



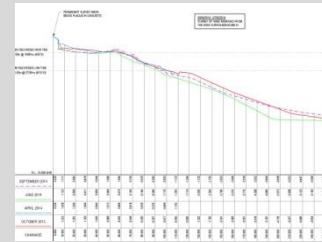
### Data Review and 5 Year Plan

**Commenced: January 2016**  
Specialist Consulting Services will be engaged to conduct a comprehensive review of the data collected so far including identifying gaps and drawing conclusions. They will prepare an overall project schedule and plan for 5 years to guide the **City of Albany** to a medium to long term management plan. Community consultation will be an integral part of this process.



### Structure Condition Survey

**Commenced: October 2013**  
A Structure Condition Survey was conducted of all of the rock structures at Emu Point by coastal engineers in April 2012, October 2013 and November 2014. Photos with GPS coordinates have been recorded to allow for accurate comparison. This is ongoing annually.



### Beach Profiles (Topography & Bathymetry)

**Commenced: October 2013**  
Permanent survey markers were installed and beach transects conducted from Ellen Cove to the Emu Point Boat Pens from the secondary dunes to 250m offshore. This will be carried out every 3 months, at the beginning of each season. **Dept of Transport (DoT)** will also carry out annual bathymetry (sea bed elevation) surveys. This work is ongoing.



### Photo Monitoring

**Commenced: July 2013**  
In July 2013 a photo monitoring program commenced that covered the area from Ellen Cove to the Emu Point Boat Pens. Photo monitoring is inexpensive and identifies trends in beach change, identifies beach management issues and assists in developing strategic directions for coastal planning. It is carried out monthly in summer and fortnightly in winter by **City of Albany** staff and **community volunteers**. This work is ongoing.



**1** AWAC

**2** AWAC

**3** Anemometer

**4** Tide Gauge

**5** Fixed Camera

**6** Trial Groynes

**7** Sand Nourishment

**8** Maintenance

**Commenced: December 2013**  
An Acoustic Water and Current Device (AWAC) was installed by **Dept of Transport (DoT)** offshore of Emu Beach. This measures wave height, period and direction, current speed and direction, water temperature and water levels. The data will be used for model calibration, which assists the design of coastal management solutions. The AWAC will be managed by **DoT**. This work is ongoing.

**Commenced: September 2015**  
In September 2015 an Acoustic Water and Current Device (AWAC) was installed by the **City of Albany** offshore of Middleton Beach. This will allow near shore data from Middleton Beach to be collected which will compliment the data being collected at Emu Point. The AWAC will be in the water for 3-6 months and managed by specialist coastal consultants **Royal Haskoning DHV**.

**Commenced: January 2014**  
Early 2014 an Anemometer was installed on the **Albany Port Authorities'** navigation beacon at Emu Beach. This instrument measures wind speed, direction and gusts and will provide localised data. Live wind data is available for viewing on the **City of Albany** website. This is managed by **Ecotech Pty Ltd**. This work is ongoing.

**Commenced: September 2014**  
In 2014 a tide gauge was installed by **Dept of Transport (DoT)** at the Emu Point Boat Pens. The aim of recording water levels in Oyster Harbour is to establish the effect of the narrow entrance on the water levels in Oyster Harbour during normal tidal conditions and also storm events. This instrument will be supplied and managed by **DoT**. This work is ongoing.

**Commenced: October 2014**  
A fixed time lapse camera was installed at the Western end of the rock revetment. This camera takes an image every half hour and these can be compiled into a time series video. This is managed by **BMT Oceanica**. This work is ongoing.

**Commenced: April 2014**  
In autumn 2014 two trial sand bag groynes were constructed at the western end of the revetment and nourished with 10000m<sup>3</sup> of sand. Early results show that local erosion in this area has stabilised. In Autumn 2016 a small amount of sand bags will be added to the groynes to maintain their structural integrity. This trial is ongoing.

**Commenced: As required**  
Sand nourishment will be carried out when necessary to Oyster Harbour. This assists with the required scraping of Middleton Beach to provide amenity and drainage. Renourishment may be carried out in order to protect the new access ramp. The results of sand nourishment will be recorded with photo monitoring and beach surveys. Completed as required.

**Commenced: As required**  
Repair work will be carried out to coastal protection structures as required. This will be identified by the Structure Condition Report.



### Seagrass Monitoring

**Commenced: Autumn 2014**

As part of a Coastwest Grant from the **Department of Planning** in autumn 2014 a survey of the Seagrass Quality and Spatial Coverage was conducted from Emu Point to Middleton Beach by **Geoff Bastyan and Associates**. This provides a baseline with which annual comparisons can be made. This work involved aerial photography towed video and diver assessments.

**Completed: April 2014**

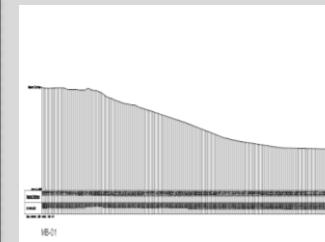


### Sediment Sampling and Analysis

**Commenced: November 2013**

Done along the beach transects, from the vegetation line to 5m under water. Analysis will provide information in regard to the size and composition of grains, types being transported onshore for beach nourishment, longshore out of the system and what the offshore sediment reservoir consists of. Carried out by **Geoff Bastyan and Associates** and **City of Albany**.

**Completed: November 2014**



### Beach Profiles (Topography and Bathymetry)

**Commenced: October 2013**

Permanent survey markers were installed and beach transects conducted from Ellen Cove to the Emu Point Boat Pens from secondary dunes to 250m offshore by John Kinnear. **Dept of Transport (DoT)** will also carry out annual bathymetry (sea bed elevation) survey. **Albany Senior High School** Marine Science student will carry out beach surveys using the permanent markers in 2014.



### Photo Monitoring

**Commenced: July 2013**

In July 2013 a photo monitoring program commenced that covered the area from Ellen Cove to the Emu Point Boat Pens. Photo monitoring is inexpensive and identifies trends in beach change, identifies beach management issues and assists in developing strategic directions for coastal planning. It is carried out monthly in summer and fortnightly in winter by **City of Albany** staff and **community volunteers**.



**1** AWAC

**Commenced: December 2013**

In December 2013 an AWAC (acoustic water and current device) was installed by **Dept of Transport (DoT)** offshore of Emu Beach. This measures wave height, period and direction, current speed and direction, water temperature and water levels. The data will be used for model calibration, which assists the design of new facilities and coastal management solutions. The AWAC will be in place for 1-3 years and managed by **DoT**.



**2** Anemometer

**Commenced: January 2014**  
Early 2014 an Anemometer was installed on the **Albany Port Authorities** navigation beacon at Emu Beach. This instrument measures wind speed, direction and gusts and will provide localised data. Live wind data will be available for viewing on a public website. This data will be used for model calibration. This instrument is funded by the **City of Albany, Dept of Transport** and the **Albany Port Authority**.



**3** Tide Gauge

**Commenced: September 2014**  
In 2014 a tide gauge was installed by **Dept of Transport (DoT)** at the Emu Point Boat Pens. The aim of recording water levels in Oyster Harbour is to establish the effect of the narrow entrance on the water levels in Oyster Harbour during normal tidal conditions and also storm events. This instrument will be supplied and managed by **DoT**.



**4** Current Study

**Commenced: April 2014**  
As part of a Coastwest Grant from the **Dept of Planning** a study of the Currents and Suspended Sediment in the Emu Point Channel was carried out by **University of WA (CENRM)**. The aim was to determine the speed and direction of currents through and around the Emu Point Channel and to determine the particle load of the water column during normal and unusual climatic.  
**Completed: September 2014**



**5** Structure Survey

**Commenced: October 2013**  
A Structure Condition Survey was conducted of all of the rock structures at Emu Point by coastal engineers in April 2012 and October 2013. Photos with GPS coordinates have been recorded to allow for accurate comparison. Annual monitoring of these structures will allow early identification of changes and timely maintenance to be carried out.



**6** Trial Groynes

**Commenced: April 2014**  
In autumn 2014 two trial sand bag groynes were constructed at the western end of the revetment. The expected outcome is that sand will build up to the east and erosion will occur to the west. This will allow data to be collected on the build up of sand whilst wave and current data is recorded which is important for future modelling. The expected build up may provide sand protection to the toe of the revetment.



**7** Sand Nourishment

**Commenced: March 2014**  
Sand nourishment will be carried out when necessary to Oyster Harbour and the western end of the revetment. This assists with the required scraping of Middleton Beach to provide amenity and drainage. The results of sand nourishment will be recorded with photo monitoring and beach surveys.



**8** Asset Management

**Commenced: April 2014**  
In winter 2014 a small section of the training wall was restored. This involved the addition of rock to an area where vegetation has caused slumping as well as backfilling of small rock material where over topping has occurred adjacent to the training wall.