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Beratender Ingenieure
und Geologen

Deponie Grauer Wall,
Antrag auf Änderung der Planfeststellung

Anlage 13:
Fachgutachten Wasserhaushaltsbetrachtungen zur ergänzenden Profilierungsschicht im Deponieabschnitt 3

erstellt im Auftrag der

Bremerhavener Entsorgungsgesellschaft mbH

durch

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1 Veranlassung

Die Bremerhavener Entsorgungsgesellschaft mbH (BEG) betreibt in Bremerhaven die Deponie Grauer Wall. Die vorhandene Deponie wird in die bestehenden Deponieabschnitte DA 1 (Altdeponiekörper) und DA 2 (Neudeponiekörper, 1. Bauabschnitt) eingeteilt. DA 1 ist weitestgehend bis zur derzeit genehmigten Endhöhe von ca. +25,00 m über Geländeoberkante verfüllt. Die Abfallablagerung findet zurzeit auf DA 2 statt.

Um die Entsorgungssicherheit für den Wirtschafsstandort Bremerhaven zu gewährleisten, wird seitens der BEG als Betreiber der Deponie und dem Senator für Umwelt, Bau, Verkehr und Europa (SUBVE) als zuständige Abfallbehörde der Weiterbetrieb der Deponie Grauer Wall angestrebt.

Gemäß öffentlich-rechtlichem Vertrag zwischen der BEG und dem SUBVE ist die Errichtung weiterer Deponieabschnitte geplant. Einer dieser geplanten Abschnitte ist der Deponieabschnitt DA 3. DA 3 ist auf der Plateaufläche von DA 1 vorgesehen und soll zur Ablagerung von Abfällen, die den Zuordnungskriterien der Deponieklasse I (DK I) entsprechen, dienen.

Zur bautechnischen Abgrenzung zwischen DA 1 und DA 3 wird eine Mehrfach-Funktionale-Abdichtung (Oberflächenabdichtung für DA 1 und gleichzeitig Basisabdichtung für DA 3) errichtet. Um das gemäß DIN 19667 erforderliche Mindestgefälle der Entwässerungsschicht zu gewährleisten, ist die Herstellung einer Gefälleausgleichsschicht als Profilierungsschicht auf der Plateaufläche des DA 1 erforderlich. Zur Reduzierung des Eintrages von Niederschlagswasser soll die Profilierungsschicht in den Bereichen, in denen bis 2012 keine Abdichtung aufgebracht wird, so beschaffen sein, dass im Mittel höchstens 30% des mittleren jährlichen Niederschlags in den Deponiekörper versickert. Die Profilierungsschicht übernimmt somit in diesen Bereichen die Funktion einer Zwischenabdeckung und wird nachfolgend auch so bezeichnet.

Um die für die Herstellung der Zwischenabdeckung geeigneten Bodenarten eingrenzen zu können, wurden Wasserhaushaltsbetrachtungen mit der deutschen Version des Simulationsprogrammes HELP (Hydraulic Evaluation of Landfill Performance) durchgeführt. Die Ergebnisse dieser Wasserhaushaltsbetrachtungen werden im Folgenden vorgestellt und näher beschrieben.

2 Grundlagen der Wasserhaushaltsbetrachtung

2.1 Verwendete Wetterdaten

Für die durchgeführten Simulationen wurden beim Deutschen Wetterdienst (DWD) die spezifischen Wetterdaten aus den Jahren 1999 bis 2008 für den zu betrachtenden Standort angefordert. Die erforderlichen täglichen Niederschlags- und Temperaturdaten sowie die durchschnittliche Luftfeuchtigkeit (Quartalswerte) wurden in der Wetterstation Bremerhaven ermittelt. Die durchschnittliche Windgeschwindigkeit über den gesamten Betrachtungszeitraum wird vom DWD mit 12,2 km/h angegeben und wurde ebenfalls an der Wetterstation Bremerhaven gemessen. Die tägliche Globalstrahlung in Joule/cm² wurde unter Verwendung der Messreihen der täglichen Sonnenscheindauer der Jahre 1999 bis 2008 der Wetterstation Bremen ermittelt.

Die verwendeten Wetterdaten weisen nachfolgend in Tabelle 1 aufgeführte Charakteristika auf und sind als repräsentativ für den Standort der Deponie Grauer Wall anzusehen:

	Minimum	**Maximum**	**Mittelwert**
Niederschlag	0,0 mm/d	70,5 mm/d	2,2 mm/d
	661,1 mm/a	994,7mm/a	810,8 mm/a
Lufttemperatur[1]	-8,5 °C	27,5 °C	10,5 °C
Globalstrahlung	23 J/cm²	3.100 J/cm²	994 J/cm²
Windgeschwindigkeit	-	-	12,2 km/h
Luftfeuchtigkeit	-	-	81 %

Tabelle 1: Kennwerte der verwendeten DWD-Wetterdaten (1999 bis 2008)

Mit den verwendeten, zehn Jahre umfassenden Wetterdaten werden auch nur gelegentlich auftretende Extremereignisse, wie Hitze- und Kälteperioden, Starkregenereignisse, länger andauernde Trockenzeiten, etc. in ausreichendem Maße berücksichtigt.

[1] Lufttemperatur als Tagesmittelwerte

2.2 Generelle Annahmen

Darüber hinaus wurden basierend auf Erfahrungen aus vergleichbaren Projekten nachfolgende, generelle Annahmen getroffen:

- Mäßiger Grasbewuchs auf der Deponieoberfläche
- Blattflächenindex (Verhältnis Blattoberfläche zu Erdoberfläche): 2,5
- Durchwurzelungstiefe: 70 cm
- Kein unterirdischer Wasserzufluss
- Beginn der Vegetationsperiode: Mitte April
- Ende der Vegetationsperiode: Mitte Oktober
- Mittlere Luftfeuchtigkeit im ersten Quartal: 85,4%
- Mittlere Luftfeuchtigkeit im zweiten Quartal: 74,2%
- Mittlere Luftfeuchtigkeit im dritten Quartal: 77,8 %
- Mittlere Luftfeuchtigkeit im vierten Quartal: 86,9 %

2.3 Schichtenaufbau

2.3.1 Allgemeines

Der Schichtenaufbau der Zwischenabdeckung wird im Zuge der Simulationen variiert. Gleichbleibend werden allerdings angesetzt:

- Gesamtmächtigkeit der Zwischenabdeckung: 100 cm
- Differenzierung in einen oberen und einen unteren Horizont
- Der obere Horizont wird aus dem in Bremerhaven oftmals bei Baumaßnahmen als Aushubboden anfallenden Klei (i.d.R. ein toniger, sandiger, humoser Schluff) hergestellt.

Variiert werden allerdings:

- Mächtigkeit des oberen Horizontes
- Mächtigkeit und Bodenart für den unteren Horizont

Letztlich soll mit dieser Variation aufgezeigt werden können, dass auch bei schwankenden Bodenzusammensetzungen eine Durchsickerung der Zwischenabdichtung von im Mittel höchstens 30 % des mittleren jährlichen Niederschlags erreicht werden kann.

2.3.2 Schichtenaufbau I

Die Schichtenaufbau I sieht vor:

- 20 cm oberer Horizont aus Klei
- 80 cm unterer Horizont
- Deponat (abgelagerter Abfall)

Für den 80 cm mächtigen unteren Horizont wurden insgesamt 5 verschiedene Bodenarten (siehe auch nachfolgende Darstellungen im Kap. 4.2) eingesetzt, deren Eignung in den Simulationsläufen geprüft wurde.

Bei den verwendeten Bodenkennwerten wurde auf die im verwendeten Simulationsprogramm HELP in einer Datenbank vorhandenen „Beispielböden" zurückgegriffen. Diese „Beispielböden" entstammen der Bodenkundlichen Kartieranleitung /5/[2].

Da der für den oberen Horizont verwendete Klei humose Anteile aufweist, erfolgt gemäß /5/ Tabelle 72 eine Korrektur der Bodenkennwerte für die Einstufung h3 (mittel humos).

Schichten-bezeichnung	**Bodenart**	**Mächtig-keit** in cm	**Poro-sität** in %	**Feldka-pazität** in %	**Welke-punkt** in %	**nutzbare Feldkap.** in %	**k-Wert** in m/s
Oberer Horizont	Klei	20	54,0	38,0	19,0	19,0	$1,0 \times 10^{-7}$
Unterer Horizont	variabel	80		variabel			

Tabelle 2: Eingabewerte Schichtenaufbau

Die Simulation erfolgte beispielhaft für den Bereich des Plateaus von DA 1, mit einer maximalen Länge von ca. 100 m und einem Gefälle von ca. 2% (siehe auch nachfolgende Tabelle).

2 Die in Schrägstriche gesetzten Ziffern, wie z.B. /5/, beziehen sich auf das Literaturverzeichnis in Kapitel 7.

	Plateau-neigung in %	**Länge** in m
Plateau DA 1	2,0	100

Tabelle 3: Eingabewerte Neigung und Länge

2.3.3 Schichtenaufbau II

Abweichend vom Schichtenaufbau I wurden angesetzt:

- 50 cm oberer Horizont aus Klei
- 50 cm unterer Horizont
- Deponat (abgelagerter Abfall)

Die sonstigen Annahmen bleiben unverändert.

3 Modellbeschreibung des Simulationsprogrammes HELP

Die folgende Programmbeschreibung des Simulationsprogramms HELP wurde im Wesentlichen einer Veröffentlichung des Programmentwicklers der deutschen HELP-Version /3/ sowie dem Programmhandbuch /2/ entnommen.

Das Programmsystem „Hydraulic Evaluation of Landfill Performance“ (HELP) wurde erstmals 1984 von Mitarbeitern der U.S. Army und der U.S. Environmental Protection Agency (EPA, Umweltbehörde der USA) der Fachöffentlichkeit vorgestellt und seit dem weiterentwickelt. In den vorliegenden Simulationen wurde die 2004 publizierte deutsche Weiterentwicklung des HELP-Modells (Version 3.80 D) verwendet.

Das Programm ist ein quasi-zweidimensionales hydrologisches Modell des Wasserhaushalts und der Wasserflüsse innerhalb von Deponien. Das Modell benutzt Wetter-, Boden- und Aufbaudaten und verwendet Berechnungsverfahren, die die Effekte folgender Prozesse berücksichtigen:

- Speicherung von Niederschlag auf der Oberfläche,
- Schneeschmelze,
- Oberflächenabfluss,
- Infiltration,

- Evapotranspiration,
- Wachstum der Vegetation,
- Speicherung von Wasser im Boden,
- Dränabfluss,
- Rezirkulierung von Dränagewasser,
- Ungesättigte vertikale Versickerung,
- Durchsickerung (Leckage) durch
    - Mineralische Dichtungsschichten,
    - Geomembranen (Kunststoffdichtungsbahnen),
    - Kombinationsdichtungen.

Es können Deponieabdichtungssysteme mit vielfältigen Kombinationen von Vegetation, Abdeckböden, Abfallschichten, Dränschichten, mineralischen Dichtungsschichten mit niedriger Wasserleitfähigkeit (Wasserdurchlässigkeit) und Kunststoffdichtungen modelliert werden.

Hauptzweck des Modells ist es, den Vergleich von Entwurfsalternativen anhand ihres spezifischen Wasserhaushalts zu ermöglichen. Das Modell kann für betriebene (offene), teilweise und vollständig abgeschlossene Deponien angewendet werden und wird als Entwurfs- und Kontrollwerkzeug sowohl von Planern als auch von Genehmigungsbehörden genutzt. Für die zuvor genannten Einsatzzwecke ist es in der Bundesrepublik seit Jahren technisch allgemein anerkannt.

Folgende, vereinfachende Annahmen liegen den HELP-Modellierungen grundsätzlich zugrunde:

- Von angrenzenden Flächen fließt kein Wasser in oder auf die Deponie bzw. die betrachteten Dichtungssysteme. Die zeitliche Verteilung (Diskretisierung) des Niederschlags (und die zugehörige Niederschlagsintensität) über den Tagesverlauf werden nicht berücksichtigt, d. h. Ermittlungen des Oberflächenabflusses für einzelne Starkregenereignisse erfolgen in diesem Punkt vergleichsweise ungenau. Die verwendete Regen-Oberflächenabfluss-Beziehung (SCS-Methode) beruht jedoch auf einer beträchtlichen Anzahl täglicher Messdaten und sollte daher für die ermittelten Oberflächenabflusswerte über längere Zeiträume hinreichend plausibel sein.

- Das HELP-Modell unterstellt eine dem Gesetz von Darcy folgende, von der Gravitation und gegebenenfalls einem hydraulischen Aufstau angetriebene Durchsickerung durch homogene Bodenschichten. Es berücksichtigt keinen bevorzugten Durchfluss durch grobe Porenstrukturen wie Risse, Wurzelkanäle oder Tiergänge (Makroporenfluss).
- Das Programm lässt ungesättigten Zufluss aus einer Schicht nur bei Wassergehalten oberhalb der Feldkapazität zu.
- Es wird angenommen, dass die Versickerungsrate aus einer Schicht gleich der ungesättigten Wasserleitfähigkeit dieser Schicht ist, sofern die darunter liegende Schicht keine Dichtung darstellt und nicht wassergesättigt ist.
- Die ungesättigte Wasserleitfähigkeit einer Schicht hängt von deren Wassergehalt ab.
- Das Modell unterstellt, dass die Bodeneigenschaften der Wasserbindung (die Wasserspannungskurve) und die ungesättigte Wasserleitfähigkeit aus der gesättigten Wasserleitfähigkeit (k_f-Wert) und den verwendeten Parametern der Wasserspeicherung (Gesamtporenvolumen, Feldkapazität, permanenter Welkepunkt) berechnet werden können.
- Das Modell berechnet nicht explizit den Durchfluss aufgrund von räumlichen Unterschieden der Wasserspannung (Gradienten der Wasserspannung bzw. des Matrixpotentials) und modelliert daher auch nicht das Aufsteigen von Wasser aufgrund von Kapillarkräften. Dieser aufwärts gerichtete Wasserdurchfluss wird in der Verdunstungszone als Extraktion modelliert, nicht als aufwärts gerichteter Transport von Wasser.
- Ungesättigter abwärts gerichteter Durchfluss wird nach dem Gesetz von Darcy modelliert.
- Die Durchflussrate ist gleich der ungesättigten Wasserleitfähigkeit, die als Funktion des Bodenwassergehalts berechnet wird. Es wird somit angenommen, dass die Durchflussrate unabhängig vom hydraulischen Gradienten ist.
- Die Durchsickerung einer mineralischen Dichtschicht wird als gesättigter Durchfluss nach dem Gesetz von Darcy modelliert. Es wird angenommen, dass Durchsickerung nur solange auftritt, wie ein Aufstau von Wasser auf der Oberfläche der Dichtung vorhanden ist.
- Das Modell unterstellt, dass die Aufstauhöhe, die die Durchsickerung verursacht, durch die (für jeden Tag des Simulationszeitraumes berechnete) mittlere Aufstauhöhe über der gesamten Dichtung repräsentiert wird. Ferner wird angenommen, dass sich die Dichtung über die gesamte Fläche der Deponie erstreckt und dass beim Auftreten von Durchsickerung die gesamte Deponiefläche durchsickert wird.

- Das Modell berücksichtigt weder das Altern noch eine Austrocknung von Dichtungselementen; daher ändert sich auch die gesättigte Wasserleitfähigkeit nicht mit der Zeit. Mineralische Dichtschichten werden stets als wassergesättigt angenommen; eine Berücksichtigung von Grenz- oder Übergangsgradienten, die bei sehr feinkörnigen Dichtungsmaterialien auftreten, erfolgt nicht.
- Das Modell zum lateralen Dränabfluss basiert auf der Annahme, dass die Spiegellinie (das Längsprofil der Höhe des wassergesättigten Aufstaus über der Oberfläche der darunter liegenden Dichtung) durch die ermittelte mittlere Aufstauhöhe charakterisiert wird.
- Das Modell nimmt des Weiteren an, dass der berechnete Aufstau über der gesamten Fläche der Dichtung vorliegt.
- Das Modell kann weder kapillares Halten von Wasser aufgrund eines Porensprungs noch ungesättigten lateralen Fluss (und daher auch keine Kapillarsperren) simulieren.
- Als Vegetation werden Getreide bzw. mehrjährige Gräser zugrunde gelegt. Des weiteren wird angenommen, dass die Vegetation in ähnlichem Maße Wasser verdunstet, die Oberfläche beschattet, den Niederschlag durch Interzeption zwischenspeichert und den Oberflächenabfluss reduziert, wie es durch Gräser oder ein entsprechend angepasstes Äquivalent des Blattflächenindex bewirkt würde.

Potenzielle Alterungsprozesse, wie etwa:

- Änderungen in der hydraulischen Leitfähigkeit durch Rissbildung, Durchwurzelung, Austrocknung, Konsolidierungsvorgänge etc.,
- Rutschungen/Setzungen,
- Verschlammung von Dränelementen,
- Bewuchs durch Pioniergehölze/Buschwerk oder
- Schäden an der Kunststoffdichtungsbahn, Dränmatte oder Dränrohre durch Alterung, Pflanzen und/oder Tiereinwirkung

können bei der Simulation nicht berücksichtigt werden.

Für den Simulationszeitraum werden somit idealisierte Bedingungen (Zustand permanent so wie planerisch vorgesehen) vorausgesetzt.

4 Ergebnisse der Wasserhaushaltsbetrachtungen

4.1 Allgemeines

Für die Profilierungsschicht des Plateaus des Deponieabschnittes DA 1 wurden mehrere Wasserhaushaltsbetrachtungen durchgeführt. Beim Schichtaufbau variierte jeweils die für den Unterboden verwendete Bodenart. Die detaillierten Ergebnisse der Betrachtungsvarianten werden in den Anlagen 2 und 3 dargestellt, eine Zusammenfassung liegt diesem Bericht in Anlage 1 bei.

4.2 Schichtenaufbau I

In der nachfolgenden Tabelle 4 wird die für fünf beispielhafte Bodenarten ermittelte Restdurchsickerung für den Schichtenaufbau I (20 cm Klei und 80 cm Unterboden) aufgelistet.

Bodenart des Unterbodens		**Restdurchsickerung** in %	**Eignung**
Sand (und gröber)	Ss	37,0	nein
schwach lehmiger Sand	Sl2	29,4	ja
stark lehmiger Sand	Sl4	28,9	ja
schluffig/lehmiger Sand	Slu	27,4	ja
stark schluffiger Sand	Su4	27,0	ja

Tabelle 4: Restdurchsickerung beim Schichtenaufbau I

Bei bindigen Sanden oder vergleichbaren Bodenarten im unteren Horizont kann demnach von einer ausreichenden Funktion zur gewünschten Regulierung des Wasserhaushaltes ausgegangen werden. Lediglich bei Böden, die quasi keine pflanzenverfügbare Wasserspeicherung (nutzbare Feldkapazität nahezu 0 mm/m) ermöglichen, wird das Kriterium einer mittleren Durchsickerung von 30 % des Niederschlages nicht erfüllt.

4.3 Schichtenaufbau II

In der nachfolgenden Tabelle 5 wird die ermittelte Restdurchsickerung für den Schichtenaufbau II (50 cm Klei und 50 cm Unterboden) aufgelistet.

Bodenart des Unterbodens		**Restdurchsickerung** in %	**Eignung**
Sand (nd gröber)	Ss	29,1	ja
schwach lehmiger Sand	Sl2	26,8	ja
stark lehmiger Sand	Sl4	26,6	ja
schluffig/lehmiger Sand	Slu	26,1	ja
stark schluffiger Sand	Su4	25,9	ja

Tabelle 5: Restdurchsickerung beim Schichtenaufbau II

Im Vergleich zum Schichtenaufbau II ist demnach das Kriterium einer mittleren Restdurchsickerung von höchstens 30 % des mittleren Niederschlages auch bei Unterböden möglich, in denen nur eine geringe pflanzenverfügbare Wasserspeicherung zu erwarten ist.

5 Einsatz von aufbereiteter MV-Schlacke

Die BEG beabsichtigt, für den unteren Horizont je nach Verfügbarkeit der vorgenannten Bodenarten alternativ aufbereitete Schlacke aus der Hausmüllverbrennung (MV-Schlacke) einzusetzen.

Hierzu wird die MV-Schlacke in einer stationären Anlage mit Sieben, FE-Abscheider und Windsichter aufbereitet. Beabsichtigt ist der Einsatz einer MV-Schlacke der Körnung 0/8 mm. Für die Beschreibung des derartig aufbereiteten Materials liegen diesem Fachgutachten in Anlage 4 folgende Unterlagen bei:

- Kornverteilungskurven
- Bestimmung der Wasserdurchlässigkeit

Demnach kann die MV-Schlacke im Hinblick auf die hier anstehenden Fragestellungen zum Wasserhaushalt am ehesten einem reinen Sand zugeordnet werden.

Eine aufbereitete MV-Schlacke der Körnung 0/8 mm kann demnach bei gleichzeitiger Einhaltung der chemischen Anforderungen bei einem Schichtenaufbau nach Nr. II für den unteren Horizont (Unterboden) bei einer etwa 50 cm mächtigen Kleiabdeckung eingesetzt werden, wobei Vergleichsberechnung aufzeigen, das diese Aussage auch gilt, wenn abweichend von den dargestellten Randbedingungen lediglich eine Durchwurzelungstiefe von 50 cm (entsprechend der Mächtigkeit der Kleiabdeckung) rechnerisch berücksichtigt wird.

6 Zusammenfassung

Auf dem bereits bestehenden Deponieabschnitt DA 1 der Deponie Grauer Wall ist u.a. die Errichtung des neuen Deponieabschnittes DA 3 geplant. Die Errichtung erfolgt zeitlich gestaffelt in mehreren Bauabschnitten. Bezüglich der derzeitigen Plateaubereiche, die bis 2012 keine Abdichtungen erhalten (Oberflächenabdichtungen bzw. Mehrfach-Funktionale-Abdichtung) sind Zwischenabdeckungen vorzusehen, die so beschaffen sind, dass im Mittel höchstens 30% des mittleren jährlichen Niederschlages in den Deponiekörper versickern.

Hierzu wurden unter Ansatz verschiedener Schichtenaufbauten und Bodenarten Simulationsbetrachtungen mit dem Programm HELP und standortspezifischen Wetterdaten durchgeführt. Im Wesentlichen ist folgendes festzustellen:

- Unter Ansatz eines 20 cm mächtigen oberen Horizontes aus Klei (bzw. in etwa vergleichbaren Böden) sind insbesondere bindige Sande als Bodenarten für einen mindestens 80 cm mächtigen unteren Horizont geeignet.
- Unter Ansatz eines 50 cm mächtigen oberen Horizontes aus Klei können für den unteren Horizont auch Bodenarten eingesetzt werden, mit denen nur eine geringe pflanzenverfügbare Wasserspeicherung verbunden ist.
- Für den unteren Horizont können daher bei einer 50 cm mächtigen Kleiabdeckung alternativ auch aufbereitete MV-Schlacken der Körnung 0/8 mm eingesetzt werden.
- Ein Grasbewuchs ist erforderlich.
- In Verbindung mit dem zu erwartenden Oberflächenwasser sind entlang der Tiefpunkte der Zwischenabdeckung durch Gräben etc. temporäre Einrichtungen vorzusehen, mit denen das Niederschlagswasser dem Ringgraben am Deponiefuß zugeführt wird.

Die Varianz der möglichen Bodenarten ist demnach als insgesamt hoch zu bezeichnen. Vertiefende Maßnahmen zur Qualitätslenkung und –sicherung im Zuge der

Herstellung der Zwischenabdeckung werden daher bei Einsatz von Kleiböden für den oberen 50 cm mächtigen Horizont als entbehrlich angesehen.

Bearbeiter:
Dipl.-Ing. Lisa Gerlach
Dipl.- Ing. Christa Huser

Bremen, im März 2010

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Anlagen

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Anlage 13: Fachgutachten Wasserhaushaltsbetrachtungen zur ergänzenden Profilierungsschicht im Deponieabschnitt 3

Anlage 1

Zusammenfassung der Eingabe- und Ausgabeparameter der Wasserhaushalts-betrachtungen

Eingabeparameter HELP (mittel verdichtete Böden, Ld 3)								Ausgabeparameter HELP			
Schichten-bezeichnung	**Bodenart**		**Mächtig-keit**	**Gesamtporen-volumen***	**Feldka-pazität***	**Welke-punkt***	**k-Wert**	**Abfluss**	**Evapotrans-piration**	**Durch-sickerung**	**Summe**
			in cm	in %	in %	in %	in cm/s	in %	in %	in %	in %
oberer Horizont:	Klei		20,0	54	38	19	1,00E-05	14,2	48,9	37,0	100,1
unterer Horizont:	reiner Sand	Ss	80,0	43	4	4	3,94E-03				
oberer Horizont:	Klei		20,0	54	38	19	1,00E-05	14,0	57,0	29,4	100,4
unterer Horizont:	schwach lehmiger Sand	Sl2	80,0	43	19	7	1,13E-03				
oberer Horizont:	Klei		20,0	54	38	19	1,00E-05	14,0	57,4	28,9	100,3
unterer Horizont:	stark lehmiger Sand	Sl4	80,0	42	25	12	4,86E-04				
oberer Horizont:	Klei		20,0	54	38	19	1,00E-05	14,0	58,7	27,4	100,1
unterer Horizont:	schluffig/lehmiger Sand	Slu	80,0	43	28	12	3,24E-04				
oberer Horizont:	Klei		20,0	54	38	19	1,00E-05	14,0	59,1	27,0	100,1
unterer Horizont:	stark schluffiger Sand	Su4	80,0	43	26	9	4,40E-04				
oberer Horizont:	Klei		50,0	54	38	19	1,00E-05	14,1	57,1	29,1	100,3
unterer Horizont:	reiner Sand	Ss	50,0	43	4	4	3,94E-03				
oberer Horizont:	Klei		50,0	54	38	19	1,00E-05	14,1	59,6	26,8	100,4
unterer Horizont:	schwach lehmiger Sand	Sl2	50,0	43	19	7	1,13E-03				
oberer Horizont:	Klei		50,0	54	38	19	1,00E-05	14,1	59,7	26,6	100,4
unterer Horizont:	stark lehmiger Sand	Sl4	50,0	42	25	12	4,86E-04				
oberer Horizont:	Klei		50,0	54	38	19	1,00E-05	14,1	60,1	26,1	100,3
unterer Horizont:	schluffig/lehmiger Sand	Slu	50,0	43	28	12	3,24E-04				
oberer Horizont:	Klei		50,0	54	38	19	1,00E-05	14,1	60,3	25,9	100,3
unterer Horizont:	stark schluffiger Sand	Su4	50,0	43	26	9	4,40E-04				

* = Bodeneigenschaften nach /2/ und /5/

Legende:

grau hinterlegte Böden sind nicht geeignet

Umtec

Deponie Grauer Wall, Antrag auf Änderung der Planfeststellung
Anlage 13: Fachgutachten Wasserhaushaltsbetrachtungen zur ergänzenden Profilierungsschicht im Deponieabschnitt 3

Anlage 2

Ergebnisse der Wasserhaushaltsbetrachtungen für den Schichtenaufbau I

U135O_B1.OUT

```
**************************************************************************
**************************************************************************
**                                                                      **
**                                                                      **
**               HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE           **
**                                                                      **
**               HELP Version 3.80 D            (25. May 2004)         **
**                             developed at                             **
**               Institut f. Bodenkunde,  Universitaet Hamburg          **
**                               based on                               **
**               US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)          **
**                   DEVELOPED BY ENVIRONMENTAL LABORATORY              **
**                     USAE WATERWAYS EXPERIMENT STATION                **
**                FOR USEPA RISK REDUCTION ENGINEERING LABORATORY       **
**                                                                      **
**                                                                      **
**************************************************************************
**************************************************************************


TIME:  14.12     DATE:  25.01.2010


PRECIPITATION DATA FILE:      H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE:        H:\GERLACH\U135O_~4\U135O_T.D7
SOLAR RADIATION DATA FILE:    H:\GERLACH\U135O_~4\U135O_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U135O_EV.D11
SOIL AND DESIGN DATA FILE  1: H:\GERLACH\U135O_~4\U135O_B1.D10
OUTPUT DATA FILE:             H:\GERLACH\U135O_~4\U135O_B1.OUT
DAILY OUTPUT DATA FILE:       H:\GERLACH\U135O_~4\U135O_B1.DAY
MONTHLY OUTPUT DATA FILE:     H:\GERLACH\U135O_~4\U135O_B1.MON
YEARLY OUTPUT DATA FILE:      H:\GERLACH\U135O_~4\U135O_B1.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

     1    DATE (yyyymmdd)
     2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    CHANGE IN TOTAL WATER STORAGE (MM)
     8    CHANGE IN SOIL WATER STORAGE (MM)
     9    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    10    CHANGE IN SNOW WATER STORAGE (MM)
    11    ANNUAL WATER BUDGET BALANCE (MM)
```


Layer 1: Klei
Layer 2: reiner Sand

U135O_B1.OUT

```
**************************************************************************

     TITLE:  Deponie Grauer Wall

**************************************************************************


                          WEATHER DATA SOURCES
--------------------------------------------------------------------------


         NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


**************************************************************************

                               LAYER DATA   1
--------------------------------------------------------------------------

                            VALID FOR  10 YEARS


      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
               COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                      MATERIAL TEXTURE NUMBER   0
          THICKNESS                     =     20.00   CM
          POROSITY                      =      0.5400 VOL/VOL
          FIELD CAPACITY                =      0.3800 VOL/VOL
          WILTING POINT                 =      0.1900 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.3895 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.1000E-04 CM/SEC


                                LAYER  2
                                --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                      MATERIAL TEXTURE NUMBER 301
          THICKNESS                     =     80.00   CM
          POROSITY                      =      0.4300 VOL/VOL
          FIELD CAPACITY                =      0.0410 VOL/VOL
          WILTING POINT                 =      0.0400 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.0534 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.3940E-02 CM/SEC
```

****

GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	10.830	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	32.300	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	9.650	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	5.800	CM
SOIL EVAPORATION ZONE DEPTH	=	43.3	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.000	CM
INITIAL WATER IN LAYER MATERIALS	=	12.060	CM
TOTAL INITIAL WATER	=	12.060	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

****

EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

RUNOFF	2.69	2.17	1.49	2.58	0.00	0.00
	2.56	1.47	8.43	2.33	4.36	39.52
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.64	10.28	22.14	48.34	42.25	60.79
	59.20	43.39	34.15	14.22	9.73	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	47.774	44.749	35.372	2.894	0.000	0.000
	0.000	0.000	0.000	23.610	18.505	113.209

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	67.609	676.090	9.39
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	366.167	3661.670	50.86
PERC./LEAKAGE THROUGH LAYER 2	286.113129	2861.131	39.74
CHANGE IN WATER STORAGE	0.011	0.110	0.00
SOIL WATER AT START OF YEAR	120.596	1205.955	
SOIL WATER AT END OF YEAR	120.607	1206.065	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.15	0.00	10.79	0.00	0.04	9.97

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

	12.61	3.95	2.12	0.00	0.00	9.09
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	11.13	11.76	20.35	43.23	42.18	76.36
	59.22	59.01	29.73	14.85	11.80	10.07
PERCOLATION/LEAKAGE THROUGH	31.185	49.948	65.017	2.867	0.000	0.000
LAYER 2	0.000	0.000	0.000	32.794	25.703	45.826

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	48.705	487.047	7.13
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	389.687	3896.870	57.04
PERC./LEAKAGE THROUGH LAYER 2	253.339722	2533.397	37.08
CHANGE IN WATER STORAGE	-8.531	-85.313	-1.25
SOIL WATER AT START OF YEAR	120.607	1206.065	
SOIL WATER AT END OF YEAR	112.075	1120.752	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.74	4.31	4.76	8.21	10.89
	5.58	6.18	120.64	0.00	1.68	11.06

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	10.08	9.11	17.64	49.30	54.19	82.75
	78.33	61.04	38.64	13.28	12.07	8.32
PERCOLATION/LEAKAGE THROUGH	18.660	27.687	25.494	21.389	1.801	0.306
LAYER 2	0.000	0.000	57.809	29.163	38.216	82.243

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	176.061	1760.613	18.98
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	434.760	4347.597	46.87
PERC./LEAKAGE THROUGH LAYER 2	302.768433	3027.684	32.64
CHANGE IN WATER STORAGE	13.911	139.107	1.50
SOIL WATER AT START OF YEAR	112.075	1120.752	
SOIL WATER AT END OF YEAR	124.249	1242.491	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.984	9.842	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	12.86	0.00	5.90	0.00	0.35
	29.28	137.90	3.84	37.82	8.10	10.19
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

ACTUAL EVAPOTRANSPIRATION	11.06	11.64	22.88	29.31	45.45	51.26
	83.26	83.18	32.90	13.66	10.27	5.81
PERCOLATION/LEAKAGE THROUGH	40.554	90.157	35.798	0.369	6.982	0.000
LAYER 2	11.399	15.836	0.000	76.338	55.499	7.930

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	246.255	2462.552	24.76
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	400.697	4006.966	40.28
PERC./LEAKAGE THROUGH LAYER 2	340.861908	3408.619	34.27
CHANGE IN WATER STORAGE	6.886	68.862	0.69
SOIL WATER AT START OF YEAR	124.249	1242.491	
SOIL WATER AT END OF YEAR	132.248	1322.479	
INTERCEPTION WATER AT START OF YEAR	0.984	9.842	
INTERCEPTION WATER AT END OF YEAR	0.624	6.243	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	15.25	0.00	6.45	7.43	14.55	7.00
	17.38	2.63	1.09	3.17	0.06	9.32
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	8.21	4.19	20.00	28.61	79.26	64.84

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

	55.10	34.23	35.48	11.83	10.49	9.74
PERCOLATION/LEAKAGE THROUGH	46.792	32.160	14.796	0.000	25.416	0.000
LAYER 2	0.000	0.000	0.000	38.023	21.112	47.412

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	84.332	843.323	12.76
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	361.971	3619.715	54.75
PERC./LEAKAGE THROUGH LAYER 2	225.710831	2257.108	34.14
CHANGE IN WATER STORAGE	-10.915	-109.145	-1.65
SOIL WATER AT START OF YEAR	132.248	1322.479	
SOIL WATER AT END OF YEAR	121.958	1219.577	
INTERCEPTION WATER AT START OF YEAR	0.624	6.243	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.004	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	9.34	0.00	0.55	0.00	5.53
	27.79	18.77	28.56	0.00	11.50	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.42	10.58	22.23	38.90	22.19	66.07
	87.96	67.12	38.22	12.48	10.82	9.48

Layer 1: Klei
Layer 2: reiner Sand

PERCOLATION/LEAKAGE THROUGH	69.089	72.161	17.658	3.202	0.000	0.000
LAYER 2	38.017	0.000	22.397	35.953	75.435	25.559

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	110.410	1104.100	12.73
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	395.469	3954.687	45.59
PERC./LEAKAGE THROUGH LAYER 2	359.471649	3594.717	41.44
CHANGE IN WATER STORAGE	2.050	20.498	0.24
SOIL WATER AT START OF YEAR	121.958	1219.577	
SOIL WATER AT END OF YEAR	123.019	1230.190	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	0.988	9.884	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.87	2.12	0.00	1.80	15.51
	21.79	7.45	3.26	10.76	5.37	2.77
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	11.94	8.81	20.71	34.44	61.17	87.09
	70.32	68.51	38.30	10.29	10.70	10.35
PERCOLATION/LEAKAGE THROUGH	48.091	24.232	23.103	4.303	2.323	2.250
LAYER 2	0.000	36.724	0.000	17.470	47.588	56.112

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	73.694	736.936	9.57
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	432.625	4326.247	56.21
PERC./LEAKAGE THROUGH LAYER 2	262.196472	2621.965	34.06
CHANGE IN WATER STORAGE	1.185	11.854	0.15
SOIL WATER AT START OF YEAR	123.019	1230.190	
SOIL WATER AT END OF YEAR	124.210	1242.096	
INTERCEPTION WATER AT START OF YEAR	0.988	9.884	
INTERCEPTION WATER AT END OF YEAR	0.513	5.128	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.78	4.75	0.00	0.00
	7.69	45.39	0.00	0.65	9.71	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.55	8.84	18.03	49.73	58.67	70.34
	38.69	67.59	39.94	15.70	12.20	11.48
PERCOLATION/LEAKAGE THROUGH	18.867	20.754	28.558	26.591	2.306	3.377
LAYER 2	0.000	22.035	7.345	13.646	71.300	37.045

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	69.969	699.694	9.62
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	398.767	3987.668	54.80
PERC./LEAKAGE THROUGH LAYER 2	251.823410	2518.234	34.61
CHANGE IN WATER STORAGE	7.141	71.407	0.98
SOIL WATER AT START OF YEAR	124.210	1242.096	
SOIL WATER AT END OF YEAR	131.676	1316.761	
INTERCEPTION WATER AT START OF YEAR	0.513	5.128	
INTERCEPTION WATER AT END OF YEAR	0.657	6.574	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.003	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	18.60	2.07	5.71	0.00	2.45	20.43
	16.08	1.31	10.86	5.42	6.54	11.48
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.30	10.17	26.05	21.32	58.53	66.91
	85.01	63.12	35.89	10.18	11.08	9.43
PERCOLATION/LEAKAGE THROUGH LAYER 2	97.346	38.849	53.759	0.088	0.832	0.000
	29.569	2.149	21.992	26.924	92.784	59.091

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	100.941	1009.408	10.96
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	410.984	4109.836	44.63
PERC./LEAKAGE THROUGH LAYER 2	423.384125	4233.841	45.98
CHANGE IN WATER STORAGE	-14.409	-144.087	-1.56
SOIL WATER AT START OF YEAR	131.676	1316.761	
SOIL WATER AT END OF YEAR	116.926	1169.256	
INTERCEPTION WATER AT START OF YEAR	0.657	6.574	
INTERCEPTION WATER AT END OF YEAR	0.999	9.993	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.27	11.36	1.14	0.00	0.00	0.00
	52.13	39.40	5.38	15.58	12.57	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.17	10.02	23.10	38.02	36.27	45.83
	79.17	70.69	26.99	14.47	10.97	8.71
PERCOLATION/LEAKAGE THROUGH LAYER 2	48.177	24.715	59.645	18.256	0.000	0.000
	3.802	0.000	0.000	60.833	54.427	21.541

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	172.816	1728.157	20.68
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	376.394	3763.942	45.05
PERC./LEAKAGE THROUGH LAYER 2	291.396637	2913.966	34.88
CHANGE IN WATER STORAGE	-5.107	-51.067	-0.61
SOIL WATER AT START OF YEAR	116.926	1169.256	
SOIL WATER AT END OF YEAR	112.818	1128.181	
INTERCEPTION WATER AT START OF YEAR	0.999	9.993	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	7.0940	0.3547
2	4.1878	0.0523
TOTAL WATER IN LAYERS	11.282	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	11.282	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)

Layer 1: Klei
Layer 2: reiner Sand

U1350_B1.OUT

PRECIPITATION	70.50	705.000
RUNOFF	56.055	560.5544
PERCOLATION/LEAKAGE THROUGH LAYER 2	24.399607	243.99606
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.1994	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.0829	

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.032	4.342	3.379	2.597	2.705	6.968
	19.289	26.444	18.417	7.573	5.990	9.342
STD. DEVIATIONS	11.805	4.921	3.435	2.883	4.890	7.226
	14.597	42.307	36.857	11.835	4.533	11.661
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.551	9.540	21.314	38.120	50.016	67.223
	69.624	61.787	35.024	13.097	11.012	9.444
STD. DEVIATIONS	1.785	2.145	2.514	9.746	15.813	12.867
	16.024	13.953	4.177	1.879	0.800	1.599
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	46.6534	42.5413	35.9201	7.9959	3.9660	0.5933
	8.2788	7.6744	10.9543	35.4755	50.0571	49.5967
STD. DEVIATIONS	23.3593	22.7891	17.7481	10.0223	7.8320	1.2037
	14.0580	12.9126	18.8004	19.3824	24.8158	30.7723

Layer 1: Klei
Layer 2: reiner Sand

U135O_B1.OUT

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	810.76 (114.950)	8107.6	100.00
RUNOFF	115.079 (63.0988)	1150.79	14.194
POTENTIAL EVAPOTRANSPIRATION	645.214 (25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	396.752 (24.8660)	3967.52	48.936
PERCOLATION/LEAKAGE THROUGH LAYER 2	299.70663 (59.76817)	2997.066	36.96613
CHANGE IN WATER STORAGE	-0.778 (0.3514)	-7.78	-0.096

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Layer 1: Klei
Layer 2: schwach lehmiger Sand

U135O_B2.OUT

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**
** HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE **
**
** HELP Version 3.80 D (25. May 2004) **
** developed at **
** Institut f. Bodenkunde, Universitaet Hamburg **
** based on **
** US HELP MODEL VERSION 3.07 (1 NOVEMBER 1997) **
** DEVELOPED BY ENVIRONMENTAL LABORATORY **
** USAE WATERWAYS EXPERIMENT STATION **
** FOR USEPA RISK REDUCTION ENGINEERING LABORATORY **
**
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TIME: 14.41 DATE: 25.01.2010

PRECIPITATION DATA FILE: H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE: H:\GERLACH\U135O_~4\U135O_T.D7
SOLAR RADIATION DATA FILE: H:\GERLACH\U135O_~4\U135O_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U135O_EV.D11
SOIL AND DESIGN DATA FILE 1: H:\GERLACH\U135O_~4\U135O_B2.D10
OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B2.OUT
DAILY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B2.DAY
MONTHLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B2.MON
YEARLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B2.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

1 DATE (yyyymmdd)
2 AIR TEMPERATURE (* INDICATES FREEZING TEMPERATURES)
3 FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
4 PRECIPITATION (MM)
5 RUNOFF (MM)
6 POTENTIAL EVAPOTRANSPIRATION (MM)
7 ACTUAL EVAPOTRANSPIRATION (MM)
8 WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
9 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyymmdd)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyy1231)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)
7 CHANGE IN TOTAL WATER STORAGE (MM)
8 CHANGE IN SOIL WATER STORAGE (MM)
9 CHANGE IN INTERCEPTION WATER STORAGE (MM)
10 CHANGE IN SNOW WATER STORAGE (MM)
11 ANNUAL WATER BUDGET BALANCE (MM)

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**********************************************************************************

     TITLE:  Deponie Grauer Wall

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                              WEATHER DATA SOURCES
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         NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


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                                  LAYER DATA   1
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                               VALID FOR  10 YEARS

      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
               COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                    TYPE 1 - VERTICAL PERCOLATION LAYER
                        MATERIAL TEXTURE NUMBER   0
          THICKNESS                      =     20.00   CM
          POROSITY                       =      0.5400 VOL/VOL
          FIELD CAPACITY                 =      0.3800 VOL/VOL
          WILTING POINT                  =      0.1900 VOL/VOL
          INITIAL SOIL WATER CONTENT     =      0.3855 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=         0.1000E-04 CM/SEC


                                  LAYER  2
                                  --------

                    TYPE 1 - VERTICAL PERCOLATION LAYER
                        MATERIAL TEXTURE NUMBER 302
          THICKNESS                      =     80.00   CM
          POROSITY                       =      0.4300 VOL/VOL
          FIELD CAPACITY                 =      0.1900 VOL/VOL
          WILTING POINT                  =      0.0700 VOL/VOL
          INITIAL SOIL WATER CONTENT     =      0.2278 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=         0.1130E-02 CM/SEC
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Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

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                  GENERAL DESIGN AND EVAPORATIVE ZONE DATA   1
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                               VALID FOR  10 YEARS


           NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
                    SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A
                    FAIR STAND OF GRASS, A SURFACE SLOPE OF  2.%
                    AND A SLOPE LENGTH OF  100. METERS.

          SCS RUNOFF CURVE NUMBER             =     81.60
          FRACTION OF AREA ALLOWING RUNOFF    =    100.0    PERCENT
          AREA PROJECTED ON HORIZONTAL PLANE  =      1.0000 HECTARES
          EVAPORATIVE ZONE DEPTH              =     70.0    CM
          INITIAL WATER IN EVAPORATIVE ZONE   =     19.063  CM
          UPPER LIMIT OF EVAPORATIVE STORAGE  =     32.300  CM
          FIELD CAPACITY OF EVAPORATIVE ZONE  =     17.100  CM
          LOWER LIMIT OF EVAPORATIVE STORAGE  =      7.300  CM
          SOIL EVAPORATION ZONE DEPTH         =     55.6    CM
          INITIAL SNOW WATER                  =      0.000  CM
          INITIAL INTERCEPTION WATER          =      0.006  CM
          INITIAL WATER IN LAYER MATERIALS    =     25.932  CM
          TOTAL INITIAL WATER                 =     25.937  CM
          TOTAL SUBSURFACE INFLOW             =      0.00   MM/YR


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                        EVAPOTRANSPIRATION DATA   1
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                               VALID FOR  10 YEARS


           NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
                    Bremerhaven         Deutschland
              STATION LATITUDE                        =  59.00 DEGREES
              MAXIMUM LEAF AREA INDEX                 =   2.50
              START OF GROWING SEASON (JULIAN DATE)   =    105
              END OF GROWING SEASON (JULIAN DATE)     =    288
              EVAPORATIVE ZONE DEPTH                  =  70.0  CM
              AVERAGE ANNUAL WIND SPEED               =   8.86 KPH
              AVERAGE 1ST QUARTER RELATIVE HUMIDITY   =  85.4  %
              AVERAGE 2ND QUARTER RELATIVE HUMIDITY   =  74.2  %
              AVERAGE 3RD QUARTER RELATIVE HUMIDITY   =  77.8  %
              AVERAGE 4TH QUARTER RELATIVE HUMIDITY   =  86.9  %

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                        MONTHLY TOTALS (MM) FOR YEAR 1999
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                                JAN/JUL FEB/AUG MAR/SEP APR/OCT MAY/NOV JUN/DEC
                                ------- ------- ------- ------- ------- -------

PRECIPITATION                    61.5    61.4    47.4    42.9    33.5    40.6
                                 64.8    60.8    50.2    53.8    37.6   165.4
```

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

RUNOFF	2.46	2.10	1.62	2.88	0.00	0.00
	1.28	1.20	8.07	2.43	4.13	39.31
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.55	10.22	21.32	50.46	43.33	110.55
	63.60	44.72	29.33	13.67	9.38	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	60.870	33.532	51.743	6.269	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	83.794

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	65.464	654.637	9.09
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	418.179	4181.786	58.09
PERC./LEAKAGE THROUGH LAYER 2	236.208450	2362.084	32.81
CHANGE IN WATER STORAGE	0.049	0.494	0.01
SOIL WATER AT START OF YEAR	259.316	2593.160	
SOIL WATER AT END OF YEAR	259.317	2593.175	
INTERCEPTION WATER AT START OF YEAR	0.057	0.565	
INTERCEPTION WATER AT END OF YEAR	0.104	1.045	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.10	0.00	10.71	0.00	0.00	9.77

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

	12.28	3.62	1.70	0.00	0.00	9.00
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.96	11.93	19.79	47.52	51.17	112.95
	66.23	63.27	26.71	14.56	11.67	9.88
PERCOLATION/LEAKAGE THROUGH LAYER 2	44.060	48.870	72.809	4.494	0.000	0.000
	0.000	0.000	0.000	0.000	3.145	40.642

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	47.183	471.832	6.91
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	446.646	4466.462	65.38
PERC./LEAKAGE THROUGH LAYER 2	214.021606	2140.216	31.33
CHANGE IN WATER STORAGE	-24.651	-246.506	-3.61
SOIL WATER AT START OF YEAR	259.317	2593.175	
SOIL WATER AT END OF YEAR	234.771	2347.713	
INTERCEPTION WATER AT START OF YEAR	0.104	1.045	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.16	4.65	8.36	10.78
	5.42	5.35	119.01	0.00	1.70	11.04

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.97	9.36	16.75	49.69	60.02	103.18
	109.19	62.48	38.71	12.39	12.07	8.12
PERCOLATION/LEAKAGE THROUGH LAYER 2	23.819	21.453	26.354	21.115	6.424	0.000
	0.000	0.000	0.000	34.347	20.208	67.356

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	173.232	1732.323	18.68
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	491.914	4919.144	53.04
PERC./LEAKAGE THROUGH LAYER 2	221.076111	2210.761	23.84
CHANGE IN WATER STORAGE	41.277	412.774	4.45
SOIL WATER AT START OF YEAR	234.771	2347.713	
SOIL WATER AT END OF YEAR	274.054	2740.542	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.242	12.419	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	12.80	0.00	5.80	0.00	0.69
	29.30	137.54	3.43	37.43	7.80	11.36
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

ACTUAL EVAPOTRANSPIRATION	10.97	11.56	21.84	35.92	53.91	81.27
	100.29	96.16	32.65	13.39	10.35	5.80
PERCOLATION/LEAKAGE THROUGH LAYER 2	50.111	76.130	68.368	5.256	0.000	0.000
	0.000	0.000	0.000	7.759	78.967	14.740

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	246.139	2461.389	24.75
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	474.130	4741.303	47.67
PERC./LEAKAGE THROUGH LAYER 2	301.330353	3013.303	30.29
CHANGE IN WATER STORAGE	-26.899	-268.993	-2.70
SOIL WATER AT START OF YEAR	274.054	2740.542	
SOIL WATER AT END OF YEAR	248.248	2482.477	
INTERCEPTION WATER AT START OF YEAR	1.242	12.419	
INTERCEPTION WATER AT END OF YEAR	0.902	9.017	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0006	-0.006	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	17.03	0.00	6.19	7.22	14.54	6.87
	16.55	1.98	0.70	3.24	0.00	9.14
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	8.97	3.98	18.77	34.46	87.98	123.28

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

	54.51	35.67	30.46	11.11	10.34	9.36
PERCOLATION/LEAKAGE THROUGH	16.201	59.278	15.045	0.000	0.283	11.565
LAYER 2	0.000	0.000	0.000	0.000	0.013	40.337

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	83.455	834.546	12.62
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	428.876	4288.757	64.87
PERC./LEAKAGE THROUGH LAYER 2	142.722824	1427.228	21.59
CHANGE IN WATER STORAGE	6.047	60.468	0.91
SOIL WATER AT START OF YEAR	248.248	2482.477	
SOIL WATER AT END OF YEAR	254.979	2549.793	
INTERCEPTION WATER AT START OF YEAR	0.902	9.017	
INTERCEPTION WATER AT END OF YEAR	0.217	2.169	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	9.11	0.00	0.13	0.00	5.09
	27.54	16.86	28.05	0.00	11.53	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.35	10.34	21.11	43.51	31.55	88.98
	100.57	96.22	42.22	11.42	10.84	9.20

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

PERCOLATION/LEAKAGE THROUGH	71.647	85.192	8.614	12.691	0.000	0.000
LAYER 2	0.000	0.000	0.000	4.169	74.815	34.518

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	106.678	1066.780	12.30
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	475.315	4753.152	54.80
PERC./LEAKAGE THROUGH LAYER 2	291.645721	2916.457	33.62
CHANGE IN WATER STORAGE	-6.239	-62.393	-0.72
SOIL WATER AT START OF YEAR	254.979	2549.793	
SOIL WATER AT END OF YEAR	247.674	2476.739	
INTERCEPTION WATER AT START OF YEAR	0.217	2.169	
INTERCEPTION WATER AT END OF YEAR	1.283	12.830	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.005	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.97	0.00	1.68	18.67
	20.49	7.35	2.46	10.86	5.45	2.82
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	11.99	8.72	20.30	39.80	66.86	113.07
	90.47	75.96	42.86	9.31	10.47	10.41
PERCOLATION/LEAKAGE THROUGH	43.736	32.013	21.051	10.572	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	16.577	64.409

U1350_B2.OUT

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.658	746.583	9.70
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	500.211	5002.107	64.99
PERC./LEAKAGE THROUGH LAYER 2	188.358871	1883.589	24.47
CHANGE IN WATER STORAGE	6.472	64.722	0.84
SOIL WATER AT START OF YEAR	247.674	2476.739	
SOIL WATER AT END OF YEAR	254.207	2542.072	
INTERCEPTION WATER AT START OF YEAR	1.283	12.830	
INTERCEPTION WATER AT END OF YEAR	0.751	7.513	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6 55.1	32.1 176.2	64.0 24.3	66.5 56.4	57.0 84.2	32.8 63.5
RUNOFF	0.00 8.33	0.00 44.62	1.53 0.00	4.71 0.79	0.00 9.72	0.00 0.00
POTENTIAL EVAPOTRANSPIRATION	10.19 146.64	10.06 91.02	20.35 64.33	58.62 18.89	103.99 12.80	121.86 12.37
ACTUAL EVAPOTRANSPIRATION	7.41 51.78	8.75 65.17	17.79 40.56	50.39 15.77	67.64 12.22	111.99 11.35
PERCOLATION/LEAKAGE THROUGH LAYER 2	27.033 0.000	18.926 0.000	17.322 0.000	43.315 0.000	0.000 41.666	0.000 48.827

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Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	69.686	696.857	9.58
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	460.802	4608.019	63.32
PERC./LEAKAGE THROUGH LAYER 2	197.089066	1970.891	27.08
CHANGE IN WATER STORAGE	0.123	1.232	0.02
SOIL WATER AT START OF YEAR	254.207	2542.072	
SOIL WATER AT END OF YEAR	254.660	2546.602	
INTERCEPTION WATER AT START OF YEAR	0.751	7.513	
INTERCEPTION WATER AT END OF YEAR	0.892	8.921	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7 142.4	62.9 52.2	54.2 92.8	7.6 40.2	66.2 111.8	98.6 70.3
RUNOFF	18.64 15.72	2.05 0.76	5.63 9.93	0.00 5.16	2.31 6.55	20.09 11.49
POTENTIAL EVAPOTRANSPIRATION	13.34 103.30	11.30 91.42	30.75 50.17	84.07 16.78	104.47 11.75	111.99 10.89
ACTUAL EVAPOTRANSPIRATION	13.34 101.19	10.20 86.33	25.57 35.69	27.17 9.23	69.58 11.15	99.94 9.15
PERCOLATION/LEAKAGE THROUGH LAYER 2	83.693 0.000	44.595 0.000	60.412 0.000	6.995 0.000	0.000 79.094	0.000 68.786

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U1350_B2.OUT

ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	98.315	983.148	10.68
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	498.549	4985.489	54.14
PERC./LEAKAGE THROUGH LAYER 2	343.574951	3435.750	37.31
CHANGE IN WATER STORAGE	-19.539	-195.389	-2.12
SOIL WATER AT START OF YEAR	254.660	2546.602	
SOIL WATER AT END OF YEAR	234.713	2347.129	
INTERCEPTION WATER AT START OF YEAR	0.892	8.921	
INTERCEPTION WATER AT END OF YEAR	1.300	13.004	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.19	0.97	0.00	0.00	0.00
	51.30	38.49	4.91	15.78	12.24	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.56	9.54	22.76	41.33	40.01	96.54
	80.93	67.98	21.75	14.31	11.16	8.52
PERCOLATION/LEAKAGE THROUGH	27.916	44.863	43.877	35.366	0.000	0.000
LAYER 2	0.000	0.000	0.000	3.207	53.189	35.699

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	170.174	1701.742	20.37
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	427.385	4273.854	51.15
PERC./LEAKAGE THROUGH LAYER 2	244.117065	2441.171	29.22
CHANGE IN WATER STORAGE	-6.176	-61.764	-0.74
SOIL WATER AT START OF YEAR	234.713	2347.129	
SOIL WATER AT END OF YEAR	229.837	2298.368	
INTERCEPTION WATER AT START OF YEAR	1.300	13.004	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.004	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	7.2293	0.3615
2	15.7543	0.1969
TOTAL WATER IN LAYERS	22.984	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	22.984	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)

PRECIPITATION	70.50	705.000
RUNOFF	56.046	560.4583
PERCOLATION/LEAKAGE THROUGH LAYER 2	8.639409	86.39409
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3166	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1043	

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.188	4.290	3.278	2.539	2.689	7.195
	18.820	25.776	17.827	7.569	5.912	9.416
STD. DEVIATIONS	11.964	4.860	3.407	2.856	4.911	7.599
	14.524	42.337	36.487	11.732	4.486	11.614
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.606	9.460	20.600	42.025	57.204	104.175
	81.876	69.397	34.093	12.516	10.964	9.283
STD. DEVIATIONS	1.775	2.200	2.550	7.839	16.679	12.717
	21.386	20.049	7.097	2.219	0.875	1.602
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	44.9087	46.4850	38.5596	14.6074	0.6708	1.1565
	0.0000	0.0000	0.0000	4.9482	36.7674	49.9110
STD. DEVIATIONS	22.0611	21.8985	23.7986	14.3292	2.0236	3.6572
	0.0000	0.0000	0.0000	10.6601	33.0467	20.7460

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B2.OUT

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM		CU. METERS	PERCENT
PRECIPITATION	810.76	(114.950)	8107.6	100.00
RUNOFF	113.498	(62.9697)	1134.98	13.999
POTENTIAL EVAPOTRANSPIRATION	645.214	(25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	462.201	(30.6724)	4622.01	57.008
PERCOLATION/LEAKAGE THROUGH LAYER 2	238.01451	(59.77024)	2380.145	29.35696
CHANGE IN WATER STORAGE	-2.954	(0.7747)	-29.54	-0.364

U1350_B3.OUT

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**                                                                                  **
**                                                                                  **
**               HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE                      **
**                                                                                  **
**               HELP Version 3.80 D            (25. May 2004)                      **
**                                  developed at                                    **
**               Institut f. Bodenkunde,  Universitaet Hamburg                      **
**                                    based on                                      **
**               US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                      **
**                    DEVELOPED BY ENVIRONMENTAL LABORATORY                         **
**                      USAE WATERWAYS EXPERIMENT STATION                           **
**                 FOR USEPA RISK REDUCTION ENGINEERING LABORATORY                  **
**                                                                                  **
**                                                                                  **
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TIME:  14.45     DATE:  25.01.2010


PRECIPITATION DATA FILE:      H:\GERLACH\U1350_~4\U1350_N.D4
TEMPERATURE DATA FILE:        H:\GERLACH\U1350_~4\U1350_T.D7
SOLAR RADIATION DATA FILE:    H:\GERLACH\U1350_~4\U1350_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U1350_~4\U1350_EV.D11
SOIL AND DESIGN DATA FILE  1: H:\GERLACH\U1350_~4\U1350_B3.D10
OUTPUT DATA FILE:             H:\GERLACH\U1350_~4\U1350_B3.OUT
DAILY OUTPUT DATA FILE:       H:\GERLACH\U1350_~4\U1350_B3.DAY
MONTHLY OUTPUT DATA FILE:     H:\GERLACH\U1350_~4\U1350_B3.MON
YEARLY OUTPUT DATA FILE:      H:\GERLACH\U1350_~4\U1350_B3.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

     1    DATE (yyyymmdd)
     2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    CHANGE IN TOTAL WATER STORAGE (MM)
     8    CHANGE IN SOIL WATER STORAGE (MM)
     9    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    10    CHANGE IN SNOW WATER STORAGE (MM)
    11    ANNUAL WATER BUDGET BALANCE (MM)
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Layer 1: Klei
Layer 2: stark lehmiger Sand

U1350_B3.OUT

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**************************************************************************************

     TITLE:  Deponie Grauer Wall

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                              WEATHER DATA SOURCES
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         NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


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                                  LAYER DATA   1
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                               VALID FOR  10 YEARS


      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
               COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                    LAYER  1
                                    --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                       MATERIAL TEXTURE NUMBER   0
     THICKNESS                     =     20.00   CM
     POROSITY                      =      0.5400 VOL/VOL
     FIELD CAPACITY                =      0.3800 VOL/VOL
     WILTING POINT                 =      0.1900 VOL/VOL
     INITIAL SOIL WATER CONTENT    =      0.3968 VOL/VOL
     EFFECTIVE SAT. HYD. CONDUCT.=        0.1000E-04 CM/SEC


                                    LAYER  2
                                    --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                       MATERIAL TEXTURE NUMBER 304
     THICKNESS                     =     80.00   CM
     POROSITY                      =      0.4200 VOL/VOL
     FIELD CAPACITY                =      0.2500 VOL/VOL
     WILTING POINT                 =      0.1200 VOL/VOL
     INITIAL SOIL WATER CONTENT    =      0.2767 VOL/VOL
     EFFECTIVE SAT. HYD. CONDUCT.=        0.4860E-03 CM/SEC
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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	21.733	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	31.800	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	20.100	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	9.800	CM
SOIL EVAPORATION ZONE DEPTH	=	65.8	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.007	CM
INITIAL WATER IN LAYER MATERIALS	=	30.068	CM
TOTAL INITIAL WATER	=	30.075	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

Layer 1: Klei
Layer 2: stark lehmiger Sand

U1350_B3.OUT

RUNOFF	2.45	2.10	1.62	2.84	0.00	0.00
	1.42	1.21	8.04	2.43	4.11	39.29
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.56	10.22	21.23	50.27	43.36	111.66
	67.23	45.03	28.59	13.59	9.36	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	58.375	36.289	47.320	3.549	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	86.680

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	65.504	655.042	9.10
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	422.131	4221.313	58.64
PERC./LEAKAGE THROUGH LAYER 2	232.214432	2322.144	32.26
CHANGE IN WATER STORAGE	0.050	0.502	0.01
SOIL WATER AT START OF YEAR	300.678	3006.781	
SOIL WATER AT END OF YEAR	300.680	3006.801	
INTERCEPTION WATER AT START OF YEAR	0.075	0.746	
INTERCEPTION WATER AT END OF YEAR	0.123	1.229	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.11	0.00	10.73	0.00	0.00	9.81

Layer 1: Klei
Layer 2: stark lehmiger Sand

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	12.20	3.64	1.69	0.00	0.00	9.00
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.96	11.92	19.74	47.38	51.24	115.23
	67.84	64.35	26.50	14.53	11.66	9.88
PERCOLATION/LEAKAGE THROUGH	40.027	52.743	70.683	0.153	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.190	44.875

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	47.188	471.876	6.91
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	451.235	4512.354	66.05
PERC./LEAKAGE THROUGH LAYER 2	208.670349	2086.704	30.54
CHANGE IN WATER STORAGE	-23.893	-238.931	-3.50
SOIL WATER AT START OF YEAR	300.680	3006.801	
SOIL WATER AT END OF YEAR	276.910	2769.099	
INTERCEPTION WATER AT START OF YEAR	0.123	1.229	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.14	4.63	8.60	10.98
	5.38	5.42	118.89	0.00	1.70	11.04

Layer 1: Klei
Layer 2: stark lehmiger Sand

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POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.97	9.37	16.74	49.64	59.98	103.17
	114.02	62.43	38.68	12.39	12.07	8.11
PERCOLATION/LEAKAGE THROUGH	19.906	26.149	26.395	19.917	0.164	0.000
LAYER 2	0.000	0.000	0.000	30.852	24.752	69.908

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	173.529	1735.286	18.71
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	496.574	4965.736	53.54
PERC./LEAKAGE THROUGH LAYER 2	218.042862	2180.429	23.51
CHANGE IN WATER STORAGE	39.355	393.549	4.24
SOIL WATER AT START OF YEAR	276.910	2769.099	
SOIL WATER AT END OF YEAR	314.249	3142.488	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.263	12.634	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	12.80	0.00	5.81	0.00	0.65
	29.39	137.59	3.42	37.41	7.79	11.92
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

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ACTUAL EVAPOTRANSPIRATION	10.95	11.56	21.77	35.86	53.78	81.26
	103.90	94.93	32.27	13.36	10.37	5.81
PERCOLATION/LEAKAGE THROUGH	46.995	79.689	65.124	0.000	0.000	0.000
LAYER 2	0.000	0.000	0.000	13.481	79.255	7.213

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	246.780	2467.801	24.81
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	475.809	4758.089	47.83
PERC./LEAKAGE THROUGH LAYER 2	291.756989	2917.570	29.33
CHANGE IN WATER STORAGE	-19.646	-196.457	-1.98
SOIL WATER AT START OF YEAR	314.249	3142.488	
SOIL WATER AT END OF YEAR	295.707	2957.069	
INTERCEPTION WATER AT START OF YEAR	1.263	12.634	
INTERCEPTION WATER AT END OF YEAR	0.912	9.121	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0006	-0.006	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	17.97	0.00	6.18	7.15	14.54	7.29
	16.57	1.98	0.66	3.24	0.00	9.15
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	8.99	3.96	18.72	34.41	87.83	125.54

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	57.35	35.94	29.77	11.01	10.32	9.31
PERCOLATION/LEAKAGE THROUGH	20.408	53.517	14.882	0.000	4.158	7.364
LAYER 2	0.000	0.000	0.000	0.000	0.197	43.497

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	84.741	847.415	12.82
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	433.157	4331.572	65.52
PERC./LEAKAGE THROUGH LAYER 2	144.022720	1440.227	21.79
CHANGE IN WATER STORAGE	-0.822	-8.216	-0.12
SOIL WATER AT START OF YEAR	295.707	2957.069	
SOIL WATER AT END OF YEAR	295.555	2955.547	
INTERCEPTION WATER AT START OF YEAR	0.912	9.121	
INTERCEPTION WATER AT END OF YEAR	0.243	2.428	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	9.14	0.00	0.04	0.00	5.16
	27.55	16.86	28.04	0.00	11.53	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.34	10.34	20.99	43.30	31.63	89.04
	100.57	96.22	42.21	11.42	10.84	9.20

Layer 1: Klei
Layer 2: stark lehmiger Sand

PERCOLATION/LEAKAGE THROUGH	70.754	80.117	12.396	7.331	0.000	0.000
LAYER 2	0.000	0.000	0.000	10.258	75.293	31.152

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	106.689	1066.889	12.30
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	475.100	4751.000	54.77
PERC./LEAKAGE THROUGH LAYER 2	287.300507	2873.005	33.12
CHANGE IN WATER STORAGE	-1.689	-16.895	-0.19
SOIL WATER AT START OF YEAR	295.555	2955.547	
SOIL WATER AT END OF YEAR	292.823	2928.230	
INTERCEPTION WATER AT START OF YEAR	0.243	2.428	
INTERCEPTION WATER AT END OF YEAR	1.285	12.849	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.96	0.00	1.67	18.82
	20.48	7.35	2.47	10.87	5.46	2.82
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	11.99	8.72	20.30	39.78	66.85	113.06
	93.54	75.56	42.63	9.24	10.47	10.42
PERCOLATION/LEAKAGE THROUGH	46.747	32.224	18.750	6.562	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	21.107	64.196

Layer 1: Klei
Layer 2: stark lehmiger Sand

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.783	747.829	9.72
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	502.547	5025.468	65.29
PERC./LEAKAGE THROUGH LAYER 2	189.585464	1895.855	24.63
CHANGE IN WATER STORAGE	2.785	27.849	0.36
SOIL WATER AT START OF YEAR	292.823	2928.230	
SOIL WATER AT END OF YEAR	295.664	2956.635	
INTERCEPTION WATER AT START OF YEAR	1.285	12.849	
INTERCEPTION WATER AT END OF YEAR	0.759	7.589	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.56	4.66	0.00	0.00
	8.57	44.61	0.00	0.79	9.72	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.40	8.74	17.77	50.33	67.61	111.97
	57.11	63.96	38.85	15.65	12.23	11.34
PERCOLATION/LEAKAGE THROUGH	24.943	20.705	11.003	42.906	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	46.342	49.027

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	69.910	699.097	9.61
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	462.963	4629.633	63.62
PERC./LEAKAGE THROUGH LAYER 2	194.925690	1949.257	26.79
CHANGE IN WATER STORAGE	-0.099	-0.986	-0.01
SOIL WATER AT START OF YEAR	295.664	2956.635	
SOIL WATER AT END OF YEAR	295.893	2958.934	
INTERCEPTION WATER AT START OF YEAR	0.759	7.589	
INTERCEPTION WATER AT END OF YEAR	0.901	9.009	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	18.65	2.05	5.62	0.00	2.37	20.01
	15.53	0.74	9.90	5.14	6.55	11.49
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.34	10.21	25.54	27.15	69.55	104.22
	102.29	82.84	35.54	9.22	11.15	9.14
PERCOLATION/LEAKAGE THROUGH LAYER 2	83.258	43.672	61.637	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	81.438	65.341

ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	98.062	980.615	10.65
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	500.193	5001.930	54.32
PERC./LEAKAGE THROUGH LAYER 2	335.345642	3353.457	36.41
CHANGE IN WATER STORAGE	-12.701	-127.005	-1.38
SOIL WATER AT START OF YEAR	295.893	2958.934	
SOIL WATER AT END OF YEAR	282.781	2827.812	
INTERCEPTION WATER AT START OF YEAR	0.901	9.009	
INTERCEPTION WATER AT END OF YEAR	1.313	13.126	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.21	0.95	0.00	0.00	0.00
	51.30	38.38	4.89	15.79	12.22	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.58	9.51	22.76	41.26	40.02	101.98
	79.40	68.24	22.21	14.30	11.16	8.52
PERCOLATION/LEAKAGE THROUGH LAYER 2	34.832	37.983	49.950	28.900	0.000	0.000
	0.000	0.000	0.000	4.314	54.442	30.333

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	170.023	1700.233	20.35
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	431.940	4319.400	51.70
PERC./LEAKAGE THROUGH LAYER 2	240.754044	2407.541	28.82
CHANGE IN WATER STORAGE	-7.217	-72.170	-0.86
SOIL WATER AT START OF YEAR	282.781	2827.812	
SOIL WATER AT END OF YEAR	276.877	2768.768	
INTERCEPTION WATER AT START OF YEAR	1.313	13.126	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0005	-0.005	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	7.3792	0.3690
2	20.3084	0.2539
TOTAL WATER IN LAYERS	27.688	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	27.688	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)
PRECIPITATION	70.50	705.000
RUNOFF	56.032	560.3160
PERCOLATION/LEAKAGE THROUGH LAYER 2	8.580958	85.80959
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3533	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1400	

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AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.283	4.295	3.276	2.512	2.718	7.272
	18.840	25.776	17.800	7.567	5.908	9.472
STD. DEVIATIONS	12.046	4.865	3.408	2.846	4.944	7.620
	14.505	42.343	36.455	11.729	4.484	11.621
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.610	9.455	20.554	41.939	57.185	105.713
	84.325	68.949	33.725	12.471	10.962	9.278
STD. DEVIATIONS	1.778	2.203	2.543	7.804	16.625	12.958
	21.063	19.454	6.947	2.209	0.881	1.600
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	44.6244	46.3088	37.8141	10.9319	0.4321	0.7364
	0.0000	0.0000	0.0000	5.8904	38.3015	49.2223
STD. DEVIATIONS	21.2821	20.5146	23.6080	14.8594	1.3100	2.3287
	0.0000	0.0000	0.0000	10.0577	33.4700	23.1296

Layer 1: Klei
Layer 2: stark lehmiger Sand

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	810.76 (114.950)	8107.6	100.00
RUNOFF	113.721 (63.0461)	1137.21	14.026
POTENTIAL EVAPOTRANSPIRATION	645.214 (25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	465.165 (29.8186)	4651.65	57.374
PERCOLATION/LEAKAGE THROUGH LAYER 2	234.26186 (56.75241)	2342.619	28.89410
CHANGE IN WATER STORAGE	-2.388 (0.6785)	-23.88	-0.294

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Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

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**
** HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE **
**
** HELP Version 3.80 D (25. May 2004) **
** developed at **
** Institut f. Bodenkunde, Universitaet Hamburg **
** based on **
** US HELP MODEL VERSION 3.07 (1 NOVEMBER 1997) **
** DEVELOPED BY ENVIRONMENTAL LABORATORY **
** USAE WATERWAYS EXPERIMENT STATION **
** FOR USEPA RISK REDUCTION ENGINEERING LABORATORY **
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TIME: 14.49 DATE: 25.01.2010

PRECIPITATION DATA FILE: H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE: H:\GERLACH\U135O_~4\U135O_T.D7
SOLAR RADIATION DATA FILE: H:\GERLACH\U135O_~4\U135O_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U135O_EV.D11
SOIL AND DESIGN DATA FILE 1: H:\GERLACH\U135O_~4\U135O_B4.D10
OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B4.OUT
DAILY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B4.DAY
MONTHLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B4.MON
YEARLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B4.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

1 DATE (yyyymmdd)
2 AIR TEMPERATURE (* INDICATES FREEZING TEMPERATURES)
3 FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
4 PRECIPITATION (MM)
5 RUNOFF (MM)
6 POTENTIAL EVAPOTRANSPIRATION (MM)
7 ACTUAL EVAPOTRANSPIRATION (MM)
8 WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
9 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyymmdd)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyy1231)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)
7 CHANGE IN TOTAL WATER STORAGE (MM)
8 CHANGE IN SOIL WATER STORAGE (MM)
9 CHANGE IN INTERCEPTION WATER STORAGE (MM)
10 CHANGE IN SNOW WATER STORAGE (MM)
11 ANNUAL WATER BUDGET BALANCE (MM)

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TITLE: Deponie Grauer Wall

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WEATHER DATA SOURCES

NOTE: PRECIPITATION DATA FOR Bremerhaven Deutschland
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR Bremerhaven Deutschland
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR Bremerhaven Deutschland
WAS ENTERED FROM AN ASCII DATA FILE.

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LAYER DATA 1

VALID FOR 10 YEARS

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	20.00	CM
POROSITY	=	0.5400	VOL/VOL
FIELD CAPACITY	=	0.3800	VOL/VOL
WILTING POINT	=	0.1900	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4006	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-04	CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 305

THICKNESS	=	80.00	CM
POROSITY	=	0.4300	VOL/VOL
FIELD CAPACITY	=	0.2800	VOL/VOL
WILTING POINT	=	0.1200	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2835	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3240E-03	CM/SEC

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U1350_B4.OUT

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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A
FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.%
AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	22.285	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	32.300	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	21.600	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	9.800	CM
SOIL EVAPORATION ZONE DEPTH	=	70.0	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.020	CM
INITIAL WATER IN LAYER MATERIALS	=	30.689	CM
TOTAL INITIAL WATER	=	30.709	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

RUNOFF	2.33	2.04	1.62	2.76	0.00	0.00
	1.33	1.02	7.86	2.43	4.00	39.24
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.60	10.32	20.63	52.13	41.81	109.80
	83.80	44.21	29.12	13.36	9.07	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	48.119	44.801	35.491	0.026	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	90.884

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	64.625	646.249	8.98
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	435.891	4358.907	60.55
PERC./LEAKAGE THROUGH LAYER 2	219.320328	2193.203	30.47
CHANGE IN WATER STORAGE	0.064	0.644	0.01
SOIL WATER AT START OF YEAR	306.894	3068.936	
SOIL WATER AT END OF YEAR	306.894	3068.944	
INTERCEPTION WATER AT START OF YEAR	0.195	1.951	
INTERCEPTION WATER AT END OF YEAR	0.259	2.587	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.19	0.00	10.69	0.00	0.00	9.76

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U1350_B4.OUT

	12.19	3.50	1.56	0.00	0.00	8.97
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.92	11.90	19.39	47.85	51.77	115.15
	81.80	64.66	26.69	14.56	11.69	9.89
PERCOLATION/LEAKAGE THROUGH LAYER 2	28.828	51.273	65.939	0.150	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	30.073

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	46.859	468.586	6.86
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	466.260	4662.596	68.25
PERC./LEAKAGE THROUGH LAYER 2	176.262390	1762.624	25.80
CHANGE IN WATER STORAGE	-6.180	-61.802	-0.90
SOIL WATER AT START OF YEAR	306.894	3068.944	
SOIL WATER AT END OF YEAR	300.973	3009.729	
INTERCEPTION WATER AT START OF YEAR	0.259	2.587	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.09	4.58	8.48	10.97
	5.36	5.17	118.38	0.00	1.70	11.04

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

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POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.94	9.38	16.48	48.90	60.82	103.05
	116.44	74.46	38.97	12.43	12.07	8.09
PERCOLATION/LEAKAGE THROUGH	21.298	27.588	24.509	20.136	0.042	0.000
LAYER 2	0.000	0.000	0.000	16.370	38.265	72.965

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	172.541	1725.411	18.60
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	511.026	5110.258	55.10
PERC./LEAKAGE THROUGH LAYER 2	221.172836	2211.728	23.85
CHANGE IN WATER STORAGE	22.760	227.603	2.45
SOIL WATER AT START OF YEAR	300.973	3009.729	
SOIL WATER AT END OF YEAR	321.633	3216.327	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.348	13.479	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	12.79	0.00	5.81	0.00	0.63
	29.41	137.60	3.39	37.39	7.76	12.43
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U1350_B4.OUT

ACTUAL EVAPOTRANSPIRATION	10.87	11.58	21.47	35.62	53.27	81.19
	103.90	100.93	33.67	13.38	10.41	5.82
PERCOLATION/LEAKAGE THROUGH	46.046	79.920	49.362	0.000	0.896	0.000
LAYER 2	0.000	0.000	0.000	23.063	62.493	7.207

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	247.210	2472.096	24.85
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	482.110	4821.099	48.47
PERC./LEAKAGE THROUGH LAYER 2	268.987854	2689.878	27.04
CHANGE IN WATER STORAGE	-3.607	-36.070	-0.36
SOIL WATER AT START OF YEAR	321.633	3216.327	
SOIL WATER AT END OF YEAR	319.193	3191.934	
INTERCEPTION WATER AT START OF YEAR	1.348	13.479	
INTERCEPTION WATER AT END OF YEAR	0.933	9.328	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0006	-0.006	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	18.70	0.00	6.17	7.14	14.54	7.41
	17.45	1.86	0.54	3.25	0.00	9.14
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	9.05	3.94	18.61	34.31	87.53	125.53

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

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	70.12	36.13	29.23	10.78	10.39	9.17
PERCOLATION/LEAKAGE THROUGH	34.091	38.548	14.830	0.000	13.316	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	37.829

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	86.208	862.083	13.04
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	444.784	4447.843	67.28
PERC./LEAKAGE THROUGH LAYER 2	138.612900	1386.129	20.97
CHANGE IN WATER STORAGE	-8.506	-85.058	-1.29
SOIL WATER AT START OF YEAR	319.193	3191.934	
SOIL WATER AT END OF YEAR	311.289	3112.886	
INTERCEPTION WATER AT START OF YEAR	0.933	9.328	
INTERCEPTION WATER AT END OF YEAR	0.332	3.317	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	9.17	0.00	0.00	0.00	5.12
	27.54	16.84	28.02	0.00	11.53	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.40	10.35	20.59	42.59	31.89	89.23
	100.57	96.21	42.16	11.43	10.84	9.20

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

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PERCOLATION/LEAKAGE THROUGH	71.693	70.866	18.333	2.045	0.000	0.000
LAYER 2	0.000	0.000	0.000	23.560	74.893	25.925

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	106.594	1065.942	12.29
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	474.474	4744.738	54.70
PERC./LEAKAGE THROUGH LAYER 2	287.316620	2873.166	33.12
CHANGE IN WATER STORAGE	-0.985	-9.850	-0.11
SOIL WATER AT START OF YEAR	311.289	3112.886	
SOIL WATER AT END OF YEAR	309.344	3093.436	
INTERCEPTION WATER AT START OF YEAR	0.332	3.317	
INTERCEPTION WATER AT END OF YEAR	1.292	12.917	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.005	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.95	0.00	1.66	18.86
	20.21	7.39	2.18	10.89	5.48	2.86
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	12.00	8.73	20.28	39.74	66.78	113.04
	103.23	79.03	40.31	8.95	10.43	10.48
PERCOLATION/LEAKAGE THROUGH	47.237	25.134	23.759	0.593	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	28.898	54.850

U1350_B4.OUT

ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.374	743.741	9.66
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	513.004	5130.035	66.65
PERC./LEAKAGE THROUGH LAYER 2	180.472031	1804.720	23.45
CHANGE IN WATER STORAGE	1.850	18.504	0.24
SOIL WATER AT START OF YEAR	309.344	3093.436	
SOIL WATER AT END OF YEAR	311.185	3111.845	
INTERCEPTION WATER AT START OF YEAR	1.292	12.917	
INTERCEPTION WATER AT END OF YEAR	0.831	8.306	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.46	4.63	0.00	0.00
	8.75	43.93	0.00	0.79	9.72	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.32	8.70	17.64	49.81	67.32	111.72
	72.88	64.03	36.90	15.44	12.29	11.30
PERCOLATION/LEAKAGE THROUGH LAYER 2	19.103	19.835	22.644	30.107	0.000	0.000
	0.000	0.000	0.000	0.000	48.206	35.747

U1350_B4.OUT

ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	69.280	692.800	9.52
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	475.343	4753.428	65.32
PERC./LEAKAGE THROUGH LAYER 2	175.642395	1756.424	24.14
CHANGE IN WATER STORAGE	7.434	74.345	1.02
SOIL WATER AT START OF YEAR	311.185	3111.845	
SOIL WATER AT END OF YEAR	318.951	3189.511	
INTERCEPTION WATER AT START OF YEAR	0.831	8.306	
INTERCEPTION WATER AT END OF YEAR	0.969	9.690	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	18.76	2.05	5.58	0.00	2.34	19.98
	15.45	0.70	9.86	5.11	6.55	11.49
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.34	10.24	25.24	27.01	69.35	104.22
	103.28	88.94	36.47	9.26	11.15	9.13
PERCOLATION/LEAKAGE THROUGH LAYER 2	92.907	37.436	57.257	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	83.752	55.834

U1350_B4.OUT

ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	97.871	978.709	10.63
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	507.637	5076.365	55.12
PERC./LEAKAGE THROUGH LAYER 2	327.186462	3271.865	35.53
CHANGE IN WATER STORAGE	-11.794	-117.942	-1.28
SOIL WATER AT START OF YEAR	318.951	3189.511	
SOIL WATER AT END OF YEAR	306.788	3067.877	
INTERCEPTION WATER AT START OF YEAR	0.969	9.690	
INTERCEPTION WATER AT END OF YEAR	1.338	13.383	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.22	0.92	0.00	0.00	0.00
	51.26	37.99	4.77	15.84	12.13	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.64	9.45	22.76	41.10	40.03	104.94
	90.56	67.95	22.38	14.26	11.20	8.49
PERCOLATION/LEAKAGE THROUGH	51.290	21.525	63.328	15.709	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.729	54.446	20.458

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	169.414	1694.138	20.28
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	445.785	4457.851	53.36
PERC./LEAKAGE THROUGH LAYER 2	227.486160	2274.862	27.23
CHANGE IN WATER STORAGE	-7.185	-71.849	-0.86
SOIL WATER AT START OF YEAR	306.788	3067.877	
SOIL WATER AT END OF YEAR	300.941	3009.411	
INTERCEPTION WATER AT START OF YEAR	1.338	13.383	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.003	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	7.4571	0.3729
2	22.6370	0.2830
TOTAL WATER IN LAYERS	30.094	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	30.094	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)

PRECIPITATION	70.50	705.000
RUNOFF	56.026	560.2589
PERCOLATION/LEAKAGE THROUGH LAYER 2	10.251194	102.51194
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3613	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1400	

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.365	4.292	3.248	2.492	2.703	7.274
	18.895	25.599	17.656	7.570	5.888	9.516
STD. DEVIATIONS	12.124	4.871	3.400	2.841	4.929	7.623
	14.483	42.341	36.336	11.725	4.474	11.616
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.608	9.461	20.309	41.906	57.058	105.787
	92.658	71.654	33.590	12.387	10.953	9.262
STD. DEVIATIONS	1.792	2.217	2.525	8.000	16.639	12.784
	15.199	20.969	6.490	2.226	0.949	1.601
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	46.0612	41.6926	37.5453	6.8766	1.4254	0.0000
	0.0000	0.0000	0.0000	6.3722	39.0953	43.1773
STD. DEVIATIONS	22.7663	20.5467	19.6369	11.0068	4.1872	0.0000
	0.0000	0.0000	0.0000	10.2711	31.3258	25.4359

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM		CU. METERS	PERCENT
PRECIPITATION	810.76	(114.950)	8107.6	100.00
RUNOFF	113.498	(63.1078)	1134.98	13.999
POTENTIAL EVAPOTRANSPIRATION	645.214	(25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	475.631	(28.3370)	4756.31	58.665
PERCOLATION/LEAKAGE THROUGH LAYER 2	222.24597	(58.20908)	2222.460	27.41205
CHANGE IN WATER STORAGE	-0.615	(0.3911)	-6.15	-0.076

U135O_B5.OUT

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**                                                                      **
**                                                                      **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE            **
**                                                                      **
**              HELP Version 3.80 D            (25. May 2004)           **
**                              developed at                            **
**              Institut f. Bodenkunde,  Universitaet Hamburg           **
**                              based on                                **
**              US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)           **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY               **
**                    USAE WATERWAYS EXPERIMENT STATION                 **
**                FOR USEPA RISK REDUCTION ENGINEERING LABORATORY       **
**                                                                      **
**                                                                      **
**************************************************************************
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TIME:  14.51     DATE:  25.01.2010


PRECIPITATION DATA FILE:      H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE:        H:\GERLACH\U135O_~4\U135O_T.D7
SOLAR RADIATION DATA FILE:    H:\GERLACH\U135O_~4\U135O_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U135O_EV.D11
SOIL AND DESIGN DATA FILE  1: H:\GERLACH\U135O_~4\U135O_B5.D10
OUTPUT DATA FILE:             H:\GERLACH\U135O_~4\U135O_B5.OUT
DAILY OUTPUT DATA FILE:       H:\GERLACH\U135O_~4\U135O_B5.DAY
MONTHLY OUTPUT DATA FILE:     H:\GERLACH\U135O_~4\U135O_B5.MON
YEARLY OUTPUT DATA FILE:      H:\GERLACH\U135O_~4\U135O_B5.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

     1    DATE (yyyymmdd)
     2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    CHANGE IN TOTAL WATER STORAGE (MM)
     8    CHANGE IN SOIL WATER STORAGE (MM)
     9    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    10    CHANGE IN SNOW WATER STORAGE (MM)
    11    ANNUAL WATER BUDGET BALANCE (MM)
```


Layer 1: Klei
Layer 2: stark schluffiger Sand

U135O_B5.OUT

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**************************************************************************

     TITLE:  Deponie Grauer Wall

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                          WEATHER DATA SOURCES
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         NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


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                               LAYER DATA   1
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                            VALID FOR  10 YEARS


      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
               COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER   0
          THICKNESS                     =     20.00   CM
          POROSITY                      =      0.5400 VOL/VOL
          FIELD CAPACITY                =      0.3800 VOL/VOL
          WILTING POINT                 =      0.1900 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.3938 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.1000E-04 CM/SEC


                                LAYER  2
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER 310
          THICKNESS                     =     80.00   CM
          POROSITY                      =      0.4300 VOL/VOL
          FIELD CAPACITY                =      0.2600 VOL/VOL
          WILTING POINT                 =      0.0900 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.2636 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.4400E-03 CM/SEC
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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	21.162	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	32.300	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	20.600	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	8.300	CM
SOIL EVAPORATION ZONE DEPTH	=	67.1	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.018	CM
INITIAL WATER IN LAYER MATERIALS	=	28.962	CM
TOTAL INITIAL WATER	=	28.980	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

RUNOFF	2.35	2.05	1.62	2.74	0.00	0.00
	1.33	1.04	7.87	2.43	4.01	39.23
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.60	10.30	20.71	52.35	41.77	109.44
	88.98	45.37	28.27	13.39	9.09	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	47.906	43.734	35.506	0.031	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	86.657

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	64.672	646.718	8.98
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	441.325	4413.253	61.30
PERC./LEAKAGE THROUGH LAYER 2	213.833481	2138.335	29.70
CHANGE IN WATER STORAGE	0.070	0.695	0.01
SOIL WATER AT START OF YEAR	289.620	2896.201	
SOIL WATER AT END OF YEAR	289.621	2896.206	
INTERCEPTION WATER AT START OF YEAR	0.178	1.778	
INTERCEPTION WATER AT END OF YEAR	0.247	2.469	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.18	0.00	10.68	0.00	0.00	9.75

Layer 1: Klei
Layer 2: stark schluffiger Sand

U1350_B5.OUT

	12.21	3.47	1.53	0.00	0.00	8.95
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.93	11.90	19.42	47.95	51.72	114.83
	87.14	64.75	26.70	14.62	11.67	9.88
PERCOLATION/LEAKAGE THROUGH	29.446	49.373	65.956	0.155	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	24.873

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	46.778	467.779	6.85
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	471.514	4715.144	69.02
PERC./LEAKAGE THROUGH LAYER 2	169.803314	1698.033	24.85
CHANGE IN WATER STORAGE	-4.895	-48.954	-0.72
SOIL WATER AT START OF YEAR	289.621	2896.206	
SOIL WATER AT END OF YEAR	284.972	2849.721	
INTERCEPTION WATER AT START OF YEAR	0.247	2.469	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.09	4.57	8.39	10.95
	5.36	5.10	118.23	0.00	1.70	11.04

Layer 1: Klei
Layer 2: stark schluffiger Sand

U1350_B5.OUT

POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.92	9.40	16.42	48.64	60.65	103.01
	116.41	79.65	39.11	12.44	12.07	8.09
PERCOLATION/LEAKAGE THROUGH	21.508	28.484	23.543	20.624	0.030	0.000
LAYER 2	0.000	0.000	0.000	11.345	39.656	78.308

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	172.186	1721.862	18.56
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	515.783	5157.832	55.61
PERC./LEAKAGE THROUGH LAYER 2	223.498474	2234.985	24.10
CHANGE IN WATER STORAGE	16.032	160.320	1.73
SOIL WATER AT START OF YEAR	284.972	2849.721	
SOIL WATER AT END OF YEAR	298.881	2988.810	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.371	13.706	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0004	0.004	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	12.78	0.00	5.81	0.00	0.64
	29.37	137.57	3.39	37.38	7.76	12.32
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

ACTUAL EVAPOTRANSPIRATION	10.85	11.59	21.40	35.55	53.14	81.17
	103.90	100.92	33.66	13.38	10.41	5.82
PERCOLATION/LEAKAGE THROUGH	46.203	80.019	42.500	0.000	1.400	0.000
LAYER 2	0.000	0.000	0.000	30.856	54.470	7.205

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	247.037	2470.367	24.84
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	481.786	4817.858	48.44
PERC./LEAKAGE THROUGH LAYER 2	262.652710	2626.527	26.41
CHANGE IN WATER STORAGE	3.225	32.250	0.32
SOIL WATER AT START OF YEAR	298.881	2988.810	
SOIL WATER AT END OF YEAR	303.295	3032.950	
INTERCEPTION WATER AT START OF YEAR	1.371	13.706	
INTERCEPTION WATER AT END OF YEAR	0.934	9.342	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0005	-0.005	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	18.49	0.00	6.16	7.14	14.54	7.33
	16.39	1.87	0.56	3.25	0.00	9.14
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	9.05	3.94	18.61	34.31	87.51	125.53

	75.32	36.07	29.42	10.81	10.38	9.19
PERCOLATION/LEAKAGE THROUGH	41.615	31.341	14.896	0.000	14.284	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	36.072

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	84.876	848.760	12.84
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	450.129	4501.293	68.09
PERC./LEAKAGE THROUGH LAYER 2	138.207809	1382.078	20.91
CHANGE IN WATER STORAGE	-12.113	-121.134	-1.83
SOIL WATER AT START OF YEAR	303.295	3032.950	
SOIL WATER AT END OF YEAR	291.797	2917.968	
INTERCEPTION WATER AT START OF YEAR	0.934	9.342	
INTERCEPTION WATER AT END OF YEAR	0.319	3.190	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	9.15	0.00	0.01	0.00	5.11
	27.54	16.82	28.03	0.00	11.53	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.38	10.35	20.65	42.69	31.85	89.20
	100.57	96.22	42.17	11.43	10.84	9.20

PERCOLATION/LEAKAGE THROUGH	68.309	70.808	18.355	2.002	0.000	0.000
LAYER 2	0.000	0.000	0.000	23.480	76.078	24.737

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	106.560	1065.604	12.29
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	474.553	4745.534	54.71
PERC./LEAKAGE THROUGH LAYER 2	283.769196	2837.692	32.71
CHANGE IN WATER STORAGE	2.517	25.169	0.29
SOIL WATER AT START OF YEAR	291.797	2917.968	
SOIL WATER AT END OF YEAR	293.343	2933.428	
INTERCEPTION WATER AT START OF YEAR	0.319	3.190	
INTERCEPTION WATER AT END OF YEAR	1.290	12.898	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.95	0.00	1.67	18.83
	20.25	7.39	2.17	10.89	5.48	2.86
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	12.00	8.73	20.28	39.75	66.80	113.05
	103.23	79.34	43.10	9.08	10.43	10.48
PERCOLATION/LEAKAGE THROUGH	47.239	25.145	23.846	0.581	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	26.089	54.306

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.371	743.712	9.66
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	516.270	5162.704	67.07
PERC./LEAKAGE THROUGH LAYER 2	177.205963	1772.060	23.02
CHANGE IN WATER STORAGE	1.853	18.527	0.24
SOIL WATER AT START OF YEAR	293.343	2933.428	
SOIL WATER AT END OF YEAR	295.185	2951.846	
INTERCEPTION WATER AT START OF YEAR	1.290	12.898	
INTERCEPTION WATER AT END OF YEAR	0.830	8.302	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.003	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.45	4.65	0.00	0.00
	8.59	43.87	0.00	0.79	9.72	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.32	8.70	17.64	49.81	67.32	111.72
	77.44	64.42	36.95	15.45	12.29	11.29
PERCOLATION/LEAKAGE THROUGH	19.116	19.838	28.319	24.549	0.421	0.000
LAYER 2	0.000	0.000	0.000	0.000	42.853	36.367

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	69.072	690.720	9.49
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	480.358	4803.577	66.01
PERC./LEAKAGE THROUGH LAYER 2	171.462128	1714.621	23.56
CHANGE IN WATER STORAGE	6.808	68.080	0.94
SOIL WATER AT START OF YEAR	295.185	2951.846	
SOIL WATER AT END OF YEAR	302.320	3023.200	
INTERCEPTION WATER AT START OF YEAR	0.830	8.302	
INTERCEPTION WATER AT END OF YEAR	0.973	9.734	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	18.77	2.05	5.58	0.00	2.30	20.00
	15.50	0.70	9.86	5.11	6.55	11.49
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.34	10.24	25.21	27.00	69.34	104.22
	103.28	88.94	36.47	9.26	11.15	9.13
PERCOLATION/LEAKAGE THROUGH LAYER 2	95.419	36.871	54.783	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	83.869	55.645

ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	97.908	979.083	10.63
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	507.589	5075.885	55.12
PERC./LEAKAGE THROUGH LAYER 2	326.587921	3265.879	35.46
CHANGE IN WATER STORAGE	-11.185	-111.849	-1.21
SOIL WATER AT START OF YEAR	302.320	3023.200	
SOIL WATER AT END OF YEAR	290.770	2907.700	
INTERCEPTION WATER AT START OF YEAR	0.973	9.734	
INTERCEPTION WATER AT END OF YEAR	1.339	13.386	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.21	0.93	0.00	0.00	0.00
	51.12	37.84	4.73	15.85	12.10	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.64	9.45	22.76	41.10	40.03	104.94
	95.67	68.15	21.96	14.28	11.20	8.49
PERCOLATION/LEAKAGE THROUGH LAYER 2	51.507	21.303	63.990	15.129	0.000	0.000
	0.000	0.000	0.000	0.000	50.498	20.481

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	169.071	1690.711	20.24
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	450.682	4506.821	53.94
PERC./LEAKAGE THROUGH LAYER 2	222.908890	2229.089	26.68
CHANGE IN WATER STORAGE	-7.162	-71.622	-0.86
SOIL WATER AT START OF YEAR	290.770	2907.700	
SOIL WATER AT END OF YEAR	284.946	2849.463	
INTERCEPTION WATER AT START OF YEAR	1.339	13.386	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	7.4099	0.3705
2	21.0847	0.2636
TOTAL WATER IN LAYERS	28.495	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	28.495	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)

U1350_B5.OUT

PRECIPITATION	70.50	705.000
RUNOFF	56.020	560.2034
PERCOLATION/LEAKAGE THROUGH LAYER 2	11.358668	113.58669
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3445	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1186	

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.345	4.290	3.247	2.492	2.690	7.261
	18.765	25.566	17.637	7.571	5.886	9.502
STD. DEVIATIONS	12.105	4.867	3.399	2.840	4.917	7.618
	14.472	42.331	36.291	11.726	4.468	11.610
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.603	9.460	20.310	41.916	57.013	105.711
	95.195	72.382	33.780	12.413	10.953	9.263
STD. DEVIATIONS	1.793	2.217	2.528	8.025	16.646	12.755
	12.903	20.938	7.010	2.211	0.944	1.600
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	46.8268	40.6916	37.1693	6.3071	1.6134	0.0000
	0.0000	0.0000	0.0000	6.5681	37.3515	42.4652
STD. DEVIATIONS	22.5697	20.6608	18.8003	9.7949	4.4739	0.0000
	0.0000	0.0000	0.0000	11.5504	30.6909	25.7767

Layer 1: Klei
Layer 2: stark schluffiger Sand

U135O_B5.OUT

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	810.76 (114.950)	8107.6	100.00
RUNOFF	113.253 (63.0830)	1132.53	13.969
POTENTIAL EVAPOTRANSPIRATION	645.214 (25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	478.999 (27.2837)	4789.99	59.080
PERCOLATION/LEAKAGE THROUGH LAYER 2	218.99298 (58.39739)	2189.930	27.01082
CHANGE IN WATER STORAGE	-0.485 (0.3393)	-4.85	-0.060

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Umtec

Deponie Grauer Wall, Antrag auf Änderung der Planfeststellung
Anlage 13: Fachgutachten Wasserhaushaltsbetrachtungen zur ergänzenden Profilierungsschicht im Deponieabschnitt 3

Anlage 3

Ergebnisse der Wasserhaushaltsbetrachtungen für den Schichtenaufbau II

U135O_B6.OUT

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**                                                                      **
**                                                                      **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE           **
**                                                                      **
**              HELP Version 3.80 D            (25. May 2004)           **
**                              developed at                            **
**              Institut f. Bodenkunde,  Universitaet Hamburg           **
**                              based on                                **
**              US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)           **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY               **
**                    USAE WATERWAYS EXPERIMENT STATION                 **
**                FOR USEPA RISK REDUCTION ENGINEERING LABORATORY       **
**                                                                      **
**                                                                      **
**************************************************************************
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TIME:  14.59     DATE:  25.01.2010


PRECIPITATION DATA FILE:      H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE:        H:\GERLACH\U135O_~4\U1350_T.D7
SOLAR RADIATION DATA FILE:    H:\GERLACH\U135O_~4\U1350_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U1350_EV.D11
SOIL AND DESIGN DATA FILE  1: H:\GERLACH\U135O_~4\U1350_B6.D10
OUTPUT DATA FILE:             H:\GERLACH\U135O_~4\U1350_B6.OUT
DAILY OUTPUT DATA FILE:       H:\GERLACH\U135O_~4\U1350_B6.DAY
MONTHLY OUTPUT DATA FILE:     H:\GERLACH\U135O_~4\U1350_B6.MON
YEARLY OUTPUT DATA FILE:      H:\GERLACH\U135O_~4\U1350_B6.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

     1    DATE (yyyymmdd)
     2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    CHANGE IN TOTAL WATER STORAGE (MM)
     8    CHANGE IN SOIL WATER STORAGE (MM)
     9    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    10    CHANGE IN SNOW WATER STORAGE (MM)
    11    ANNUAL WATER BUDGET BALANCE (MM)
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Layer 1: Klei
Layer 2: reiner Sand

U135O_B6.OUT

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     TITLE:  Deponie Grauer Wall

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                          WEATHER DATA SOURCES
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        NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                 WAS ENTERED FROM AN ASCII DATA FILE.


        NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                 WAS ENTERED FROM AN ASCII DATA FILE.


        NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                 WAS ENTERED FROM AN ASCII DATA FILE.


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                               LAYER DATA   1
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                           VALID FOR  10 YEARS


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER   0
          THICKNESS                    =     50.00   CM
          POROSITY                     =      0.5400 VOL/VOL
          FIELD CAPACITY               =      0.3800 VOL/VOL
          WILTING POINT                =      0.1900 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.4438 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=      0.1000E-04 CM/SEC


                                LAYER  2
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER 301
          THICKNESS                    =     50.00   CM
          POROSITY                     =      0.4300 VOL/VOL
          FIELD CAPACITY               =      0.0410 VOL/VOL
          WILTING POINT                =      0.0400 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.0571 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=      0.3940E-02 CM/SEC
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Layer 1: Klei
Layer 2: reiner Sand

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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	23.816	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	35.600	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	19.820	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	10.300	CM
SOIL EVAPORATION ZONE DEPTH	=	61.0	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.008	CM
INITIAL WATER IN LAYER MATERIALS	=	25.046	CM
TOTAL INITIAL WATER	=	25.054	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

Layer 1: Klei
Layer 2: reiner Sand

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RUNOFF	2.43	2.09	1.62	2.85	0.00	0.00
	1.44	1.17	8.02	2.43	4.10	39.28
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.56	10.21	21.18	50.16	42.91	107.94
	72.74	44.99	28.80	13.54	9.31	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	53.870	41.679	48.776	7.759	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	78.931

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	65.452	654.515	9.09
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	423.386	4233.856	58.81
PERC./LEAKAGE THROUGH LAYER 2	231.013519	2310.135	32.09
CHANGE IN WATER STORAGE	0.049	0.494	0.01
SOIL WATER AT START OF YEAR	250.459	2504.594	
SOIL WATER AT END OF YEAR	250.460	2504.602	
INTERCEPTION WATER AT START OF YEAR	0.085	0.847	
INTERCEPTION WATER AT END OF YEAR	0.133	1.333	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.12	0.00	11.03	0.00	0.00	9.79

Layer 1: Klei
Layer 2: reiner Sand

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	12.23	3.57	1.63	0.00	0.00	8.99
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.96	11.92	19.71	47.29	50.41	111.94
	73.30	63.82	26.69	14.49	11.66	9.88
PERCOLATION/LEAKAGE THROUGH	39.203	50.441	69.348	11.236	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	32.809

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	47.360	473.596	6.93
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	452.095	4520.952	66.17
PERC./LEAKAGE THROUGH LAYER 2	203.036865	2030.369	29.72
CHANGE IN WATER STORAGE	-19.292	-192.915	-2.82
SOIL WATER AT START OF YEAR	250.460	2504.602	
SOIL WATER AT END OF YEAR	231.302	2313.020	
INTERCEPTION WATER AT START OF YEAR	0.133	1.333	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.13	4.62	8.29	10.90
	5.39	5.30	118.79	0.00	1.70	11.05

Layer 1: Klei
Layer 2: reiner Sand

U1350_B6.OUT

POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.98	9.38	16.63	49.33	61.02	101.68
	110.35	69.40	38.61	12.41	12.07	8.11
PERCOLATION/LEAKAGE THROUGH	24.374	20.993	26.608	20.012	10.953	0.000
LAYER 2	0.000	0.000	0.000	22.556	23.953	78.084

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	172.927	1729.268	18.64
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	498.956	4989.564	53.80
PERC./LEAKAGE THROUGH LAYER 2	227.533829	2275.338	24.53
CHANGE IN WATER STORAGE	28.083	280.829	3.03
SOIL WATER AT START OF YEAR	231.302	2313.020	
SOIL WATER AT END OF YEAR	257.353	2573.525	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.280	12.798	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	13.17	0.00	5.80	0.00	0.65
	29.35	137.65	3.45	37.54	7.81	13.41
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

ACTUAL EVAPOTRANSPIRATION	10.94	11.57	21.71	35.81	53.30	79.22
	99.75	94.75	32.18	13.34	10.33	5.80
PERCOLATION/LEAKAGE THROUGH	41.261	86.460	51.423	13.172	0.000	0.000
LAYER 2	0.000	0.000	0.000	16.961	69.862	13.578

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	248.843	2488.427	25.02
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	468.691	4686.912	47.12
PERC./LEAKAGE THROUGH LAYER 2	292.716827	2927.168	29.43
CHANGE IN WATER STORAGE	-15.551	-155.505	-1.56
SOIL WATER AT START OF YEAR	257.353	2573.525	
SOIL WATER AT END OF YEAR	242.942	2429.417	
INTERCEPTION WATER AT START OF YEAR	1.280	12.798	
INTERCEPTION WATER AT END OF YEAR	0.893	8.926	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.004	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	20.06	0.00	6.20	7.18	14.54	7.14
	16.48	1.92	0.62	3.24	0.00	9.14
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	8.94	3.98	18.82	33.98	87.43	123.04

	67.02	35.89	29.87	10.84	10.29	9.25
PERCOLATION/LEAKAGE THROUGH	16.935	52.416	15.813	7.712	0.000	4.192
LAYER 2	0.000	0.000	0.000	0.000	0.000	31.320

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	86.535	865.352	13.09
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	439.354	4393.535	66.46
PERC./LEAKAGE THROUGH LAYER 2	128.388092	1283.881	19.42
CHANGE IN WATER STORAGE	6.823	68.231	1.03
SOIL WATER AT START OF YEAR	242.942	2429.417	
SOIL WATER AT END OF YEAR	250.390	2503.898	
INTERCEPTION WATER AT START OF YEAR	0.893	8.926	
INTERCEPTION WATER AT END OF YEAR	0.268	2.677	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	9.73	0.00	0.05	0.00	5.12
	27.67	16.97	28.07	0.00	11.61	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.35	10.33	20.88	43.10	31.43	87.32
	97.27	93.42	40.56	11.38	10.84	9.21

PERCOLATION/LEAKAGE THROUGH	71.073	82.649	12.352	14.514	1.722	0.000
LAYER 2	0.000	0.000	0.000	10.397	75.941	31.817

ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	107.589	1075.890	12.40
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	465.073	4650.733	53.62
PERC./LEAKAGE THROUGH LAYER 2	300.465515	3004.655	34.64
CHANGE IN WATER STORAGE	-5.728	-57.279	-0.66
SOIL WATER AT START OF YEAR	250.390	2503.898	
SOIL WATER AT END OF YEAR	243.665	2436.646	
INTERCEPTION WATER AT START OF YEAR	0.268	2.677	
INTERCEPTION WATER AT END OF YEAR	1.265	12.650	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.97	0.00	1.68	18.77
	20.44	7.34	2.45	10.87	5.46	2.84
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	11.97	8.70	20.34	39.91	65.87	109.54
	98.50	71.81	41.04	9.16	10.43	10.42
PERCOLATION/LEAKAGE THROUGH	46.035	29.448	18.201	18.660	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	19.524	60.966

ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.704	747.043	9.71
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	497.683	4976.832	64.66
PERC./LEAKAGE THROUGH LAYER 2	192.834702	1928.347	25.05
CHANGE IN WATER STORAGE	4.478	44.779	0.58
SOIL WATER AT START OF YEAR	243.665	2436.646	
SOIL WATER AT END OF YEAR	248.177	2481.769	
INTERCEPTION WATER AT START OF YEAR	1.265	12.650	
INTERCEPTION WATER AT END OF YEAR	0.760	7.601	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.53	4.69	0.00	0.00
	8.48	44.49	0.00	0.79	9.72	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.40	8.74	17.77	50.33	67.51	109.30
	61.25	64.25	37.12	15.62	12.23	11.32
PERCOLATION/LEAKAGE THROUGH	26.921	16.094	18.863	42.796	3.869	0.000
LAYER 2	0.000	0.000	0.000	0.000	39.880	44.390

ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	69.691	696.909	9.58
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	462.839	4628.393	63.60
PERC./LEAKAGE THROUGH LAYER 2	192.812592	1928.126	26.50
CHANGE IN WATER STORAGE	2.357	23.572	0.32
SOIL WATER AT START OF YEAR	248.177	2481.769	
SOIL WATER AT END OF YEAR	250.855	2508.545	
INTERCEPTION WATER AT START OF YEAR	0.760	7.601	
INTERCEPTION WATER AT END OF YEAR	0.910	9.102	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	18.78	2.05	5.62	0.00	2.31	20.05
	15.58	0.78	9.96	5.18	7.60	11.50
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.34	10.21	25.50	27.13	68.74	100.75
	97.68	81.22	34.58	9.21	11.16	9.16
PERCOLATION/LEAKAGE THROUGH LAYER 2	84.871	43.157	59.654	13.384	0.000	0.000
	0.000	0.000	0.000	0.000	80.746	69.908

ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	99.409	994.087	10.79
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	488.686	4886.859	53.07
PERC./LEAKAGE THROUGH LAYER 2	351.720612	3517.206	38.19
CHANGE IN WATER STORAGE	-18.916	-189.156	-2.05
SOIL WATER AT START OF YEAR	250.855	2508.545	
SOIL WATER AT END OF YEAR	231.568	2315.678	
INTERCEPTION WATER AT START OF YEAR	0.910	9.102	
INTERCEPTION WATER AT END OF YEAR	1.281	12.813	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.32	0.97	0.00	0.00	0.00
	51.84	38.36	4.88	15.80	12.21	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.51	9.58	22.78	41.45	39.41	102.45
	76.64	67.47	23.83	14.27	11.17	8.52
PERCOLATION/LEAKAGE THROUGH LAYER 2	32.906	41.264	47.393	33.313	2.532	0.000
	0.000	0.000	0.000	0.000	51.647	30.290

Layer 1: Klei
Layer 2: reiner Sand

U1350_B6.OUT

ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	170.676	1706.760	20.43
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	430.079	4300.792	51.48
PERC./LEAKAGE THROUGH LAYER 2	239.345825	2393.458	28.65
CHANGE IN WATER STORAGE	-4.601	-46.010	-0.55
SOIL WATER AT START OF YEAR	231.568	2315.678	
SOIL WATER AT END OF YEAR	228.248	2282.481	
INTERCEPTION WATER AT START OF YEAR	1.281	12.813	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	19.9678	0.3994
2	2.8570	0.0571
TOTAL WATER IN LAYERS	22.825	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	22.825	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)
PRECIPITATION	70.50	705.000
RUNOFF	56.054	560.5364
PERCOLATION/LEAKAGE THROUGH LAYER 2	9.819524	98.19524
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.3792	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1471	

Layer 1: Klei
Layer 2: reiner Sand

U1350_B6.OUT

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.505	4.402	3.309	2.519	2.683	7.241
	18.891	25.756	17.787	7.585	6.021	9.621
STD. DEVIATIONS	12.261	5.024	3.484	2.852	4.904	7.616
	14.648	42.366	36.429	11.763	4.523	11.663
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.595	9.462	20.531	41.849	56.802	103.319
	85.451	68.702	33.327	12.426	10.949	9.271
STD. DEVIATIONS	1.771	2.199	2.543	7.796	16.627	12.499
	16.986	18.679	5.997	2.226	0.899	1.601
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	43.7449	46.4600	36.8431	18.2559	1.9077	0.4192
	0.0000	0.0000	0.0000	4.9914	36.1554	47.2094
STD. DEVIATIONS	21.2584	23.2898	20.7117	11.3843	3.4630	1.3257
	0.0000	0.0000	0.0000	8.5336	32.1600	23.0603

Layer 1: Klei
Layer 2: reiner Sand

U135O_B6.OUT

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM		CU. METERS	PERCENT
PRECIPITATION	810.76	(114.950)	8107.6	100.00
RUNOFF	114.318	(63.4032)	1143.18	14.100
POTENTIAL EVAPOTRANSPIRATION	645.214	(25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	462.684	(26.9201)	4626.84	57.068
PERCOLATION/LEAKAGE THROUGH LAYER 2	235.98685	(64.34867)	2359.868	29.10687
CHANGE IN WATER STORAGE	-2.230	(0.5624)	-22.30	-0.275

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Layer 1: Klei
Layer 2: schwach lehmiger Sand

U135O_B7.OUT

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**
** HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE **
**
** HELP Version 3.80 D (25. May 2004) **
** developed at **
** Institut f. Bodenkunde, Universitaet Hamburg **
** based on **
** US HELP MODEL VERSION 3.07 (1 NOVEMBER 1997) **
** DEVELOPED BY ENVIRONMENTAL LABORATORY **
** USAE WATERWAYS EXPERIMENT STATION **
** FOR USEPA RISK REDUCTION ENGINEERING LABORATORY **
**
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TIME: 15.02 DATE: 25.01.2010

PRECIPITATION DATA FILE: H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE: H:\GERLACH\U135O_~4\U135O_T.D7
SOLAR RADIATION DATA FILE: H:\GERLACH\U135O_~4\U135O_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U135O_EV.D11
SOIL AND DESIGN DATA FILE 1: H:\GERLACH\U135O_~4\U135O_B7.D10
OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B7.OUT
DAILY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B7.DAY
MONTHLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B7.MON
YEARLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B7.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

1 DATE (yyyymmdd)
2 AIR TEMPERATURE (* INDICATES FREEZING TEMPERATURES)
3 FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
4 PRECIPITATION (MM)
5 RUNOFF (MM)
6 POTENTIAL EVAPOTRANSPIRATION (MM)
7 ACTUAL EVAPOTRANSPIRATION (MM)
8 WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
9 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyymmdd)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyy1231)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)
7 CHANGE IN TOTAL WATER STORAGE (MM)
8 CHANGE IN SOIL WATER STORAGE (MM)
9 CHANGE IN INTERCEPTION WATER STORAGE (MM)
10 CHANGE IN SNOW WATER STORAGE (MM)
11 ANNUAL WATER BUDGET BALANCE (MM)

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********************************************************************************

     TITLE:  Deponie Grauer Wall

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                            WEATHER DATA SOURCES
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         NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


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                                LAYER DATA   1
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                              VALID FOR  10 YEARS

      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
               COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                       MATERIAL TEXTURE NUMBER   0
            THICKNESS                     =     50.00   CM
            POROSITY                      =      0.5400 VOL/VOL
            FIELD CAPACITY                =      0.3800 VOL/VOL
            WILTING POINT                 =      0.1900 VOL/VOL
            INITIAL SOIL WATER CONTENT    =      0.4523 VOL/VOL
            EFFECTIVE SAT. HYD. CONDUCT.=        0.1000E-04 CM/SEC


                                LAYER  2
                                --------

                  TYPE 1 - VERTICAL PERCOLATION LAYER
                       MATERIAL TEXTURE NUMBER 302
            THICKNESS                     =     50.00   CM
            POROSITY                      =      0.4300 VOL/VOL
            FIELD CAPACITY                =      0.1900 VOL/VOL
            WILTING POINT                 =      0.0700 VOL/VOL
            INITIAL SOIL WATER CONTENT    =      0.2296 VOL/VOL
            EFFECTIVE SAT. HYD. CONDUCT.=        0.1130E-02 CM/SEC
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Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B7.OUT

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                  GENERAL DESIGN AND EVAPORATIVE ZONE DATA   1
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                              VALID FOR  10 YEARS


          NOTE:  SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
                   SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A
                   FAIR STAND OF GRASS, A SURFACE SLOPE OF  2.%
                   AND A SLOPE LENGTH OF  100. METERS.

        SCS RUNOFF CURVE NUMBER             =     81.60
        FRACTION OF AREA ALLOWING RUNOFF    =    100.0    PERCENT
        AREA PROJECTED ON HORIZONTAL PLANE  =      1.0000 HECTARES
        EVAPORATIVE ZONE DEPTH              =     70.0    CM
        INITIAL WATER IN EVAPORATIVE ZONE   =     27.493  CM
        UPPER LIMIT OF EVAPORATIVE STORAGE  =     35.600  CM
        FIELD CAPACITY OF EVAPORATIVE ZONE  =     22.800  CM
        LOWER LIMIT OF EVAPORATIVE STORAGE  =     10.900  CM
        SOIL EVAPORATION ZONE DEPTH         =     70.0    CM
        INITIAL SNOW WATER                  =      0.000  CM
        INITIAL INTERCEPTION WATER          =      0.025  CM
        INITIAL WATER IN LAYER MATERIALS    =     34.096  CM
        TOTAL INITIAL WATER                 =     34.121  CM
        TOTAL SUBSURFACE INFLOW             =      0.00   MM/YR


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                        EVAPOTRANSPIRATION DATA   1
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                              VALID FOR  10 YEARS


          NOTE:  EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
                   Bremerhaven         Deutschland
              STATION LATITUDE                    =  59.00 DEGREES
              MAXIMUM LEAF AREA INDEX             =   2.50
              START OF GROWING SEASON (JULIAN DATE)  =   105
              END OF GROWING SEASON (JULIAN DATE)    =   288
              EVAPORATIVE ZONE DEPTH              =  70.0  CM
              AVERAGE ANNUAL WIND SPEED           =   8.86 KPH
              AVERAGE 1ST QUARTER RELATIVE HUMIDITY  =  85.4  %
              AVERAGE 2ND QUARTER RELATIVE HUMIDITY  =  74.2  %
              AVERAGE 3RD QUARTER RELATIVE HUMIDITY  =  77.8  %
              AVERAGE 4TH QUARTER RELATIVE HUMIDITY  =  86.9  %
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                        MONTHLY TOTALS (MM) FOR YEAR 1999
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                              JAN/JUL FEB/AUG MAR/SEP APR/OCT MAY/NOV JUN/DEC
                              ------- ------- ------- ------- ------- -------

PRECIPITATION                  61.5    61.4    47.4    42.9    33.5    40.6
                               64.8    60.8    50.2    53.8    37.6   165.4
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Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B7.OUT

RUNOFF	2.29	2.01	1.64	2.73	0.00	0.00
	1.26	0.95	7.81	2.43	3.97	39.27
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.55	10.36	20.38	51.85	41.92	109.44
	96.07	45.52	28.10	13.26	9.03	11.05
PERCOLATION/LEAKAGE THROUGH	60.434	31.281	64.441	11.064	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	40.718

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	64.362	643.618	8.94
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	447.541	4475.414	62.17
PERC./LEAKAGE THROUGH LAYER 2	207.938110	2079.381	28.88
CHANGE IN WATER STORAGE	0.059	0.588	0.01
SOIL WATER AT START OF YEAR	340.960	3409.600	
SOIL WATER AT END OF YEAR	340.965	3409.646	
INTERCEPTION WATER AT START OF YEAR	0.245	2.453	
INTERCEPTION WATER AT END OF YEAR	0.300	2.996	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.21	0.00	11.12	0.00	0.00	9.73

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B7.OUT

	12.19	3.46	1.51	0.00	0.00	8.95
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.87	11.90	19.28	47.47	51.92	115.12
	87.14	70.53	26.77	14.61	11.68	9.85
PERCOLATION/LEAKAGE THROUGH	51.491	40.131	73.467	20.013	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	1.081

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	47.171	471.711	6.90
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	477.142	4771.423	69.84
PERC./LEAKAGE THROUGH LAYER 2	186.184067	1861.841	27.25
CHANGE IN WATER STORAGE	-27.297	-272.973	-4.00
SOIL WATER AT START OF YEAR	340.965	3409.646	
SOIL WATER AT END OF YEAR	313.967	3139.668	
INTERCEPTION WATER AT START OF YEAR	0.300	2.996	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.08	4.56	8.45	10.96
	5.35	5.07	118.03	0.00	1.70	11.04

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B7.OUT

POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.90	9.41	16.39	48.45	60.52	102.97
	116.38	88.04	39.21	12.53	12.07	8.08
PERCOLATION/LEAKAGE THROUGH LAYER 2	27.711	18.453	25.260	20.341	18.281	0.000
	0.000	0.000	0.000	0.000	15.084	60.479

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	171.999	1719.995	18.54
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	523.947	5239.472	56.49
PERC./LEAKAGE THROUGH LAYER 2	185.610168	1856.102	20.01
CHANGE IN WATER STORAGE	45.943	459.433	4.95
SOIL WATER AT START OF YEAR	313.967	3139.668	
SOIL WATER AT END OF YEAR	357.752	3577.519	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.406	14.056	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	13.50	0.00	5.81	0.00	0.63
	29.38	137.64	3.39	37.51	7.78	13.73
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B7.OUT

ACTUAL EVAPOTRANSPIRATION	10.85	11.59	21.30	35.46	52.92	79.44
	103.90	100.90	33.64	13.38	10.42	5.82
PERCOLATION/LEAKAGE THROUGH LAYER 2	61.020	62.263	78.262	15.386	0.000	0.000
	0.000	0.000	0.000	0.000	66.778	23.861

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	249.359	2493.590	25.07
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	479.613	4796.130	48.22
PERC./LEAKAGE THROUGH LAYER 2	307.569733	3075.697	30.92
CHANGE IN WATER STORAGE	-41.842	-418.415	-4.21
SOIL WATER AT START OF YEAR	357.752	3577.519	
SOIL WATER AT END OF YEAR	317.132	3171.318	
INTERCEPTION WATER AT START OF YEAR	1.406	14.056	
INTERCEPTION WATER AT END OF YEAR	0.937	9.368	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0005	-0.005	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	20.49	0.00	6.16	7.14	14.54	7.41
	17.20	1.71	0.38	3.26	0.00	9.22
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	9.06	3.93	18.59	34.29	87.47	125.52

Layer 1: Klei
Layer 2: schwach lehmiger Sand

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	89.87	36.26	29.27	10.48	10.39	8.94
PERCOLATION/LEAKAGE THROUGH	3.854	60.442	16.198	10.428	0.000	2.658
LAYER 2	0.000	0.000	0.000	0.000	0.000	1.915

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	87.510	875.096	13.24
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	464.091	4640.911	70.20
PERC./LEAKAGE THROUGH LAYER 2	95.495384	954.954	14.44
CHANGE IN WATER STORAGE	14.004	140.039	2.12
SOIL WATER AT START OF YEAR	317.132	3171.318	
SOIL WATER AT END OF YEAR	331.630	3316.301	
INTERCEPTION WATER AT START OF YEAR	0.937	9.368	
INTERCEPTION WATER AT END OF YEAR	0.442	4.424	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	10.03	0.00	0.00	0.00	5.04
	27.64	16.74	28.01	0.00	11.83	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.47	10.29	20.09	41.71	32.20	89.45
	100.57	96.20	42.10	11.46	10.85	9.20

Layer 1: Klei
Layer 2: schwach lehmiger Sand

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PERCOLATION/LEAKAGE THROUGH	66.836	86.057	18.654	14.216	2.730	0.000
LAYER 2	0.000	0.000	0.000	0.042	61.390	46.589

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	107.664	1076.642	12.41
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	473.578	4735.779	54.60
PERC./LEAKAGE THROUGH LAYER 2	296.513763	2965.138	34.18
CHANGE IN WATER STORAGE	-10.356	-103.560	-1.19
SOIL WATER AT START OF YEAR	331.630	3316.301	
SOIL WATER AT END OF YEAR	320.415	3204.147	
INTERCEPTION WATER AT START OF YEAR	0.442	4.424	
INTERCEPTION WATER AT END OF YEAR	1.302	13.017	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.95	0.00	1.66	18.86
	20.21	7.39	2.18	10.89	5.48	2.90
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	12.01	8.75	20.26	39.67	66.69	113.01
	103.23	79.34	43.09	9.08	10.43	10.48
PERCOLATION/LEAKAGE THROUGH	33.603	34.474	24.307	20.733	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	49.939

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.400	744.002	9.67
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	516.043	5160.432	67.04
PERC./LEAKAGE THROUGH LAYER 2	163.056061	1630.561	21.18
CHANGE IN WATER STORAGE	16.201	162.009	2.10
SOIL WATER AT START OF YEAR	320.415	3204.147	
SOIL WATER AT END OF YEAR	336.617	3366.166	
INTERCEPTION WATER AT START OF YEAR	1.302	13.017	
INTERCEPTION WATER AT END OF YEAR	0.830	8.303	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.003	0.00

MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.46	4.63	0.00	0.00
	8.87	43.46	0.00	0.79	9.73	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.32	8.70	17.64	49.81	67.32	111.72
	85.08	64.23	35.28	15.37	12.32	11.28
PERCOLATION/LEAKAGE THROUGH LAYER 2	39.546	13.644	20.756	43.519	3.294	0.000
	0.000	0.000	0.000	0.000	2.563	50.165

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	68.955	689.553	9.48
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	486.072	4860.724	66.80
PERC./LEAKAGE THROUGH LAYER 2	173.487335	1734.873	23.84
CHANGE IN WATER STORAGE	-0.815	-8.152	-0.11
SOIL WATER AT START OF YEAR	336.617	3366.166	
SOIL WATER AT END OF YEAR	336.091	3360.907	
INTERCEPTION WATER AT START OF YEAR	0.830	8.303	
INTERCEPTION WATER AT END OF YEAR	1.011	10.115	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	19.01	2.05	5.55	0.00	2.29	19.98
	15.45	0.69	9.85	5.11	8.23	11.53
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.34	10.27	25.01	26.93	69.22	104.22
	103.28	88.93	36.47	9.27	11.15	9.13
PERCOLATION/LEAKAGE THROUGH LAYER 2	81.284	46.174	60.689	22.385	0.000	0.000
	0.000	0.000	0.000	0.000	53.900	73.256

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ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	99.744	997.438	10.83
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	507.220	5072.202	55.08
PERC./LEAKAGE THROUGH LAYER 2	337.687805	3376.878	36.67
CHANGE IN WATER STORAGE	-23.752	-237.522	-2.58
SOIL WATER AT START OF YEAR	336.091	3360.907	
SOIL WATER AT END OF YEAR	312.008	3120.077	
INTERCEPTION WATER AT START OF YEAR	1.011	10.115	
INTERCEPTION WATER AT END OF YEAR	1.342	13.423	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0004	0.004	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.31	0.92	0.00	0.00	0.00
	51.03	37.76	4.71	15.87	12.08	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.64	9.45	22.76	41.08	40.04	104.94
	99.29	67.04	23.16	14.28	11.18	8.49
PERCOLATION/LEAKAGE THROUGH	24.623	50.194	39.100	42.015	6.109	0.000
LAYER 2	0.000	0.000	0.000	0.000	14.112	41.622

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	168.955	1689.553	20.22
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	454.341	4543.409	54.38
PERC./LEAKAGE THROUGH LAYER 2	217.774033	2177.740	26.07
CHANGE IN WATER STORAGE	-5.570	-55.700	-0.67
SOIL WATER AT START OF YEAR	312.008	3120.077	
SOIL WATER AT END OF YEAR	307.780	3077.799	
INTERCEPTION WATER AT START OF YEAR	1.342	13.423	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0004	-0.004	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	20.3399	0.4068
2	10.4381	0.2088
TOTAL WATER IN LAYERS	30.778	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	30.778	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)

PRECIPITATION	70.50	705.000
RUNOFF	56.017	560.1693
PERCOLATION/LEAKAGE THROUGH LAYER 2	7.034180	70.34180
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4362	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1557	

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AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.565	4.457	3.288	2.487	2.694	7.260
	18.859	25.487	17.587	7.586	6.080	9.664
STD. DEVIATIONS	12.329	5.126	3.503	2.839	4.924	7.623
	14.434	42.347	36.242	11.762	4.569	11.667
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.602	9.465	20.170	41.671	57.022	105.584
	98.481	73.699	33.710	12.372	10.951	9.231
STD. DEVIATIONS	1.787	2.218	2.483	7.917	16.545	13.121
	9.360	21.225	6.744	2.220	0.961	1.601
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	45.0402	44.3113	42.1134	22.0101	3.0415	0.2658
	0.0000	0.0000	0.0000	0.0042	21.3827	38.9624
STD. DEVIATIONS	23.3263	21.7470	24.5438	11.6904	5.7476	0.8406
	0.0000	0.0000	0.0000	0.0133	27.8772	23.5439

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Layer 1: Klei
Layer 2: schwach lehmiger Sand

U1350_B7.OUT

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM		CU. METERS	PERCENT
PRECIPITATION	810.76	(114.950)	8107.6	100.00
RUNOFF	114.012	(63.4021)	1140.12	14.062
POTENTIAL EVAPOTRANSPIRATION	645.214	(25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	482.959	(25.6813)	4829.59	59.569
PERCOLATION/LEAKAGE THROUGH LAYER 2	217.13165	(75.03705)	2171.316	26.78125
CHANGE IN WATER STORAGE	-3.343	(0.9870)	-33.43	-0.412

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U135O_B8.OUT

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**                                                                      **
**                                                                      **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE            **
**                                                                      **
**              HELP Version 3.80 D            (25. May 2004)           **
**                              developed at                            **
**              Institut f. Bodenkunde,  Universitaet Hamburg           **
**                              based on                                **
**              US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)           **
**                   DEVELOPED BY ENVIRONMENTAL LABORATORY              **
**                     USAE WATERWAYS EXPERIMENT STATION                **
**                FOR USEPA RISK REDUCTION ENGINEERING LABORATORY       **
**                                                                      **
**                                                                      **
**************************************************************************
**************************************************************************


TIME:  15.08     DATE:  25.01.2010


PRECIPITATION DATA FILE:      H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE:        H:\GERLACH\U135O_~4\U135O_T.D7
SOLAR RADIATION DATA FILE:    H:\GERLACH\U135O_~4\U135O_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U135O_EV.D11
SOIL AND DESIGN DATA FILE  1: H:\GERLACH\U135O_~4\U135O_B8.D10
OUTPUT DATA FILE:             H:\GERLACH\U135O_~4\U135O_B8.OUT
DAILY OUTPUT DATA FILE:       H:\GERLACH\U135O_~4\U135O_B8.DAY
MONTHLY OUTPUT DATA FILE:     H:\GERLACH\U135O_~4\U135O_B8.MON
YEARLY OUTPUT DATA FILE:      H:\GERLACH\U135O_~4\U135O_B8.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

     1    DATE (yyyymmdd)
     2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    CHANGE IN TOTAL WATER STORAGE (MM)
     8    CHANGE IN SOIL WATER STORAGE (MM)
     9    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    10    CHANGE IN SNOW WATER STORAGE (MM)
    11    ANNUAL WATER BUDGET BALANCE (MM)
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Layer 1: Klei
Layer 2: stark lehmiger Sand

U135O_B8.OUT

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**************************************************************************

     TITLE:  Deponie Grauer Wall

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                          WEATHER DATA SOURCES
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         NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


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                               LAYER DATA   1
--------------------------------------------------------------------------

                            VALID FOR  10 YEARS


      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
               COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER   0
          THICKNESS                     =     50.00   CM
          POROSITY                      =      0.5400 VOL/VOL
          FIELD CAPACITY                =      0.3800 VOL/VOL
          WILTING POINT                 =      0.1900 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.4552 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.1000E-04 CM/SEC


                                LAYER  2
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER 304
          THICKNESS                     =     50.00   CM
          POROSITY                      =      0.4200 VOL/VOL
          FIELD CAPACITY                =      0.2500 VOL/VOL
          WILTING POINT                 =      0.1200 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.2783 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.4860E-03 CM/SEC
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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A
FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.%
AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	28.578	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	35.400	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	24.000	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	11.900	CM
SOIL EVAPORATION ZONE DEPTH	=	70.0	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.026	CM
INITIAL WATER IN LAYER MATERIALS	=	36.678	CM
TOTAL INITIAL WATER	=	36.703	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

RUNOFF	2.27	2.01	1.65	2.73	0.00	0.00
	1.26	0.93	7.79	2.43	3.95	39.32
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.54	10.37	20.32	51.68	41.94	109.43
	98.20	45.56	28.09	13.24	9.02	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	60.318	31.576	64.016	7.239	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	42.910

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	64.337	643.371	8.94
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	449.443	4494.430	62.43
PERC./LEAKAGE THROUGH LAYER 2	206.058029	2060.580	28.62
CHANGE IN WATER STORAGE	0.062	0.618	0.01
SOIL WATER AT START OF YEAR	366.778	3667.777	
SOIL WATER AT END OF YEAR	366.782	3667.822	
INTERCEPTION WATER AT START OF YEAR	0.257	2.573	
INTERCEPTION WATER AT END OF YEAR	0.315	3.146	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.22	0.00	11.16	0.00	0.00	9.72

Layer 1: Klei
Layer 2: stark lehmiger Sand

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	12.19	3.46	1.50	0.00	0.00	8.94
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.86	11.89	19.24	47.33	51.97	115.11
	87.14	72.61	26.79	14.63	11.69	9.83
PERCOLATION/LEAKAGE THROUGH LAYER 2	50.767	40.930	73.284	15.980	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	2.454

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	47.192	471.920	6.91
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	479.107	4791.072	70.13
PERC./LEAKAGE THROUGH LAYER 2	183.415833	1834.158	26.85
CHANGE IN WATER STORAGE	-26.515	-265.148	-3.88
SOIL WATER AT START OF YEAR	366.782	3667.822	
SOIL WATER AT END OF YEAR	340.582	3405.820	
INTERCEPTION WATER AT START OF YEAR	0.315	3.146	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.08	4.55	8.44	10.95
	5.35	5.07	117.95	0.00	1.70	11.06

Layer 1: Klei
Layer 2: stark lehmiger Sand

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POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.89	9.41	16.38	48.36	60.46	102.95
	116.37	90.15	39.27	12.59	12.07	8.07
PERCOLATION/LEAKAGE THROUGH LAYER 2	28.220	18.336	24.832	19.460	15.923	0.000
	0.000	0.000	0.000	0.000	16.620	61.523

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	171.923	1719.234	18.54
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	525.975	5259.752	56.71
PERC./LEAKAGE THROUGH LAYER 2	184.913284	1849.133	19.94
CHANGE IN WATER STORAGE	44.688	446.882	4.82
SOIL WATER AT START OF YEAR	340.582	3405.820	
SOIL WATER AT END OF YEAR	383.099	3830.990	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.419	14.186	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	13.54	0.00	5.81	0.00	0.63
	29.38	137.63	3.38	37.51	7.79	13.85
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

ACTUAL EVAPOTRANSPIRATION	10.85	11.59	21.27	35.42	52.85	79.42
	103.90	100.89	33.64	13.38	10.42	5.82
PERCOLATION/LEAKAGE THROUGH	58.066	67.978	73.846	12.404	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.014	70.906	19.863

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	249.516	2495.162	25.08
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	479.430	4794.301	48.20
PERC./LEAKAGE THROUGH LAYER 2	303.075073	3030.751	30.47
CHANGE IN WATER STORAGE	-37.321	-373.211	-3.75
SOIL WATER AT START OF YEAR	383.099	3830.990	
SOIL WATER AT END OF YEAR	347.011	3470.112	
INTERCEPTION WATER AT START OF YEAR	1.419	14.186	
INTERCEPTION WATER AT END OF YEAR	0.938	9.379	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0005	-0.005	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	20.66	0.00	6.16	7.14	14.54	7.41
	17.20	1.69	0.37	3.26	0.00	9.23
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	9.06	3.93	18.59	34.29	87.45	125.52

	91.88	36.28	29.27	10.47	10.38	8.92
PERCOLATION/LEAKAGE THROUGH	4.542	63.273	15.637	7.184	0.000	2.680
LAYER 2	0.000	0.000	0.000	0.000	0.000	2.302

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	87.651	876.506	13.26
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	466.054	4660.543	70.50
PERC./LEAKAGE THROUGH LAYER 2	95.619034	956.190	14.46
CHANGE IN WATER STORAGE	11.776	117.760	1.78
SOIL WATER AT START OF YEAR	347.011	3470.112	
SOIL WATER AT END OF YEAR	359.272	3592.725	
INTERCEPTION WATER AT START OF YEAR	0.938	9.379	
INTERCEPTION WATER AT END OF YEAR	0.453	4.526	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	10.13	0.00	0.00	0.00	5.03
	27.65	16.74	28.01	0.00	11.77	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.48	10.29	20.04	41.63	32.22	89.47
	100.57	96.20	42.09	11.46	10.85	9.20

PERCOLATION/LEAKAGE THROUGH	68.787	85.563	15.351	13.956	2.472	0.000
LAYER 2	0.000	0.000	0.000	0.439	65.680	44.177

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	107.685	1076.845	12.41
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	473.491	4734.906	54.59
PERC./LEAKAGE THROUGH LAYER 2	296.425476	2964.255	34.17
CHANGE IN WATER STORAGE	-10.201	-102.006	-1.18
SOIL WATER AT START OF YEAR	359.272	3592.725	
SOIL WATER AT END OF YEAR	348.222	3482.218	
INTERCEPTION WATER AT START OF YEAR	0.453	4.526	
INTERCEPTION WATER AT END OF YEAR	1.303	13.026	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.95	0.00	1.66	18.86
	20.21	7.39	2.18	10.89	5.48	2.95
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	12.01	8.75	20.25	39.66	66.68	113.01
	103.23	79.34	43.09	9.08	10.43	10.48
PERCOLATION/LEAKAGE THROUGH	35.565	34.237	22.325	18.800	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	54.151

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.442	744.416	9.67
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	516.027	5160.271	67.04
PERC./LEAKAGE THROUGH LAYER 2	165.077591	1650.776	21.45
CHANGE IN WATER STORAGE	14.154	141.537	1.84
SOIL WATER AT START OF YEAR	348.222	3482.218	
SOIL WATER AT END OF YEAR	362.378	3623.775	
INTERCEPTION WATER AT START OF YEAR	1.303	13.026	
INTERCEPTION WATER AT END OF YEAR	0.830	8.301	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	-0.0001	-0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.46	4.64	0.00	0.00
	8.83	43.25	0.00	0.79	9.74	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.32	8.70	17.64	49.81	67.32	111.72
	87.11	64.40	35.08	15.33	12.33	11.27
PERCOLATION/LEAKAGE THROUGH	36.560	14.781	18.389	43.694	3.089	0.000
LAYER 2	0.000	0.000	0.000	0.000	4.253	50.819

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	68.712	687.121	9.44
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	488.043	4880.428	67.07
PERC./LEAKAGE THROUGH LAYER 2	171.585861	1715.859	23.58
CHANGE IN WATER STORAGE	-0.641	-6.408	-0.09
SOIL WATER AT START OF YEAR	362.378	3623.775	
SOIL WATER AT END OF YEAR	362.005	3620.052	
INTERCEPTION WATER AT START OF YEAR	0.830	8.301	
INTERCEPTION WATER AT END OF YEAR	1.032	10.320	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	19.06	2.05	5.54	0.00	2.27	19.97
	15.45	0.69	9.85	5.10	8.18	11.57
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.34	10.30	24.90	26.89	69.16	104.22
	103.28	88.92	36.48	9.27	11.15	9.13
PERCOLATION/LEAKAGE THROUGH LAYER 2	81.410	45.770	60.874	18.412	0.000	0.000
	0.000	0.000	0.000	0.000	58.145	73.170

ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	99.731	997.310	10.83
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	507.046	5070.457	55.06
PERC./LEAKAGE THROUGH LAYER 2	337.781525	3377.815	36.68
CHANGE IN WATER STORAGE	-23.658	-236.585	-2.57
SOIL WATER AT START OF YEAR	362.005	3620.052	
SOIL WATER AT END OF YEAR	338.034	3380.344	
INTERCEPTION WATER AT START OF YEAR	1.032	10.320	
INTERCEPTION WATER AT END OF YEAR	1.344	13.443	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.31	0.92	0.00	0.00	0.00
	51.00	37.70	4.69	15.88	12.07	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.64	9.44	22.76	41.06	40.04	104.94
	101.32	67.06	23.11	14.30	11.17	8.49
PERCOLATION/LEAKAGE THROUGH LAYER 2	24.665	50.142	38.982	41.785	2.502	0.000
	0.000	0.000	0.000	0.000	16.624	41.342

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	168.860	1688.604	20.21
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	456.325	4563.250	54.62
PERC./LEAKAGE THROUGH LAYER 2	216.042694	2160.427	25.86
CHANGE IN WATER STORAGE	-5.728	-57.280	-0.69
SOIL WATER AT START OF YEAR	338.034	3380.344	
SOIL WATER AT END OF YEAR	333.651	3336.508	
INTERCEPTION WATER AT START OF YEAR	1.344	13.443	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.003	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	20.4847	0.4097
2	12.8804	0.2576
TOTAL WATER IN LAYERS	33.365	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	33.365	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)

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PRECIPITATION	70.50	705.000
RUNOFF	56.015	560.1486
PERCOLATION/LEAKAGE THROUGH LAYER 2	7.296389	72.96388
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4499	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1700	

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.587	4.471	3.291	2.486	2.691	7.257
	18.851	25.454	17.572	7.587	6.067	9.691
STD. DEVIATIONS	12.352	5.147	3.512	2.839	4.923	7.622
	14.433	42.337	36.221	11.762	4.557	11.683
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.600	9.468	20.139	41.613	57.010	105.580
	99.301	74.141	33.692	12.374	10.950	9.227
STD. DEVIATIONS	1.787	2.219	2.461	7.886	16.528	13.121
	8.833	21.348	6.752	2.218	0.966	1.600
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	44.8901	45.2585	40.7536	19.8913	2.3986	0.2680
	0.0000	0.0000	0.0000	0.0453	23.2228	39.2711
STD. DEVIATIONS	23.1473	22.2869	24.6573	12.8132	4.9206	0.8476
	0.0000	0.0000	0.0000	0.1386	29.6274	23.8969

Layer 1: Klei
Layer 2: stark lehmiger Sand

U135O_B8.OUT

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM		CU. METERS	PERCENT
PRECIPITATION	810.76	(114.950)	8107.6	100.00
RUNOFF	114.005	(63.4322)	1140.05	14.061
POTENTIAL EVAPOTRANSPIRATION	645.214	(25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	484.094	(25.3262)	4840.94	59.709
PERCOLATION/LEAKAGE THROUGH LAYER 2	215.99945	(74.58426)	2159.995	26.64160
CHANGE IN WATER STORAGE	-3.338	(0.9296)	-33.38	-0.412

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Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U135O_B9.OUT

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**
** HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE **
**
** HELP Version 3.80 D (25. May 2004) **
** developed at **
** Institut f. Bodenkunde, Universitaet Hamburg **
** based on **
** US HELP MODEL VERSION 3.07 (1 NOVEMBER 1997) **
** DEVELOPED BY ENVIRONMENTAL LABORATORY **
** USAE WATERWAYS EXPERIMENT STATION **
** FOR USEPA RISK REDUCTION ENGINEERING LABORATORY **
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TIME: 15.13 DATE: 25.01.2010

PRECIPITATION DATA FILE: H:\GERLACH\U135O_~4\U135O_N.D4
TEMPERATURE DATA FILE: H:\GERLACH\U135O_~4\U135O_T.D7
SOLAR RADIATION DATA FILE: H:\GERLACH\U135O_~4\U135O_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U135O_~4\U135O_EV.D11
SOIL AND DESIGN DATA FILE 1: H:\GERLACH\U135O_~4\U135O_B9.D10
OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B9.OUT
DAILY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B9.DAY
MONTHLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B9.MON
YEARLY OUTPUT DATA FILE: H:\GERLACH\U135O_~4\U135O_B9.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

1 DATE (yyyymmdd)
2 AIR TEMPERATURE (* INDICATES FREEZING TEMPERATURES)
3 FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
4 PRECIPITATION (MM)
5 RUNOFF (MM)
6 POTENTIAL EVAPOTRANSPIRATION (MM)
7 ACTUAL EVAPOTRANSPIRATION (MM)
8 WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
9 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyymmdd)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

1 DATE OF ULTIMO (yyyy1231)
2 PRECIPITATION (MM)
3 RUNOFF (MM)
4 POTENTIAL EVAPOTRANSPIRATION (MM)
5 ACTUAL EVAPOTRANSPIRATION (MM)
6 LEAK #1: PERCOLATION/LEAKAGE THROUGH LAYER 2 (MM)
7 CHANGE IN TOTAL WATER STORAGE (MM)
8 CHANGE IN SOIL WATER STORAGE (MM)
9 CHANGE IN INTERCEPTION WATER STORAGE (MM)
10 CHANGE IN SNOW WATER STORAGE (MM)
11 ANNUAL WATER BUDGET BALANCE (MM)

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TITLE: Deponie Grauer Wall

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WEATHER DATA SOURCES

NOTE: PRECIPITATION DATA FOR Bremerhaven Deutschland
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: TEMPERATURE DATA FOR Bremerhaven Deutschland
WAS ENTERED FROM AN ASCII DATA FILE.

NOTE: SOLAR RADIATION DATA FOR Bremerhaven Deutschland
WAS ENTERED FROM AN ASCII DATA FILE.

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LAYER DATA 1

VALID FOR 10 YEARS

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	50.00	CM
POROSITY	=	0.5400	VOL/VOL
FIELD CAPACITY	=	0.3800	VOL/VOL
WILTING POINT	=	0.1900	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4557	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-04	CM/SEC

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 305

THICKNESS	=	50.00	CM
POROSITY	=	0.4300	VOL/VOL
FIELD CAPACITY	=	0.2800	VOL/VOL
WILTING POINT	=	0.1200	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2894	VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3240E-03	CM/SEC

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U135O_B9.OUT

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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A
FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.%
AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	28.738	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	35.600	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	24.600	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	11.900	CM
SOIL EVAPORATION ZONE DEPTH	=	70.0	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.029	CM
INITIAL WATER IN LAYER MATERIALS	=	37.256	CM
TOTAL INITIAL WATER	=	37.285	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U1350_B9.OUT

RUNOFF	2.24	1.99	1.64	2.71	0.00	0.00
	1.24	0.91	7.76	2.43	3.94	39.30
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.51	10.38	20.17	51.29	43.69	111.50
	100.78	45.60	28.08	13.22	9.00	11.05
PERCOLATION/LEAKAGE THROUGH LAYER 2	56.418	37.323	53.066	7.405	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	46.205

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	64.169	641.693	8.91
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	455.265	4552.646	63.24
PERC./LEAKAGE THROUGH LAYER 2	200.417755	2004.177	27.84
CHANGE IN WATER STORAGE	0.048	0.481	0.01
SOIL WATER AT START OF YEAR	372.556	3725.555	
SOIL WATER AT END OF YEAR	372.557	3725.574	
INTERCEPTION WATER AT START OF YEAR	0.290	2.900	
INTERCEPTION WATER AT END OF YEAR	0.336	3.362	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.23	0.00	11.17	0.00	0.00	9.71

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U1350_B9.OUT

	12.19	3.45	1.48	0.00	0.00	8.93
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.83	11.89	19.19	47.13	52.05	115.10
	87.14	78.72	26.84	14.68	11.73	9.79
PERCOLATION/LEAKAGE THROUGH LAYER 2	41.825	50.508	69.054	10.452	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	1.002

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	47.152	471.519	6.90
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	485.098	4850.981	71.00
PERC./LEAKAGE THROUGH LAYER 2	172.840286	1728.403	25.30
CHANGE IN WATER STORAGE	-21.890	-218.899	-3.20
SOIL WATER AT START OF YEAR	372.557	3725.574	
SOIL WATER AT END OF YEAR	351.004	3510.037	
INTERCEPTION WATER AT START OF YEAR	0.336	3.362	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.07	4.54	8.42	10.94
	5.35	5.06	117.94	0.00	1.70	11.08

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U1350_B9.OUT

POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.88	9.45	16.34	48.10	60.28	102.89
	116.34	96.45	39.28	12.60	12.07	8.07
PERCOLATION/LEAKAGE THROUGH	24.502	20.991	26.612	20.587	9.808	0.000
LAYER 2	0.000	0.000	0.000	0.000	13.763	69.246

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	171.869	1718.690	18.53
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	531.735	5317.348	57.33
PERC./LEAKAGE THROUGH LAYER 2	185.510544	1855.105	20.00
CHANGE IN WATER STORAGE	38.386	383.856	4.14
SOIL WATER AT START OF YEAR	351.004	3510.037	
SOIL WATER AT END OF YEAR	387.217	3872.173	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.419	14.194	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0003	0.003	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	13.48	0.00	5.81	0.00	0.63
	29.38	137.63	3.39	37.51	7.79	13.95
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

U1350_B9.OUT

ACTUAL EVAPOTRANSPIRATION	10.85	11.59	21.26	35.42	52.84	79.42
	103.90	100.90	33.64	13.38	10.41	5.82
PERCOLATION/LEAKAGE THROUGH	49.012	78.415	61.650	12.405	0.000	0.000
LAYER 2	0.000	0.000	0.000	1.956	75.265	13.558

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	249.561	2495.608	25.09
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	479.423	4794.231	48.20
PERC./LEAKAGE THROUGH LAYER 2	292.260254	2922.603	29.38
CHANGE IN WATER STORAGE	-26.544	-265.438	-2.67
SOIL WATER AT START OF YEAR	387.217	3872.173	
SOIL WATER AT END OF YEAR	361.909	3619.087	
INTERCEPTION WATER AT START OF YEAR	1.419	14.194	
INTERCEPTION WATER AT END OF YEAR	0.937	9.368	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0007	-0.007	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	20.80	0.00	6.16	7.14	14.54	7.41
	17.21	1.66	0.33	3.26	0.00	9.25
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	9.06	3.93	18.59	34.29	87.47	125.52

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

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	97.87	36.32	29.28	10.44	10.36	8.88
PERCOLATION/LEAKAGE THROUGH	10.152	57.734	15.344	7.159	0.000	2.659
LAYER 2	0.000	0.000	0.000	0.000	0.000	0.801

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	87.756	877.564	13.27
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	472.017	4720.171	71.40
PERC./LEAKAGE THROUGH LAYER 2	93.848053	938.481	14.20
CHANGE IN WATER STORAGE	7.478	74.784	1.13
SOIL WATER AT START OF YEAR	361.909	3619.087	
SOIL WATER AT END OF YEAR	369.845	3698.448	
INTERCEPTION WATER AT START OF YEAR	0.937	9.368	
INTERCEPTION WATER AT END OF YEAR	0.479	4.792	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	10.12	0.00	0.00	0.00	5.01
	27.65	16.71	28.01	0.00	11.94	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.49	10.27	19.93	41.42	32.29	89.51
	100.57	96.19	42.08	11.47	10.85	9.20

Layer 1: Klei
Layer 2: schluffig-lehmiger Sand

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PERCOLATION/LEAKAGE THROUGH	70.830	82.361	12.429	13.800	2.530	0.000
LAYER 2	0.000	0.000	0.000	2.792	74.475	32.916

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	107.803	1078.031	12.43
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	473.261	4732.610	54.56
PERC./LEAKAGE THROUGH LAYER 2	292.132996	2921.330	33.68
CHANGE IN WATER STORAGE	-5.798	-57.977	-0.67
SOIL WATER AT START OF YEAR	369.845	3698.448	
SOIL WATER AT END OF YEAR	363.222	3632.217	
INTERCEPTION WATER AT START OF YEAR	0.479	4.792	
INTERCEPTION WATER AT END OF YEAR	1.305	13.046	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0007	0.007	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.95	0.00	1.66	18.85
	20.21	7.39	2.18	10.89	5.48	2.92
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	12.02	8.76	20.25	39.65	66.66	113.00
	103.23	79.34	43.09	9.08	10.43	10.48
PERCOLATION/LEAKAGE THROUGH	45.973	29.475	17.921	17.561	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	1.701	62.211

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.418	744.183	9.67
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	515.993	5159.935	67.04
PERC./LEAKAGE THROUGH LAYER 2	174.841934	1748.419	22.72
CHANGE IN WATER STORAGE	4.446	44.462	0.58
SOIL WATER AT START OF YEAR	363.222	3632.217	
SOIL WATER AT END OF YEAR	367.673	3676.731	
INTERCEPTION WATER AT START OF YEAR	1.305	13.046	
INTERCEPTION WATER AT END OF YEAR	0.829	8.289	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6 55.1	32.1 176.2	64.0 24.3	66.5 56.4	57.0 84.2	32.8 63.5
RUNOFF	0.00 9.27	0.00 42.73	1.46 0.00	4.64 0.80	0.00 9.74	0.00 0.00
POTENTIAL EVAPOTRANSPIRATION	10.19 146.64	10.06 91.02	20.35 64.33	58.62 18.89	103.99 12.80	121.86 12.37
ACTUAL EVAPOTRANSPIRATION	7.32 92.43	8.70 64.83	17.64 34.70	49.82 15.24	67.33 12.30	111.73 11.23
PERCOLATION/LEAKAGE THROUGH LAYER 2	26.854 0.000	16.238 0.000	18.800 0.000	41.814 0.000	3.084 10.054	0.000 46.394

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	68.650	686.502	9.43
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	493.263	4932.626	67.78
PERC./LEAKAGE THROUGH LAYER 2	163.239227	1632.392	22.43
CHANGE IN WATER STORAGE	2.548	25.478	0.35
SOIL WATER AT START OF YEAR	367.673	3676.731	
SOIL WATER AT END OF YEAR	370.434	3704.343	
INTERCEPTION WATER AT START OF YEAR	0.829	8.289	
INTERCEPTION WATER AT END OF YEAR	1.086	10.860	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7 142.4	62.9 52.2	54.2 92.8	7.6 40.2	66.2 111.8	98.6 70.3
RUNOFF	19.08 15.45	2.05 0.68	5.50 9.84	0.00 5.10	2.22 8.25	19.97 11.60
POTENTIAL EVAPOTRANSPIRATION	13.34 103.30	11.30 91.42	30.75 50.17	84.07 16.78	104.47 11.75	111.99 10.89
ACTUAL EVAPOTRANSPIRATION	13.34 103.28	10.29 88.91	24.61 36.48	27.66 9.27	69.07 11.16	104.22 9.12
PERCOLATION/LEAKAGE THROUGH LAYER 2	84.788 0.000	42.971 0.000	59.841 0.000	12.474 0.000	0.000 62.758	0.000 69.939

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ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	99.739	997.385	10.83
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	507.427	5074.272	55.10
PERC./LEAKAGE THROUGH LAYER 2	332.771667	3327.717	36.14
CHANGE IN WATER STORAGE	-19.038	-190.378	-2.07
SOIL WATER AT START OF YEAR	370.434	3704.343	
SOIL WATER AT END OF YEAR	351.133	3511.329	
INTERCEPTION WATER AT START OF YEAR	1.086	10.860	
INTERCEPTION WATER AT END OF YEAR	1.350	13.496	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0004	0.004	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.32	0.92	0.00	0.00	0.00
	51.00	37.57	4.65	15.88	12.04	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.64	9.43	22.75	41.03	40.04	104.93
	107.35	67.09	23.01	14.33	11.19	8.48
PERCOLATION/LEAKAGE THROUGH	31.645	42.359	45.339	34.353	2.518	0.000
LAYER 2	0.000	0.000	0.000	0.000	22.585	30.262

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	168.674	1686.745	20.19
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	462.268	4622.677	55.33
PERC./LEAKAGE THROUGH LAYER 2	209.062164	2090.622	25.02
CHANGE IN WATER STORAGE	-4.504	-45.042	-0.54
SOIL WATER AT START OF YEAR	351.133	3511.329	
SOIL WATER AT END OF YEAR	347.978	3479.784	
INTERCEPTION WATER AT START OF YEAR	1.350	13.496	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.003	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	20.5600	0.4112
2	14.2378	0.2848
TOTAL WATER IN LAYERS	34.798	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	34.798	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)

PRECIPITATION	70.50	705.000
RUNOFF	56.015	560.1513
PERCOLATION/LEAKAGE THROUGH LAYER 2	8.979405	89.79405
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4541	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1700	

AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.601	4.462	3.287	2.484	2.684	7.252
	18.894	25.379	17.558	7.588	6.088	9.703
STD. DEVIATIONS	12.370	5.135	3.511	2.838	4.921	7.621
	14.402	42.315	36.224	11.763	4.582	11.684
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.594	9.469	20.073	41.580	57.173	105.783
	101.288	75.434	33.649	12.370	10.949	9.213
STD. DEVIATIONS	1.787	2.217	2.406	7.633	16.335	13.199
	7.950	21.937	6.755	2.214	0.971	1.594
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	44.2000	45.8375	38.0057	17.8011	1.7941	0.2659
	0.0000	0.0000	0.0000	0.4747	26.0601	37.2534
STD. DEVIATIONS	22.4686	22.1425	21.9852	11.5819	3.0961	0.8409
	0.0000	0.0000	0.0000	1.0200	31.9064	26.1420

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM		CU. METERS	PERCENT
PRECIPITATION	810.76	(114.950)	8107.6	100.00
RUNOFF	113.979	(63.4389)	1139.79	14.058
POTENTIAL EVAPOTRANSPIRATION	645.214	(25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	487.575	(24.4682)	4875.75	60.138
PERCOLATION/LEAKAGE THROUGH LAYER 2	211.69250	(72.68191)	2116.925	26.11038
CHANGE IN WATER STORAGE	-2.487	(0.7300)	-24.87	-0.307

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**                                                                      **
**                                                                      **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE            **
**                                                                      **
**              HELP Version 3.80 D            (25. May 2004)           **
**                                 developed at                         **
**              Institut f. Bodenkunde,  Universitaet Hamburg           **
**                                  based on                            **
**              US HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)           **
**                   DEVELOPED BY ENVIRONMENTAL LABORATORY              **
**                     USAE WATERWAYS EXPERIMENT STATION                **
**                FOR USEPA RISK REDUCTION ENGINEERING LABORATORY       **
**                                                                      **
**                                                                      **
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TIME:  15.29     DATE:  25.01.2010


PRECIPITATION DATA FILE:      H:\GERLACH\U1350_~4\U1350_N.D4
TEMPERATURE DATA FILE:        H:\GERLACH\U1350_~4\U1350_T.D7
SOLAR RADIATION DATA FILE:    H:\GERLACH\U1350_~4\U1350_GS.D13
EVAPOTRANSPIRATION DATA F. 1: H:\GERLACH\U1350_~4\U1350_EV.D11
SOIL AND DESIGN DATA FILE  1: H:\GERLACH\U1350_~4\U1350B10.D10
OUTPUT DATA FILE:             H:\GERLACH\U1350_~4\U1350B10.OUT
DAILY OUTPUT DATA FILE:       H:\GERLACH\U1350_~4\U1350B10.DAY
MONTHLY OUTPUT DATA FILE:     H:\GERLACH\U1350_~4\U1350B10.MON
YEARLY OUTPUT DATA FILE:      H:\GERLACH\U1350_~4\U1350B10.YR

COLUMNS OF DAILY OUTPUT DATA FILE:

     1    DATE (yyyymmdd)
     2    AIR TEMPERATURE  (* INDICATES FREEZING TEMPERATURES)
     3    FROZEN SOIL STATE (* INDICATES FROZEN SOIL)
     4    PRECIPITATION (MM)
     5    RUNOFF (MM)
     6    POTENTIAL EVAPOTRANSPIRATION (MM)
     7    ACTUAL EVAPOTRANSPIRATION (MM)
     8    WATER CONTENT OF THE EVAPORATIVE ZONE (MM)
     9    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF MONTHLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyymmdd)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)

COLUMNS OF YEARLY OUTPUT DATA FILE:

     1    DATE OF ULTIMO (yyyy1231)
     2    PRECIPITATION (MM)
     3    RUNOFF (MM)
     4    POTENTIAL EVAPOTRANSPIRATION (MM)
     5    ACTUAL EVAPOTRANSPIRATION (MM)
     6    LEAK  #1: PERCOLATION/LEAKAGE THROUGH LAYER  2 (MM)
     7    CHANGE IN TOTAL WATER STORAGE (MM)
     8    CHANGE IN SOIL WATER STORAGE (MM)
     9    CHANGE IN INTERCEPTION WATER STORAGE (MM)
    10    CHANGE IN SNOW WATER STORAGE (MM)
    11    ANNUAL WATER BUDGET BALANCE (MM)
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**************************************************************************

     TITLE:  Deponie Grauer Wall

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                          WEATHER DATA SOURCES
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         NOTE:  PRECIPITATION DATA FOR     Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  TEMPERATURE DATA FOR       Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


         NOTE:  SOLAR RADIATION DATA FOR   Bremerhaven         Deutschland
                  WAS ENTERED FROM AN ASCII DATA FILE.


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                               LAYER DATA   1
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                           VALID FOR  10 YEARS


      NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
               COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                LAYER  1
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER   0
          THICKNESS                     =     50.00   CM
          POROSITY                      =      0.5400 VOL/VOL
          FIELD CAPACITY                =      0.3800 VOL/VOL
          WILTING POINT                 =      0.1900 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.4542 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.1000E-04 CM/SEC


                                LAYER  2
                                --------

                TYPE 1 - VERTICAL PERCOLATION LAYER
                    MATERIAL TEXTURE NUMBER 310
          THICKNESS                     =     50.00   CM
          POROSITY                      =      0.4300 VOL/VOL
          FIELD CAPACITY                =      0.2600 VOL/VOL
          WILTING POINT                 =      0.0900 VOL/VOL
          INITIAL SOIL WATER CONTENT    =      0.2657 VOL/VOL
          EFFECTIVE SAT. HYD. CONDUCT.=        0.4400E-03 CM/SEC
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GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 10 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 9 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 2.% AND A SLOPE LENGTH OF 100. METERS.

SCS RUNOFF CURVE NUMBER	=	81.60	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	1.0000	HECTARES
EVAPORATIVE ZONE DEPTH	=	70.0	CM
INITIAL WATER IN EVAPORATIVE ZONE	=	28.196	CM
UPPER LIMIT OF EVAPORATIVE STORAGE	=	35.600	CM
FIELD CAPACITY OF EVAPORATIVE ZONE	=	24.200	CM
LOWER LIMIT OF EVAPORATIVE STORAGE	=	11.300	CM
SOIL EVAPORATION ZONE DEPTH	=	70.0	CM
INITIAL SNOW WATER	=	0.000	CM
INITIAL INTERCEPTION WATER	=	0.029	CM
INITIAL WATER IN LAYER MATERIALS	=	35.996	CM
TOTAL INITIAL WATER	=	36.026	CM
TOTAL SUBSURFACE INFLOW	=	0.00	MM/YR

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EVAPOTRANSPIRATION DATA 1

VALID FOR 10 YEARS

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
Bremerhaven Deutschland

STATION LATITUDE	=	59.00	DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50	
START OF GROWING SEASON (JULIAN DATE)	=	105	
END OF GROWING SEASON (JULIAN DATE)	=	288	
EVAPORATIVE ZONE DEPTH	=	70.0	CM
AVERAGE ANNUAL WIND SPEED	=	8.86	KPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	85.4	%
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	74.2	%
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	77.8	%
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	86.9	%

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MONTHLY TOTALS (MM) FOR YEAR 1999

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	61.5	61.4	47.4	42.9	33.5	40.6
	64.8	60.8	50.2	53.8	37.6	165.4

RUNOFF	2.24	1.99	1.64	2.71	0.00	0.00
	1.23	0.89	7.75	2.43	3.93	39.31
POTENTIAL EVAPOTRANSPIRATION	12.43	10.58	27.24	69.78	106.61	118.84
	130.64	92.18	68.28	16.90	11.54	11.05
ACTUAL EVAPOTRANSPIRATION	10.51	10.38	20.15	51.22	43.70	111.49
	102.86	45.61	28.08	13.21	8.99	11.05
PERCOLATION/LEAKAGE THROUGH	53.828	41.924	48.481	7.414	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	46.819

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ANNUAL TOTALS FOR YEAR 1999

	MM	CU. METERS	PERCENT
PRECIPITATION	719.90	7199.000	100.00
RUNOFF	64.126	641.255	8.91
POTENTIAL EVAPOTRANSPIRATION	676.052	6760.518	
ACTUAL EVAPOTRANSPIRATION	457.255	4572.553	63.52
PERC./LEAKAGE THROUGH LAYER 2	198.466248	1984.662	27.57
CHANGE IN WATER STORAGE	0.053	0.529	0.01
SOIL WATER AT START OF YEAR	359.961	3599.614	
SOIL WATER AT END OF YEAR	359.962	3599.621	
INTERCEPTION WATER AT START OF YEAR	0.295	2.949	
INTERCEPTION WATER AT END OF YEAR	0.347	3.470	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2000

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	49.7	58.9	85.8	30.1	45.0	76.7
	80.0	43.2	68.6	56.1	29.8	59.3
RUNOFF	0.24	0.00	11.15	0.00	0.00	9.70

Layer 1: Klei
Layer 2: stark schluffiger Sand

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	12.18	3.45	1.47	0.00	0.00	8.93
POTENTIAL EVAPOTRANSPIRATION	12.15	12.11	22.81	69.64	116.73	117.99
	87.19	94.63	48.51	17.00	12.19	11.23
ACTUAL EVAPOTRANSPIRATION	10.82	11.89	19.16	47.03	52.09	115.09
	87.14	80.78	26.86	14.70	11.74	9.78
PERCOLATION/LEAKAGE THROUGH	39.238	50.511	69.083	10.487	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 2000

	MM	CU. METERS	PERCENT
PRECIPITATION	683.20	6832.003	100.00
RUNOFF	47.121	471.208	6.90
POTENTIAL EVAPOTRANSPIRATION	622.178	6221.775	
ACTUAL EVAPOTRANSPIRATION	487.087	4870.869	71.29
PERC./LEAKAGE THROUGH LAYER 2	169.318787	1693.188	24.78
CHANGE IN WATER STORAGE	-20.326	-203.260	-2.98
SOIL WATER AT START OF YEAR	359.962	3599.621	
SOIL WATER AT END OF YEAR	339.983	3399.831	
INTERCEPTION WATER AT START OF YEAR	0.347	3.470	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0002	-0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2001

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	35.9	40.8	44.4	72.8	51.3	93.2
	60.4	74.1	259.5	34.4	62.3	98.4
RUNOFF	0.00	2.76	4.07	4.54	8.41	10.94
	5.35	5.05	117.94	0.00	1.70	11.07

Layer 1: Klei
Layer 2: stark schluffiger Sand

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POTENTIAL EVAPOTRANSPIRATION	11.25	10.53	21.06	59.31	109.72	105.95
	122.49	97.66	43.83	19.12	12.07	10.10
ACTUAL EVAPOTRANSPIRATION	9.88	9.46	16.33	48.01	60.22	102.87
	116.33	96.83	41.01	12.60	12.07	8.07
PERCOLATION/LEAKAGE THROUGH	23.474	20.981	26.619	20.661	9.829	0.000
LAYER 2	0.000	0.000	0.000	0.000	12.766	71.458

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ANNUAL TOTALS FOR YEAR 2001

	MM	CU. METERS	PERCENT
PRECIPITATION	927.50	9275.002	100.00
RUNOFF	171.836	1718.364	18.53
POTENTIAL EVAPOTRANSPIRATION	623.079	6230.791	
ACTUAL EVAPOTRANSPIRATION	533.677	5336.772	57.54
PERC./LEAKAGE THROUGH LAYER 2	185.787155	1857.872	20.03
CHANGE IN WATER STORAGE	36.199	361.993	3.90
SOIL WATER AT START OF YEAR	339.983	3399.831	
SOIL WATER AT END OF YEAR	374.010	3740.101	
INTERCEPTION WATER AT START OF YEAR	0.000	0.000	
INTERCEPTION WATER AT END OF YEAR	1.420	14.197	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.753	7.526	0.08
ANNUAL WATER BUDGET BALANCE	0.0001	0.001	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2002

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	56.2	114.9	34.3	49.0	26.5	49.4
	128.1	238.7	52.8	138.2	66.6	40.0
RUNOFF	0.00	13.38	0.00	5.81	0.00	0.63
	29.38	137.63	3.39	37.51	7.78	13.93
POTENTIAL EVAPOTRANSPIRATION	12.17	12.16	29.01	63.13	97.76	112.98
	103.92	104.12	59.38	16.13	11.29	9.24

ACTUAL EVAPOTRANSPIRATION	10.85	11.59	21.26	35.41	52.84	79.42
	103.90	100.90	33.64	13.38	10.41	5.82
PERCOLATION/LEAKAGE THROUGH	47.269	81.650	57.042	12.406	0.000	0.000
LAYER 2	0.000	0.000	0.000	5.998	71.232	13.558

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ANNUAL TOTALS FOR YEAR 2002

	MM	CU. METERS	PERCENT
PRECIPITATION	994.70	9946.997	100.00
RUNOFF	249.441	2494.410	25.08
POTENTIAL EVAPOTRANSPIRATION	631.288	6312.885	
ACTUAL EVAPOTRANSPIRATION	479.419	4794.194	48.20
PERC./LEAKAGE THROUGH LAYER 2	289.154694	2891.547	29.07
CHANGE IN WATER STORAGE	-23.315	-233.149	-2.34
SOIL WATER AT START OF YEAR	374.010	3740.101	
SOIL WATER AT END OF YEAR	351.931	3519.310	
INTERCEPTION WATER AT START OF YEAR	1.420	14.197	
INTERCEPTION WATER AT END OF YEAR	0.937	9.365	
SNOW WATER AT START OF YEAR	0.753	7.526	0.08
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0005	-0.005	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2003

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	66.0	18.0	31.4	41.2	112.4	47.0
	85.5	41.5	61.6	52.2	33.9	70.4
RUNOFF	20.77	0.00	6.16	7.14	14.54	7.41
	17.21	1.65	0.32	3.26	0.00	9.25
POTENTIAL EVAPOTRANSPIRATION	10.90	9.17	28.71	73.72	101.34	132.91
	121.79	111.80	59.93	15.64	12.12	10.98
ACTUAL EVAPOTRANSPIRATION	9.06	3.93	18.59	34.29	87.47	125.53

	99.86	36.33	29.29	10.43	10.36	8.87
PERCOLATION/LEAKAGE THROUGH	12.692	55.247	15.344	7.158	0.000	2.654
LAYER 2	0.000	0.000	0.000	0.000	0.000	0.000

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ANNUAL TOTALS FOR YEAR 2003

	MM	CU. METERS	PERCENT
PRECIPITATION	661.10	6610.998	100.00
RUNOFF	87.713	877.131	13.27
POTENTIAL EVAPOTRANSPIRATION	689.018	6890.183	
ACTUAL EVAPOTRANSPIRATION	474.014	4740.137	71.70
PERC./LEAKAGE THROUGH LAYER 2	93.094215	930.942	14.08
CHANGE IN WATER STORAGE	6.279	62.788	0.95
SOIL WATER AT START OF YEAR	351.931	3519.310	
SOIL WATER AT END OF YEAR	358.659	3586.585	
INTERCEPTION WATER AT START OF YEAR	0.937	9.365	
INTERCEPTION WATER AT END OF YEAR	0.488	4.878	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2004

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	100.9	69.9	34.8	26.1	22.2	90.3
	142.3	100.5	101.1	41.7	103.8	33.8
RUNOFF	8.37	10.11	0.00	0.00	0.00	5.00
	27.65	16.71	28.01	0.00	11.87	0.00
POTENTIAL EVAPOTRANSPIRATION	11.14	11.55	26.29	72.61	92.13	103.23
	100.59	99.53	60.49	16.90	11.65	10.80
ACTUAL EVAPOTRANSPIRATION	9.49	10.27	19.89	41.36	32.31	89.52
	100.57	96.19	42.08	11.47	10.85	9.20

PERCOLATION/LEAKAGE THROUGH	69.759	82.258	12.442	13.827	2.565	0.000
LAYER 2	0.000	0.000	0.000	2.812	75.682	31.779

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ANNUAL TOTALS FOR YEAR 2004

	MM	CU. METERS	PERCENT
PRECIPITATION	867.40	8674.002	100.00
RUNOFF	107.708	1077.082	12.42
POTENTIAL EVAPOTRANSPIRATION	616.905	6169.051	
ACTUAL EVAPOTRANSPIRATION	473.187	4731.871	54.55
PERC./LEAKAGE THROUGH LAYER 2	291.123810	2911.238	33.56
CHANGE IN WATER STORAGE	-4.619	-46.192	-0.53
SOIL WATER AT START OF YEAR	358.659	3586.585	
SOIL WATER AT END OF YEAR	353.222	3532.218	
INTERCEPTION WATER AT START OF YEAR	0.488	4.878	
INTERCEPTION WATER AT END OF YEAR	1.305	13.053	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2005

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	55.9	32.7	47.7	26.8	59.1	88.0
	126.9	94.3	52.7	44.9	65.2	75.5
RUNOFF	0.00	2.90	1.94	0.00	1.66	18.85
	20.21	7.39	2.18	10.89	5.48	2.95
POTENTIAL EVAPOTRANSPIRATION	12.52	9.94	23.93	68.77	98.96	121.71
	107.20	79.65	64.43	19.44	11.97	10.93
ACTUAL EVAPOTRANSPIRATION	12.02	8.76	20.25	39.65	66.66	113.00
	103.23	79.34	43.09	9.08	10.43	10.48
PERCOLATION/LEAKAGE THROUGH	46.045	29.402	17.922	17.563	0.000	0.000
LAYER 2	0.000	0.000	0.000	0.000	3.098	60.795

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ANNUAL TOTALS FOR YEAR 2005

	MM	CU. METERS	PERCENT
PRECIPITATION	769.70	7697.000	100.00
RUNOFF	74.448	744.482	9.67
POTENTIAL EVAPOTRANSPIRATION	629.460	6294.600	
ACTUAL EVAPOTRANSPIRATION	515.982	5159.817	67.04
PERC./LEAKAGE THROUGH LAYER 2	174.824844	1748.248	22.71
CHANGE IN WATER STORAGE	4.445	44.452	0.58
SOIL WATER AT START OF YEAR	353.222	3532.218	
SOIL WATER AT END OF YEAR	357.673	3576.732	
INTERCEPTION WATER AT START OF YEAR	1.305	13.053	
INTERCEPTION WATER AT END OF YEAR	0.829	8.286	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.471	4.705	0.06
ANNUAL WATER BUDGET BALANCE	0.0000	0.000	0.00

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MONTHLY TOTALS (MM) FOR YEAR 2006

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	15.6	32.1	64.0	66.5	57.0	32.8
	55.1	176.2	24.3	56.4	84.2	63.5
RUNOFF	0.00	0.00	1.46	4.64	0.00	0.00
	9.27	42.68	0.00	0.80	9.74	0.00
POTENTIAL EVAPOTRANSPIRATION	10.19	10.06	20.35	58.62	103.99	121.86
	146.64	91.02	64.33	18.89	12.80	12.37
ACTUAL EVAPOTRANSPIRATION	7.32	8.70	17.64	49.82	67.33	111.73
	94.44	64.87	34.66	15.23	12.30	11.22
PERCOLATION/LEAKAGE THROUGH	26.854	16.237	18.800	41.814	3.083	0.000
LAYER 2	0.000	0.000	0.000	0.000	10.150	44.353

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ANNUAL TOTALS FOR YEAR 2006

	MM	CU. METERS	PERCENT
PRECIPITATION	727.70	7277.000	100.00
RUNOFF	68.589	685.892	9.43
POTENTIAL EVAPOTRANSPIRATION	671.125	6711.247	
ACTUAL EVAPOTRANSPIRATION	495.263	4952.627	68.06
PERC./LEAKAGE THROUGH LAYER 2	161.291611	1612.916	22.16
CHANGE IN WATER STORAGE	2.556	25.564	0.35
SOIL WATER AT START OF YEAR	357.673	3576.732	
SOIL WATER AT END OF YEAR	360.437	3604.370	
INTERCEPTION WATER AT START OF YEAR	0.829	8.286	
INTERCEPTION WATER AT END OF YEAR	1.092	10.916	
SNOW WATER AT START OF YEAR	0.471	4.705	0.06
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0002	0.002	0.00

MONTHLY TOTALS (MM) FOR YEAR 2007

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	121.7	62.9	54.2	7.6	66.2	98.6
	142.4	52.2	92.8	40.2	111.8	70.3
RUNOFF	19.09	2.05	5.50	0.00	2.21	19.97
	15.45	0.68	9.84	5.10	8.14	11.58
POTENTIAL EVAPOTRANSPIRATION	13.34	11.30	30.75	84.07	104.47	111.99
	103.30	91.42	50.17	16.78	11.75	10.89
ACTUAL EVAPOTRANSPIRATION	13.34	10.29	24.58	27.64	69.06	104.22
	103.28	88.91	36.48	9.27	11.16	9.12
PERCOLATION/LEAKAGE THROUGH LAYER 2	84.883	42.873	59.863	12.490	0.000	0.000
	0.000	0.000	0.000	0.000	62.904	69.955

Layer 1: Klei
Layer 2: stark schluffiger Sand

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ANNUAL TOTALS FOR YEAR 2007

	MM	CU. METERS	PERCENT
PRECIPITATION	920.90	9209.000	100.00
RUNOFF	99.608	996.081	10.82
POTENTIAL EVAPOTRANSPIRATION	640.245	6402.447	
ACTUAL EVAPOTRANSPIRATION	507.366	5073.662	55.09
PERC./LEAKAGE THROUGH LAYER 2	332.966492	3329.665	36.16
CHANGE IN WATER STORAGE	-19.041	-190.413	-2.07
SOIL WATER AT START OF YEAR	360.437	3604.370	
SOIL WATER AT END OF YEAR	341.137	3411.372	
INTERCEPTION WATER AT START OF YEAR	1.092	10.916	
INTERCEPTION WATER AT END OF YEAR	1.350	13.501	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0005	0.005	0.00

MONTHLY TOTALS (MM) FOR YEAR 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	101.5	48.2	83.2	36.4	15.8	34.3
	154.8	124.4	35.8	100.7	73.6	26.8
RUNOFF	35.29	11.32	0.92	0.00	0.00	0.00
	51.00	37.52	4.64	15.88	12.03	0.00
POTENTIAL EVAPOTRANSPIRATION	12.88	12.08	25.17	63.47	122.83	124.83
	112.06	88.39	52.78	16.11	11.90	10.30
ACTUAL EVAPOTRANSPIRATION	12.64	9.43	22.75	41.03	40.04	104.93
	109.35	67.10	22.97	14.33	11.19	8.48
PERCOLATION/LEAKAGE THROUGH LAYER 2	32.858	41.152	47.508	32.188	2.520	0.000
	0.000	0.000	0.000	0.000	20.668	30.260

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ANNUAL TOTALS FOR YEAR 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	835.50	8354.999	100.00
RUNOFF	168.600	1685.997	20.18
POTENTIAL EVAPOTRANSPIRATION	652.789	6527.895	
ACTUAL EVAPOTRANSPIRATION	464.241	4642.413	55.56
PERC./LEAKAGE THROUGH LAYER 2	207.153809	2071.538	24.79
CHANGE IN WATER STORAGE	-4.495	-44.945	-0.54
SOIL WATER AT START OF YEAR	341.137	3411.372	
SOIL WATER AT END OF YEAR	337.993	3379.928	
INTERCEPTION WATER AT START OF YEAR	1.350	13.501	
INTERCEPTION WATER AT END OF YEAR	0.000	0.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	-0.0003	-0.003	0.00

FINAL WATER STORAGE AT END OF YEAR 2008

LAYER	(CM)	(VOL/VOL)
1	20.5138	0.4103
2	13.2854	0.2657
TOTAL WATER IN LAYERS	33.799	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	33.799	

PEAK DAILY VALUES FOR YEARS 1999 THROUGH 2008

	(MM)	(CU. METERS)
PRECIPITATION	70.50	705.000
RUNOFF	56.015	560.1519
PERCOLATION/LEAKAGE THROUGH LAYER 2	9.529699	95.29700
SNOW WATER	9.32	93.1868
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4450	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1614	

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AVERAGE MONTHLY VALUES (MM) FOR YEARS 1999 THROUGH 2008

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	66.49	53.98	52.72	39.94	48.90	65.09
	104.03	100.59	79.94	61.86	66.88	70.34
STD. DEVIATIONS	32.50	26.99	19.41	19.43	28.03	26.61
	38.55	63.95	67.27	32.45	28.03	39.68
RUNOFF						
TOTALS	8.599	4.452	3.284	2.483	2.682	7.250
	18.893	25.365	17.554	7.588	6.067	9.703
STD. DEVIATIONS	12.368	5.116	3.506	2.838	4.920	7.620
	14.403	42.313	36.225	11.763	4.565	11.683
POTENTIAL EVAPOTRANSPIRATION						
TOTALS	11.896	10.947	25.532	68.312	105.454	117.227
	113.583	95.039	57.213	17.291	11.928	10.790
STD. DEVIATIONS	0.986	1.045	3.497	7.640	9.113	8.926
	17.121	8.875	7.972	1.360	0.417	0.813
ACTUAL EVAPOTRANSPIRATION						
TOTALS	10.593	9.470	20.060	41.546	57.172	105.781
	102.095	75.686	33.817	12.370	10.949	9.209
STD. DEVIATIONS	1.786	2.216	2.403	7.610	16.327	13.197
	7.827	22.013	6.938	2.216	0.974	1.593
PERCOLATION/LEAKAGE THROUGH LAYER 2						
TOTALS	43.6899	46.2234	37.3104	17.6007	1.7997	0.2654
	0.0000	0.0000	0.0000	0.8810	25.6500	36.8977
STD. DEVIATIONS	21.8270	22.4303	21.2656	11.2509	3.1030	0.8391
	0.0000	0.0000	0.0000	2.0034	31.4151	26.5627

Layer 1: Klei
Layer 2: stark schluffiger Sand

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AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1999 THROUGH 2008

	MM	CU. METERS	PERCENT
PRECIPITATION	810.76 (114.950)	8107.6	100.00
RUNOFF	113.919 (63.4165)	1139.19	14.051
POTENTIAL EVAPOTRANSPIRATION	645.214 (25.5753)	6452.14	
ACTUAL EVAPOTRANSPIRATION	488.749 (24.2461)	4887.49	60.283
PERCOLATION/LEAKAGE THROUGH LAYER 2	210.31819 (72.74410)	2103.182	25.94087
CHANGE IN WATER STORAGE	-2.226 (0.6803)	-22.26	-0.275

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Umtec

Deponie Grauer Wall, Antrag auf Änderung der Planfeststellung
Anlage 13: Fachgutachten Wasserhaushaltsbetrachtungen zur ergänzenden Profilierungsschicht im Deponieabschnitt 3

Anlage 4

Untersuchungsergebnisse MV-Schlacke, Körnung 0/8 mm

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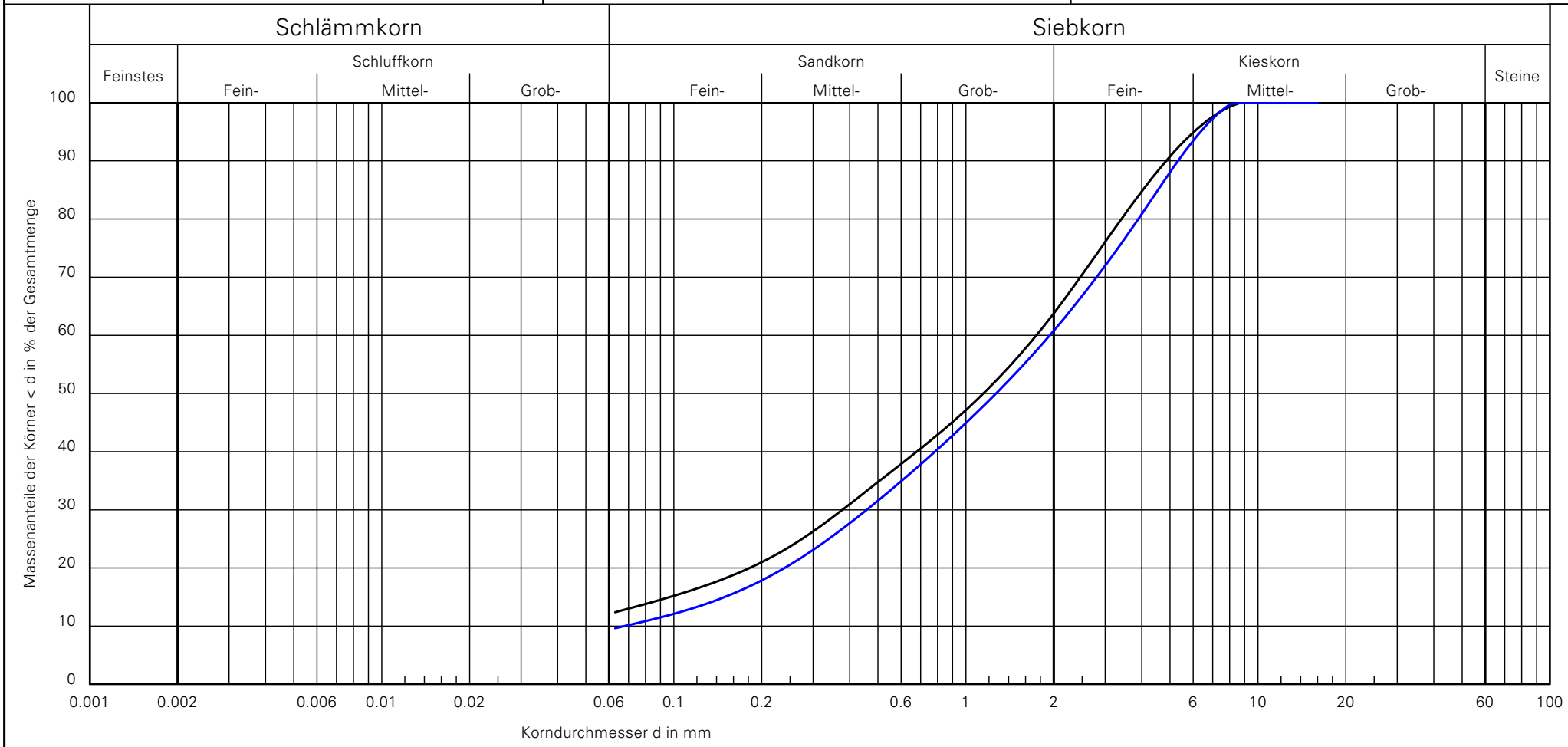
Körnungslinie

Deponie Grauer Wall

U135009

Bearbeiter / Datum: Irmer/ 21.12.2009
Probe entnommen am: 16.12.2009
Art der Entnahme: gestört
Arbeitsweise: Naßsiebung nach DIN 18123

U135009_MV Schlacke 0_8_mm.kvs



Bezeichnung:	MV Schlacke 0/8 mm	MV Schlacke 0/8 mm
Entnahmestelle:	Halde auf OEG - Gelände, Probe 1	Halde auf OEG - Gelände, Probe 2
Bodenart:	S, g, u'	S, g, u'
T/U/S/G [%]:	- /12.4/51.4/36.2	- /9.7/51.2/39.2
U/Cc	-/-	28.7/1.6
k [m/s] (Hazen):	-	$5.3 * 10^{-5}$
Bodengruppe	SU	SU
Frostsicherheit	F2	F2

Bemerkungen:

Anlage 4.1

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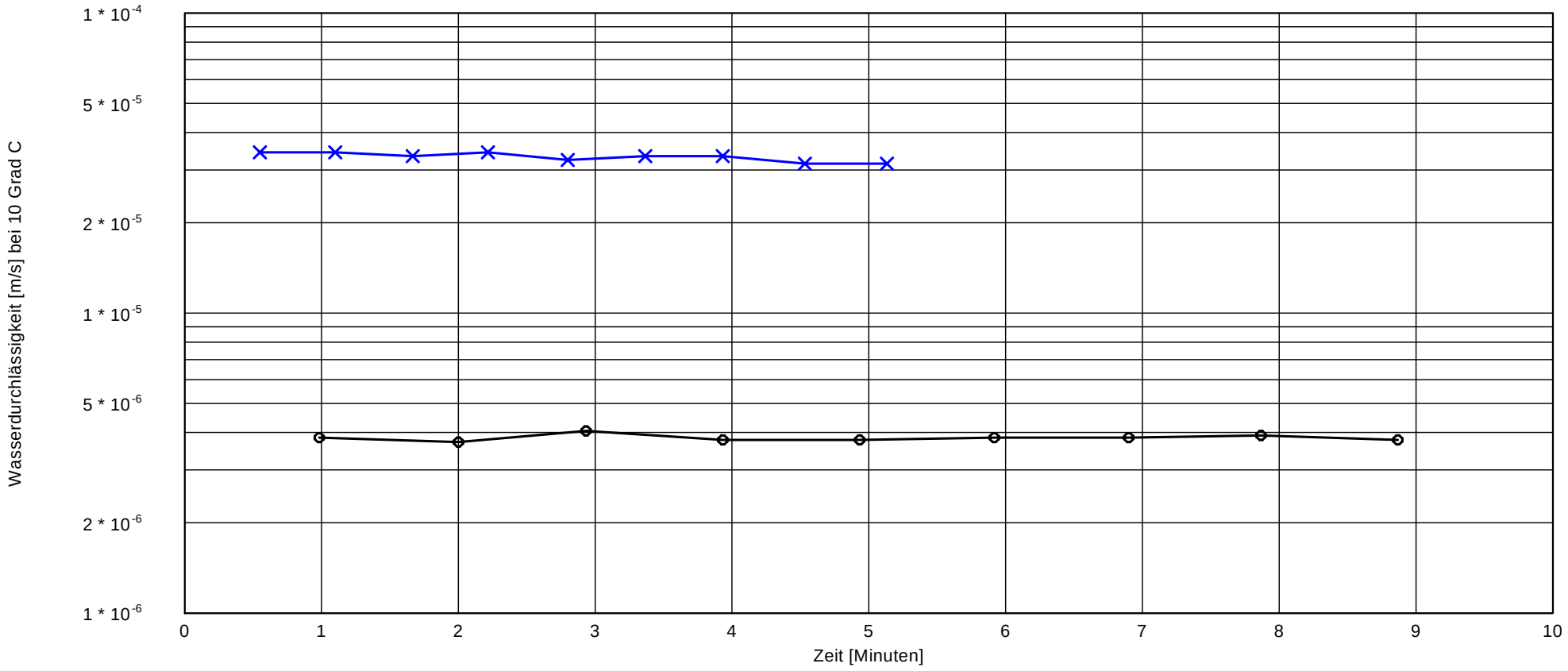
Durchlässigkeitsversuch
mit veränderlichem hydraulischen Gefälle
Deponie Grauer Wall
U135009

Bearbeiter / Datum: Irmer / 17.12.2009
Probe entnommen am: 16.12.2009
Art der Entnahme: gestört
Arbeitsweise: DIN 18130 - ZY - DE - MZ



Versuch:		
Entnahmestelle:	Halde auf OEG - Gelände, Probe 1	Halde auf OEG - Gelände, Probe 2
Bodenart:	MV Schlacke 0/8 mm	MV Schlacke 0/8 mm
Länge / Fläche:	12.02 / 72.38	12.02 / 72.38
mittlererer hyd. Gradient:	4.70	4.70
w (Ein-/Ausbau) [%]:	25,5 / -	22,9 / -
Tr.- dichte (Ein-/Ausbau) [g/cm³]:	1,411 / -	1,380 / -
Durchströmung:	von unten nach oben	von unten nach oben
k (10°) [m/s]:	$3.8 * 10^{-6}$	$3.3 * 10^{-5}$

Bemerkungen
Durchlässigkeitswert ist gemittelt
(konstanter Bereich).
Einbau des Probekörpers in 3 Lagen mit je 12 Schlägen verdichtet

freigegeben: tw (07.01.2010)

Anlage 4.2