1.1.1. Proposed Monitoring

A primary objective of the program is to assess effects of beach nourishment on area beaches. Construction monitoring data will be one metric used to quantify the project impacts on the environment. The monitoring data will be important in assessing the success of the program in order to make future adjustments for optimization, if appropriate. The following construction monitoring program components are recommended.

1.1.2. Sandy Intertidal Monitoring

California grunion are known to spawn on nearby Imperial Beach (USACE 1995). California grunion spawn at night as the highest tides recede and after approximately two weeks, recently hatched fish larvae are swept out to sea during high tides. California grunion use the upper intertidal habitat of beaches for spawning from late February to early September. Grunion activity is expected to be concentrated from late March to early June, which does not coincide with the proposed project's implementation schedule. Therefore, no grunion monitoring is proposed.

Other sandy intertidal fauna are anticipated to be present at the project placement site, including macroinvertebrates. These resources are anticipated to be monitored as part of a separate, long-term Biological Monitoring Plan effort over a period beginning prior to placement and extending post-placement. Monitoring during placement operations is not proposed.

1.1.3. Nearshore Sandy Bottom Habitat and Nearshore Reef Monitoring

Pre-project biological surveys noted the presence of sand dollar (*Dendraster excentricus*) beds in the nearshore, in the vicinity of the outer limit of the surf zone direct. Since sand dollars have the ability to move vertically in the sediment and are subject to natural sedimentation events of a far greater magnitude from the Tijuana River, it is anticipated that the population will not be impacted by the project. It is anticipated that the population will be studied separately as part of the long-term Biological Monitoring Plan. Monitoring during the construction phase will not be undertaken due to the likely exceedance of water quality criteria during the wet season.

Monitoring of nearshore reefs is not recommended for the Border Field State Beach site as a result of the lack of nearshore reefs in the area. The closest nearshore reefs are located to the north of the Tijuana River mouth, well outside the immediate area of impact. These reefs consist of a patchy cobble substrate and sand, an environment which is likely near equilibrium with sedimentation loads flowing into the nearshore from the Tijuana River during the wet season (the average of which are several times the volume of the proposed project). Offshore kelp forest resources are located at a greater distance, and also consist of a cobble substrate.

Since nearshore reefs are not present in the immediate vicinity of the project site, and construction will take place during the winter when river discharge may cause bacteriological contamination (and thereby limit water contact), no monitoring is proposed.

1.1.4. Snowy Plover Monitoring

It is well known that an over-wintering population of snowy plovers regularly inhabit the dunes south of the Tijuana River slough mouth, and monitoring provisions were included in the project as a mitigation measure for potential impacts (CDPR 2008). A minimum 400-yard buffer south of the slough mouth will be staked and delineated with signs, and all vehicle traffic and primary construction activities shall be prohibited from this area.

A qualified wildlife biologist monitor will be utilized to both ensure compliance with the mitigation measures and observe plover behavior. The monitor will perform a pre-construction survey and also perform periodic inspections of the construction site during all phases of project implementation to ensure that impacts to all sensitive plants and wildlife are minimized. Inspections should take place once or twice a week, depending on the sensitivity of the resources. The monitor shall have the authority to expand the buffer zone from the south of the slough mouth up to 600 yards, and suspend work activities if necessary, to ensure protection of snowy plovers.

1.1.5. Turbidity

Turbidity will be monitored throughout construction to qualify the effect on ocean water clarity from the project. Conditions in the area are typically moderately clear in the surf zone due to resuspension. Occasional storms cause high turbidity events due to both increased wave action and discharge of suspended solids from the Tijuana River. The project is anticipated to result in increased turbidity, but the condition will be short-lived, limited to the surf zone, and should diminish shortly after construction activities are halted. Turbidity will be monitored by an observer from a vantage point (such as a bluff top landward of the placement site) noting the extent of turbid conditions. The observer will map the area of turbidity each day on a base map and photograph the turbidity in the ocean. A map will be created by the observer, and they will document all other pertinent environmental conditions such as waves, wind, and weather. If monitoring indicates excessive turbidity (greater than ambient beyond one-half mile offshore at or downcoast of the placement site) for a prolonged period (five days), then placement may be modified or halted to reduce turbidity. This judgment will be made by the project engineer in consultation with the California Department of Parks and Recreation (State Parks), the City of Imperial Beach and regulatory staff assigned to the project.

1.1.6. Bacteriological Monitoring

Sediments were tested for bacteria contact and found to contain coliform and enterococcus bacteria. Levels were below the criteria set forth in California Assembly Bill 411, and it is anticipated that further aeration and ultraviolet light exposure during the sediment sorting process and during rehandling during the project would further reduce or eliminate bacteria in sediments proposed for placement.

However, the data demonstrate that bacteriological impacts are a potential issue with respect to water quality, and it is therefore proposed that triplicate monitoring be undertaken once per week during placement activities in the swash zone 100 feet downcurrent of the operations. Testing will include total and fecal coliform (using SM 9221 E) and enterococcus (using SM 9230 B), and be coordinated to occur at the same time as the county's program.

1.1.7. Beach Profiling

Beach profiles will be monitored to quantify sand accretion or loss at Border Field State Park beach. The survey is to provide data that enables the State Parks and the City of Imperial Beach to determine the sand gain or loss at the placement site from the project. A licensed surveyor experienced with the survey methods and the specific project site will generate beach profiles of the site pre- and post-construction. There are two established profiles that will be used for this study. Tasks for beach profiling include:

1) Utilize two existing beach profile transects to document pre- and post-construction conditions. These transects include one that is located within the beach fill footprint that is designated as SS-0005 and one located just downcoast of the site that is designated as SS-0003. Beach profiles at these transects will be surveyed within 30 days prior to construction, and within 14 days after construction to record pre- and post construction conditions, respectively.
2) Record beach and seabed elevation along the profiles from the back of the beach out to the depth of 30 feet relative to mean lower low water. Survey equipment to be used includes:
    a) Standard survey equipment (level, Global Positioning System or GPS, and rod) for work on land; and
    b) A survey boat with a fathometer and GPS for work on the water to tie into the land profile.
3) Reduce data and produce receiver site profiles to compare pre-project with post-project profiles for interpretation and reporting

1.1.8. Surfing

Monitoring of surfing is intended to provide qualitative information to understand if projects caused negative impacts to surfing at Border Field State Beach. This monitoring is not required to be technical nor precise, but rather to be non-technical to simply obtain a sense from observations and periodic interviews/questioning of surfers if the program is problematic to the activity. If so, possibly more detailed data can be obtained to verify concerns. If not, projects should be able to continue without modification. State Parks or City staff or volunteers should be able to perform this monitoring without necessarily being surfers. Simple counts of the number of surfers in the water during the peak surfing times (generally in the morning) should roughly indicate if changed conditions affected surfing. General surfing conditions should be observed and noted over a period of 14 days prior to construction and for at least 14 days after construction, and for no longer than 30 days afterward.

The frequency of observations should be three times per week, with one day falling on a weekend. More frequent observations should be made during construction, such as five times per week.

Observations can be relative short in time, possibly for 15 minutes at some point between the hours of 6 and 9 AM. Observations and notes should be recorded on data recording forms specifying the general conditions:

- month/date/time,
- approximate wave height and direction estimated by the eye,
- tide from a tide book,
- wind as roughly estimated by the observer,
- water temperature from lifeguards, the newspaper, or the observer,
- qualitative water clarity by the observer, and
- number of surfers in the water.

The involved agency staff should perform short interviews with surfers periodically (once during most visits) to ascertain effects of the project that may not be able to be determined from observations. For instance, asking how frequently a person surfs that location and why they surf there rather than elsewhere should help solicit their feelings and experience about the site. Finally, the involved agency staff may surf the site as needed before and after the project to identify potential effects first-hand.

1.1.9. Recreation and Access

Recreation, other than surfing, includes such activities as sun-bathing, swimming, bird-watching, sightseeing, and equestrian uses. The project has the potential to disrupt recreation and access to the BFSP during construction due to the use of Horse Trail Road and Monument Road by heavy equipment. Although the project does not include long-term closure of these roads, vehicular access to the Border Field State Park overlook and parking area may be interrupted along Monument Road. In addition, the horse trail road would be temporarily closed during periods of sediment transport. During construction a flagman and signage at key park access points will be provided to ensure safe public access to the Border Field State Park. In addition, heavy equipment operators shall be briefed on equipment-equestrian interaction safety.

1.1.10. Monitoring Frequency

Monitoring will occur over time from pre- to post-construction as described below.

1) Pre-Project Baseline Monitoring – Surveys of the two beach profiles and general surfing conditions will occur within one month prior to construction to observe and document the baseline condition.

2) Construction Monitoring – Turbidity will be observed during construction to document project effects on a daily basis, and surfing will be observed five days per week. Plover monitoring will be undertaken at times during which heavy equipment is operated at the placement site. Bacteriological testing shall be undertaken weekly.

3) Post-Construction Monitoring – Beach profile monitoring will occur immediately after construction to quantify initial project conditions. Beach profiling will occur at two locations as performed before construction.

4) Longer-Term Post-Project Monitoring – Monitoring will continue after construction to quantify project effects. Beach profiles will be recorded twice for one year after construction. They are to be recorded in fall and spring seasons after construction to determine changes and account for the natural seasonality. Surfing should be observed for at least 14 days, and for no longer than 30 days after construction to identify any trends.

1.1.11. Sediment Screening

Unsorted sediments currently stockpiled at the project site have been characterized in terms of their physical, chemical, and biological characteristics (AMEC 2008). It is anticipated that these sediments will be transported to the placement site during the first and possibly the second placement events. To complete the second and third placement events, it is anticipated that sediments currently residing in the Goat Canyon retention basins will require additional confirmation testing to ensure that their characteristics are similar, and suitable for beach placement. The confirmation testing will included collection of sediments once they are stockpiled (this is anticipated to occur within the October to November 2008 time period). The methods and techniques employed for the initial characterization will be employed (per the approved Sampling and Analysis Plan), but with a much-reduced sampling frequency, since watershed land uses have not changed significantly in the last year. Results of the confirmation testing shall be reported to regulatory agencies in order to obtain a letter of permission well in advance of their placement on the beach.

1.1.12. Reporting

A Project Notification Report (PNR) must be submitted to the USACE, California Coastal Commission, California State Lands Commission, and the San Diego Regional Water Quality Control Board prior to any construction actions. The PNR presents the material source information, specifies the placement site, timing, methods and any other relevant information in context with permit conditions. Reporting requirements are specified and an example of a completed PNR is included in the SCOUP Plan document as Appendix E.

Annual monitoring reports will be submitted to the permitting agencies. Project-specific monitoring reports will also be submitted to all permitting agencies, at 60 days after construction, at 6 months afterward, and at one year after construction (included in annual reports).