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## Alternatives to the conventional management of spent catalyst

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Saudi Aramco extensively utilizes different types of catalysts in its refining and gas processing; this resulted in a huge volume of spent catalyst waste generated from the company's operations. The amount of spent catalyst is expected to rise with the expansion of the company's operations. Management of the spent catalyst at landfills is always the least environmentally preferred option according to the Waste Management Hierarchy (WMH). Therefore, other alternatives were assessed. The assessment includes conducting literature reviews of European and US standards and publications, in well-recognized periodicals. This effort resulted in several feasible types of recommendations and alternatives to spent catalyst management. The recommendations identified have been found suitable in the local market. The assessment concluded that there are four viable options for the management of spent catalyst: First to reduce the generation of spent catalyst at the source by switching to more environment friendly, longer lifetime and less toxic catalyst during the selection process; the second option is to regenerate the spent catalyst. If it is not feasible, then precious metal recovery should be explored. Finally, the spent catalyst may be used as a feedstock to the cement industry. These alternatives of managing spent catalyst were recommended to be followed in a sequential order by priority, based on the sampling and analyses requirements. A criterion for selecting the management option was based on site-specific factors, safety, environment, mobility, etc. A best practice document was developed to provide general guidance for the management of spent catalyst, for better handling within Saudi Aramco.

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