



TURNING A POISONOUS LEGACY INTO PRIME PORTSIDE REAL ESTATE

BHP REMEDIATION PROJECT / DARACON



Photography courtesy of Toby Phillip and Daracon

Deconstructing a highly polluted former industrial development and transforming it into prime portside land has given Daracon an opportunity to demonstrate the integrated talents which have built them such a sterling reputation in the civil construction sector.

Undertaking the work specified in BHP's Voluntary Remediation Agreement with Hunter Development Corporation for the former BHP site at Mayfield, on the Hunter River, has been a lengthy and complex project for Daracon, involving civil works, demolition, remediation, and construction of 1.7km of new rail track.

The first stage commenced in 2007, and spread over 34 hectares. It included cut to fill of contaminated soil, followed by the import of VENM clay to form a 500mm cap. There was also extensive concrete demolition of the site's existing structures including basements and subterranean footings, with this concrete then used in the fill profile. No waste of any kind has been left on this site. Daracon also constructed box culverts, open drains and stormwater controls, completing all work by May 2008.

Stage two included the relocation of 1.7km of rail line by Daracon's new Rail Division, to form the new track for One Steel. The work was conducted adjacent to the existing track, meaning the works had a minimal impact on One Steel's operations, construction works included building of the new track bed above a VENM cap, laying of ballast and sleepers, and installing a boom gate level crossing. Extensive dewatering was also required in the western drainage, before Daracon installed 114 treated timber piles, 22 box culverts and two in-situ wing walls.

The new rail alignment was heavily constrained by existing site features and existing rail tie ins and needed to be designed with very tight horizontal and vertical curves. Daracon's team turned this challenge into track so successfully, Andrew Rennie, the independent rail certifier was quoted as saying, "Visually and by survey I think that this would be one of the best sections of constructed track that I have seen in my thirty years in the survey industry".

The \$20 million Stage 2 main works began in June 2011 and are anticipated to be complete by October 2012. This stage included 38 hectares of contaminated land requiring remediation works. Daracon undertook 132,000m³ of cut and fill earthworks, and imported 450,000m³ of VENM clay to form the 500mm thick cap over the

contaminated fill. They also demolished existing structures and slabs on the site, and constructed 3km of open drains, and a culvert reinforced box culvert crossing founded on timber piles.

"There were two main principles, for the remediation – firstly the physical separation of the contaminated fill by 500mm of clean imported material, and secondly preventing the ingress of water and consequently the mobilisation of contaminants," explained Daracon Project Manager, Allan Greer.

"When we did the cut to fill, there was a broad classification of material, which was layered in the fill profile with the worst materials at the bottom. This process was selected as the most cost-effective way of remediating the site.

"The site was divided into 40m x 40m grids, and the movement of all material was tracked within this grid system, and all fill validated to ensure it was classified correctly."

"There were some particular challenges, including placing the VENM clay cap adjacent to the Hunter River, as we needed to prevent runoff, effectively ensuring a nil discharge scenario. We also had four friable asbestos discoveries, amounting to a total of 11,000m³ of friable asbestos contaminated fill. We ensured a strict protocol of isolation, whereby we engaged Enviropacific Services to instigate air quality and occupational hygiene monitoring for the duration of the removal. "We were careful to control plant movement throughout remediation works, distinguishing between clean plant and dirty plant (working in contaminated areas). In one location pulling out 5,000m³ of coal tar, we constructed wheel washes and a designated wash down area. The general site induction also included information on the contaminants."



Image Daracon's involvement on the project included civil works, demolition, remediation, and construction of 1.7km of new rail track.

In total Daracon inducted close to 1,000 workers on site, up to 100 of them direct employees. The Daracon management team included Project Manager Allan Greer, Environmental Systems Manager Bob Murphy, Senior Project Engineer Greg Taylor, two junior engineers, Supervisor Peter Hibbert, administration and a full time surveyor. The LTI-free safety record of this five-year project is proof of the care with which this dedicated team managed safety.

As with all their projects, Daracon had their own GPS-equipped civil construction plant on the job, and part of their truck-and-dog fleet, which brought all the VENM clay to the site from the company's own quarry at Buttai. This level of vertical integration has many benefits for their projects, including increased efficiency, streamlined management and the kind of cohesive team-focused planning which delivers results on time and within budget, no matter how tough the challenge.

Daracon have been involved with the remediation of the Mayfield site following the BHP closure in 1999, and have undertaken numerous other Hunter River remediation projects, always working with an eye on the protection of the environment and care for human safety.

The result of their latest efforts is further work, with the company contracted by Stolthaven, the first tenant to move onto the reclaimed land, to undertake early works for a diesel distribution facility.

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Soils ain't soils.



EnviroPacific is a company that prides itself on its overall capabilities in the specialist fields of environmental remediation.

EnviroPacific maintains a core focus on contaminated site remediation, including the safe and reliable handling and disposal of complex wastes.



EnviroPacific Services main role during the BHP Remediation works was the practical implementation of the Material Management Plan (MMP). This involved the classification and management of contaminated material identified in preliminary investigations and those encountered during earthworks.

The former use of the site as a Steelworks left a legacy of contamination which included asbestos, coal tar, hydrocarbons and heavy metals. The practical application of the MMP to the contamination involved identification of the specific contaminants and development of respective management strategies. Material was identified by EnviroPacific using visual and olfactory indicators to classify the material into one of three broad levels of contamination. The movement of each type of material was tracked from source location to placement area. For each specific type of contamination, particularly friable asbestos and free flowing Separate Phase Hydrocarbons (SPHs), detailed management plans were created to provide certainty that the material was managed appropriately and in accordance with the relevant standards and legislation.

EnviroPacific ensured that the required controls were implemented to prevent cross contamination and potential exposure of onsite personnel, and the environment, to the contaminants.

The removal of the SPH material required both environmental and personal monitoring to be conducted. EnviroPacific observed and recorded readings at several locations at 30 minute intervals to ensure that the volatile gas concentrations and odour levels in the ambient atmosphere were maintained at a low level for the duration of works. Operators and ground personnel in the contamination zone were required to wear tyvek suits and gloves. The action limits were not reached during removal works.

EnviroPacific has worked on multiple stages of the BHP Remediation Project, however job specific procedures continued to be developed throughout this

stage of works to manage gross contamination on a case-by-case basis. This involved inducting site personnel into each system of work, outlining the risks and safe work practices depending on the material.

Project specific procedures were developed for the onsite management of grossly contaminated materials which included personnel monitoring, atmospheric monitoring and decontamination procedures.

EnviroPacific Services are industry leaders in site remediation and industrial waste management, including the treatment of contaminated soils, water and by-products from industrial and manufacturing production. They have extensive expertise in delivering efficient and cost effective environmental remediation solutions to a broad range of public sectors and private enterprise.

The company's success is a result of the way they conduct their business. By placing the highest importance on client satisfaction, cost effective project delivery, QHSE and compliance with relevant laws and regulations, EnviroPacific has achieved a consistent, high level of repeat business. A significant element of the company's success is also the result of a heavy investment in personnel training and development.

EnviroPacific has grown to incorporate more than 120 staff and has offices situated throughout Australia. EnviroPacific's team is largely comprised of engineers, scientists and supervisory practitioners with an understanding of the need to produce turnkey outcomes for clients that are economic and delivered to agreed schedules.

They have undertaken projects for a large range of clients across many diverse sectors and all levels of government. The scale of projects that EnviroPacific has delivered ranges from small one-week projects to multimillion dollar projects lasting several years.



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BHP Remediation site, NSW



Below Macka's Sand & Soil were contracted to supply the bedding sand, fill sand and screened loam for the turf underlay on the BHP Remediation project.



Macka's Sand & Soil supplied bedding sand, fill sand and screened loam for the turf underlay on the BHP Remediation project in Mayfield. The team at Macka's Sand & Soil have formed a close relationship with Daracon and have provided materials for several of their projects. Their work with Daracon has involved the supply of material for a concrete plant, pipe bedding, electrical cabling, fill requirements and several landscaping works.

The BHP Remediation project consisted of the demolition of existing slabs and structures and the removal of services and storm water systems. There was a large amount of earthworks including the placement of VENM clay onto the site, along with the construction and remediation of culverts and pipelines.

Macka's Sand & Soil have been providing sand and soil throughout New South Wales for more than twenty years. They offer the choice of supply and deliver or clients are able to pick up materials ex-pit. All products supplied by Macka's Sand & Soil are carefully selected and of a high standard ensuring complete client

satisfaction on all transactions. The team are highly experienced in their field and are ready to offer advice on all products, helping to make projects run smoothly.

As one of the largest suppliers of sand along the East Coast of Australia, Macka's Sand & Soil work with a diverse client range and supply products for several industries including concrete plants, building and construction, state and federal infrastructure, turf and horticulture. The materials they provide are used for a variety of projects such as ovals, beaches, regeneration and fill for various developments.

For more information contact Macka's Sand & Soil Supplies, 2684 Nelson Bay Rd, Salt Ash, NSW 2318, phone 02 4982 6227, email robert@mackas.com.au