

Morrison Ground Water Restoration



Location: Morrison, Illinois

Site Issue: Well field used as a public drinking water supply contaminated with Volatile Organic Compounds (VOCs)

Solution: Design and construct an air stripping tower to remove the VOCs from the drinking water supply.

Client: Fortune 10 Conglomerate



Brief History

The Morrison, Illinois water supply well field was contaminated by VOCs with concentrations ranging from 100 ppb to 800 ppb. The source of the contamination for this 1,800 feet deep aquifer system, under 300 to 400 feet of impermeable Maquoketa shale, was unknown. The VOC contamination had forced three of the city's four water supply wells out of service.

HE&C personnel performed an investigation to determine the source of contamination, and to develop alternatives to provide the City of Morrison with a backup water supply to the remaining operating water well. The alternative selected, after consultation with the city water department, was treatment of water by air stripping at 1,000 gpm, and the abandonment of City Wells 1 and 2 in accordance with state regulations. The air stripper also removed hydrogen sulfide (H₂S), naturally present in the aquifer, thus saving the city money by treating the H₂S problem along with VOC removal. The VOC concentrations in the ground water influent to the air stripper reduced from 58 ppb to less than 3 ppb during the operation of the air stripper.

Primary Activities Performed by HEC Personnel

- Evaluated the economics of the available alternatives for supplying water to the City of Morrison if the last remaining well was forced out of service.
- Designed, constructed, and started up an air stripping tower which reduced VOC concentrations in the water to less than 0.5 ppb.
- Evaluated and identified two wells as the transport mechanism which allowed the VOCs to migrate into and contaminate the deep aquifer.
- Abandoned, in accordance with state regulations, two water supply wells that were over 1,600 feet deep.
- Concentrations of TCE into the air stripper reduced from 58 ppb to less than 3 ppb, with effluent concentrations less than 0.5 ppb.
- Provided consulting services to the city for the continued operation and maintenance of the air stripper. This included changing the packing media, after nine years of operation.