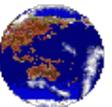
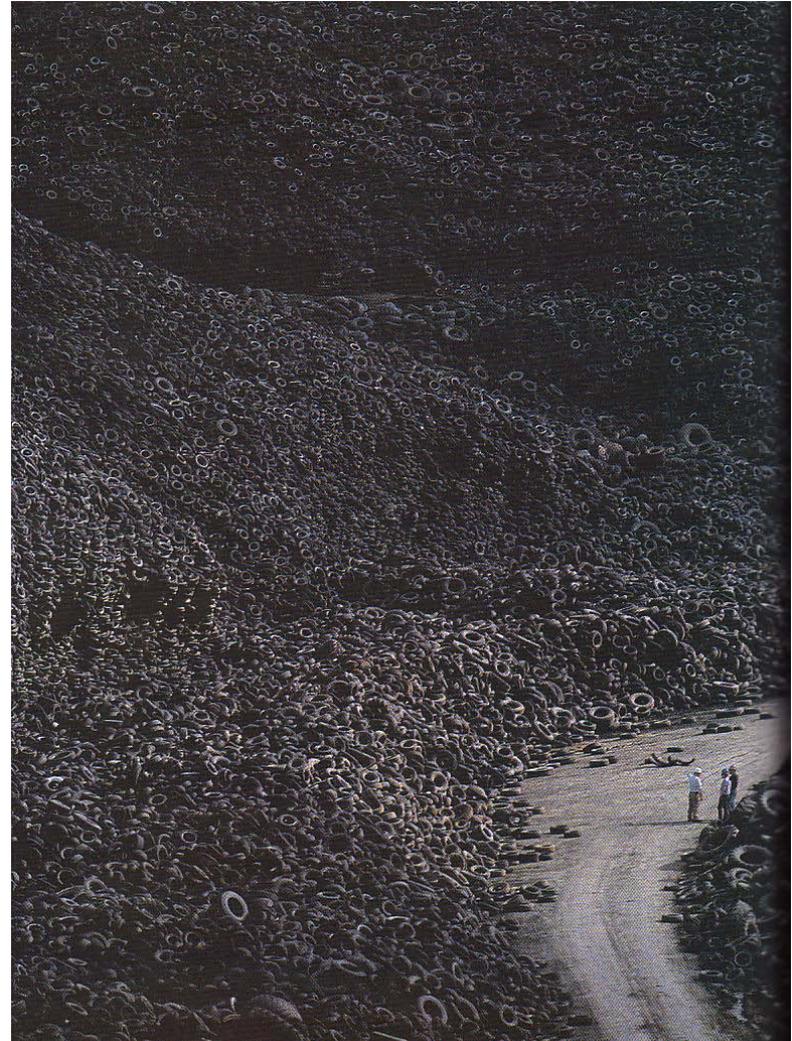
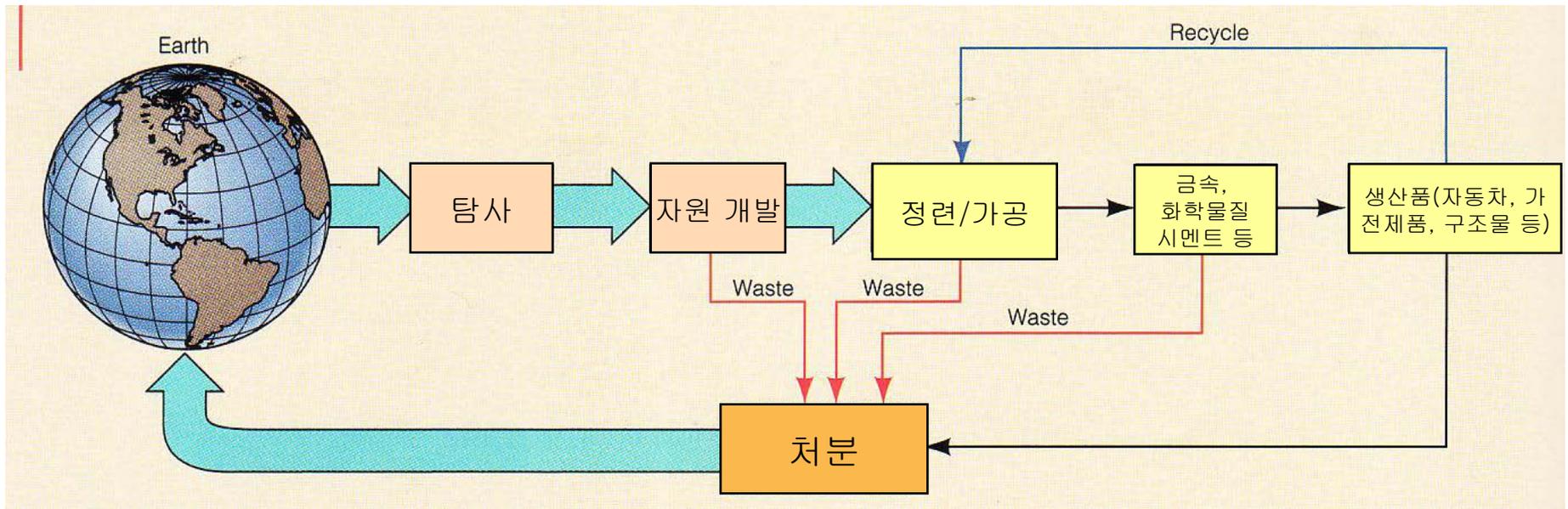


제 4 부 환경에 대한 인간의 영향

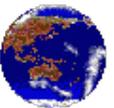
♻ 폐기물 관리



Environmental Geology



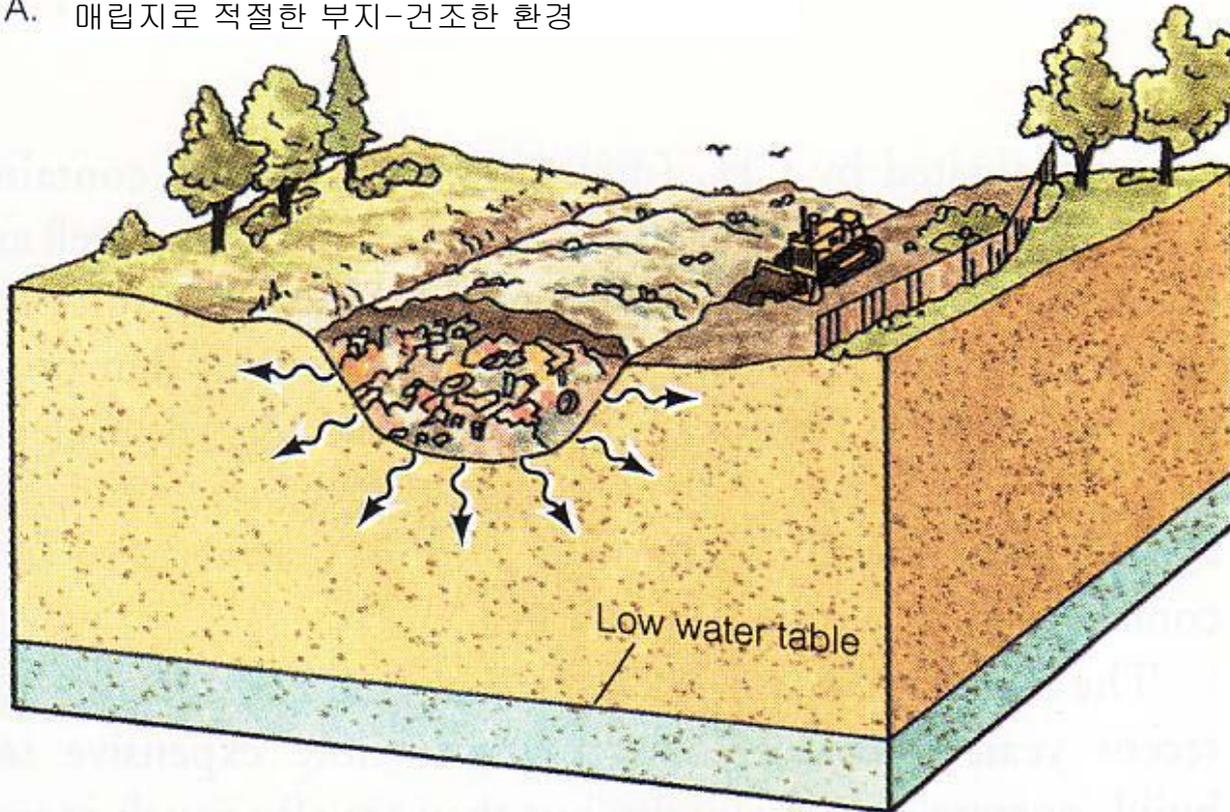
지구시스템을 통한 자원의 순환 사이클과 폐기물의 발생



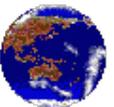
16. 폐기물 처분

✓ 고체폐기물

A. 매립지로 적절한 부지-건조한 환경

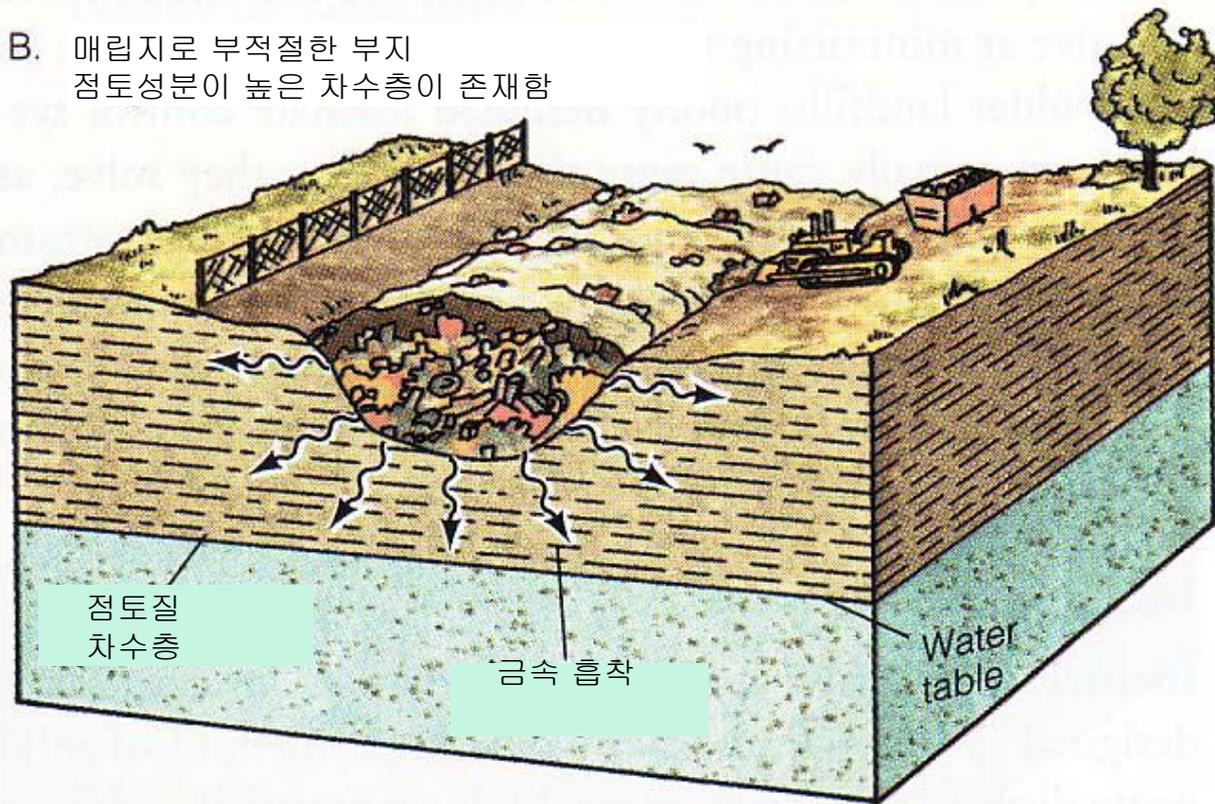


- 강수량이 적다
- 침출수가 적게 생성된다
- 침출수 이동이 느리다

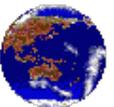


Environmental Geology

B. 매립지로 부적절한 부지
점토성분이 높은 차수층이 존재함

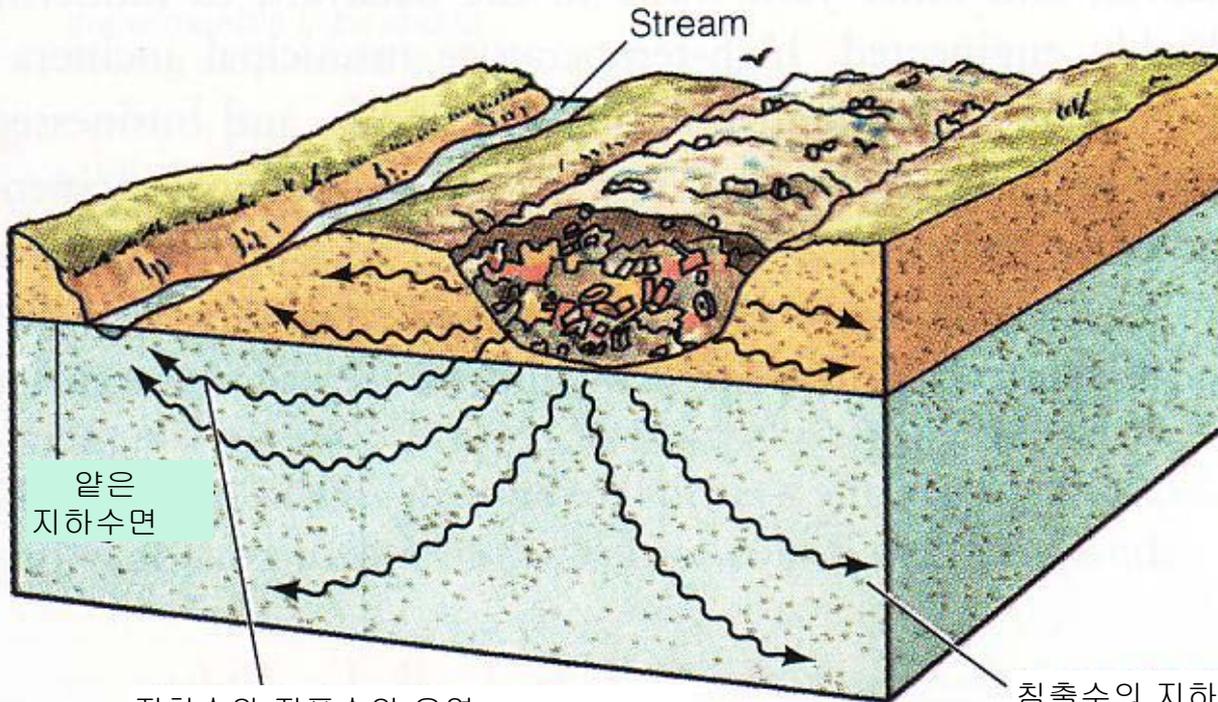


- 지하수면이 얕으며
침출수 생성율이 높다.
하지만 불투성의
점토질 차수층에 의해
침출수의 이동이
느리다



Environmental Geology

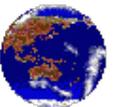
C. 매립지로 부적절한 부지-지하수면이 너무 얁다



- 지하수면이 얁다
- 침출수 생성율이 높다
- 침출수 이동이 매우 원활하다

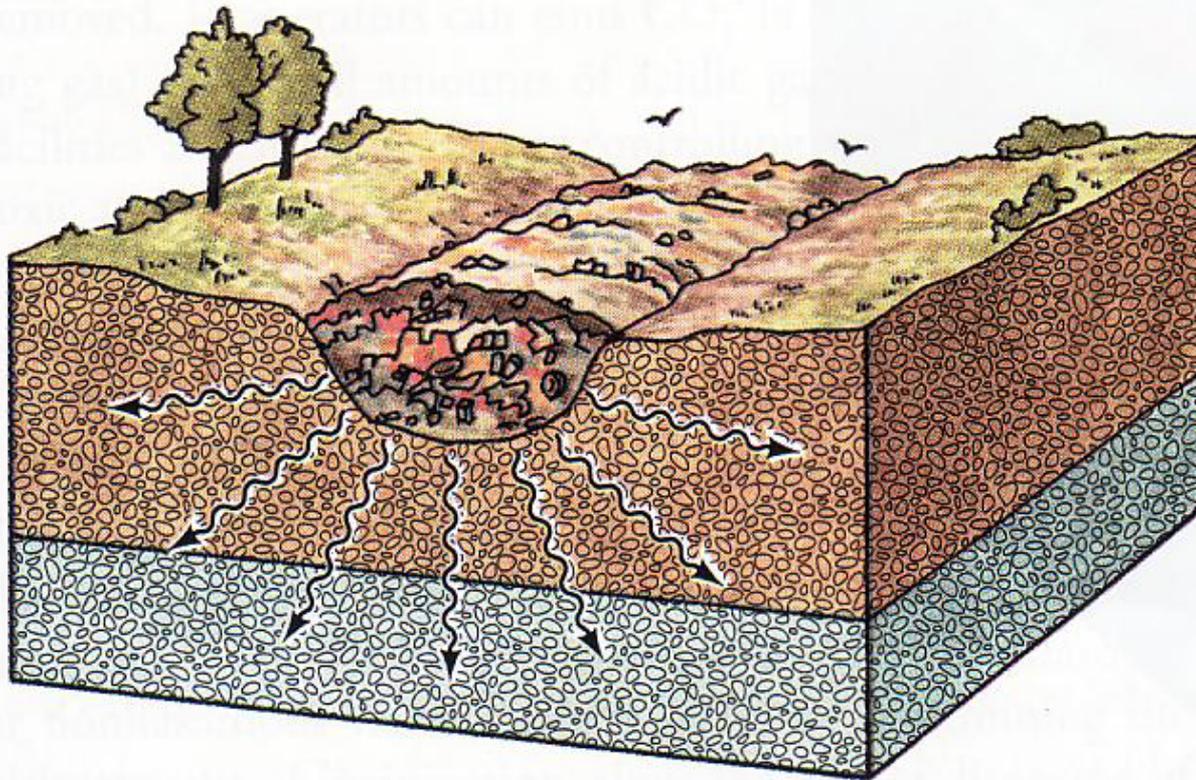
지하수와 지표수의 오염

침출수의 지하수계로의 이동

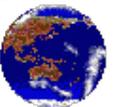


Environmental Geology

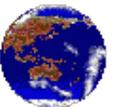
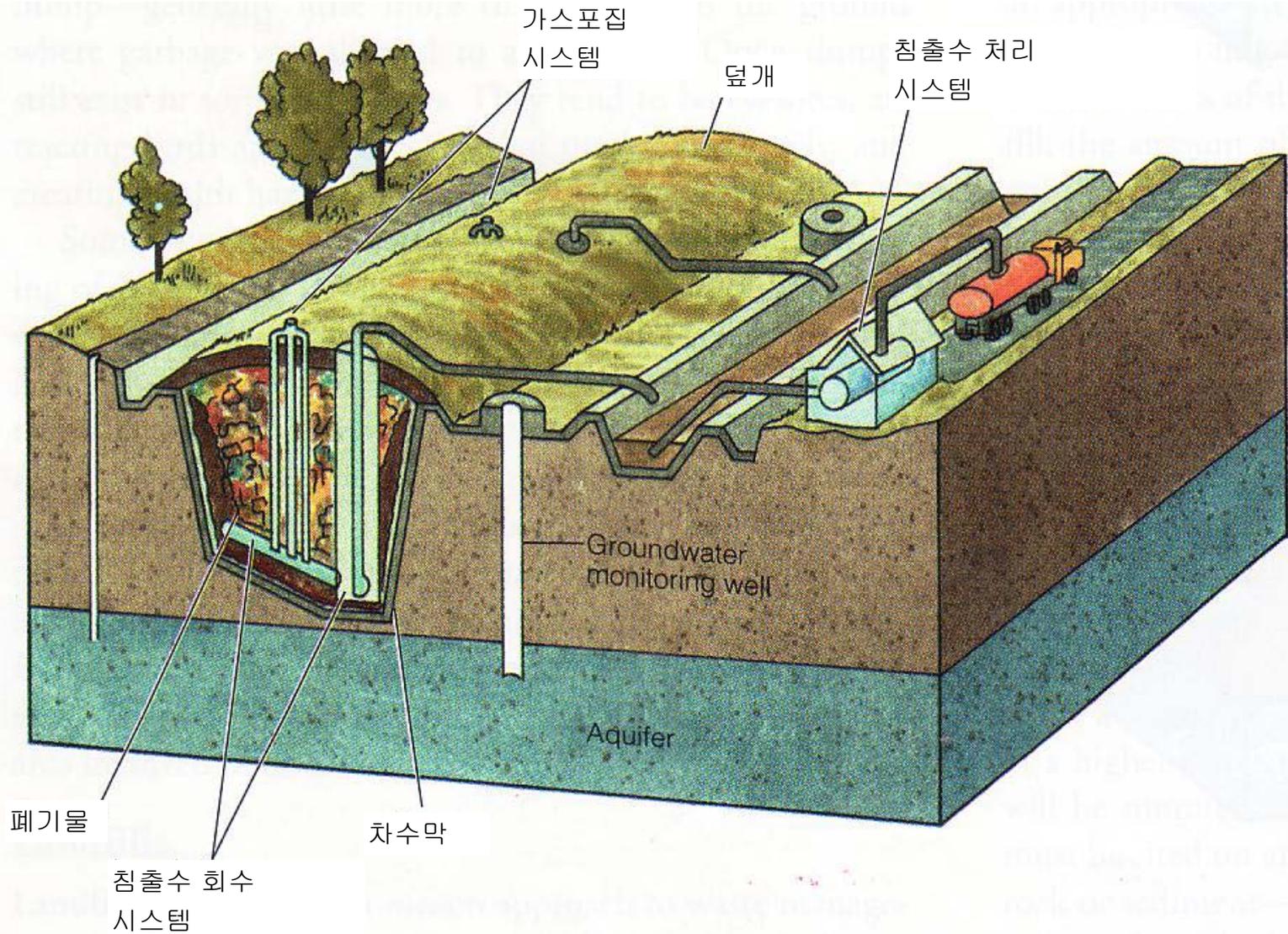
- D. 매립지로 부적절한 부지
매립지 하부 물질의 공극율과 투수성이 너무 높다



- 다공질이며 투수성이 높은 물질
- 침출수의 이동에 매우 빠르다



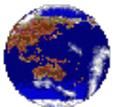
Environmental Geology



Environmental Geology

오염통제 설비의 유무에 따라 소각로로부터 발생 할수 있는 **15종류의 오염물**

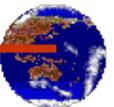
오염물	일반적인 발생량	공기오염통제 장치가 없는 구식 소각로로부터의 발생량
염화수소	75mg/m ³	430ppmdv
일산화탄소	57mg/m ³	150ppmdv
다이옥신과 푸란	0.5ng/m ³	250ng/m ³
미립자 물질	20mg/m ³	6,300mg/m ³
이산화황	260mg/m ³	260mg/m ³
질소화합물	400mg/m ³	400mg/m ³
PAHs	5ug/m ³	70ug/m ³
PCBs	1ug/m ³	3ug/m ³
Pentachlorophenol	1ug/m ³	2.7ug/m ³
Polychlorobenzene	1ug/m ³	12ug/m ³
납	50ug/m ³	34,000ug/m ³
카드뮴	100ug/m ³	1,500ug/m ³
수은	200ug/m ³	320ug/m ³
비소	1ug/m ³	130ug/m ³
크롬	10ug/m ³	2,000ug/m ³



Environmental Geology

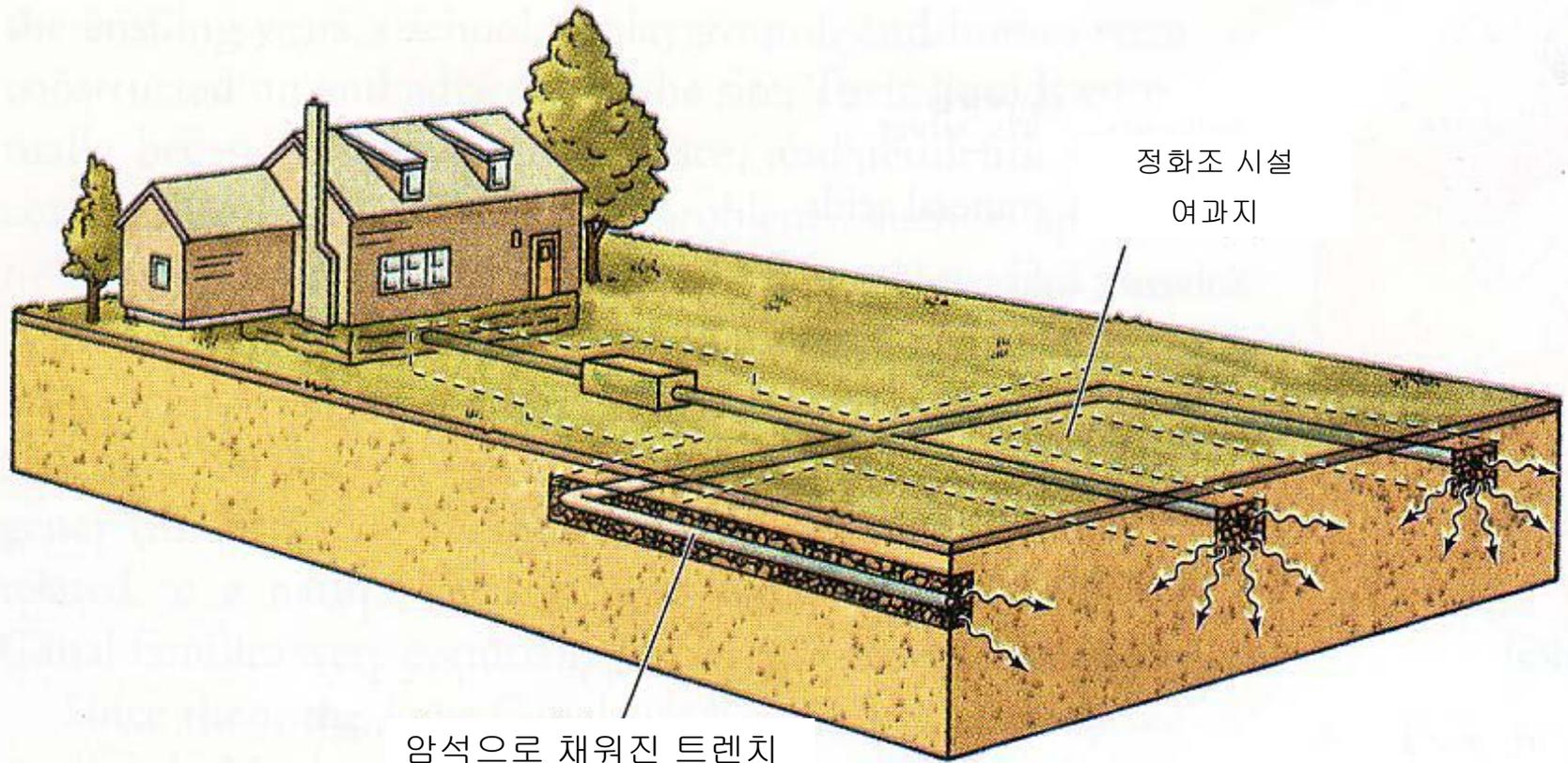
지역 소각장에서 발생하는 바닥에 쌓이는 재와 비산재에서 발견되는 오염물

화합물	오염의 범위	
	바닥에 쌓이는 재	비산재
유기화합물		
다이옥신	NDc-0.16 ng/g	0.7-1,040 ng/g
푸란	ND	1.4-373 ng/g
PAHs	0.23-968 ng/g	18-5,640 ng/g
무기화합물		
카드뮴	ND-18ug/g	23-1,080 ug/g
크롬	984-3,170ug/g	86-1,070 ug/g
납	1,000-9,900ug/g	1,400-26,000 ug/g
수은	2.1-3.4ug/g	8.0-54 ug/g
아연	1,300-5,210ug/g	4,700-70,000 ug/g



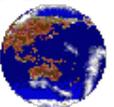
Environmental Geology

✓ 액체폐기물



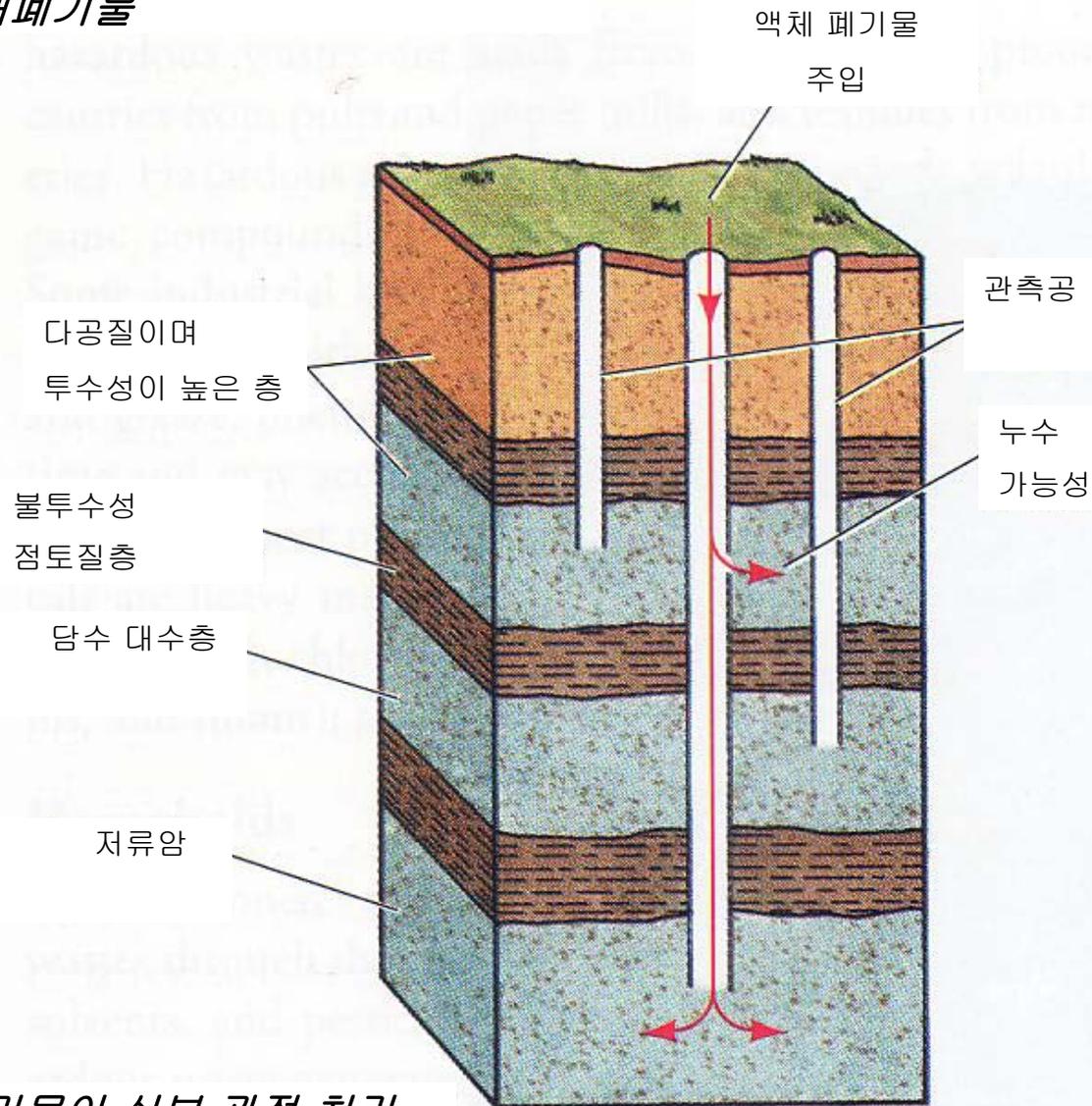
정화조 시설
여과지

암석으로 채워진 트렌치
내에 설치된 다공질 관

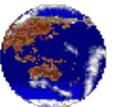


Environmental Geology

✓ 유해폐기물

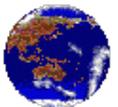
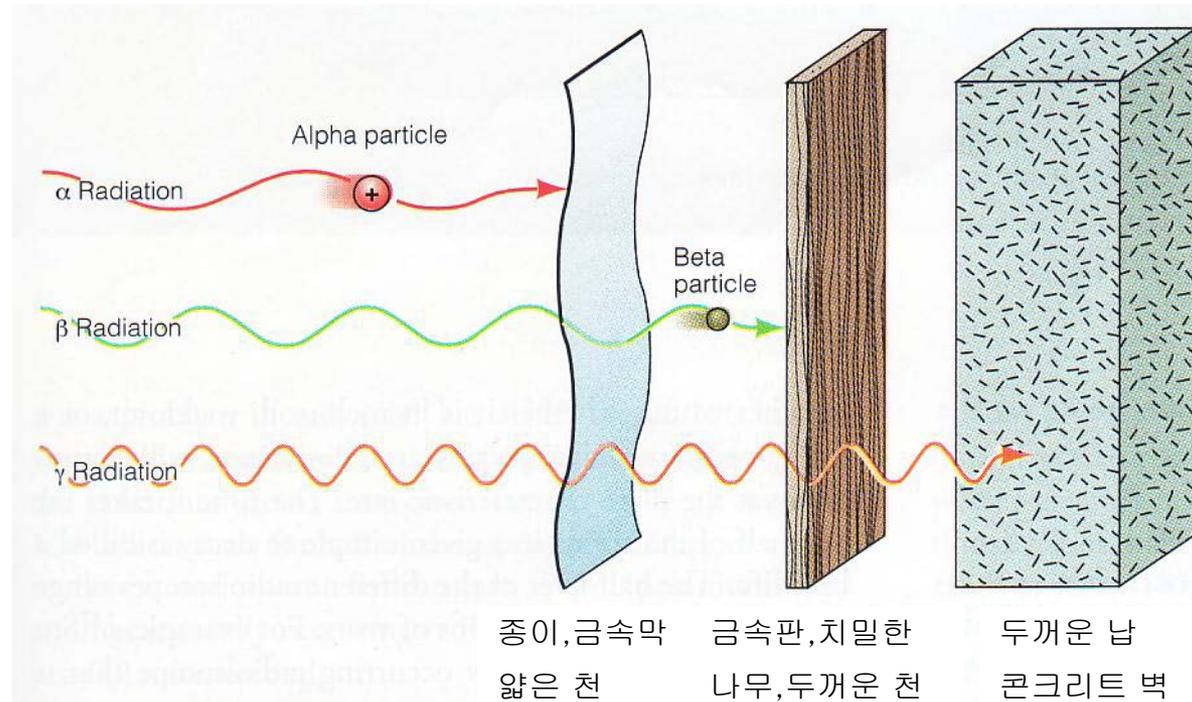
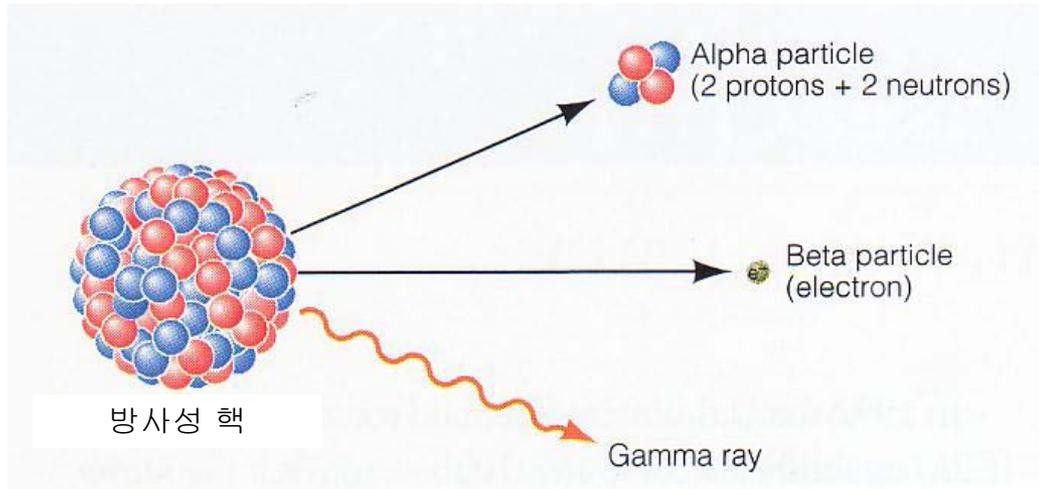


액체 유해 폐기물이 심부 관정 처리



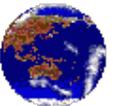
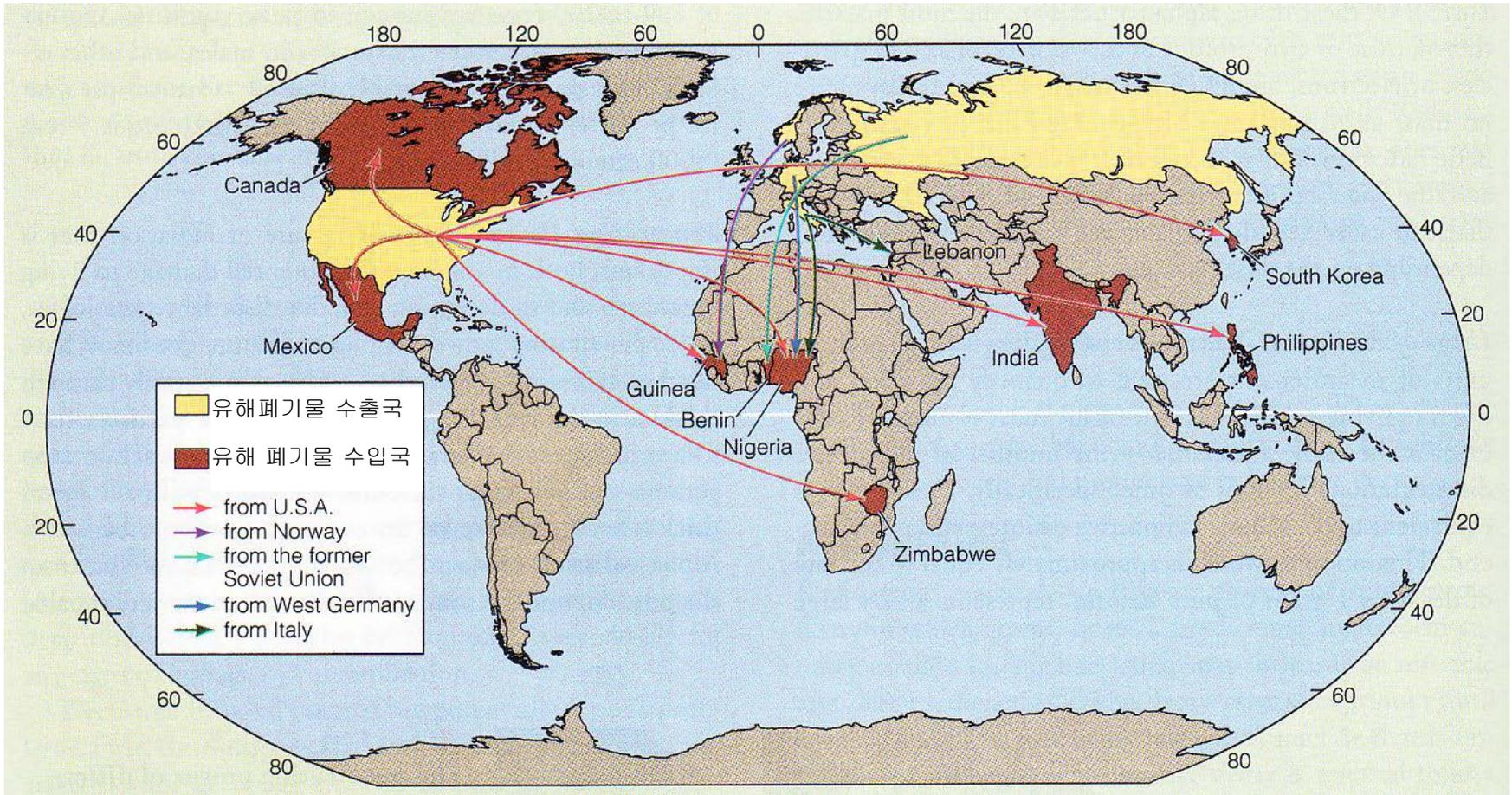
Environmental Geology

✓ 방사성폐기물

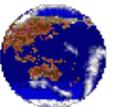
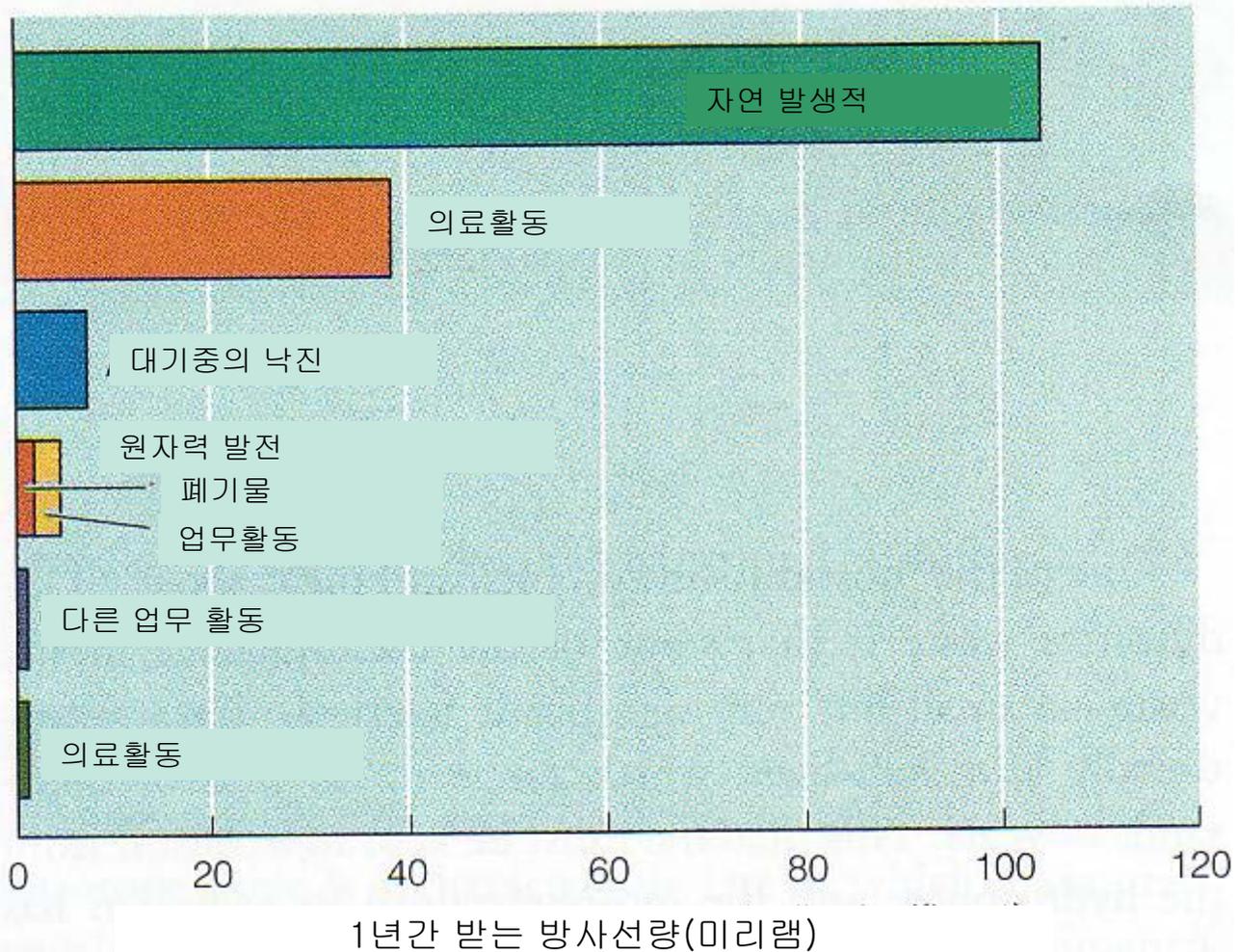


Environmental Geology

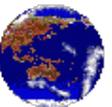
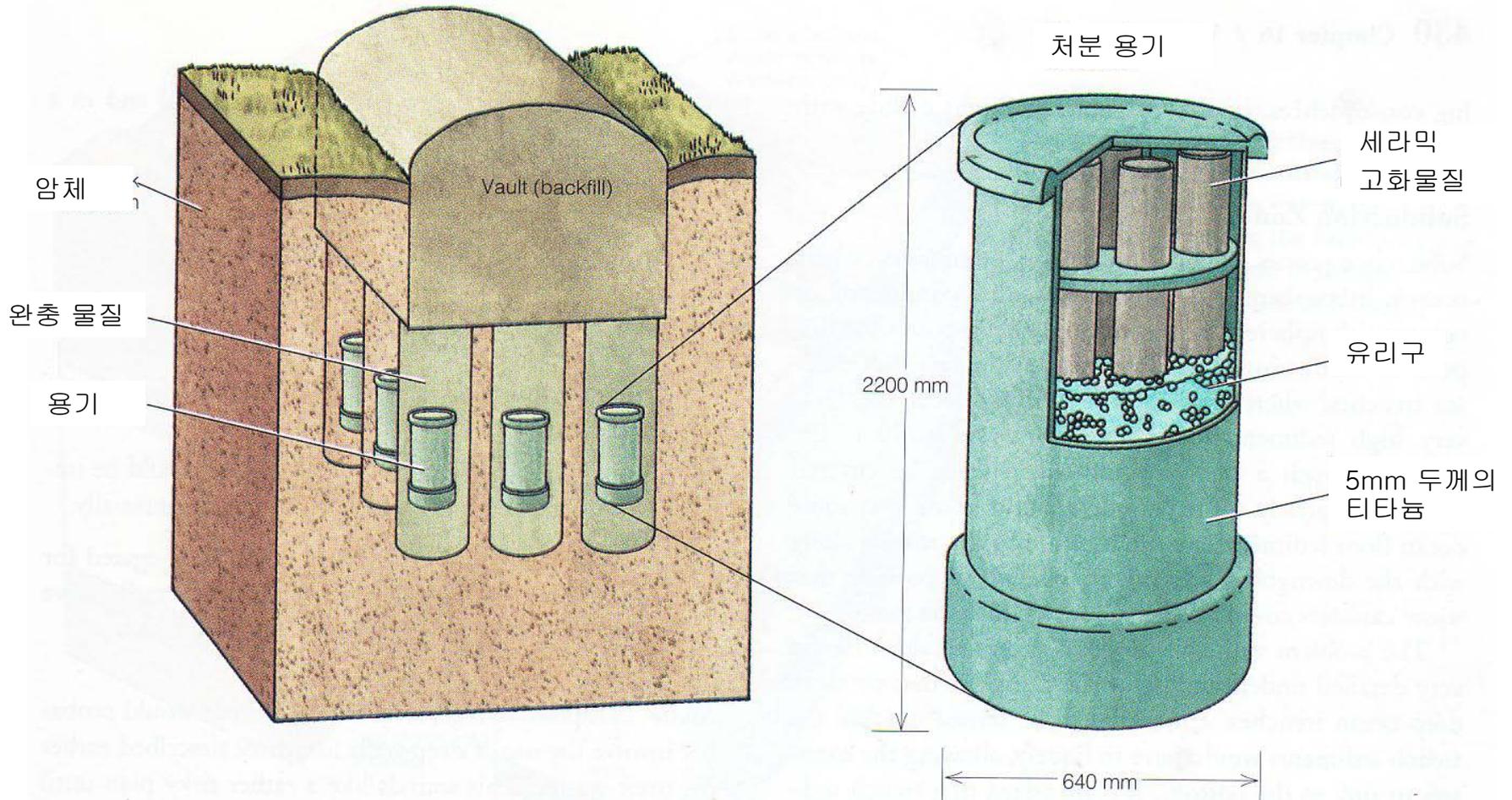
✓ 국제적인 유해 폐기물의 주 이동로



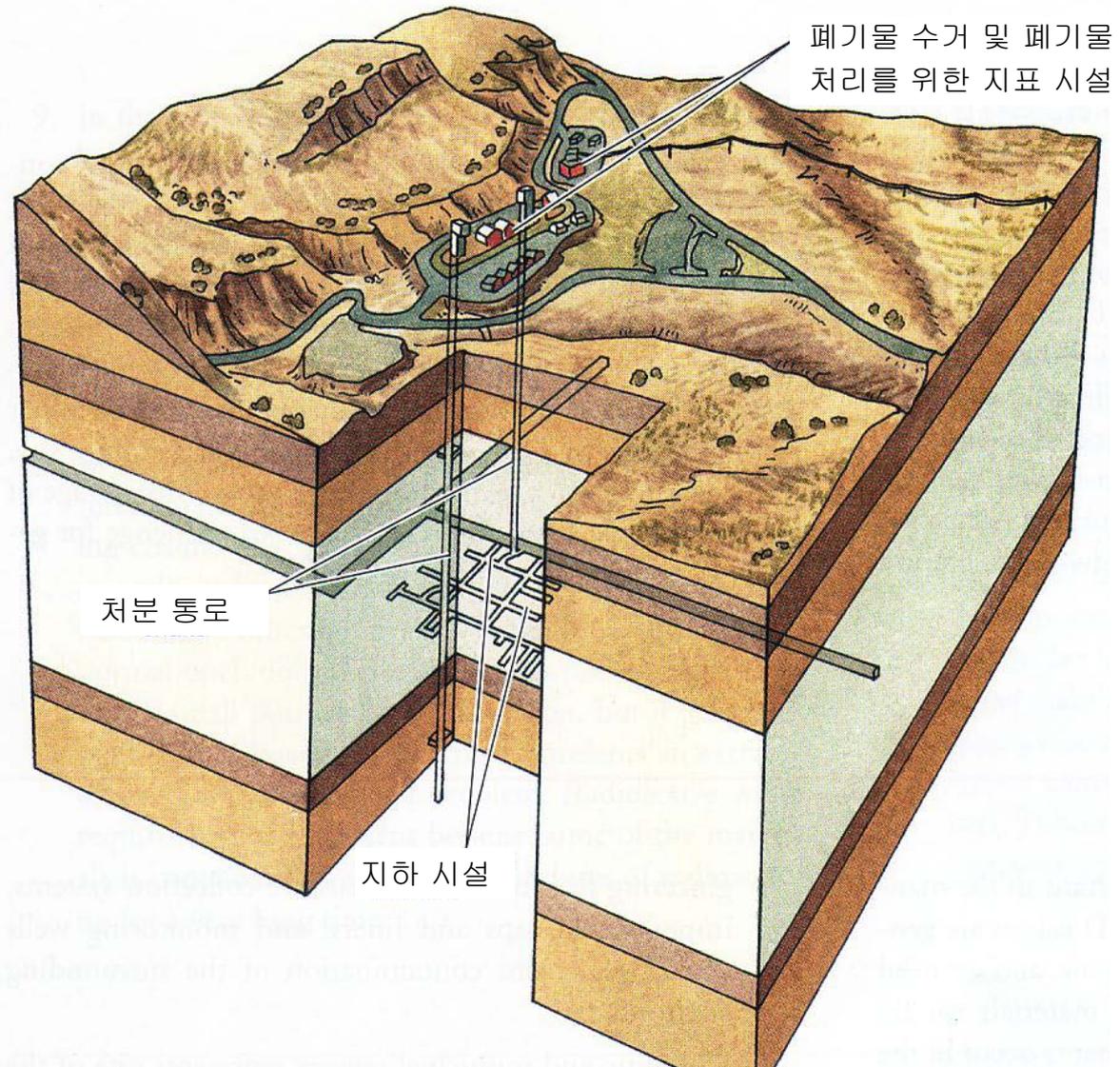
Environmental Geology



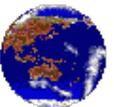
Environmental Geology



Environmental Geology

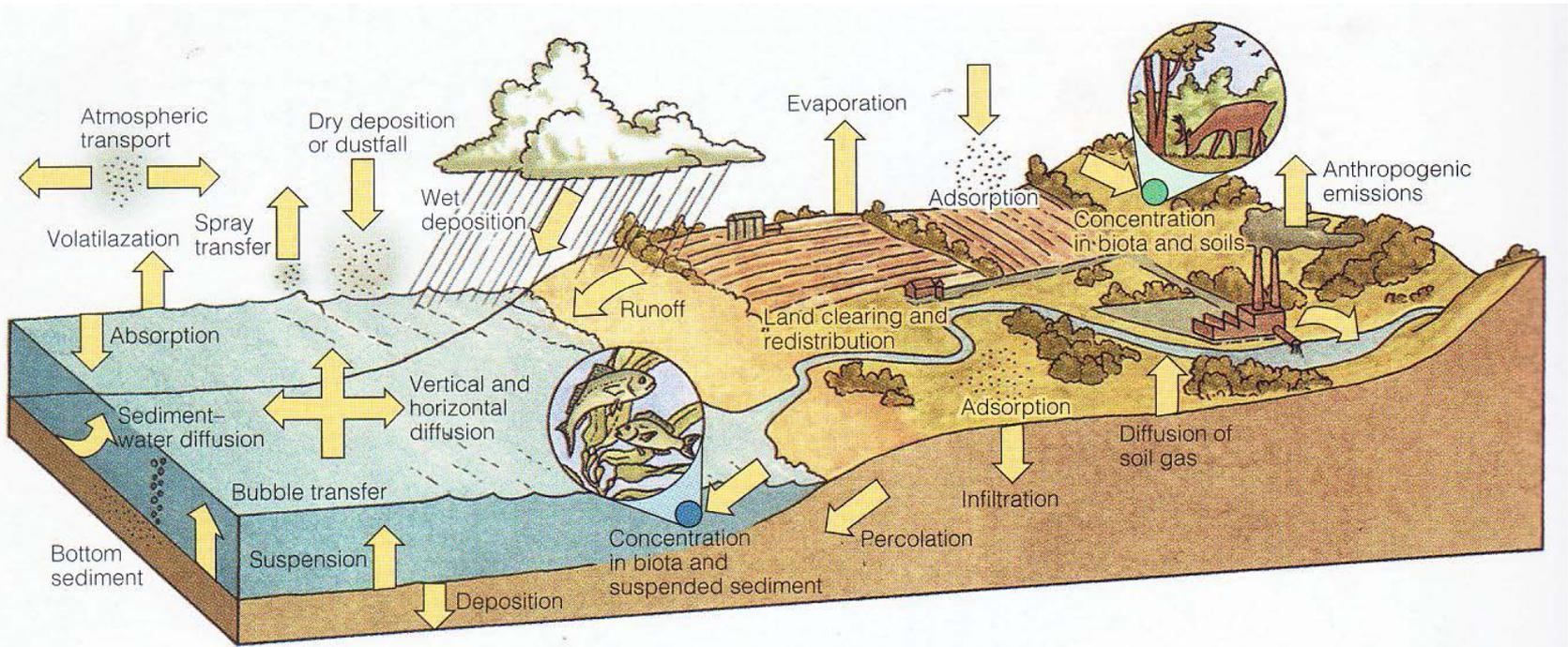


네바다의 유카산 지역에 제안된 방사성 폐기물 처분장

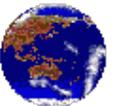


17. 지질환경의 오염물질

폐기물과 오염



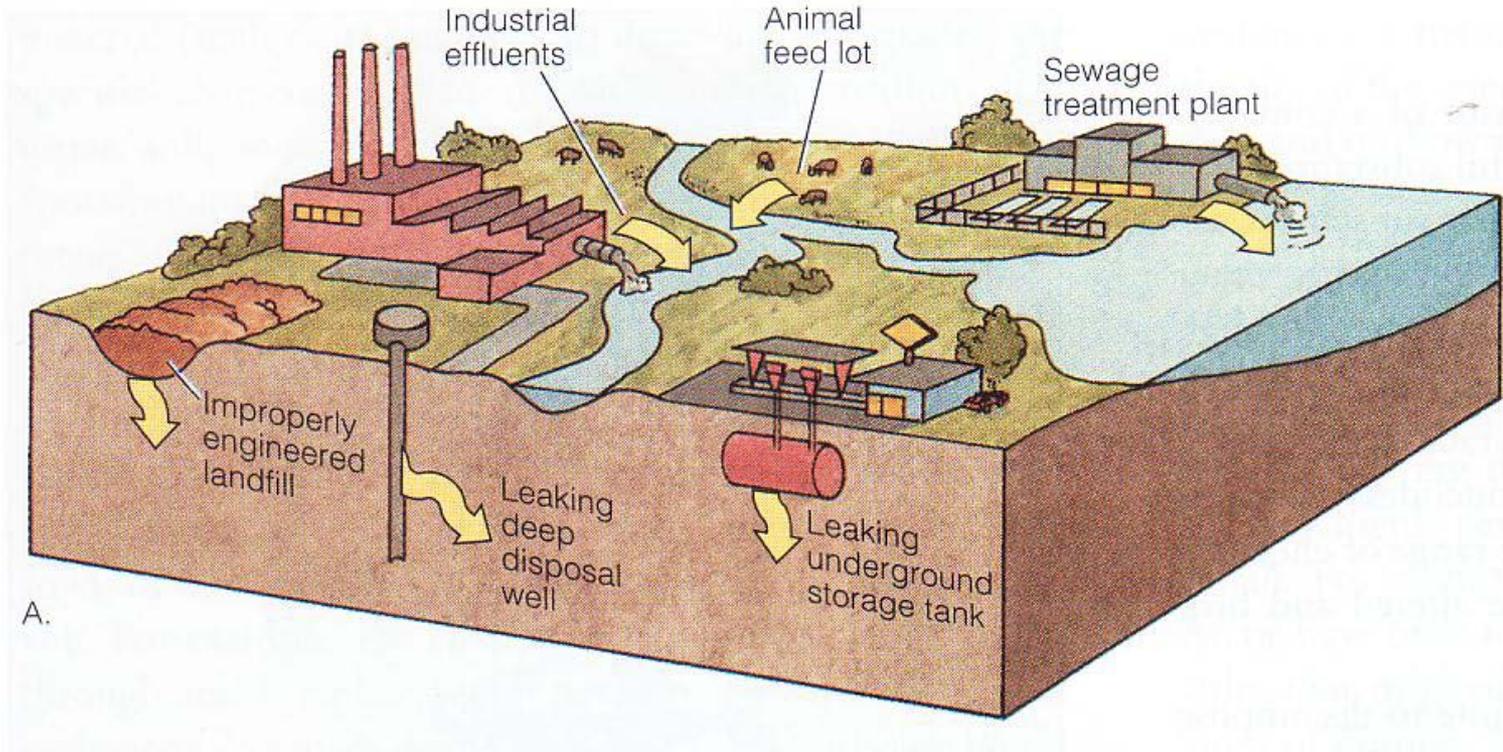
오염물이 지질환경으로 유입되어 이동되는 여러가지 통로



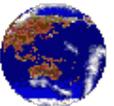
Environmental Geology

환경에서 오염물질의 거동

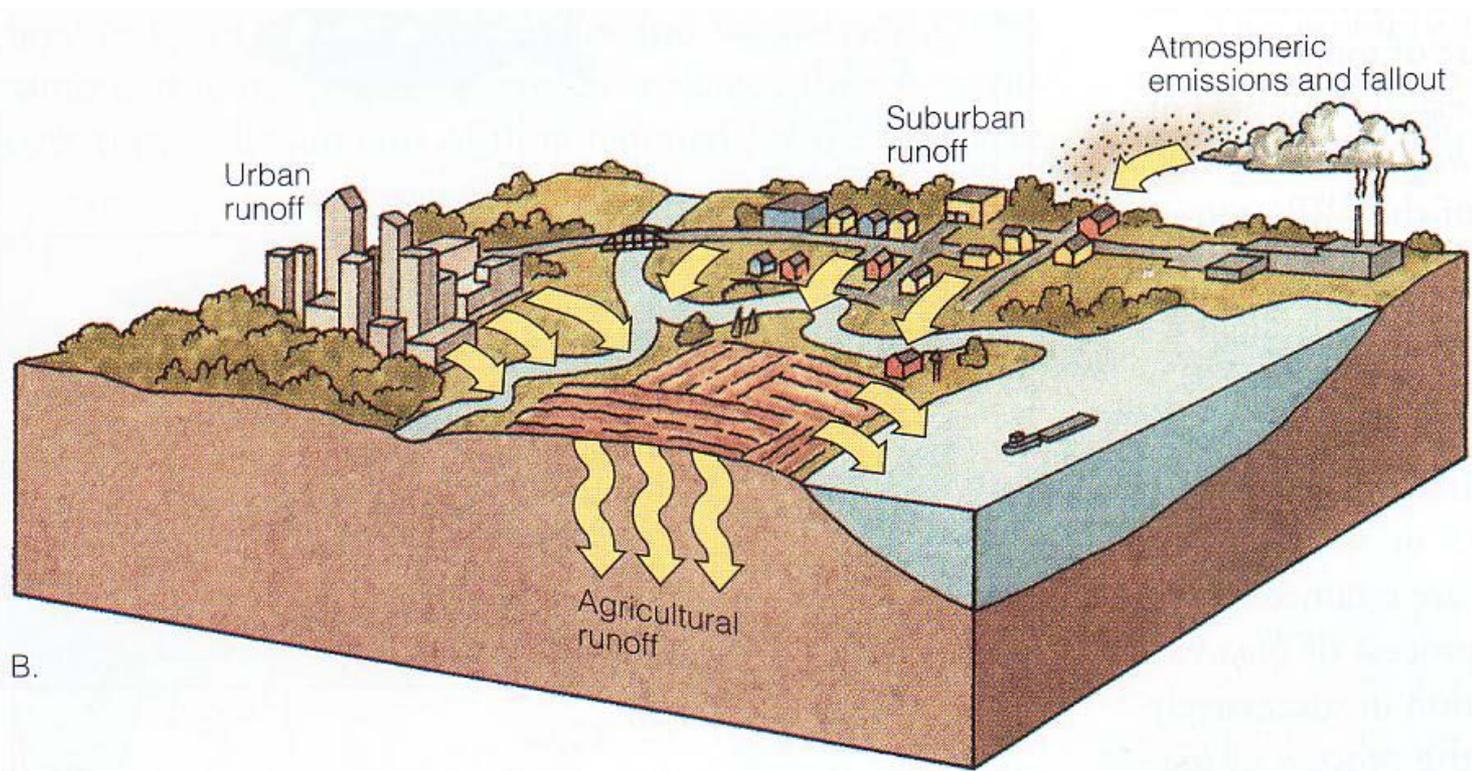
✓ 점오염원과 비점오염원



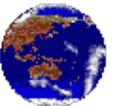
점오염원의 일반적인 형태



Environmental Geology

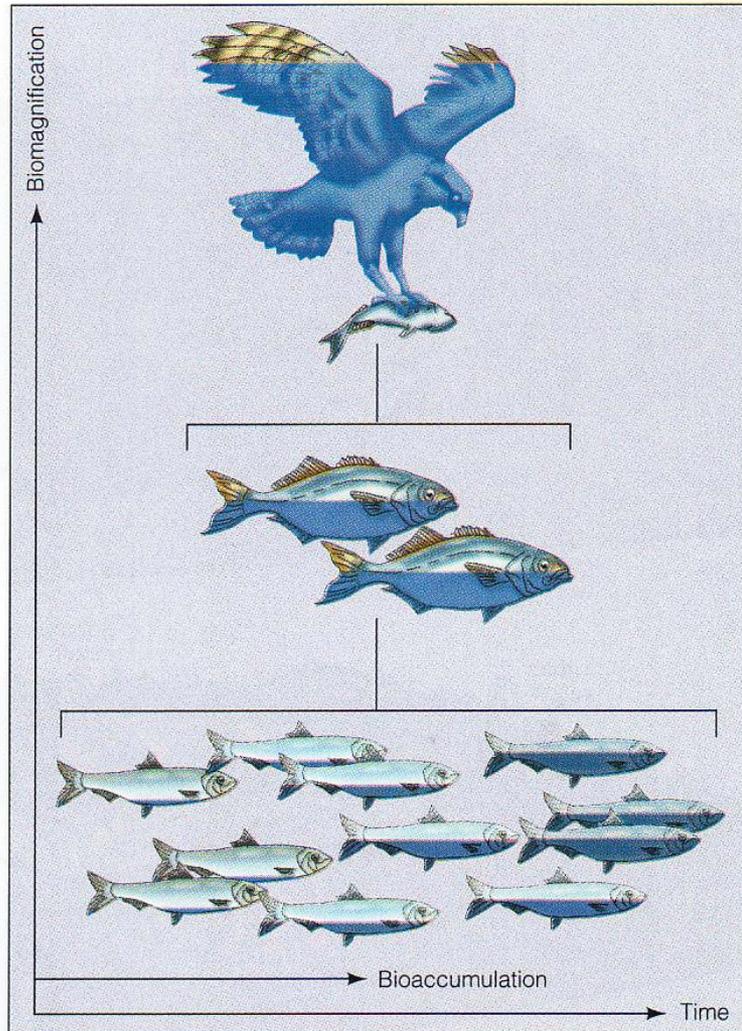


비점오염원의 일반적인 형태



Environmental Geology

✓ 부패와 분해작용

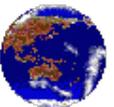


생분해작용
지속성오염물
생물학적 농축

✓ 체재시간

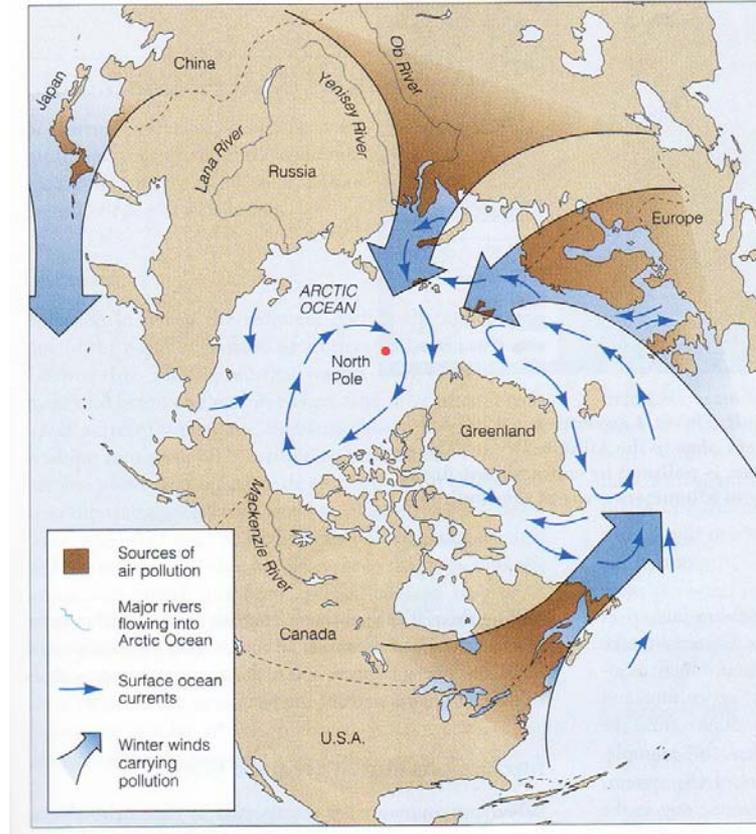
특정 저장소에 물질이 머무는
평균시간

먹이사슬에서 독성 오염물의
생물학적 농도

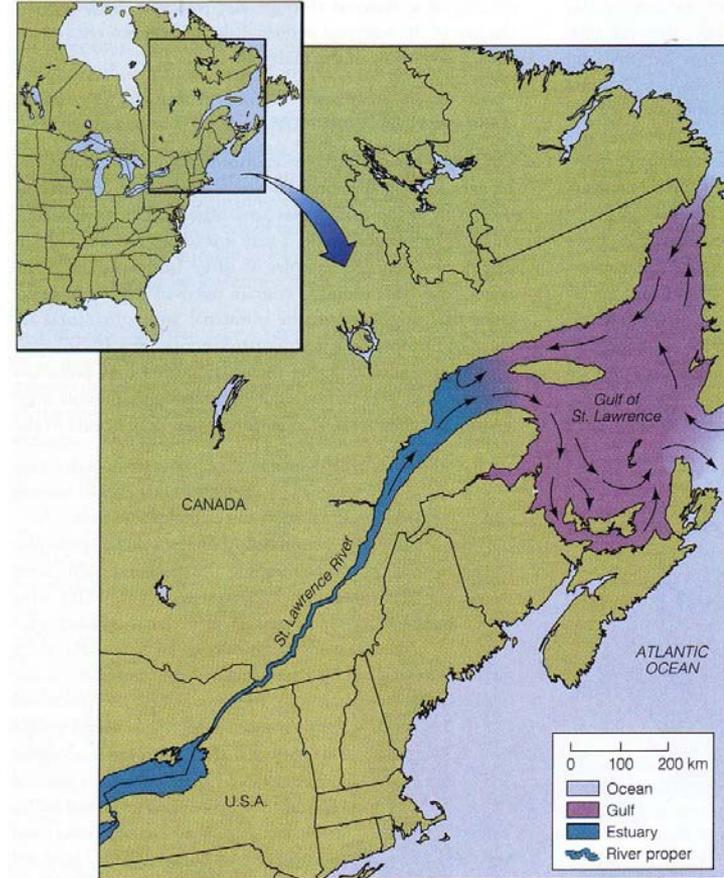


Environmental Geology

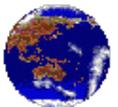
✓ 이동기구



북극으로의 오염물질의 이동



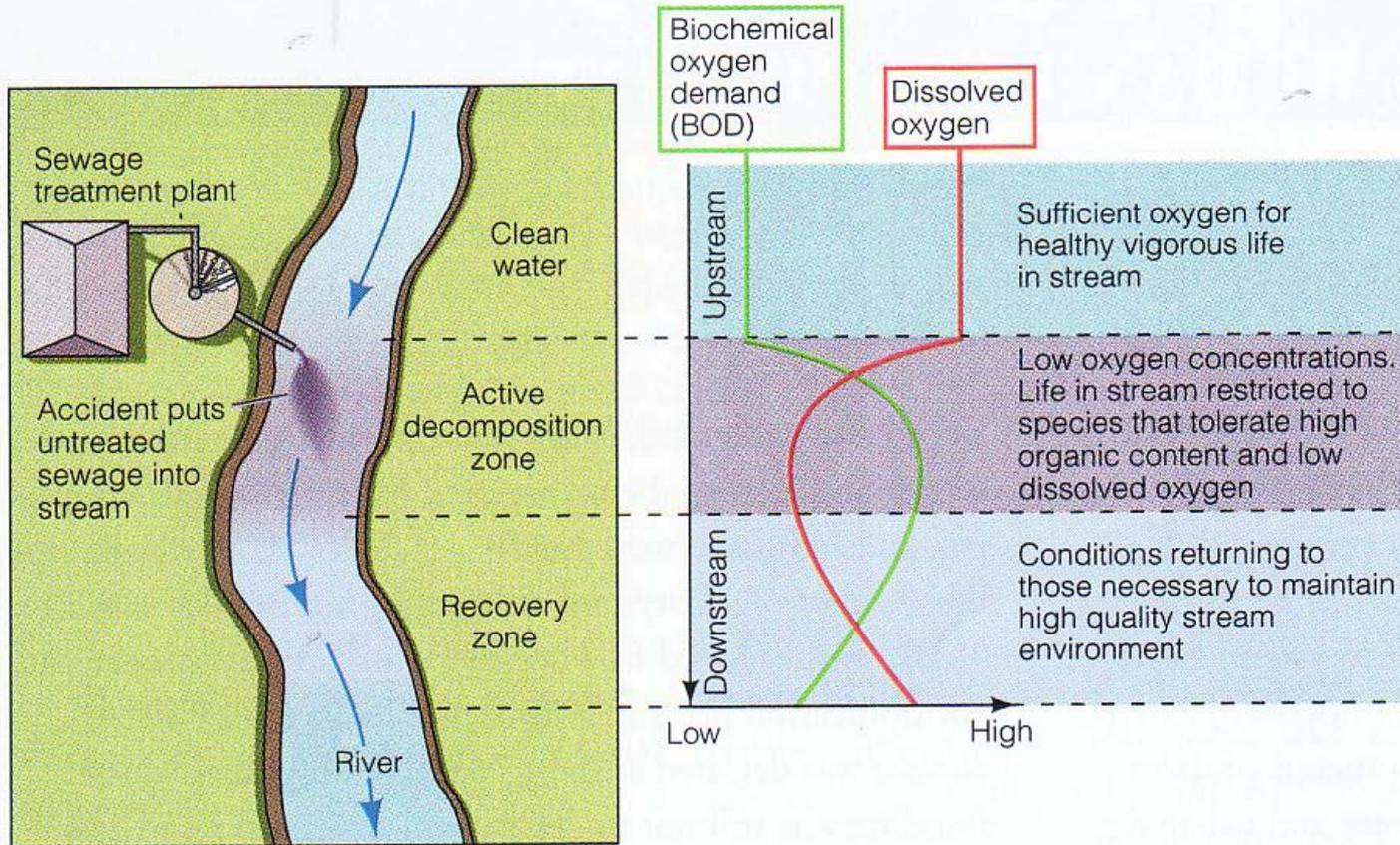
✓ 상호반응과 상승효과



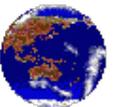
Environmental Geology

지표수 오염

유기오염



하수가 유입되는 하천에서 생화학적 산소요구량과 용존산소의 상관관계

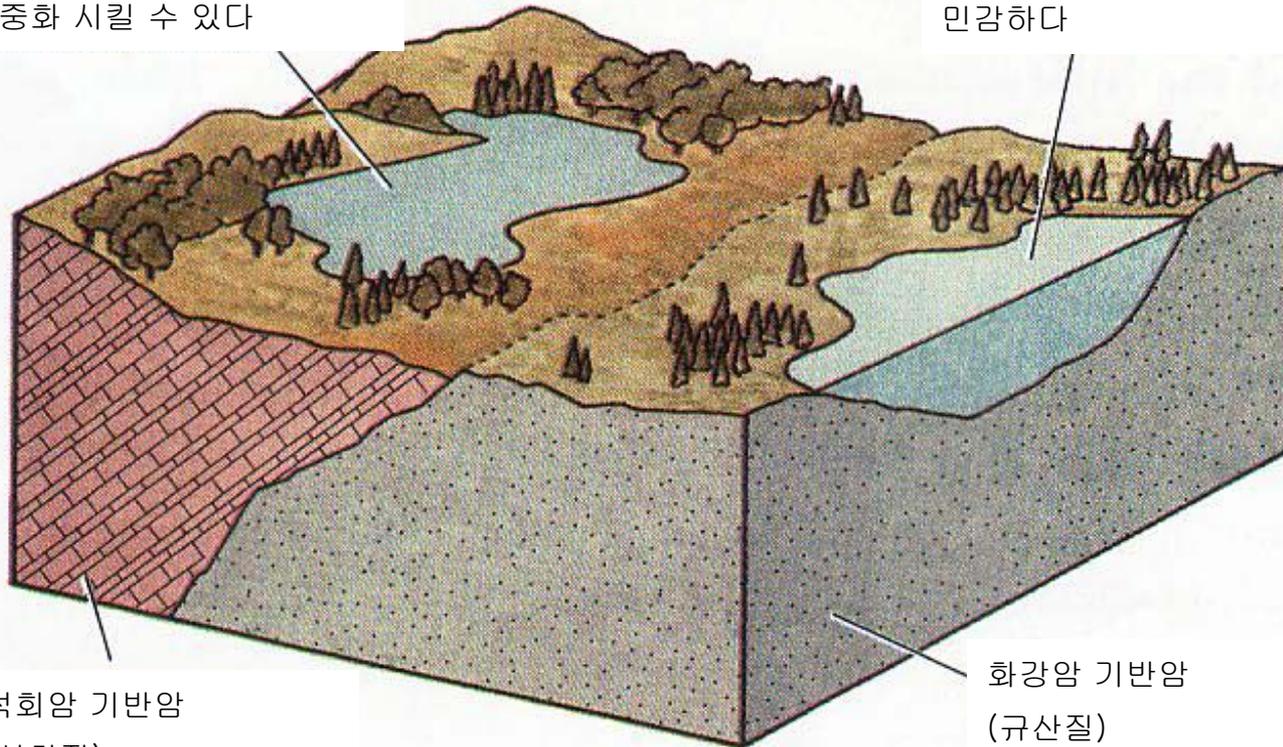


Environmental Geology

지표수 산성화에 대한 중화작용

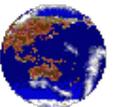
용존칼슘과 중탄산 이온을
가진 경수 호수는 산을
중화 시킬 수 있다

규산질 기반암 위에 연수
호수는 산성화 작용에
민감하다



석회암 기반암
(석회질)

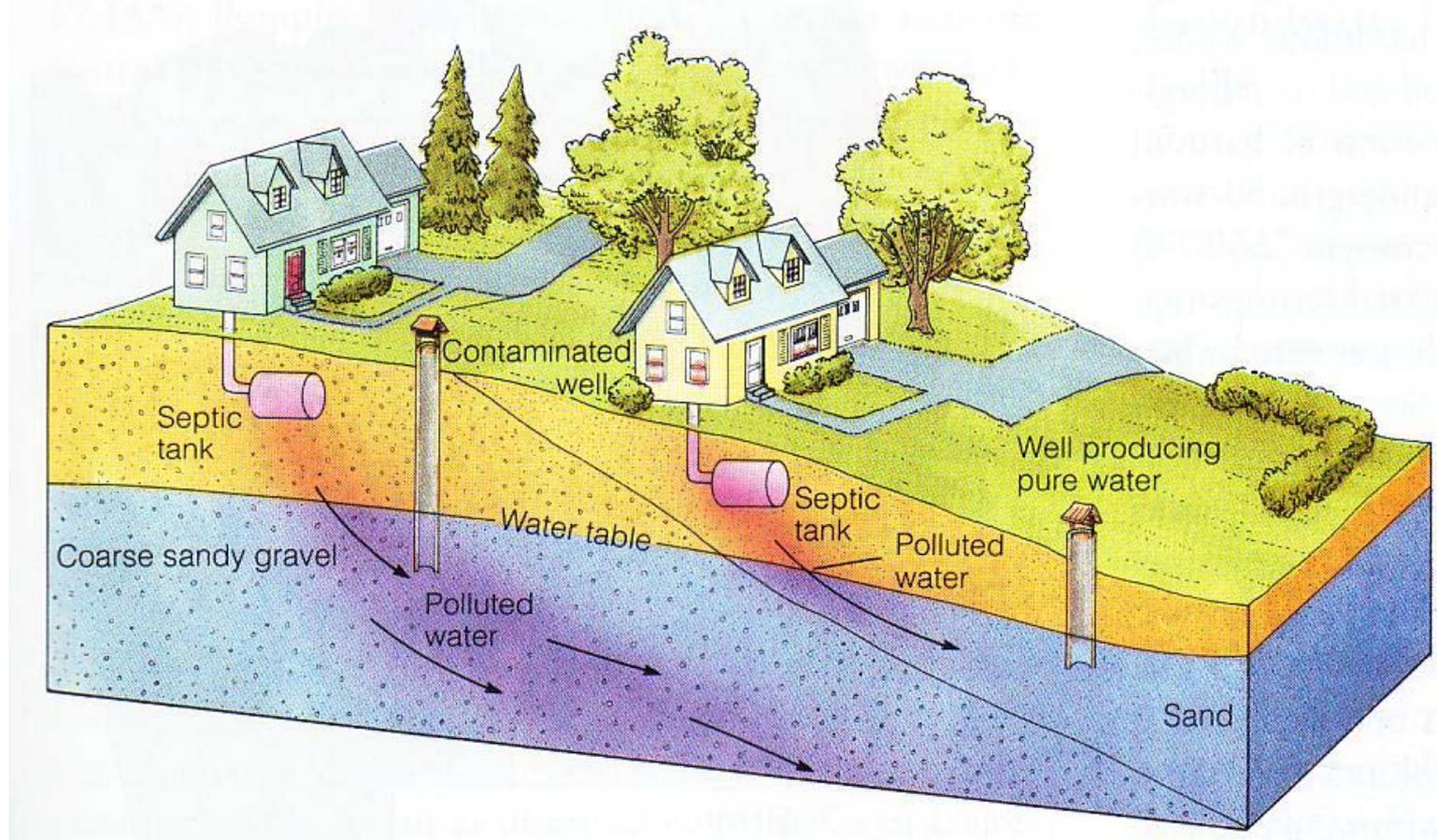
화강암 기반암
(규산질)



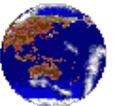
Environmental Geology

지하수 오염

지하수 오염의 유형과 오염원



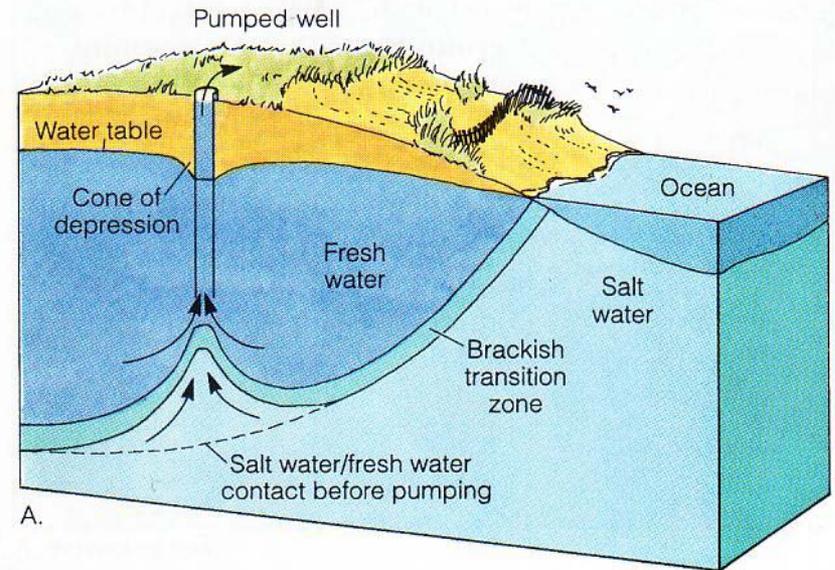
생활하수에 의해 오염된 지하수의 정화



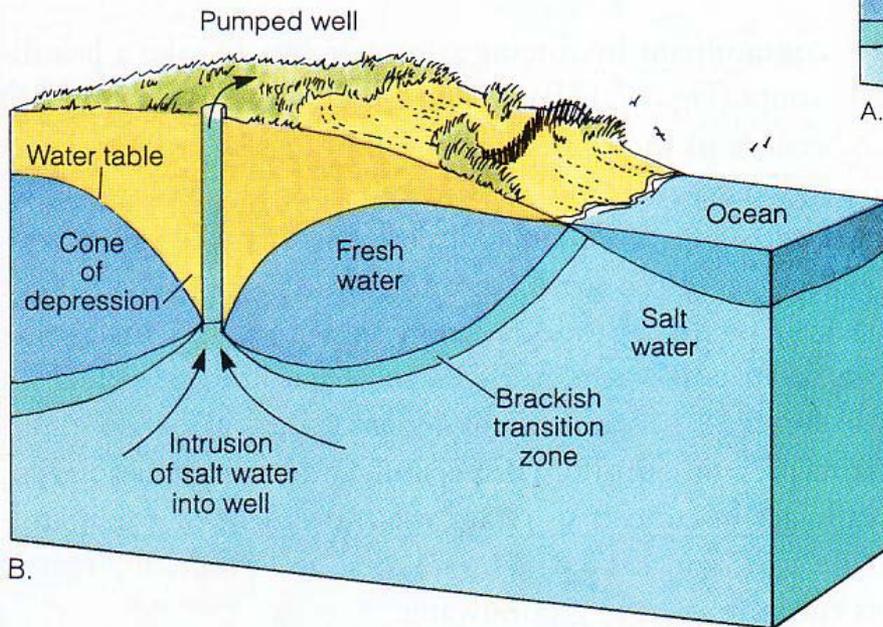
Environmental Geology

해수에 의한 오염

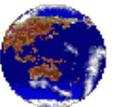
해안지역에서 해수침투는
양수정의 오염



A.



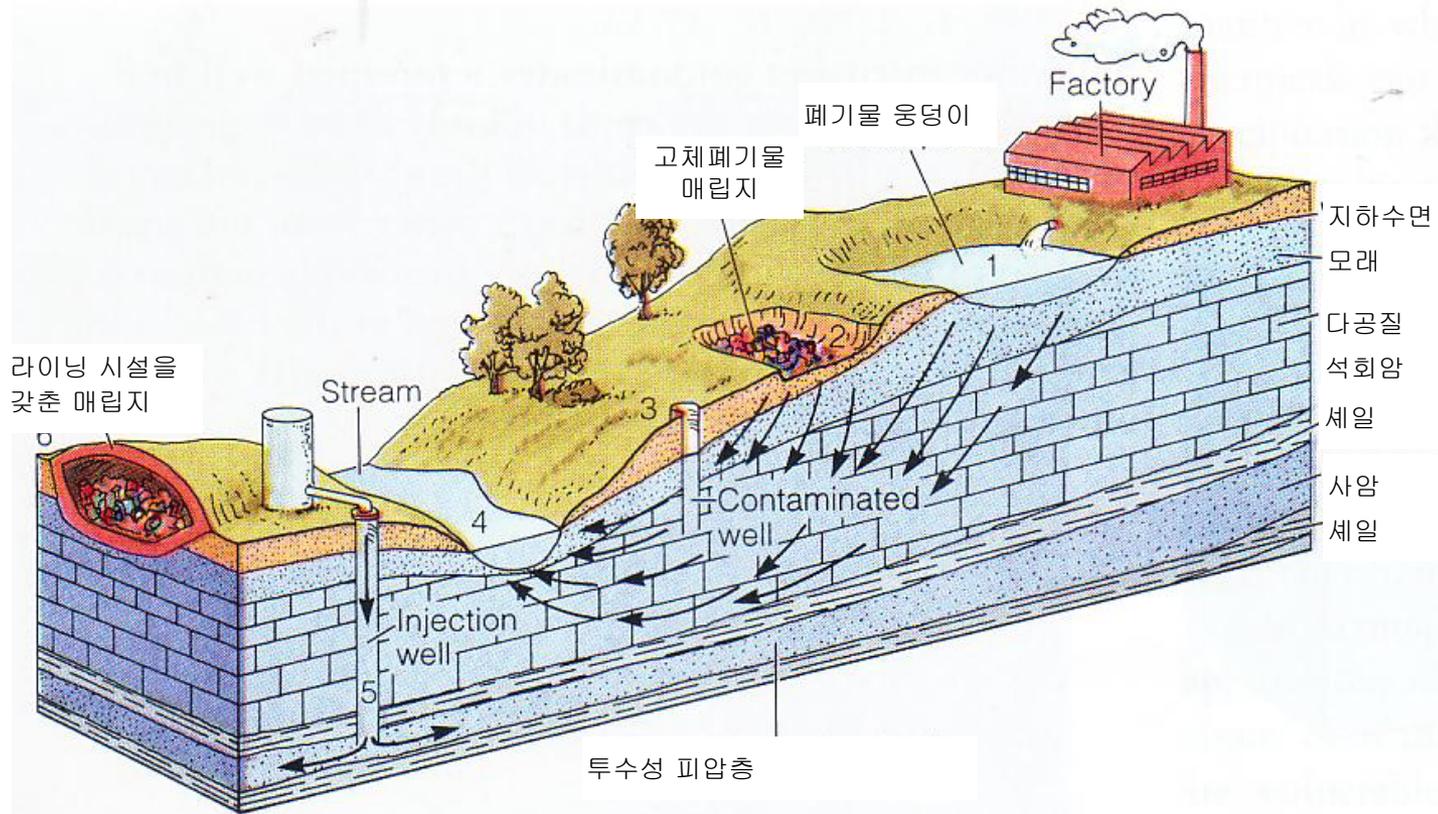
B.



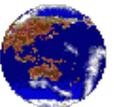
Environmental Geology

✓ 지하환경에서의 오염물 거동

지하수 유동

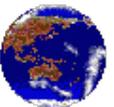
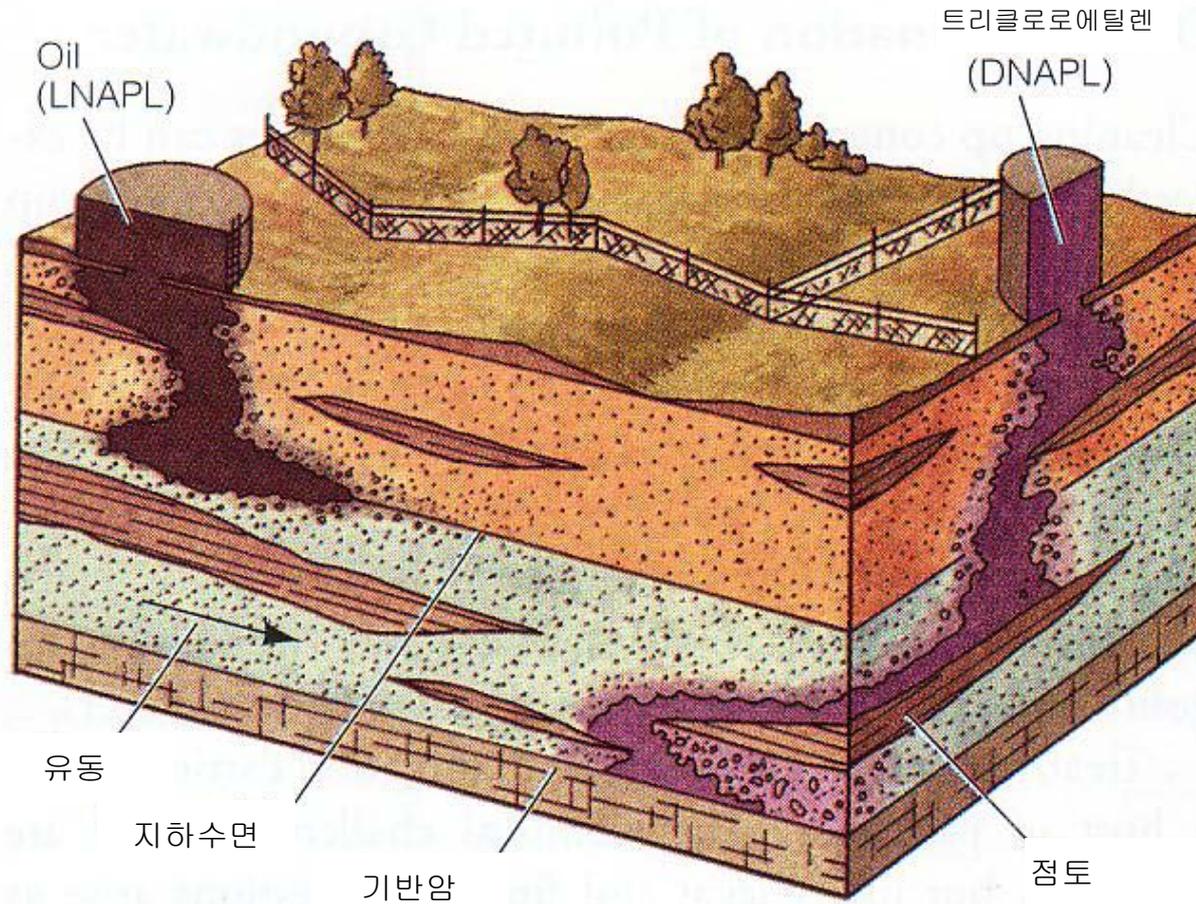


독성 폐기물에 의해 오염된 지하수계



Environmental Geology

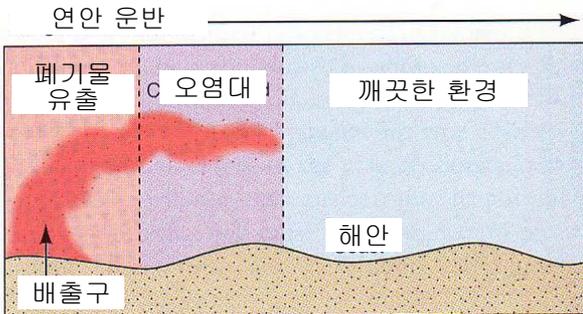
DNAPLs 와 LNAPLs



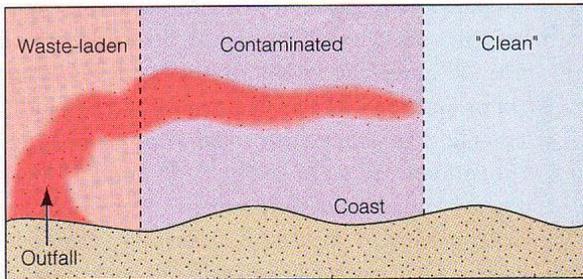
Environmental Geology

해양 환경의 오염

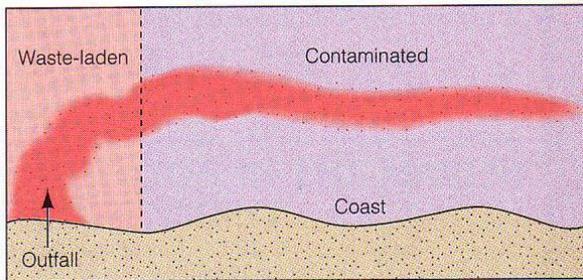
해안오염원



A.



B.



해안을 따른 해수 순환과정에 의한 오염



해안조류에 의해 해안을 따라서 형성된 기름띠

