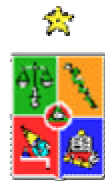


CI61Q

CI61Q/CI61Q PRINCIPIOS DE REMEDIACION Y RESTAURACION

CLASE 2 SITIOS CONTAMINADOS

SEMESTRE PRIMAVERA 2010



UNIVERSIDAD DE CHILE
FACULTAD DE CIENCIAS FÍSICAS Y MATEMÁTICAS
DEPARTAMENTO DE INGENIERIA CIVIL



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Sedimento
contaminado

Petróleo sobrenadante

Agua contaminada

Suelo contaminado



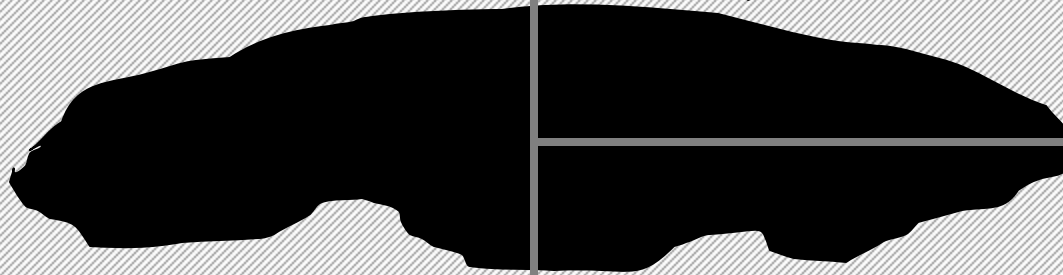
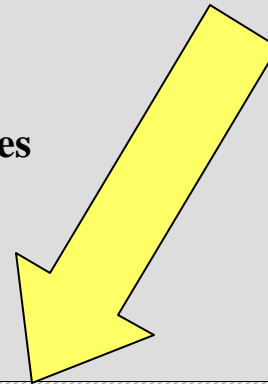
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SUELO
IMPACTADO

*Inmediatamente
Comienzan a operar
procesos
químicos, físicos y
biológicos*

volátiles

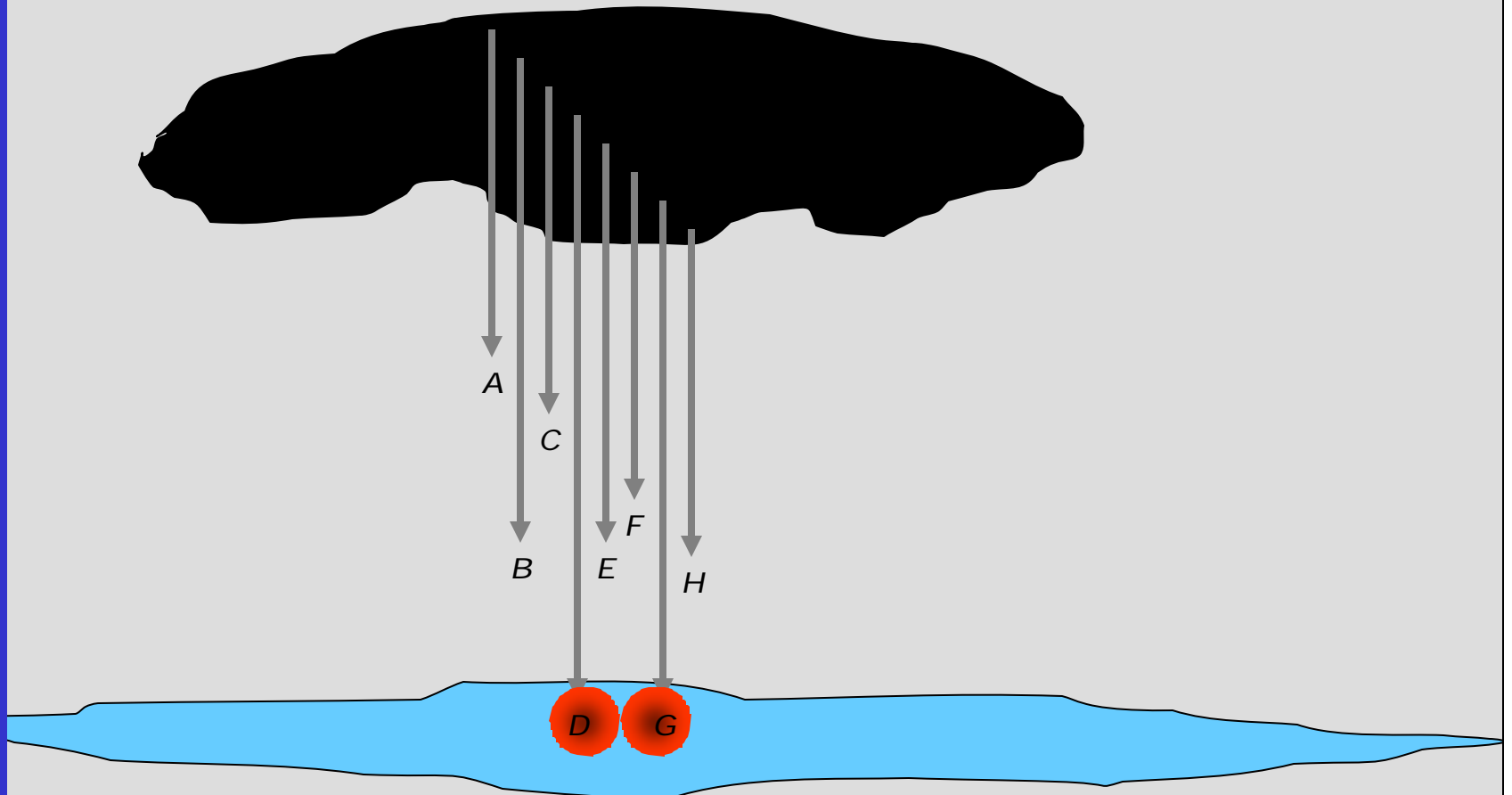


Desplazamiento
lateral

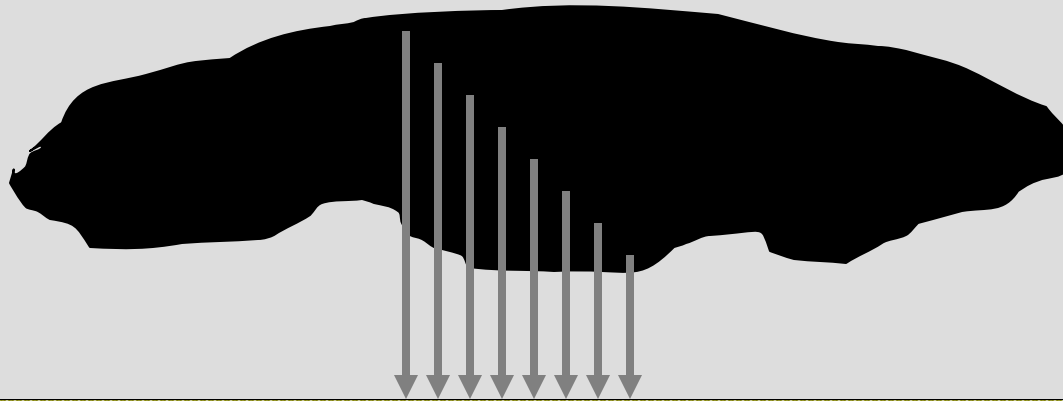
Migración
vertical



*Migración diferencial
de contaminantes*



*Migración diferencial
de contaminantes*

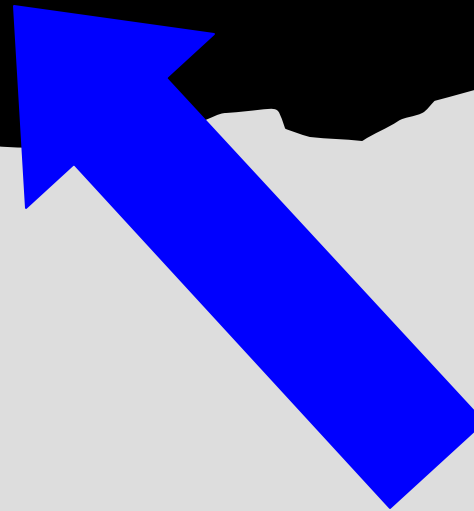
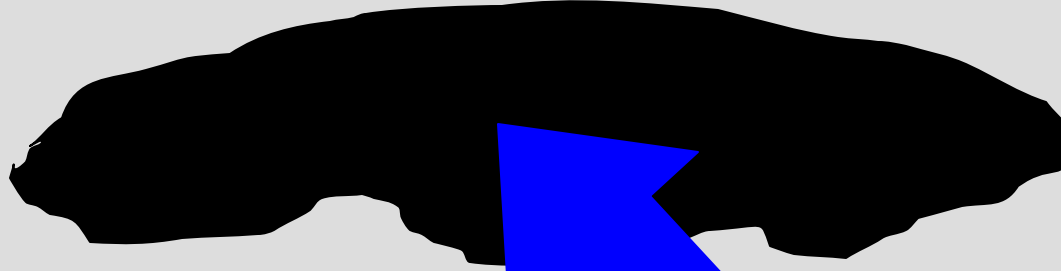
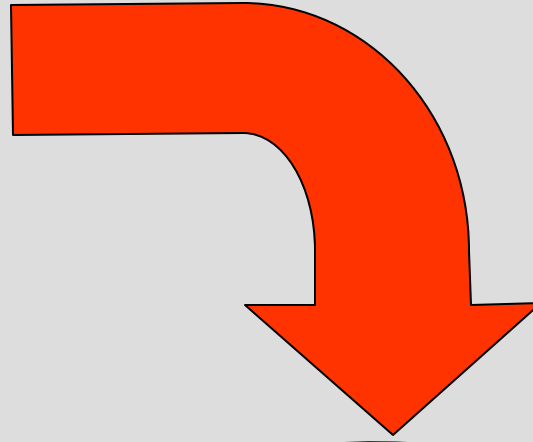


CAPA DE AISLACIÓN NATURAL



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*Proceso de
atenuación
natural*



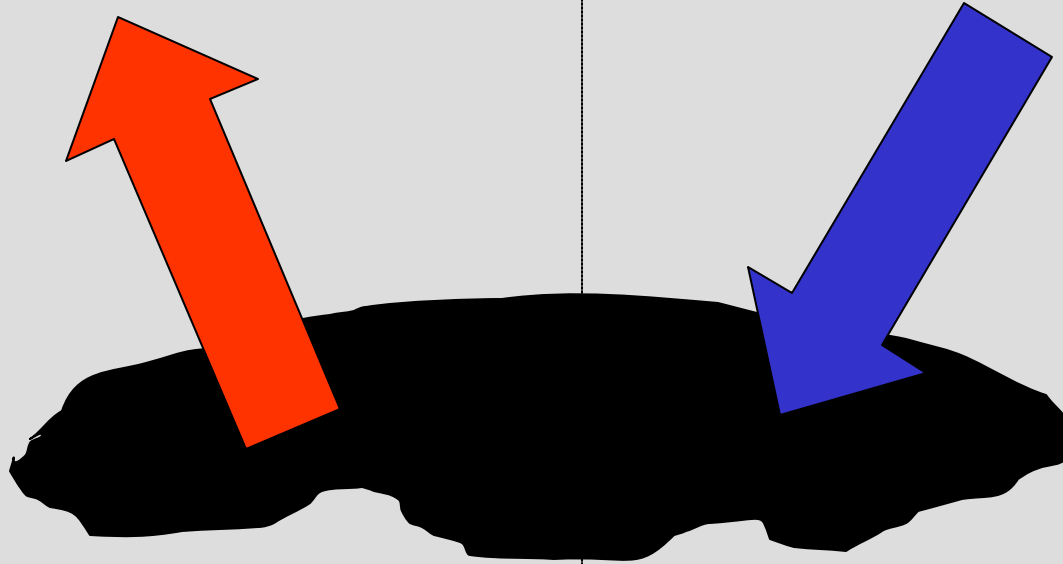
*Aplicación de
técnicas
de remediación*



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*Tratamiento
Ex situ*

*Tratamiento
In situ*



*Excavación y transporte
Tratamiento*

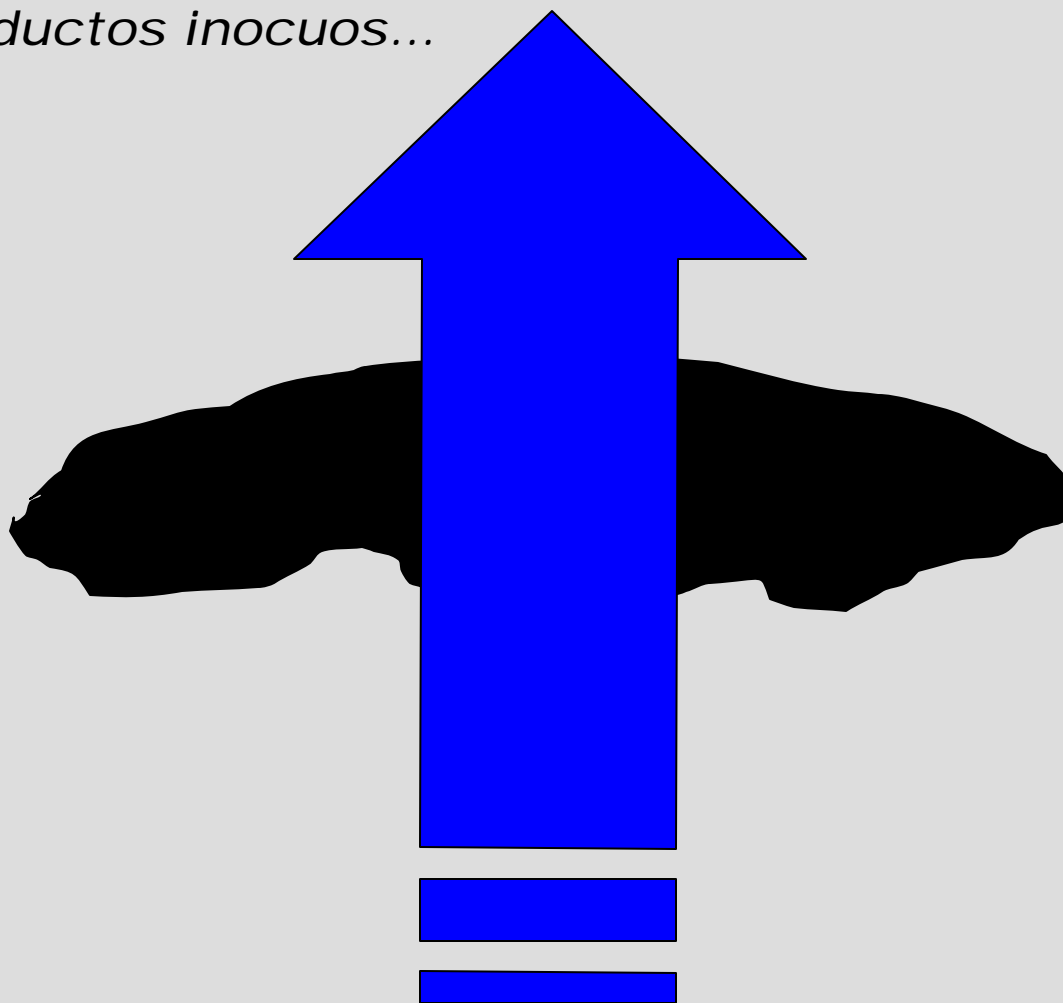
Tratamiento en el lugar



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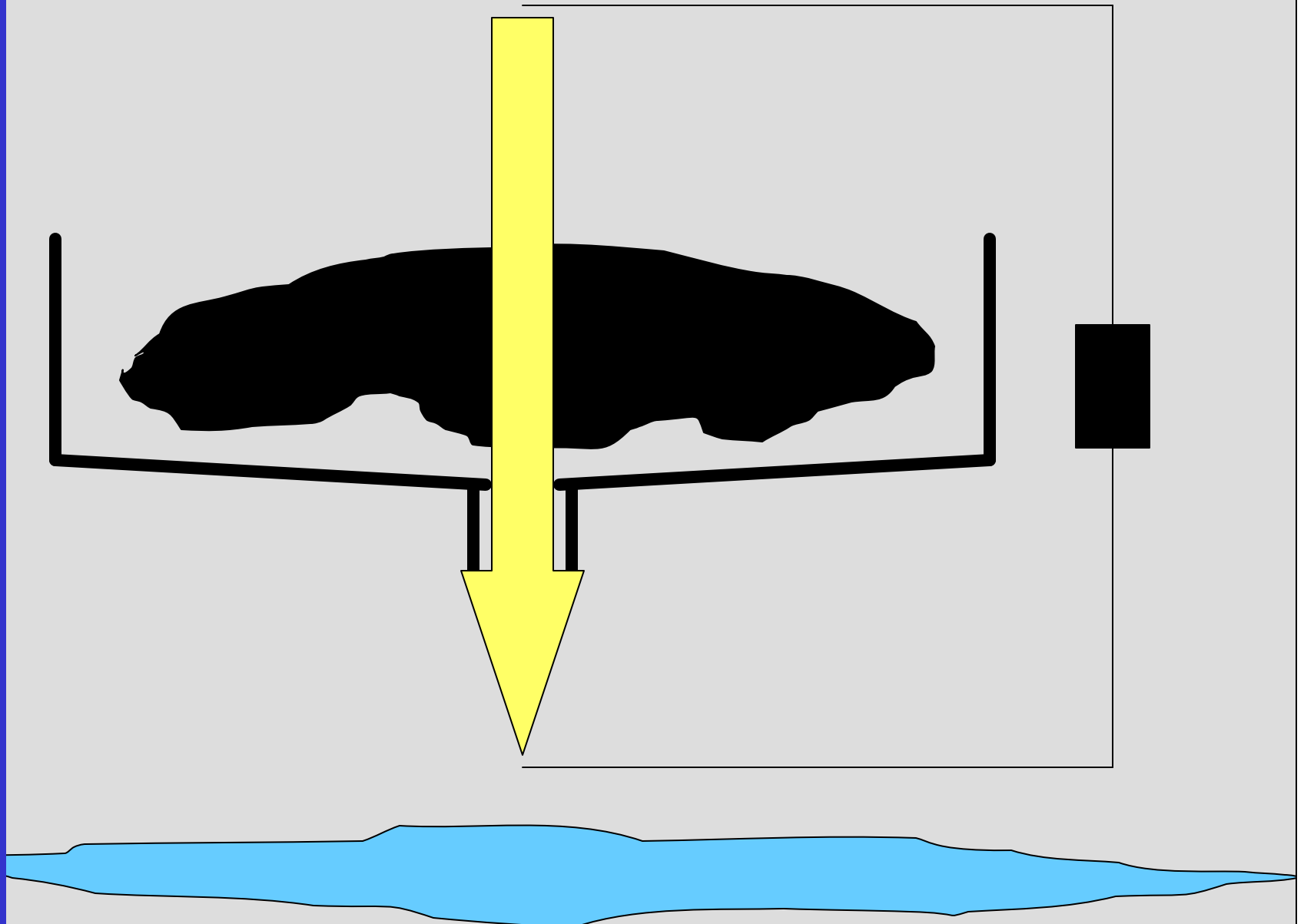
*Destruir o alterar
el contaminante*

Productos inocuos...



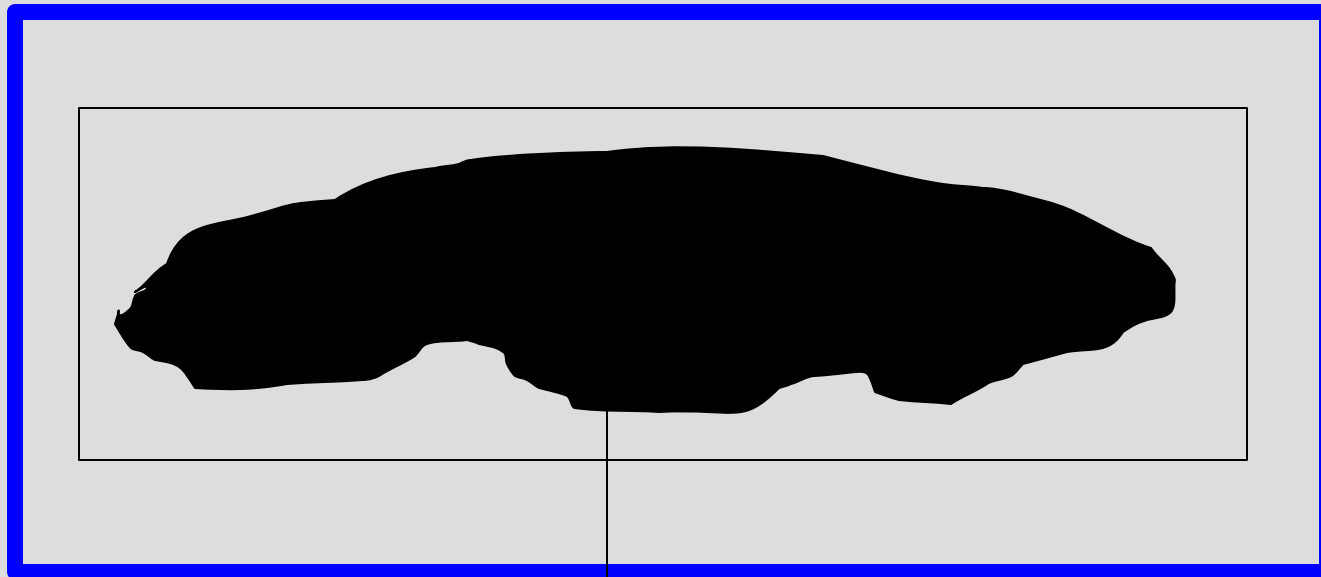
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*Extracción o
Lavado del contaminante*



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*Estabilización
Inmovilización*



Migración de lixiviados controlada



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Confinamiento



CI61Q



CI61Q



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NORMAS Y REGULACIONES



ASPECTOS LEGALES

- PROTECCION DE AGUAS SUBTERRANEAS EN LOS EEUU
 - SAFE DRINKING WATER ACT (1974)
 - RESOURCE CONSERVATION AND RECOVERY ACT (1976)
 - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT, CERCLA (1980)
 - HAZARDOUS AND SOLID WASTE AMENDMENTS, HSWA (1984)
 - SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT, SARA (1986)



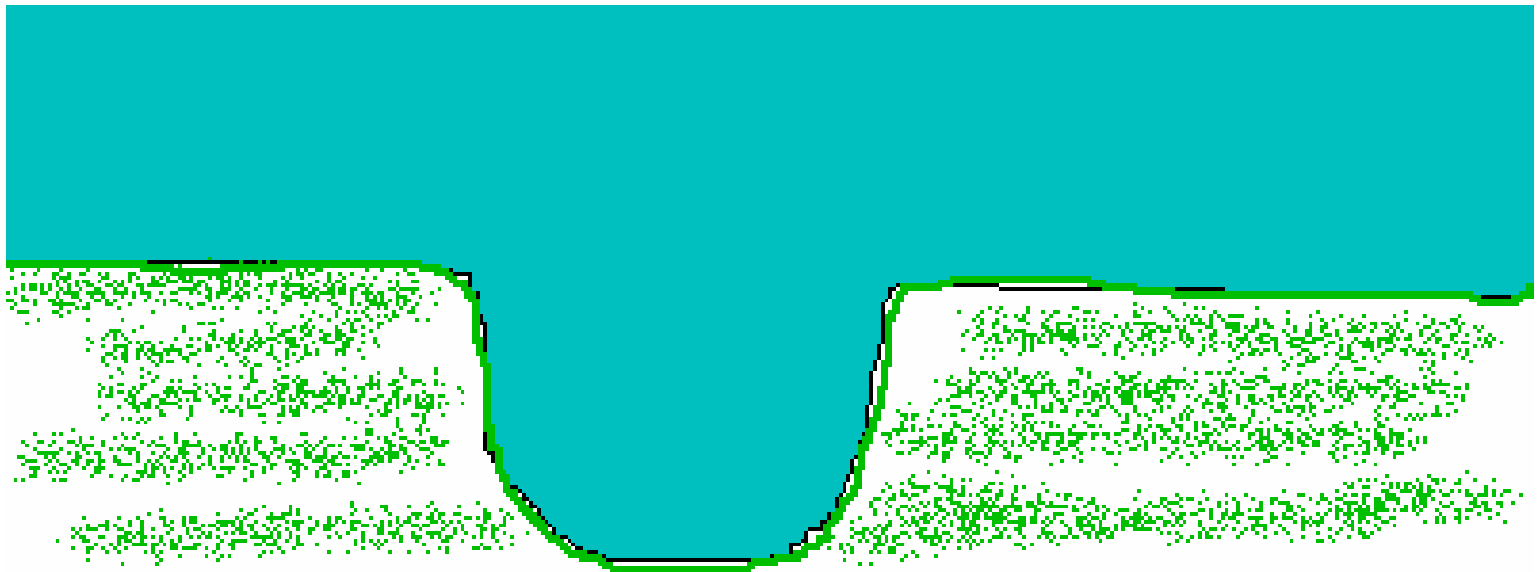
ASPECTOS LEGALES

- PROTECCIÓN DE AGUAS SUBTERRANEAS EN CHILE
 - LEY 19.300, BASES DEL MEDIO AMBIENTE (1994)
 - CÓDIGO DE AGUAS (1980)
 - NORMA DE EMISIÓN DE RESIDUOS LÍQUIDOS A AGUAS SUBTERRANEAS (D46/2002)
 - REGLAMENTO SOBRE RESIDUOS PELIGROSOS (2004)



SITIOS CONTAMINADOS

LOVE CANAL, NEW YORK



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The Love Canal neighborhood is in the southeast section of the La Salle area of Niagara Falls, New York.

William T. Love, an 1890's visionary and entrepreneur, sought to develop a planned industrial community, Model City, in the area. Waters from the Niagara River were to be routed around the Niagara escarpment (the other famous attraction of the region, Niagara Falls) to produce cheap hydroelectric power.

Model City never happened, but work on the canal to transport waters from the Niagara River did.

In 1942, Hooker Chemicals and Plastics Corporation purchased the site of the Love Canal. Between 1942 and 1953 Hooker Chemical disposed of about 22,000 tons of mixed chemical wastes into the Love Canal.



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In 1955, the 99th Street Elementary School was constructed on the Love Canal property and opened its doors to students.

Subsequent development of the area would see hundreds of families take up residence in the suburban, blue-collar neighborhood of the Love Canal.

Unusually heavy rain and snowfalls in 1975 and 1976 provided high groundwater levels in the Love Canal area.

Portions of the Hooker landfill subsided, 55-gallon drums surfaced, ponds and other surface water area became contaminated, basements began to ooze an oily residue, and noxious chemical odors permeated the area. Physical evidence of chemical corrosion of sump pumps and infiltration of basement cinderblock walls was apparent.



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In April of 1978 the New York Department of Health Commissioner, Robert Whalen, declared the Love Canal area a threat to human health and ordered the fencing of the area near the actual old landfill site.

In August, the Health Commissioner declared a health emergency at the Love Canal, closed the 99th Street School, and recommended temporary evacuation of pregnant women and young children from the first two rings of houses around the site.

Within a week, Governor Hugh Carey announced the intended purchase of all "Ring 1" houses (later expanded to 238 houses in Rings 1 and 2). President Jimmy Carter simultaneously announced the allocation of federal funds and ordered the Federal Disaster Assistance Agency to assist the City of Niagara Falls to remedy the Love Canal site.



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PELICULA 1



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Courtesy WTEN

PELICULA 2



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