

## Impact assessment of the groundwater quality in the surrounding villages of ash ponds

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Power sector is one of the fastest growing sectors in India and it supports the economic growth of the nation. The coal based power plant has been increasing steadily and is poised for further growth in the 12<sup>th</sup> Five-Year Plan. Present installed capacity of power Plants is about 1, 24,310 MW and thermal power Plants account for about 66.4% of the total installed capacity. The thermal power plant is situated at about 5 km away from the sea coast. The generated ash is transported using sea water and stored in the ash pond. The present study aims at assessing the impact of ash pond on groundwater quality in the watershed surrounding the ash ponds. An integrated approach has been adopted in this study by utilizing various tools like hydrogeology, geophysics and groundwater chemistry. A network of observation wells has been set up and monitoring of the wells has been carried out in the pre-monsoon and post-monsoon seasons for the major cations, anions and trace elements. Geophysical studies were carried out to decipher the aquifer geometry and possible signatures of ash pond on soil and groundwater regime. Accordingly, Time Domain Electro-Magnetic (TDEM) and Resistivity/IP Imaging studies were undertaken at the different locations in the study area. The IP imaging results do not support the presence of clay content in different location. The resistivity imaging indicates that very conductive patches are obtained in the deeper sections at some locations. The water level (above mean sea level) contours indicate that the groundwater flow direction is in the north-west to south-east direction. Groundwater quality in the study area indicates that few observation wells in the downstream of the ash pond have high total dissolved solids (TDS) concentrations. Besides, some groundwater sources in the upstream of ash pond also have high TDS concentrations. Groundwater source SIMH-34 (upstream of the ash pond) has high TDS (8658 mg/L) and sulphate (534 mg/L) concentration in post-monsoon season. The impact on the groundwater quality can be either due to the ash pond or also due to the sea water intrusion as the thermal power plant is nearer to the sea. Further detailed studies have to be carried out to assess the impact on groundwater quality.

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