCE

Any entity, whether private or public, that wishes to develop a project must adhere to certain environmental regulations intended to mitigate the anticipated environmental impacts of the project. Every environmental regulation and environmental permit mandate has impacts to both the design and construction, and these ultimately affect the project's schedule and budget. A public agency that develops a project passes the environmental compliance costs on to the public that benefit from the project. The Nacimiento Water Project was no different: the public that benefits is the population of the Project's participating agencies. The people of San Luis Obispo County, California, are stewards of this area's environment and they expect owners of a project to exercise good environmental stewardship practices; however, they rarely have an opportunity to see the cost implications of complying with the myriad of environmental regulations imposed on the projects which they are funding. What exactly are those costs for environmental compliance? Engineers have a much easier time answering the general public's questions on how much brick-and-mortar-type projects cost, but engineers and environmental specialists are not so well equipped with answers to the direct and indirect costs associated with environmental compliance. The purpose of this section of the paper

is to provide a case history presenting the actual itemization of the costs associated with the Project's environmental compliance. The Project's environmental costs are both direct and indirect, and examples of these are presented in Table 2.

Table 2. Examples of Direct and Indirect Costs Associated with Environmental Compliance for the Project

Direct Costs	Indirect Costs
➢ Costs for preparing the project's environmental impact documents ➢ Costs during the design phase for preparing the environmental permit applications ➢ Costs for implementing permit requirements into construction contract documents ➢ Costs for environmental monitoring during construction ➢ Costs for environmental reporting during construction ➢ Costs for adaptive management activities to respond to changed environmental conditions found during construction ➢ Costs for post-construction environmental reporting	➢ Costs associated with environmentally-driven design decisions associated with avoiding and/or mitigating environmental permitting impacts ➢ Costs associated with permit-mandated schedule restraints that affect efficiency of construction activities ➢ Unanticipated resource finds and rigid (inflexible) regulations that cannot rapidly mitigate for such finds and enable the project to proceed in a timely cost-effective manner ➢ Schedule slippage due to late and/or changed decisions by regulators

Costs for environmental compliance are billed to the Project's participating agencies as a pro-rata of the annual volume of water that they contracted for with the District regardless of where the participating agency is geographically located along the pipeline. Each agency recognized this method of cost allocation as the most fair as compared to allocating the cost to the specific area where the environmental impact occurred along the pipeline.

Direct Costs of Environmental Compliance. Table 3 presents a summary of the direct costs associated with the Project's environmental compliance obligations. The cost is about $9.8-million, or about 5.6 percent of the Design and Construction Phase budget.

The base-value (i.e., the initial budgeted value) was $6.8-million, and changes to the scope of work for both professional services and construction services increased this expenditure by about $3.0-million. Table 4 presents a description of the base and changed scope of work.

Table 3. Direct Costs for Environmental Compliance

Direct Cost Item	Cost
Environmental Impact Report (CEQA)	$1,310,000
Design Phase – District's Resources	$264,000
Design Phase – Base Professional Services	$800,000
Design Phase – Changed Professional Services	$1,623,000
Construction Phase – District's Resources	$340,000
Construction Phase – Base Professional Services	$2,400,000
Construction Phase – Changed Professional Services	$955,000
Construction Phase – Bid Environmental Mitigation	$1,687,000
Construction Phase – Changed Environmental Mitigation	$406,000
TOTAL	**$9,785,000**

Indirect Costs of Environmental Compliance. The indirect costs of environmental compliance include those design-based decisions that are made to avoid and/or mitigate environmental impacts. They also include unknown changes to the construction schedule when resources are discovered during the excavation process. The actual cost associated with these is often less precise; however, their order-of-magnitude value can be discussed and presented. The utilization of trenchless technology to cross the Nacimiento (one crossing) and Salinas Rivers (five crossings) will serve as an example. The District's management and environmental staff, in cooperation with the pipeline design and the environmental permitting consultants, took into consideration the cost to mitigate and the permit scheduling duration when evaluating the crossing of the rivers. Both rivers could be crossed using standard open cut-and-cover trenching technology, yet the

environmental regulatory community might consider this as too harmful to the habitat. Both rivers are considered habitat for steelhead.

Table 4. Base and Changed Scope of Work for Environmental Compliance

Base Scope of Work	Changed Scope of Work
<u>Design Phase</u> ➢ Environmental Permit Applications ➢ Prepare Construction Documents to Include Environmental Mitigation Measures <u>Construction Phase</u> ➢ Environmental Compliance Monitoring ➢ Environmental Compliance Training ➢ Environmental Permit Reporting	➢ EIR Addenda ➢ CA Dept of Fish & Game Permit for Geotechnical Exploration near Streams ➢ NEPA EIS Document* ➢ Phase 1 Pre-Excavation for cultural and paleontology resources ➢ Additional Phase 2 and 3 work ➢ Treatment of Groundwater ➢ Limited Work Near Raptor Nest ➢ Tightened Work Area ➢ Shutdown for Discoveries ➢ Support of Additional Phase 2 and 3 Investigations ➢ Demobilize Around Environmental Work Areas ➢ Extend Bore and Jack Tunnel ➢ Hazardous Material Handling

*An unexpected expense was the cost to generate a NEPA Environmental Impact Study for the portion of the Project on Camp Roberts. Initial consultation with the National Guard and the Corps of Engineers led the District to understand that the CEQA EIR document, which was prepared to be a dual EIR and EIS document, would satisfy those agencies' requirements for environmental compliance reporting. The late decision requiring a NEPA EIS caused a ripple effect in the procurement of ROW on Camp Roberts, and delayed Contractor's access to the post for construction.

The Salinas River typically is a dry sand-bottom waterway during the summer, while the Nacimiento River is wetted with water conservation flows released from Nacimiento Dam. The use of horizontal directional drilling (HDD) trenchless technology was evaluated as the most advantageous to avoiding environmental constraints for crossing these streams (Hollenbeck 2009). Ten thousand feet of steel pipe was installed using HDD technology for these river crossings at an aggregate cost of $10.8-million. The unit

cost of installation is $1,080 per foot, albeit the diameters for these installations vary from 8-inches up to 30-inches. The weighted average of pipe diameter (i.e., summation of the product of HDD length times the HDD pipe diameter, divided by the aggregate HDD length) is 24-inches. The bid unit price for cut-and-cover trenched installation of 24-inch diameter pipe is $219 per foot, or about one-fifth the cost of the HDD installation. The unit cost for these installations cannot be compared with one another because the depth of trenched installation was a minimum 42-inches below grade, whereas the installation in the river (if trenched) would be closer to 20-feet below grade to avoid the scour zone of the river during significant floods. What can be inferred, however, from comparing these two costs is that trenched construction is significantly less expensive than HDD construction. The District recognized this when the Project was being designed, and nonetheless judged HDD technology as the better investment for the Project to cross the rivers when evaluating the impact to the environment, coupled with the reduced risk to environmental permit scheduling.

TOOLS FOR PROJECT SUCCESS

Team Building and Early, Open Communication. Surprises, mistakes, and disappointments occur during large projects; the Nacimiento Water Project was no exception. However, overall costs remained within budget and the Project was completed on time. And most of those involved still greet each other with a smile and a handshake. Success was due in part to attention paid to the environmental process throughout the Project. During the Design Phase, District staff began to look ahead to Construction, and how best to organize the team to ensure compliance with

environmental permit conditions. An environmental firm was needed with the capability to simultaneously monitor multiple construction sites with a variety of specialists. At the same time, Project Management debated the most efficient way to integrate the environmental firm into the team. Because of District staff's experience with the Project during the Design Phase, and familiarity with local environmental resources, staff solicited proposals and selected the environmental monitoring firm. Project leaders decided to place the environmental firm under the Construction Manager's oversight. This relationship ensured enhanced communication regarding construction schedules and activities, and the most effective use of the construction (compliance) monitor's personnel over the five construction contracts.

Prior to construction, half-day partnering workshops were held for each construction contract. A partnering specialist not otherwise involved in the Project facilitated these sessions. Participants included key members of each contractor's firm, the construction management firm, environmental monitoring staff, as well as the Nacimiento Project Manager and other key District staff. The sessions provided a forum for the players to get to know one another, build trust, and establish protocols for efficiently resolving differences. Most importantly, the sessions encouraged all parties to work together to complete the project without becoming adversaries. Also before construction began, environmental training for managers and supervisors was provided, tailored for each construction contract. A PowerPoint presentation focused on sensitive biological and cultural resources, permits, and highlighted date restrictions and pre-construction surveys required prior to mobilization to new sites. This training provided the opportunity for

each contractor to ask questions such as "What do we do if we encounter cultural resources?" Most importantly, managers were in the same room to openly discuss issues that could arise and how the Project would address them. Compliance issues had to be repeatedly addressed during construction, but the training for supervisors laid an important foundation by identifying key environmental and contractor representatives, and established the Construction Manager as the enforcer of environmental responsibilities.

Clear communication was also enhanced because the Nacimiento Project Manager and environmental staff were engaged in the environmental decision making throughout the Design and Construction Phases. This strong local agency presence provided a consistent foundation of leadership, while allowing the environmental monitoring staff to independently make decisions in most cases. When District input was sought, the Nacimiento Project Manager and environmental staff strived to respond in a timely manner. District staff provided constructive feedback on all draft reports and work products, and tried to work as a partner with the environmental consultants. Staff, consultants, and contractors do not always agree about environmental issues, or on the best approach to address environmental challenges. However, the Project succeeded in part because management worked to establish a cooperative team atmosphere, and to maintain this good will until water deliveries began.

The Master Compliance Table. Prior to the start of construction, the Project developed a Master Compliance Table (MCT) to consolidate the Project's environmental requirements into a single document for use in the field. The MCT was organized by

stationing, resource type (biological, cultural or paleontological), and provided the protective measures and monitoring requirements at each resource. The MCT was issued to Project personnel including the Contractor, Environmental Team, and Construction Management. In the field, the Contractor's foremen and superintendents used the table to locate the Project's sensitive resources by pipeline stationing. This table was used to coordinate the level of biological, cultural, and paleontological monitoring (fulltime, part-time, or spot-check) and to determine mitigation measure implementation by the Environmental Team (flagging, pre-construction surveys) and the Contractor (avoidance measures, reduced ROW corridors, and site restoration). As a 'living document' the MCT was revised to update location of sensitive resources, unanticipated discoveries, and staging areas. The updated table was provided to the Construction Management Team and the Contractor after each revision.

And at the Eleventh Hour. By November 2009, the Project had overcome numerous challenges through creative design solutions and teamwork. Within a quarter mile of the pipeline's completion, the end was literally in sight when trench construction encountered a Native American burial on Camp Roberts, the National Guard base. Cranial fragments were first identified within the spoil piles by the onsite Native American monitor. Upon closer inspection of the trench wall, a portion of a skeleton was observed. Construction activities immediately ceased and the Project's Management Team notified. Under other circumstances, such a discovery could have put the Project on hold, indefinitely.

An onsite meeting was convened the next day with managers present from the District, Environmental Team, Design Team, Contractor, and representatives from the Native American community and the California National Guard. An action plan to proceed with trench excavation through the archaeological site was developed and with the USACOE's permission, construction resumed the next day with supplemental archaeological and Native American monitors. With the burial location secured, both for trench safety and as protection from possible looting, the Project turned its attention to the skeleton, which was still within the trench wall. Several conundrums were immediately clear: 1) the Project's MOA did not identify a most-likely descendant (MLD) tribe for the National Guard base and the tribe conducting the Native American monitoring on the base was not federally-recognized; 2) without a federally-recognized tribe to participate in the Native American Graves Protection and Repatriation Act (NAGPRA) process, the skeleton could remain in a secure storage facility indefinitely; and 3) the process on a National Guard base was unclear.

The Project contacted the USACOE archaeologist for guidance. On behalf of the project, the archaeologist voluntarily took the lead to coordinate with the other MOA signatories, guiding the project through the NAGPRA process, avoiding regulatory limbo. The Native American Heritage Commission (NAHC) and the USACOE archaeologist contacted the local federally-recognized tribe who agreed to represent the most-likely descendents.

Pipeline trenching was completed adjacent to the archaeological site four days after the discovery of the burial; the remainder of the pipeline was then installed. The burial was removed within 30 days. The NAGRPRA process proceeded and the skeleton was re-interred nearby within 90 days of its discovery. From the beginning of construction, the Project had established strong internal and external communication channels amongst the Project's participants. As described above, from the first days of construction, the Project developed and then maintained an ongoing dialogue with the USACOE's archaeologist. The positive relationship with the lead agency resulted in the effective, swift and respectful resolution of the burial amongst all the MOA the signatories.

CONCLUSION

Complying with environmental commitments on a large infrastructure project can be expensive and frustrating. Regulators can be difficult to reach, and demands on their time (and the way environmental process guidelines are written) can make original positions inflexible, even when it seems to fly in the way of common sense. Why couldn't Sam the Trout have been moved with a bucket and a dip net? On the other hand, several Fish and Game Agreements were successfully amended to accommodate changed conditions, the Project instituted a procedure for evaluating extra work spaces without having to refer back to the Corps for permission, and were able to observe improvements in the way construction crews operated through a combination of admonition, education, and providing them with up-to-date information via the MCT. Until federal regulatory budgets are increased or permit processes streamlined, environmental compliance will continue to require imagination, cooperation and a lot of hard work.

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