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TYPICAL SOLID WASTE MANAGEMENT PROJECTS UNDERTAKEN BY SMHB AND ASSOCIATED FIRMS

* updated March 2023

Project	Description of Services	Type of Waste	Year of Completion
1. Operational/Technical Due Diligence on a Waste Management and Environment Services Company	Due diligence for solid waste management facilities located in Putrajaya, Kuala Lumpur and Pahang covers solid waste collection facility, public cleansing services, landfill and solid waste transfer station.	Solid Waste	2018
2. Waste Stream and Characterisation Study for Vietnam	Study of waste generated and disposed at landfill and its characteristics, and assessment of current waste management system.	Solid Waste	2009
3. Detailed Environmental Impact Assessment (DEIA) and Conceptual Design for the Proposed Kuala Langat Sanitary Landfill, Selangor	The landfill is to meet the urgent need in the state of Selangor for a proper sanitary landfill. The capacity of landfill is 1,000 tonnes of wastes per day. The facilities encompass a 15 km access road, weighbridge, administration building, waste disposal area, drainage system, leachate collection and treatment and landfill gas management. The design aspects includes selecting a suitable liner system to contain leachate as well as design of leachate and landfill gases collection systems, final capping during closure, designing the leachate treatment plant, estimating air space capacity and life span of the landfill and also identifying the closure and post closure programme.	Solid Waste	2007
4. Domestic, Medical and Hazardous Waste Management Services in Riau, Indonesia	Detailed feasibility study and Privatisation Master Plan which focused on major islands of the Riau Archipelago that include Batam, Bintan and Karimun. The study includes review of the existing practice, legislations and policies for domestic, medical and hazardous waste management in the study areas.	Medical/ Hazardous Waste	2006 – 2007
5. Beroga Solid Waste Treatment Plant, Selangor	Detailed design and authority approval, design review and construction supervision of Solid Waste Thermal Treatment Plant. Scope of work covers authority coordination, and all civil, structural and infrastructural engineering for the entire project. The proposed thermal treatment plant has a design capacity to treat approximately 1,500 tonnes/day of municipal solid waste. Apart from providing an alternative to landfilling methods of solid waste management, the system also supports waste recovery and recycling.	Solid Waste	2006
6. Medical/Hazardous Waste Management in West Java	Detailed feasibility study and Privatisation Master Plan for the Privatisation Proposal of the Integrated Medical and Hazardous Management Services. Scope of works for the consultancy services include:	Medical/ Hazardous Waste	2005



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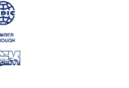


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	<ul style="list-style-type: none"> • Study of existing waste disposal facilities. • Study on thermal treatment facility for medical waste and sludge generated from domestic industries and other scheduled wastes. • Integrated medical and hazardous waste management facility (IWMF). • Siting of the Integrated Waste Management Facility (IWMF). • Project cost, financial modelling, financing and economic evaluation • Risk management and environmental assessment 		
7. Solid Waste Management in Greater Bandung, Indonesia	<p>Feasibility Study and Privatisation Master Plan for an integrated solid waste management services.</p> <p>Scope of works:</p> <ul style="list-style-type: none"> • Review Draft Interim Report prepared by associate firms. • Prepare Privatisation Master Plan emphasising on Solid Waste Transfer Station and Sanitary Landfill. <p>The goal of the Privatisation Master Plan is the promotion of a cleaner, healthier and safer living and working environment for the citizens of Greater Bandung through the provision of a proper and integrated system for the management of solid waste.</p>	Solid Waste	2005
8. Waste Management Solution for Bantar Gebang, Indonesia	<p>Review existing waste management system, focusing on composition and characteristics of the waste and options of technologies.</p>	Solid Waste	2004
9. Integrated Solid Waste Recycling Facilities for the State of Negeri Sembilan	<p>Detailed feasibility study to develop an innovative and practical solutions in environment conservation for current landfill at an economical implementation cost.</p>	Solid Waste	2004
10. Kuala Lumpur International Airport Solid Waste, Selangor	<p>Detailed design of utilities including solid waste system for the new airport.</p> <p>A feasibility study was carried out to determine the various options of solid wastes collection, treatment and disposal.</p> <p>A waste arisings survey was carried out at Subang International Airport to determine basic design parameters such as waste volumes, densities and calorific values. The estimated solid waste generation at the new airport is approximately 150 tonne per day.</p> <p>SMHB has recommended the “cradle-to-grave” solutions, which involve waste separation at source, recycling, incineration and landfilling.</p>	Solid Waste	1994 – 1995
11. Pre-Tender Design for Pulau Pinang Solid Waste, Pulau Pinang	<p>Full logistic design/analysis or refuse transfer systems.</p> <p>Detailed drawings of refuse transfer station building at Jelutong and Prai which were designed to cater for 1,020 tonnes per day during the final year of the concession period.</p> <p>The sanitary landfill which is located at Pulau Burong covers an area of 62.4 ha with 4.05 ha currently utilised as a solid waste disposal site.</p>	Solid Waste	1994 – 1997



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	Barge transportation was also proposed as an alternative to collection vehicles and articulated container-trailer vehicles. Bill of quantity and materials for tender submission were also provided.		
12. Environmental Impact Assessment of Sanitary Landfill Sites at Pulaui in Kedah and Teluk Chempedak on Pangkor Island in Perak	Environmental impact study. SMHB was commissioned by the Ministry of Housing and Local Government to carry out preliminary environmental impact assessment studies for these proposed landfill sites. The Pangkor landfill was an extension to an existing landfill and as such the impact study included an assessment of the methods of operation of the existing landfill as well as the impacts of the new construction. Impacts were considered in terms of construction, operation and abandonment. The site at Pulaui was on sloping ground incised by a steep valley. The initial landfilling operation would involve the infilling of the valley and thereafter development of the remainder of the site. At both sites the main concern is surface and groundwater quality and the impacts of leachate generation and movement. The report included proposals for the most cost effective mitigating measures and raw and treated leachate, and surface and groundwater quality monitoring.	Solid Waste	1993
13. Gypsum Waste Treatment and Environmental Monitoring, Terengganu	Detailed engineering design, environmental impact assessment and construction supervision of all waste management facilities. This project involved an assessment of the potential sites, including investigations to confirm safe containment of waste, design of a scheme for handling waste, preparation of contract documents, construction supervision and presentation of geotechnical and geological aspects at a public enquiry of the environmental impact assessment. Work carried out included sampling and testing of clays, sand and groundwater; hydrographic and geophysical survey for marine discharge pipeline; hydrological studies and drilling programmes; detailed design for the construction of containment embankments on soft clay, requiring the construction and monitoring of a trial embankment and construction supervision of all waste management facilities.	Industrial Wastewater and Solid Waste	1988 - 1993
14. Development of Centralised Pig Farms in the States of Penang and Melaka	Site studies, detailed engineering design and preparation of tender documents. The Department of Veterinary Services commissioned SMHB to provide consultancy services for the development of centralised pig farming areas in the two states in which comprehensive environmental control measures were required.	Agricultural Wastewater and Solid Waste	1990



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15. Design of Waste Treatment System for Pig Farms with Limited Land Availability, Negeri Sembilan	<p>The centralisation of pig farms aimed at a more systematic, progressive, environmentally acceptable and stable pig husbandry compared to the large number of small, scattered farms previously. Comprehensive studies were undertaken to identify suitable sites and to prepare preliminary designs and cost estimates. Management and operational strategies were also developed.</p> <ul style="list-style-type: none"> Waste management was one of the major issues, and recommendations were made for the treatment of waste produced. A system was designed to provide on-farm liquid and solid separation with the liquid portion of the waste being transferred to a centralised activated sludge treatment facility. The separated solids are treated in a primary/secondary anaerobic digestion plant, prior to landfilling. <p>Study, preparation of information brochures for distribution to farmers and conceptual design for a demo treatment plant.</p> <p>Scope of work include:</p> <ul style="list-style-type: none"> Assessment of the most cost effective treatment options for solid waste and wastewater arising from pig farms with limited land availability for setting up a treatment plant that should be able to treat standing pig population (SSP) of as follows: <ul style="list-style-type: none"> 100 - 500 SSP 500 - 1000 SSP 1000 - 3000 SSP 2000 - 5000 SSP Detail design, specification and tender documentation for the handling, treatment and management of wastes and wastewater from pig farms. Preparation of guidelines for pig farmers on the available options for on farm waste management. 	Agricultural Wastewater and Solid Waste	1989 – 1990
16. Sewage Treatment Plant and Centralised Sludge Treatment Facility, Port Dickson, Negeri Sembilan	<p>Detailed design and construction supervision.</p> <p>The STP serves the town of Port Dickson and the associated tourist areas and caters for a population equivalent (P.E.) of 30,000. The Centralised Sludge Treatment Facility (CSTF) has a capacity of 98,000 PE and treats waste sludge arising from the STP as well as sludge collected from other STPs and arising from the desludging of septic tanks.</p>	Domestic/ Industrial Wastewater and Solid Waste	2002 – 2004



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	<p>The STP utilises an activated sludge type of treatment process modified to achieve biological removal of nitrogen and phosphorus using fine bubble diffused aeration and secondary clarification.</p> <p>Preliminary processes consist of flow equalisation, coarse and fine screening, and grit and grease removal. The effluent will be discharged and will comply with Standard "A" requirements i.e. BOD 10 mg/1 and SS 20 mg/1.</p> <p>Process units in the CSTF include mechanical sludge thickening, anaerobic sludge digestion and mechanical sludge dewatering using membrane plate pressure filtration.</p>		
17. Sludge Management Facilities at the Cheras and Langat Water Treatment Plants (WTP), Selangor	<p>Feasibility study, concept design and detailed engineering design of sludge management facilities.</p> <p>Several sludge treatment process options were studied and the recommended option involves mechanical dewatering utilising a centrifuge system for the Sungai Langat WTP and sludge lagoon method for the Cheras WTP.</p>	Domestic/ Industrial Wastewater and Solid Waste	2002 – 2004
18. Sungai Selangor Water Supply Scheme – Feasibility Study of Sludge Disposal on Land and EIA Study for Sludge Landfill	<p>Concept design of disposal sites and assessment of potential impacts and mitigation measures.</p>	Solid Waste	2001
19. Sludge Treatment Plant for Wangsa Maju Water Treatment Plant, Selangor	<p>Detailed design and construction supervision of the associated civil works comprising the balancing tank and pumphouse, sludge thickener and supernatant tank.</p> <p>The Wangsa Maju Water Treatment Plant (WTP) in Kuala Lumpur has a treated water production capacity of 45,000 m³ per day. Sludge is generated at the flocculation tanks, the dissolved air flotation plant and the filtration plant. It is discharged into a 900 mm diameter reinforced concrete pipe and released untreated directly into the monsoon drain adjacent to the WTP. The sludge treatment plant is constructed to avoid the practise of discharging sludge/washwater into the monsoon drain. It comprises a balancing tank, a gravity thickener, centrifuge decanters, dosing system and associated works. The sludge cake from the centrifuge decanters is expected to have between 20% and 25% dry solid contents. The sludge production rate is about 11,160 kg/day.</p>	Domestic/ Industrial Wastewater and Solid Waste	1998 – 1999
20. Environmental Monitoring for Malaysian Integrated Scheduled Waste Management Centre, Negeri Sembilan	<p>Evaluation, interpretation and reporting of the monitoring results and annual audits.</p> <p>SMHB was involved in the preparation of the Environmental Impact Assessment report for the Malaysian Integrated Scheduled Waste Collection, Treatment and Disposal Project in 1992. In December 1995, Kualiti Alam was granted the approval to build, operate and maintain the Waste Management Centre and construction on the site began in January 1996.</p>	Industrial Solid Waste	1996 - 2005

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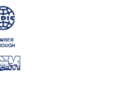
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	<p>An environmental monitoring programme was carried out involving both the physical and biological components of the environment. This programme would also ensure compliance of site activities to the relevant regulations.</p> <ul style="list-style-type: none"> The programme involves field sampling, observation and analysis. Kualiti Alam appointed SMHB to evaluate, interpret and report on the results of the programme. SMHB also carries out an annual audit of the programme to ensure its coverage and effectiveness. 		
21. Carlsberg Brewery Effluent Impact Study	An impact study of the effluent discharge on the downstream receiving waters of Carlsberg Brewery Malaysia Berhad.	Industrial Solid Waste	1993
22. Malaysian Integrated Scheduled Wastes Collection, Treatment and Disposal Project, Negeri Sembilan	<p>Environmental impact study.</p> <p>SMHB was appointed by the Consortium developing the concept to carry out an Environmental Impact Assessment (EIA) of the proposed facility in accordance with the EIA Regulations of the Environmental Quality Act.</p> <p>The EIA included in-depth studies on air quality, including the modelling of stack emissions, surface and ground water quality, aquatic and terrestrial flora and fauna, socio-economic aspects, health and safety issues and also involved a comprehensive hazard and risk analysis. Mitigating measures were recommended where appropriate.</p>	Industrial Solid Waste	1991
23. Bandar Indera Mahkota Sewage Treatment Plant Project and Sewer Network, Kuantan, Pahang	Preliminary and detailed design, tender documentation, head office direction and construction supervision of M&E works for a regional sewage treatment plant of 150,000 PE and associated sewerage network.	Wastewater	2020
24. Cadangan Pembinaan Centralised Sewage Treatment Plant (STP) dan Penyambungan Rangkaian Paip Pembedungan di Kawasan Tadahan Lembangan Sungai Langat Secara Reka dan Bina, Selangor	The project rationalized all multi-point or fragmented public STPs and private STPs located within the highly-urbanized catchment of the upper reaches Sungai Langat encompassing an area of approximately 77 sq. km from Taman Bukit Hartamas in the north extending southwards to Seksyen 5 Bandar Baru Bangi and Jalan Semenyih, Taman Kajang Utama to the East and Taman Putra Budiman to the West. All sewage generated will flow to the proposed centralised sewage treatment plant (CSTP). The proposed project takes into consideration the future growth within the catchment area, which is projected to be 920,000 ultimate PE in the year 2035. Functional specification, detailed engineering design, construction supervision, environmental impact assessment study, planning submission and approval.	Wastewater	2018
25. Package D43 - Design of Sewerage Network in Batu, Jinjang and Kepong (Design & Build), Kuala Lumpur	Tender design, detailed design and construction supervision of 42 km trunk sewer network and 5 nos pumping station.	Wastewater	2018

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26. Proposed Construction of Sewer Pipeline for Si-Rusa Area, Port Dickson, Negeri Sembilan	Sewer extension and rationalisation of public sewage treatment plants within the Sunggala catchment (8.34 sq km). 8 km new trunk sewer. Rationalisation of 4 sewage treatment plants (285 PE - 3,600 PE); for conversion into pumping stations or decommissioned. 9,500 PE. Preliminary engineering design, detailed design, tender documentation and construction supervision.	Wastewater	2017
27. Cadangan Kerja-kerja Menaiktaraf Loji Rawatan (PEG073) Batu Ferringhi (Design & Build), Pulau Pinang	Tender design, environmental services, detailed design and construction supervision to increase treatment capacity to 60,000 PE.	Wastewater	2016
28. Sewerage Catchment Review Study for Pencala-Pantai & River of Life Precinct 1 to 11, Kuala Lumpur	Sewerage and sludge catchment study for Precincts 1-11. Overall catchment study for whole of Pantai involving capacity assessment and recommendations for sewerage system improvements.	Wastewater	2015
29. Feasibility Study to Develop Water Recycling Plant in Peninsula Malaysia	A pilot water re-cycling plant in Peninsular Malaysia utilising effluent from sewage treatment plants located in industrialised and water-stressed states such as Pulau Pinang, Selangor and Johor.	Wastewater	2012
30. Co-Digestion to Optimise Bio-gas and Bio-fertilizer Yield for Anaerobic Digester Tank at Existing Bonus Sewage Treatment Plant at Titiwangsa, Kuala Lumpur	Co-digestion Project to optimise bio-gas and bio-fertilizer yield for anaerobic digester tank at the existing Bonus STP at Titiwangsa. The ultimate objective of the project is to construct facilities to generate 1 MW of electrical power on a commercial basis using co-digestion of sewage sludge and the organic fraction of municipal solid waste. Secondary objective is to assess the potential use of the dewatered sludge as fertiliser in view of the increased bio solids yield.	Wastewater	2011
31. Standard Method of Measurement for Water and Wastewater Project, Malaysia	Development of standards for procurement of water and wastewater projects in Malaysia	Wastewater	2010
32. Labuan Effluent Water Recycling Plant, Wilayah Persekutuan Labuan	Development of a Water Recycling Plant pilot project using affluent from the Ranche-Ranche Sewage Treatment Plant to supply water to Petronas Methanol Labuan.	Wastewater	2010
33. Pantai 2 Sewage Treatment Plant, Kuala Lumpur	Review of M&E, Process Design, construction supervision. Ultimately cater for 1.8 Million population until 2035. First STP built underground in Malaysia with a community centre above the STP complete with sports and recreational facilities.	Wastewater	2015



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CERT. NO.: ABMS-90228



Project	Description of Services	Type of Waste	Year of Completion
<p>The project promotes sustainability living environment through low energy consumption, low pollution, low emission and utilised green technology measures such as rainwater harvesting, use of bio-gas and solar panels to generate electricity.</p>			