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Low Impact Stormwater Treatment Methods

APPLICATION OF A SIMPLIFIED ANALYSIS METHOD FOR NATURAL DISPERSION OF HIGHWAY STORMWATER RUNOFF

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16. ABSTRACT

This paper focuses on evaluating natural dispersion runoff infiltration performance by utilizing simulated rainfall/runoff data collected using a field-scale rainfall simulator coupled with a numerical model to study the effects of slope length, angle, and impervious contributory area on natural dispersion applications. A simplified equation was established, termed the LID Design Equation, to analyze natural dispersion performance based on multiple variables that can be determined for site specific conditions, allowing highway engineers to tailor natural dispersion requirements to various locations throughout Washington. Furthermore, the research and resulting evaluation procedure indicate that current evaluation procedures for the use of natural dispersion as a viable stormwater quantity control strategy are not physically accurate.

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EXECUTIVE SUMMARY

Stormwater quantity control has long been a challenge for highway designers. Traditionally centralized best management practice (BMP) designs are often cost prohibitive and inefficient in many rural highway applications. The use of existing vegetated rights of way as a method of treating stormwater, a component of the broader stormwater treatment concept more generally referred to as "low impact development" (LID), has become a primary focus of the Washington State Department of Transportation. In order to adequately design and utilize such stormwater management controls, however, further research and correlation between numerical infiltration/runoff models and field experiments were needed. This paper focuses on evaluating natural dispersion runoff infiltration performance by utilizing simulated rainfall/runoff data collected using a field-scale rainfall simulator coupled with a numerical model to study the effects of slope length, angle, and impervious contributory area on natural dispersion applications. A simplified equation was established, termed the LID Design Equation, to analyze natural dispersion performance based on multiple variables that can be determined for site specific conditions, allowing highway engineers to tailor natural dispersion requirements to various locations throughout Washington. Furthermore, the research and resulting evaluation procedure indicate that current evaluation procedures for the use of natural dispersion as a viable stormwater quantity control strategy are not physically accurate.

Specifically, it was determined that:

- Over the range of slopes and system specific conditions studied, runoff did not correlate positively to slope (i.e., higer runoff was not observed at higher slopes). Most importantly, the current design guidline requiring LID slopes to be not steeper than 7:1 is not justified. Application of this guidline eliminates many areas that have been shown to yield

accepatble levels of LID infiltration performance or increases the LID length well beyond what is necessary at many roadside locations.

- Saturated conductivity (Ks) was found to be the most critical design parameter. Required minimum values of Ks (102 mm/hr) found in existing natural dispersion guidance were found to be not physically based, again eliminating areas that are well suited for LID application or resulting in LID lengths greater than needed in some situations.

As a result of this research, a simplied, user friendly design equation (LID Design Equation) was developed and shown to be an accurate means of determining LID length by comparison to field data and calibrated model simulations using a finite difference solution to the hydrodynamic wave equaiton dynamically coupled with the Green-Ampt infiltration equation.

INTRODUCTION AND BACKGROUND

Development and urbanization is a primary cause of many adverse environmental impacts in the United States and abroad. One critical aspect of these impacts is related to stormwater runoff from man-made impervious areas, such as buildings, subdivisions, parking lots, and roadways (Booth and Jackson 1997; Lee and Heaney 2003; USEPA 2000) . Many research efforts have been undertaken in recent years to determine the characteristics of stormwater impacts on the natural environment; it has been generally concluded that stormwater from pollution generating impervious surfaces (PGIS) must be mitigated to ensure that the quantity and quality of that runoff will not further degrade baseline environmental conditions (Booth et al. 2002; Lee and Heaney 2003; Massman 2003; Tilley et al. 2003; USEPA 2000; WSDOE 2001; WSDOE 2004).

Traditional methods of stormwater runoff quantity treatment from PGIS have focused on centralized detention-based best management practices (BMPs) that reduce the amount of stormwater released from a developed site (Prince George's County 1999). Stormwater quality treatment – which targets pollutant removal from the runoff water – has also utilized systems that focus primarily on detention and precipitation of pollutants by settling of suspended solids, sometimes coupled with biological processes at centralized locations (Massman 2003). These traditional methods, while generally effective in achieving established treatment goals, have various drawbacks – particularly maintenance and property costs – which encourage environmental engineers and scientists to search for alternative methods of stormwater mitigation. Studies have shown that detention based BMPs inhibit the natural recharge of groundwater to localized areas, may not meet new stormwater regulations imposed by state and federal agencies, and are very susceptible to performance problems when maintenance practices are neglected (Massman 2003; Prince George's County 1999).

A relatively recent concept in stormwater management is emerging as a result of increased interest placed on stormwater impacts by regulatory agencies and the public. Known as "low impact development" (LID), this new technology first pioneered by Price George's County in Maryland utilizes natural drainage and infiltration systems coupled with engineered site designs to treat stormwater runoff quantity and quality at or near the PGIS that contributes runoff (Prince George's County 1999). By using decentralized treatment regimes such as rain gardens, grass filter strips, or natural bioretention cells located adjacent to runoff producing PGIS, the focus of LID is to reduce conveyance costs (i.e. pipe, catch basins), provide low-maintenance treatment areas, and improve the aesthetic aspect of stormwater management in urban areas. Although originally envisioned for use in urban development, LID principles show promise for incorporation into transportation facilities as an economical and environmentally sound stormwater management practice (Tilley et al. 2003; USEPA 2000).

Methods of stormwater mitigation are comprised of two basic elements: stormwater quality treatment (to improve the runoff water quality by reducing contaminant concentrations) and stormwater quantity treatment (to reduce the total volume of stormwater resulting from conversion of permeable soils to impermeable pavements). Numerous studies and research efforts have been performed in recent years to determine the performance and design characteristics of many of the LID strategies currently being used for highway stormwater treatment (Backstrom 2003; Barber et al. 2003; Barrett et al. 1998b; Barrett et al. 1998a; CALTRANS 2003; Cristina and Sansalone 2003; Deletic 2001h; Deletic 2004; Dierkes and Geiger 1999; Kaighn and Yu 1996; Mikkelsen et al. 1997; Munoz-Carpena et al. 1999a; Prince George's County 1999; Sansalone 2004; Tilley et al. 2003; United States EPA 2000; USEPA 2000; Yonge 2000; Yonge and Newberry 1996). A vast majority of work found in the literature

is focused on quality treatment of highway runoff; most generally regarding contaminant and sediment retention capabilities of roadside grassed swales and filter strips designed for runoff quality treatment. However, in many roadway settings the attenuation of the total volume of highway stormwater runoff is of particular interest, especially in rural areas where the extensive linearity and length associated with the highway system preclude the efficient and practical use of more traditional centralized detention-based quantity control facilities (i.e. detention and infiltration ponds and constructed wetlands). Centralized BMPs such as these are problematic in the rural highway system as containment and conveyance of runoff must first be achieved in order to transport the stormwater to the quantity and/or quality treatment facility. These systems, with their numerous components necessary to ensure effectiveness (curb and gutters, catch basins, drain pipes, detention ponds, and overflow outfalls) have relatively high continuous maintenance needs and have been subject to numerous failure issues due to poorly estimated design infiltration rates and hydraulic conveyance issues (Massman 2003). Detention-based quantity control BMPs have also been shown to be marginal in their ability to protect downstream receiving waters and also ineffective in groundwater recharge (Booth et al. 2002; Booth and Jackson 1997; Massman 2003). The use of LID BMP design in lieu of traditional stormwater treatment is beneficial not only in its more aesthetic acceptance by the public but also in its ability to reduce maintenance needs and increase groundwater recharge (Prince George's County 1999; USEPA 2000).

Current LID Design Guidance for Highway Stormwater Mitigation

General Quality/Quality Control

Current design guidance available for highway design use in Washington State can be found in several documents, including the Washington State Department of Ecology's (WSDOE) *Stormwater Management Manual for Western Washington, Stormwater Management Manual for*

Eastern Washington, and the WSDOT's *Highway Runoff Manual*. Numerous design parameters have been established in these and other guidance sources for the use of LID principles such as grassed filter strips, grassed swales, infiltration/exfiltration trenches, and amended soils for the treatment of stormwater quality (contaminant retention) adjacent to the roadway edge (WSDOE 2001; WSDOE 2004; WSDOT 2004b). As mentioned previously, the amount of research specific to quality treatment using LID methods is extensive and the basis for design criteria associated with these BMPs is understandable. However, the use of these types of BMPs for the total containment of highway runoff (quantity control) is not well documented in the literature; as a result, the design guidance as currently established in Washington State's stormwater manuals is not fundamentally based, but rather engineering "judgment" and existing runoff quality treatment guidelines have been used for guideline development (Personal Communication – Steve Foley, King County Water and Land Resources Division, Seattle WA., October 2003; Personal Communication – Karen Dinicola, WSDOE Municipal Stormwater Unit, Olympia WA., October 2003; Unpublished Meeting Notes – WSDOT, LID Credit Committee Meeting, Olympia WA., October 2004). As a result, the use of existing quantity control LID design guidance may be suspect in its applicability and effectiveness.

Natural Dispersion

As a quantity control LID measure, "natural dispersion" is the process of treating stormwater by infiltration in roadside areas immediately adjacent to the roadway edge. Dispersive measures include the interception of sheet flow runoff along the length of the roadway without containment or conveyance and allowing for the hydrologic capacity of the roadside soils to effectively infiltrate the stormwater (WSDOT 2004b). Current natural dispersion design guidance provided by WSDOE and WSDOT is summarized in Table 1.

WSDOT is encouraged to incorporate LID methods to treat stormwater runoff volumes on rural linear transportation facilities; however, several of the natural dispersion design parameters included in the guidance sources eliminate the use of this method at most highway locations in Washington State. The specific requirements for slope angles and saturated hydraulic conductivity (K_s, L/T) for the adjacent roadside treatment areas (hereafter termed "LID areas") may be too conservative and are not easily achievable within highway rights-of-way. While the benefits (both economic and hydrologic) of using natural dispersion on rural transportation facilities are apparent, the applicable design methods used to determine their suitability are questionable.

Of particular interest to highway designers is the slope requirement necessary to achieve effective natural dispersion. As stated in the WSDOT *Highway Runoff Manual*, side slopes for LID treatment areas can not exceed a 7:1 horizontal/vertical ratio (WSDOT 2004b), although slopes preceding LID areas (but not included in the overall LID length) can by 4:1. Unfortunately, the 7:1 slope requirement eliminates the incorporation of roadway embankments into the total LID area available within the existing rights of way (WSDOT 2004a). Design slopes for roadway embankments are between 6:1 and 2:1 for most applications, with an overwhelming majority of slopes flatter than 4:1 being located on major divided highways and interstates (WSDOT 2004a). Rationale behind limiting the LID treatment area slope to 7:1 or less is based primarily on two factors: slopes included in previous research efforts for the use of grassy swales for roadway runoff quality control rarely exceeded 10:1 (Backstrom 2003; Barrett et al. 1998d; Deletic 2001g; Deletic 2004; Munoz-Carpena et al. 1999b; Yonge 2000), and concern over erosion and flow concentration on slopes greater than those already deemed acceptable for use as quality control facilities (WSDOT 2004b). As mentioned previously

however, according to the WSDOT *Highway Runoff Manual*, roadway side-slopes upstream from an acceptable LID area can be as steep as 4:1 (WSDOT 2004b). This fact brings into question the concern over flow concentration on steeper slopes as being a viable issue.

Table 1. Current Natural Dispersion Guidelines

	WSDOE - Stormwater Management Manual for Eastern Washington (2004)	WSDOE - Stormwater Management Manual for Western Washington (2001)	WSDOT - Highway Runoff Manual (2004)
Impervious Area Slope:	<15%	<15%	<15%
LID Area Slope:	12.5:1 (8%) or increase LID length by 1.5 ft per 1% increase in slope above 8%	12.5:1 (8%) or increase LID length by 1.5 ft per 1% increase in slope above 8%	7:1 (14%) max.
Length Ratio (impervious/LID area):	10 ft for first 20 ft of impervious; 5 ft for each additional 20 ft or fraction thereof	10 ft for first 20 ft of impervious; 5 ft for each additional 20 ft or fraction thereof	10 ft for first 20 ft of impervious; ratio of 4:1 for each additional foot of impervious thereafter
Infiltration Rate (in/hr):	N/A	N/A	4 in/hr min.

Current Research Goals

For reasons stated above, the Washington State Department of Transportation has been very interested in determining the applicability and performance of LID methods for use in rural areas. The WSDOT manages over 18,000 lane miles of highway in Washington State, a majority of which are located in rural areas (CH2M-Hill Staff 2001; WSDOT Transportation Data Homepage 2004). As a budgetary item, the agency's biennial investment in stormwater treatment related to design and maintenance approaches $10M, with no good estimate on actual construction and right-of-way costs associated with these activities (CH2M-Hill 2001). In an effort to control these costs and investigate methods of improving stormwater treatment efficiency, the WSDOT maintains an ongoing research and development program to pursue new

and innovative ways to handle stormwater generated on its facilities. Of key importance in these efforts is the determination of stormwater quantity treatment effectiveness of existing roadside embankments, specifically the use of natural dispersion. The use of typical roadway embankments is presently not allowed by the current design guidance.

Without regulatory guidance allowing for the inclusion of roadway embankments as a practical runoff quantity control strategy, hydrologic modeling of such embankments would be necessary to demonstrate their effectiveness or their inclusion into the natural dispersion design criteria. According to WSDOT however, there is a lack of modeling methods currently available to quantify stormwater losses along roadside areas due to natural dispersive and infiltrative mechanisms; a situation which potentially leads to the design of excessively large detention facilities if they are required (Yonge 2003). The effects of scale are equally important to hydrologic analysis as previous research has shown (Joel et al. 2002a). Use of traditional runoff modeling equations such as The Rational Method can result in significant error when analyzing smaller catchments similar to those found along roadside areas. A better methodology based on actual field data and modeling is needed.

The purpose of this research project was to investigate the relationship between roadway embankment slope (length and angle), soil properties (soil texture, vegetative cover, and hydraulic conductivity), rainfall intensities, and contributory impervious area (roadway width) to infiltration and runoff. Coupled with field data, a numerical model capable of analyzing dispersed stormwater runoff from roadway pavements (and the infiltration of that runoff into roadway embankments) was also incorporated into the analysis; this allowed for extrapolation of empirical data to various roadway and environmental situations. The final results of the research show that existing guidelines for the incorporation of natural dispersion are inaccurate for many

roadway configurations in rural areas of Washington State and also, based on the data collected during this study, the concern over negative effects of increased slope on the capabilities of the LID area to attenuate highway runoff are unwarranted.

EXPERIMENTAL METHODS

The investigational approach of this study included two primary efforts: (1) field experiment data collection and (2) numerical model calibration and validation. By using two separate methods it was anticipated that the computer simulation could be calibrated and verified by the field data, allowing for further investigation of the effects of the various parameters (rainfall intensity, roadway width, LID area length, soil properties, and slope angle) beyond the constraints of the field experiments using the computer model. Determination of a simplified relationship between the design parameters, capable of being applied by highway design professionals without the need for extensive computer modeling, was also a primary consideration of the chosen research methodology.

Field Experiments

The first task to be completed was the data collection component, which consisted of two strategies: obtaining real-world rainfall/runoff data at select highway locations (static site monitoring) and generating synthetic data using a rainfall/runoff simulation method at various other locations (simulation). At all locations, "natural" roadway embankments (i.e. those embankments not specifically designed for stormwater treatment such as grassed swales or filter strips) were analyzed to determine their runoff treatment capabilities. By using both actual rainfall/runoff data and simulated data, the relationships between actual natural dispersion performance and that observed in simulation could be determined. Although the primary objective of the field experiments was to verify and calibrate the computer model (described in a

subsequent section titled *Numerical Modeling*), it could be argued that relying completely on field simulation data may not represent the realities of the natural events.

Static Site Monitoring

Static site monitoring was accomplished by the selection of three separate highway locations in Washington State with differing soil and climactic characteristics. Two sites were located in eastern Washington; Site 1 was located on US-2 north of Spokane (MP 298.4), Site 2 was located on SR-270 east of Pullman (MP 6.3). The third site (Site 3) was located in western Washington on I-90 west of Snoqualmie Pass (MP 45.7). Each site differed in annual precipitation, with average annual tabulated values of 18in, 24in, and 90in (460cm, 610mm, and 2290mm), respectively (WSDOE 2001; WSDOE 2004). Contributory impervious area and site layout varied at each location as shown in Figure 1 and reported in Table 2.

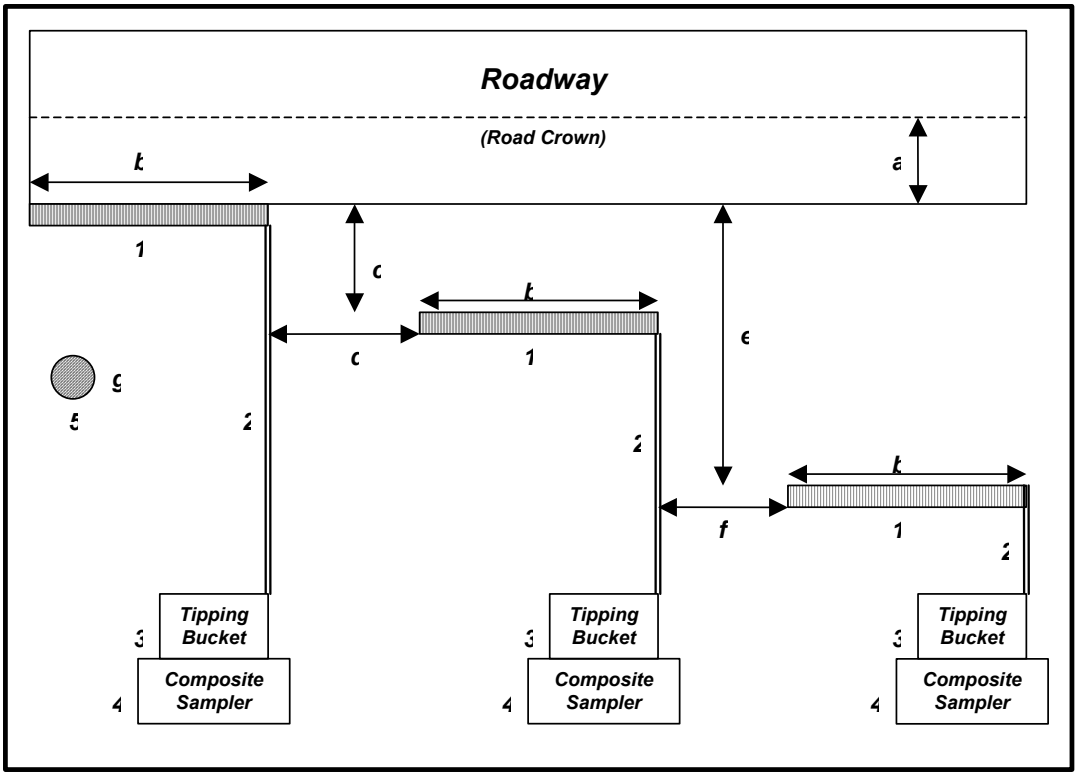

Figure 1. Remote Monitoring Site Layout

Table 2. Remote Monitoring Site Field Dimensions

Variable	Description	Roadway		
		Pullman SR 270	**Spokane US 2**	**North Bend I 90**
a	Distance from crown to edge of pavement	5.9m	8.6m	10m
b	Length of slot drain	2m	2m	2m
c	Distance from edge of pavement to 2nd slot drain	2.0m	3.2m	1.7m
d	Distance between 1st and 2nd slot drain	2.5m	3.0m	1.5m
e	Distance from edge of pavement to 3rd slot drain	4m	6.1m	3.5m
f	Distance between 2nd and 3rd slot drain	2.5m	3.0m	1.5m
g	Rain gauge height	3.1m	3.5m	~10m
Ksat	Saturated Hydraulic Conductivity (Sieve Test)	304 mm/hr	692 mm/hr	447 mm/hr

Measurement of natural rainfall at each site was performed by standard tipping bucket rain gauges equipped with recording data loggers (Hobo Event 4 – Onset Corp.). To determine the relationship between LID area (in this case lateral length from the edge of paved shoulder) and resulting runoff from the end of the pervious embankment, slot drains were installed at various distances down-slope from the roadway shoulder; typically 0m, 3.1m, and 6.1m (0ft, 10ft, and 20ft). Each slot drain was plumbed by PVC pipe to specially designed flow tipping meters (Figure 2). Tipping bucket flow meters have long been used as reliable, versatile method of measuring flow rates in runoff and erosion studies (Chow 1976; Edwards et al. 1974; Johnson 1942; Khan and Ong 1997). The use of tipping buckets was preferred over a critical flow measurement flume system due to concerns with debris clogging which could occur at the field locations. Each tipping bucket was calibrated in our laboratory to generate tip vs. volume relationships. Each flow meter was also equipped with similar recording data loggers as the rain gauges. The general site set-up is similar to another recent study by Caltrans to determine similar runoff relationships of roadway embankments (CALTRANS 2003). Photos of the remote sites are shown in Figure 3 through Figure 5.

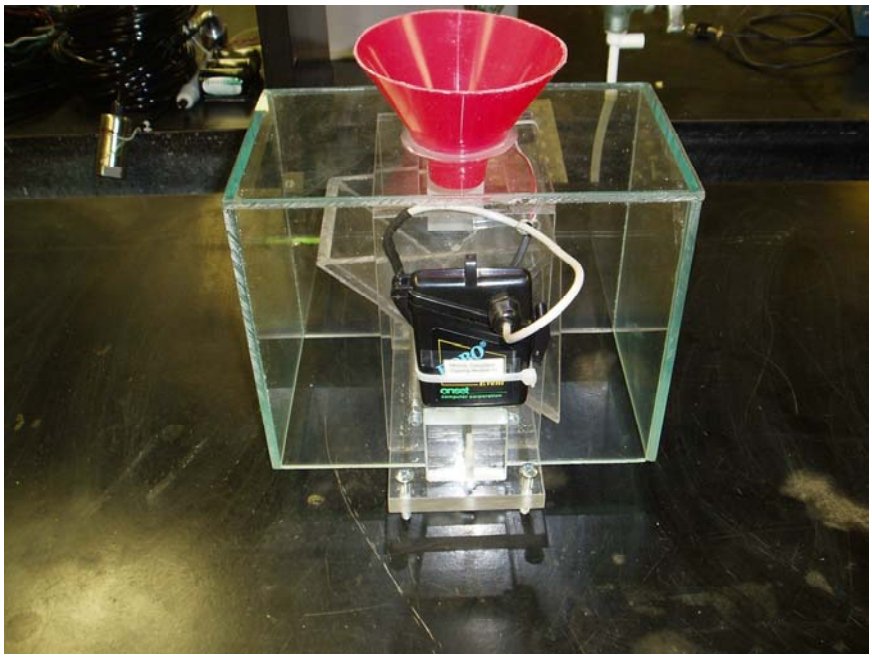

Figure 2. Tipping Bucket Flow Meter w/Onset (HOBO) Data Logger

Figure 3. US-2 Remote Monitoring Site (Spokane)

Figure 4. SR-270 Remote Monitoring Site (Pullman)

Figure 5. I-90 Remote Monitoring Site (North Bend)

Mobile Rainfall Simulation

The second portion of the data collection effort, vital to the numerical modeling component of the research, was rainfall/runoff simulation at various roadway locations. Mobile rainfall simulation included the application of controlled rainfall and run-on to LID area test plots of various lengths at different highway locations. By using a simulation method, variables included in the investigation of LID area runoff characteristics (rainfall intensity, contributory impervious area, slope, soil properties, and storm duration) could be easily controlled in the field and used as input parameters in the modeling phase; such control is not possible during natural rainfall events as studied in the static site monitoring. Rainfall simulation to determine infiltration and runoff characteristics of soil plots is a common investigative method found in the literature (Darboux et al. 2002; Fiedler et al. 2002; Frasier et al. 1995; Frasier et al. 1998c; Frasier et al. 1998a; Humphry et al. 2002; Pearce et al. 1998a; Springer 2004; Suleiman and Swartzendruber 2003; Weiler and Naef 2003). A run-on flow component was also included in the total hydrologic input of the study plots to simulate overland flow from upslope runoff (Frasier et al. 1998b; Pearce et al. 1998b). Differences between previous research and this effort are the use of rainfall simulation on constructed roadway embankments with the run-on component (to simulate roadway runoff) which is a much more significant portion of the total hydraulic input to the study plot.

Rainfall simulation was accomplished by the use of square-flow nozzles (FULLJET SS14WSQ, SS20WSQ, and SS50WSQ – Spraying Systems Co.). Single nozzles were mounted on a stationary boom and placed approximately 2.8m above the center of the test plots. Rainfall intensity during testing was measured by placing between 4 and 6 non-recording plastic rain gauges at each corner and center of the plots; depths were recording for given time durations

during simulation to calculate the average intensity. Both arithmetic and weighted means between the rain gauges were used to determine rain intensity used as an input parameter for computer modeling. Applied rain intensities were varied between 21 to 84 mm/hr (0.8 and 3.3 in/hr) and were adjusted by changing simulator nozzles, varying input flow rates (3.8 to 11.4 L/min), and changing the height of the nozzle above the plot (2.3 to 2.9 m). Water was supplied by a truck-mounted holding tank, which was in turn pumped through a rotometer manifold by an electric pump powered by a generator.

The run-on component was provided by a perforated PVC spreader-bar assembly placed at the uphill edge of the test plots. Water was evenly spread across the top of the plot and allowed to flow down slope to imitate dispersed flow originating from a roadway surface. Run-on flow rates were controlled through the same rotometer manifold system used for rain simulation. Flow rates were varied from 0 and 9.4 L/min (0 to 2.5 gal/min). As both the rain simulator and run-on simulator were supplied by the same storage tank (2270 L capacity) and pumping system, duration of testing (varying from 15 minutes to 1.5 hours) was limited based on total flow requirements and the volume of the storage tank.

Soil moisture measurements were made by installing 2 to 3 (depending on plot size) dielectric soil moisture probes (ECH_2O EC-20 – Decagon Devices, Inc.) into the soil plots at equidistant locations from the upstream plot edge. Soil moisture readings were taken at regular time intervals beginning at the start of each test. This information was used to study the propagation of the wetted soil front downhill in the test plots; equally, the initial soil moisture deficit was also calculated by taking the difference between the initial and saturated soil moisture readings. Initial soil moisture deficit, relative to saturation, was used as an input parameter for

the numerical modeling portion of the study, as discussed later. All tests were performed during Fall 2004; antecedent soil moisture contents were typically between 2-5% (relatively dry).

Test plots for mobile simulation were located on various highway embankments with slopes varying from 6:1 to 3:1. Plot sizes were also varied from 1m x 2m to 1m x 4m (3.3ft x 6.6ft to 3.3ft x 13.1ft) with the longest dimension in the down slope direction. The long sides of the plots were horizontally partitioned from the surrounding soils by inserting metal strips approximately 50mm (2in) into the ground. The top of the plot was equipped with the 1m (3.1ft) spreader-bar assembly and runoff was collected in a 1m (3.1ft) slot drain plumbed to a tipping bucket flow gauge discussed previously. Figure 6 and Figure 7 provide schematics of typical mobile rainfall simulation set-up. The photograph depicted in Figure 8 shows the field installation using a 4m (13.1 ft) plot located on US-395 while the photograph in Figure 9 shows a typical slot drain installation at the downstream end of the plot (similar to static site slot drain application).

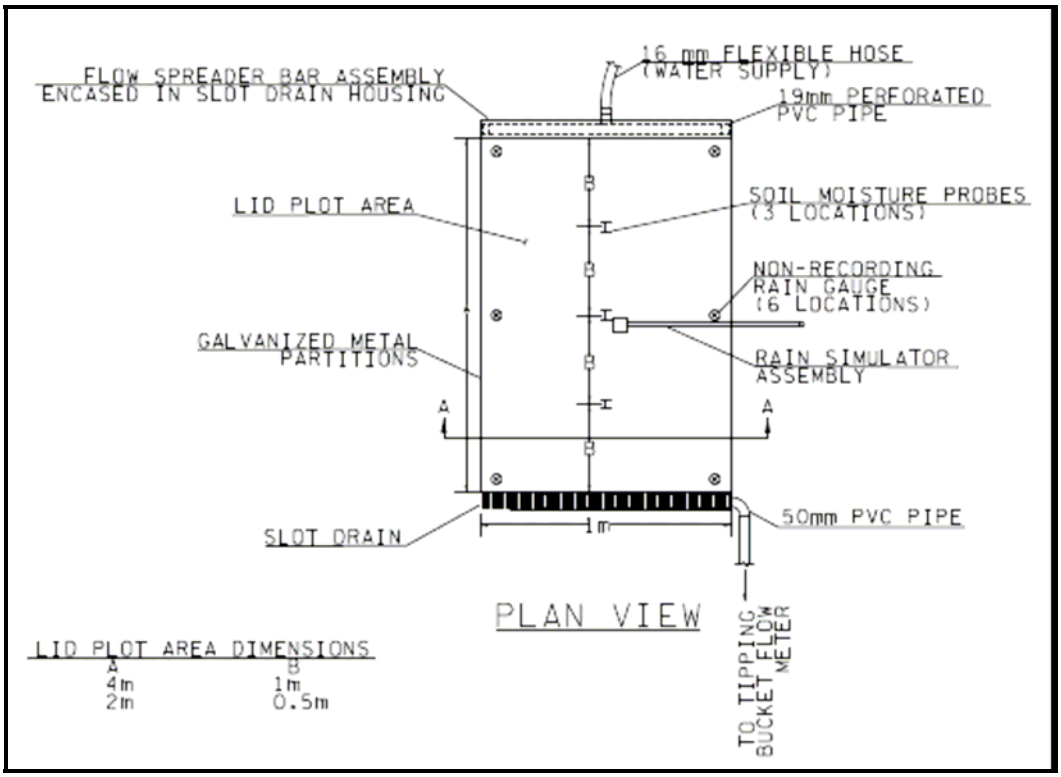

Figure 6. Mobile Simulation Schematic

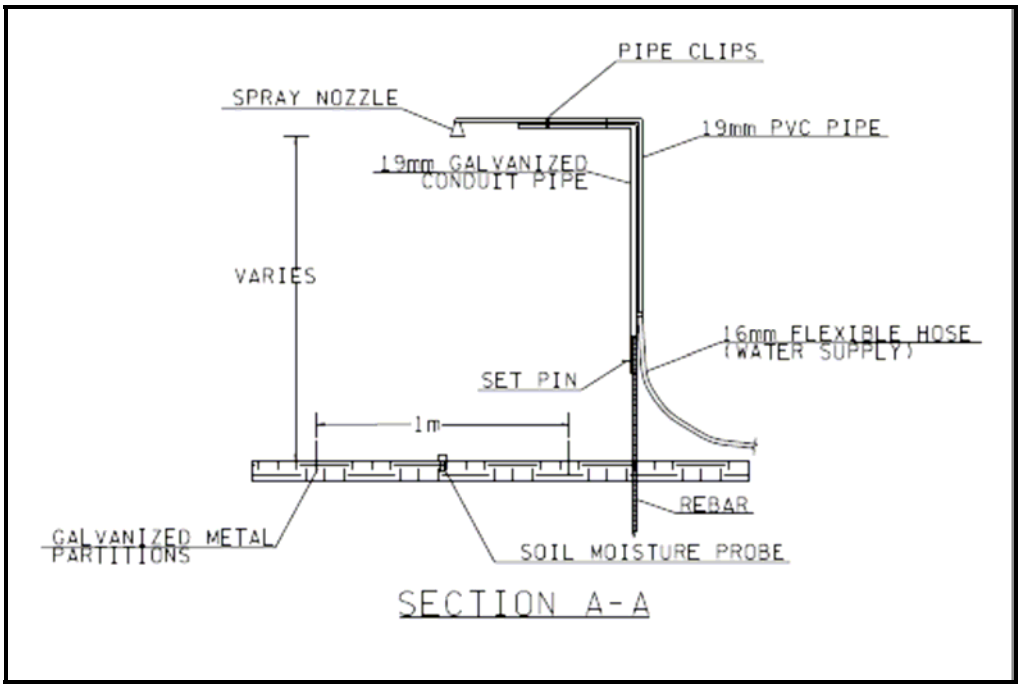

Figure 7. Mobile Simulation Schematic (Profile)

Testing protocol for mobile simulation involved application of a constant rain and run-on component for each test until steady-state runoff, defined by a relatively constant time interval between bucket tips, was achieved. Treatment (or infiltration) performance of each test plot under various rain/run-on conditions was then determined by calculating the portion of applied inflow that was measured as runoff at the end of the plot, which has been established as a well-accepted method of hydrologic analysis (Frasier et al. 1998d). The difference between applied rainfall (without a run-on component) and measured runoff, normalized over the total LID area, was used to estimate the hydraulic conductivity of the plot using the Equation 1:

$$K_e = r_i - q \qquad \textbf{(1)}$$

Where $\mathbf{K_e}$ = estimated saturated hydraulic conductivity (mm/hr), $\mathbf{r_i}$ = applied rainfall intensity (mm/hr), and **q** = measured normalized runoff intensity (mm/hr). Equation 1 is valid for steady-state, fully saturated conditions, which were achieved during field simulations. Normalizing the flow rate involves dividing the volumetric flow rate by the total effective plot area, allowing for easy comparison of runoff between plots of different sizes.

In addition to the simplified method for estimating K_s by Equation 1, soils samples from each simulation site (one per site) were collected and analyzed per the WSDOT's Simplified D_{10} and Modified D_{10} Sieve Analyses as described in the *Mobile Rainfall Simulation* section. A third method for K_s estimation, involving direct measurement with a Guelph Permeameter (Soilmoisture Equipment Corp.) was also used at each site.

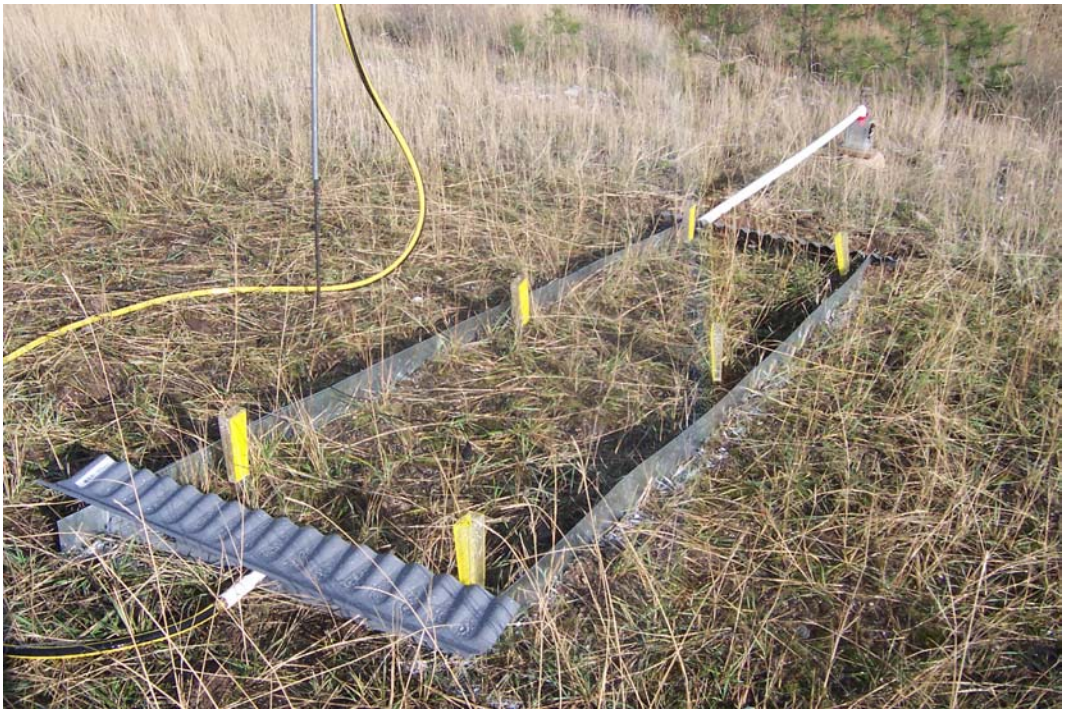

Figure 8. Mobile Simulation Plot (US-395)

Figure 9. Slot Drain Installation

Numerical Modeling

Consistent with WSDOT's need to adequately analyze existing natural dispersion guidance and propose new strategies, a physically based hydrologic flow model was necessary. Various numerical models have been proposed and effectively used to solve the complex process of rainfall infiltration with the runoff of excess water (beyond the infiltrative capacity of the soil) in hydrologic systems (Bronstert and Plate 1997; Castillo et al. 2003a; Corradini et al. 1998a; Deletic 2001f; Fiedler and Ramirez 2000; Galbiati and Savi 1995d; Howes and Abrahams 2003a; Leonard et al. 2004; Liu et al. 2004a; Munoz-Carpena et al. 1999c; Springer 2004; Wallach et al. 1997b). For the most part, approximations of the kinematic wave model using finite difference schemes have been used (Castillo et al. 2003b; Corradini et al. 1998b; Deletic 2001e; Galbiati and Savi 1995c; Howes and Abrahams 2003b; Liu et al. 2004b; Munoz-Carpena et al. 1999d; Springer 2004; Wallach et al. 1997a). As a majority of numerical methods developed are based on relatively continuous hydrologic conditions, where large discontinuities between soil properties (namely K_s) are not present, the kinematic approximation method is quite valid. However, given the large change in soil properties (most importantly K_s) and surface slope associated with highway runoff flowing onto highly permeable roadway embankments, a full hydrodynamic solution was sought for this study.

Fiedler and Ramirez Solution Approach

A numerical solution to the complete St. Venant equations, also known as the hydrodynamic wave equation (Chow et al. 1988), was proposed by Fiedler and Ramirez (2000). This model (MAC-2D) was chosen for this study due to its ability to handle the discontinuity condition in the saturated hydraulic conductivity (Ks) magnitude that arises between the impervious surface interface of the roadway edge and the pervious LID area as well as the run-on phenomenon. The model can also calculate overland flow wave propagation down slope with a near-zero depth

condition (i.e., a type of shock wave), a situation not easily approximated by kinematic wave models (Fiedler and Ramirez 2000).

MAC-2D is a finite difference solution to the full hydrodynamic wave equations for the overland flow component dynamically coupled with the Green-Ampt infiltration equation to describe the soil infiltration component. The Green-Ampt equation has been widely used by many authors for use in numerical models of infiltration of surface and rain waters into soil systems (Castillo et al. 2003c; Corradini et al. 1998c; Deletic 2001d; Galbiati and Savi 1995b; Liu et al. 2004c; Munoz-Carpena et al. 1999e; Springer 2004) and is described by Equation 2 (Chow et al. 1988):

$$F(t) = K_S \cdot t + \psi \cdot \Delta\theta \cdot \ln\left(1 + \frac{F(t)}{\psi \cdot \Delta\theta}\right) \qquad \textbf{(2)}$$

For this application of the Equation 2, $\mathbf{K_s}$ = saturated hydraulic conductivity [L/T], $\boldsymbol{\psi}$ = soil head suction potential [L], $\boldsymbol{\Delta\theta}$ = volumetric soil moisture deficit (L^3/L^3), **t** = elapsed time [T], and **F(t)** = time dependant cumulative infiltration [L]. Equation (2) can also be written in the form of instantaneous infiltration rate [L/T] at any time (t), as given in Equation 3 (Chow et al. 1988):

$$f(t) = K_S \cdot \left(\frac{\psi \cdot \Delta\theta}{F(t)} + 1\right) \qquad \textbf{(3)}$$

The Green-Ampt equation is a physically based solution to soil infiltration and its parameters are readily estimated by field measurements, which lend to its versatility in hydrologic field studies.

The Fiedler and Ramirez (2000) model has 7 input parameters that are used to solve the coupled hydrodynamic overland flow equations and the Green-Ampt infiltration equation. Model parameters include saturated hydraulic conductivity (Ks, cm/s), soil suction head potential

(ψ, cm), initial volumetric soil moisture content (θ, %), and the overland flow resistance friction parameter, K_0. The resistance friction parameter (K_0) is computed by Equation 4 (Fiedler and Ramirez 2000):

$$K_0 = f \cdot \mathrm{Re} \qquad \textbf{(4)}$$

Where $\boldsymbol{f}$ = the Darcy-Weisbach friction factor and **Re** = the Reynolds number, both well-known hydraulic parameters described in Chow et al (1988). (Note that Equation 4 is only valid in the laminar flow regime). Other model input values include a spatially discretionalized 3-D node system (surface model), applied rainfall intensity r_i (mm/hr), and duration of rainfall (sec).

In addition to normalized runoff hydrographs, the model also provides output for total cumulative infiltration F (cm), depth of overland flow H (cm), and overland flow velocities v (cm/s) at each x-y node. Although a full description of the model is beyond the scope of this paper, the reader is referred to Fiedler and Ramirez (2000) for further information and model verification. Model validation was presented in a later study, which indicated a high degree of model accuracy (Fiedler et al., 2002).

Coupling Mobile Simulation with Numerical Modeling

Of key importance in this study is the use of field rainfall/runoff simulation to calibrate and validate the numerical model for the highway systems currently being considered. This was achieved by fitting recorded field data from the mobile simulation phase with model outputs. Simulation plots were input into the spatial grid discretionalization of the model and field estimates of the K_s parameter were used as a starting point to calibrate the model output hydrograph. Of all input parameters, it was anticipated that the runoff hydrograph produced by the model would be most sensitive to the K_s parameter, as determined in previous studies (Castillo et al. 2003d; Deletic 2001c; Galbiati and Savi 1995a; Howes and Abrahams 2003c;

Springer 2004). A sensitivity analysis performed on the model for various non-simulated conditions confirmed this assumption.

Temporal and spatial discretionalization of the model, specifically the computational time-step interval and 3-D grid sizing (dx, dy, and z input) was established to satisfy the Courant condition as necessary in explicit finite difference schemes (Chow et al. 1988; Fiedler and Ramirez 2000). This resulted in a time increment (i) of 0.05 seconds, dx and dy lengths (cross and down slope directions, respectively) of 1cm, and spatially dependant z grid values based on surface slopes (50:1 slope used for roadway (impervious) surface with embankment slopes varying from 6:1 to 3:1). Larger time steps or larger x-y lengths produced instability in the model. Values of $K_{.s}$, ψ, and $\Delta\theta$ were assigned to each x-y node in the spatial grid and a constant slope angle for both the impervious roadway area and pervious LID area were applied (resulting in a smooth ground surface model). Although the model was written to handle total variability of hydrologic soil properties (K_s, $\Delta\theta$, ψ) and microtopographic features (z values) at each spatial node, to determine microtopographic and microhydrologic properties of the test plots was beyond the feasibility of this study. Therefore, lumped hydrologic properties and constant surface model slopes were used.

RESULTS AND DISCUSSION

Static Site Monitoring

Rainfall/runoff data from natural storm events were collected from September to December, 2004. In spite of the typical problems encountered during field sampling campaigns, including data logger failure and damage/clogging of tipping bucket flow meters, a total of 55 separate events were recorded (all sites combined). Site 1 had moderate precipitation activity with 17 recorded events and no apparent equipment failures. Site 2 on SR-270 had 36 rainfall events

successfully recorded. Although the most active site for rainfall was Site 3 on the western crest of the Cascade Mountains (I-90), the previously mentioned problems with monitoring equipment failure eliminated most hydrograph recording at this location and resulted in only 2 useable data events.

Original location and installation of the three remote sites was based on the assumption that significant runoff would be measured at short distances from the edge of paved shoulder with reduced runoff quantities positively correlated with increasing distance from the roadway edge. Vegetation was also expected to play a significant role in determining the relationship between slope length and measured runoff quantities. Observed data was far different, however. Site 1 (US-2) recorded only 5 events with any measurable runoff at the 3.0m distance and only 1 event recording flow at the 6.1m distance from the roadway edge. Runoff coefficients calculated for the 3.0m distance (evaluated by dividing the total normalized runoff depth by the related precipitation depth) never exceeded 0.2 for any of these events and usually averaged less than 0.1. The 6.1m distance runoff coefficient, again only calculated for the single measured event, was 0.08. Site 2 (SR-270) recorded no measurable runoff at any distance from the roadway edge for any event, even though there was no vegetation on the embankment slope. Early assumptions would dictate that Site 1 would outperform (yield higher infiltration rates of less down-slope runoff) Site 2 based on moderate vegetation and more shallow slopes; this was not the case, however. The most plausible explanation for this is the observed layer of fine silt/clay soils within 150mm (6 in) of the surface of the LID plots; this material effectively reduced the available soil water capacity at this site, which in turn reduced the effective infiltration rate for the longer duration events.

Site 3 was plagued by equipment problems; however, the two events successfully measured showed dramatic reductions in roadway runoff. No effective runoff was measured at either slot drain location away from the edge of paved shoulder.

Overall the static site monitoring method produced mixed results and was not a significant analysis method for this research, although it did provided a good "reality check" with the other two investigative methods, namely mobile rainfall simulation and numerical modeling.

Effects of Slope Angle on Runoff

Variability in site slopes included in the static site monitoring phase were limited due to site selection; therefore, comparisons between LID area slope and runoff are not conclusive; vegetative cover effect is the only considerable variation. However, a more expansive and similar research effort recently completed in the CALTRANS RVTS Study (2003), which focused on stormwater treatment performance of typical roadway embankments, suggests a lack of correlation between embankment slope angle and stormwater runoff attenuation (CALTRANS 2003). Results of the 2-year study are summarized in Table 3. Some sites included in the summary include impervious contributory areas not laterally contributing to adjacent to the LID areas, so effective unit roadway width lengths (as reported in Table 3) are normalized by dividing the total impervious area by the width of collection drains along the embankment slope, a convention used in this study and necessary for comparison between the two research efforts. Results from the RVTS Study (CALTRANS 2003) indicate that runoff coefficients (based on the ratio of total stormwater inflow to runoff volumes) are very low, even for 2:1 slopes. None of the 8 sites studied in this effort were engineered for stormwater treatment. The primary parameters correlated to stormwater attenuation/treatment performance of the road embankments were reported to be infiltration and vegetative cover (CALTRANS 2003).

Table 3. Caltrans RVTS Study (CALTRANS 20003).

SITE / SYSTEM		SLOPE (%)	Pavement Width (m)	LID Width (m)	ACP/LID Ratio	Vegetation (% cover)	Infiltration Rate (in/hr)	Relative Comaction (%)	Soil Type (USDA)	Runoff Coeff.
Sacramento	1	EP	16.1	0	NA	0	0.0		***D***	
	2	5%	16.2	1.1	14.7	93%	75.2	93.5%		0.31
	3	33%	16.6	4.6	3.6	84%	68.1	81.2%		0.32
	4	33%	17.8	6.6	2.7	92%	59.7	79.7%		0.28
	5	33%	17.4	8.4	2.1	90%	79.8	78.4%		0.15
Cottonwood	1	EP	10.5	0	NA	0%	0.0		***C***	
	2	52%	10.5	9.3	1.1	73%	88.9	85.8%		0.19
Redding	1	EP	9.0	0	NA	0%	0.0		***C***	
	2	10%	11.8	2.2	5.4	80%	48.0	93.0%		0.57
	3	10%	11.8	4.2	2.8	85%	84.8	88.6%		0.31
	4	10%	11.8	6.2	1.9	87%	105.4	78.8%		0.45
San Rafael	1	EP	61.6	0	NA	0%	0.0		***C/D***	
	2	50%	135.8	8.3	16.4	84%	236.0	78.8%		0.13
Yorba Linda	1	EP	30.3	0	NA	0%	0.0		***B***	
	2	14%	34.2	1.9	18.0	61%	32.0	89.2%		0.37
	3	14%	33.8	4.9	6.9	82%	22.1	82.5%		0.51
	4	14%	28.7	7.6	3.8	74%	39.9	87.7%		0.58
	5	14%	48.4	13.0	3.7	76%	46.0	86.8%		0.17
Irvine	1	EP	19.4	0	NA	0%	0.0		***B***	
	2	11%	22.6	3.0	7.5	70%	39.1	88.4%		0.39
	3	11%	22.6	6.0	3.8	63%	41.9	84.7%		0.05
	4	11%	32.9	13.0	2.5	62%	23.4	87.6%		0.16
Moreno Valley	1	EP	15.4	0	NA	0%	0.0		***C***	
	2	13%	16.6	2.6	6.4	3%	18.3	90.7%		0.95
	3	13%	16.8	4.9	3.4	16%	14.5	93.3%		0.95
	4	13%	17.4	8.0	2.2	22%	23.9	92.9%		0.48
	5	13%	18.0	9.9	1.8	18%	26.4	93.9%		0.51
San Onofre	1	EP	26.6	0	NA	0%	0.0		***B/C***	
	2	8%	22.0	1.3	16.9	81%	57.2	95.9%		0.45
	3	10%	23.9	5.3	4.5	74%	31.8	88.5%		0.27
	4	16%	25.1	9.9	2.5	69%	19.1	85.3%		0.07

The primary runoff attenuation parameter was the hydraulic conductivity of the soil, regardless of slope. For more information on the previous research and methods used therein, the reader is directed to CALTRANS (2003).

Mobile Rainfall Simulation

A total of 16 simulated storm events were completed during this phase of the research, including both rainfall/run-on and rainfall-only tests. Summaries of field simulations are reported in Table 4. It was observed that effective infiltration rates associated with higher rainfall/run-on intensities were consistently higher than those estimated for the lower intensity tests using Equation 1; this phenomenon, generally identified as “interactive infiltration”, is well documented in the literature (Corradini et al. 1998d; Fiedler et al. 2002; Morin and Kosovsky

1995; Springer 2004). Interactive infiltration results from spatial variability of the physical properties of the plot, most specifically areas of variable hydraulic conductivity magnitudes and microtopography. As runoff propagates down slope, it may be intercepted by areas of localized higher K_s values, effectively infiltrating a large percentage of the overland flow without the contribution of the total surface plot area for runoff. Smaller runoff flow rates resulting from rainfall and impervious runoff may also concentrate as overland flow in microtopographic low areas void of vegetation and areas with other macropore features (Fiedler et al. 2002; Howes and Abrahams 2003d; Weiler and Naef 2003), hence lowering the apparent effective hydraulic conductivity of the system. As rainfall and run-on increases, the depth of overland flow in these microtopographic regions can increase, or areas that were fully infiltrating the excess runoff previously may become saturated and begin to contribute to runoff; this process causes overland flow to move into areas of higher hydraulic conductivities not previously saturated, thus increasing the apparent effective infiltration of the entire test plot (Corradini et al. 1998e; Fiedler et al. 2002; Morin and Kosovsky 1995; Weiler and Naef 2003). As mentioned previously, estimating individual node hydrologic soil properties was outside the scope of this study due to practical limitations; therefore spatially averaged lumped K_s values were used to describe the entire test plot – giving rise to variable infiltration rates calculated for varying rainfall intensities. Estimation of K_s values was made initially by performing rain-only simulations on the test plots by using Equation 1, with values reported in the "Ks Test" column of Table 4. Soils samples (one per test location) were also collected and sieve analyses were performed per current WSDOT guidelines and Massman (2003). Both the Simplified D_{10} and Modified D_{10} sieve analyses (Massman 2003) methods were used; results of these tests are reported in Table 4 ("D_{10}" and "Modified D_{10}" columns, respectively). ASTM D422 Gradation Testing is used for the

Simplified D_{10} test, with recommended long-term infiltration rates presented in Table 5 (WSDOT 2004b). The Modified D_{10} Analysis is a more detailed approach, with K_s values calculated using Equation 5 (Massman 2003; WSDOT 2004b):

$$\log(K_S) = -1.57 + 1.90 \cdot D_{10} + 0.015 \cdot D_{60} - 0.013 \cdot D_{90} - 2.08 f_{fines} \quad \textbf{(5)}$$

Where D_{10} ,D_{60} and D_{90} are the grain sizes in mm for which 10, 60, and 90 percent of the sample is finer and Df_{fines} is the fraction of the soil by weight passing the #200 sieve (Massman 2003; WSDOT 2004b). Units for K_s in Equation 5 are given in feet/day.

Table 4. Mobile Simulation Test Summary

Test # (Mobile #)	Site	LID Lenth (m)	LID Width (m)	LID Slope (m/m)	Test Duration (min)	Rain (mean) mm/hr	Rain (Dev) (mm/hr)	Rain (wmean) (mm/hr)	Runon (L/min)	ACP Length (m)	ACP/LID Ratio	Max Runoff (mm/hr)	Runoff %	Time to Peak (min)	Ks Test (mm/hr)	Ks for Model (mm/hr)	Modified D_{10} Ks (mm/hr)	Modified D_{10} Ks (mm/hr)	GP (mm/hr)
1 (1)	US 2	1.95	1.03	6:1	30	25.4	*	*	3.8	8.68	4.5	24.2	95.2%	15	_	9.0	30.5	706.5	104.2
2 (1)	US 2	1.95	1.02	6:1	58	25.4	*	*	3.8	8.77	4.5	15.8	62.2%	45	_	54.0	30.5	706.5	104.2
3 (2)	US 2	1.92	1.02	6:1	68	25.4	*	*	3.8	8.77	4.6	10.8	42.4%	**	_	82.8	30.5	706.5	104.2
4 (3)	US 2	4.03	1.02	6:1	15	25.4	*	*	3.8	8.77	2.2	17.5	68.9%	5	_	_	30.5	706.5	104.2
5 (4)	US 2	4.03	1.03	6:1	30	45.7	30.0	65.3	3.8	3.38	0.8	31.0	47.6%	26	35.3	57.6	30.5	706.5	104.2
6 (6)	US 395	4.00	1.05	4:1	69	27.9	11.9	26.5	4.9	10.59	2.6	10.0	37.5%	37	42.2	63.0	27.9	248.9	-
7 (6)	US 395	4.00	1.05	4:1	20	67.7	23.5	72.4	0.0	0	_	42.7	63.1%	10	17.4	39.6	27.9	248.9	-
8 (7)	US 395	4.00	1.05	4:1	45	32.2	14.2	29.8	4.9	9.42	2.4	11.2	37.5%	36	21.9	52.2	27.9	248.9	-
9 (7)	US 395	4.00	1.05	4:1	25	80.3	10.4	85.6	7.6	5.39	1.3	20.7	25.8%	16	21.9	153.0	27.9	248.9	-
10 (8)	US 395	4.00	1.05	4:1	42	35.2	11.5	32.1	4.9	8.77	2.2	14.8	46.3%	36	21.9	50.4	27.9	248.9	-
11 (9)	US 395	3.90	1.00	4:1	70	37.9	12.4	33.9	4.9	7.78	2.0	0.0	0.0%	N/A	_	_	114.3	632.5	-
12 (10)	US 395	4.00	1.02	4:1	30	70.9	11.5	72.0	9.5	7.86	2.0	0.2	0.2%	15	_	_	114.3	632.5	-
13 (10)	US 395	2.00	1.02	4:1	30	66.7	1.3	_	9.5	8.35	4.2	1.6	2.3%	5	_	333.0	114.3	632.5	-
14 (11)	US 195	4.00	1.02	3:1	60	32.0	4.0	32.9	4.9	8.80	2.2	0.2	0.5%	24	76.6	_	22.9	566.4	101.8
15 (12)	US 195	2.00	1.01	3:1	52	0.0	0.0	_	4.9	14.12	7.1	0.0	0.0%	N/A	66.7	_	22.9	566.4	101.8
16 (13)	US 195	2.00	1.01	3:1	40	0.0	0.0	_	9.46	6.68	3.3	39.8	47.3%	25	66.7	180.0	22.9	566.4	101.8

It is apparent from the values in Table 4 that the Simplified D_{10} test values for K_s greatly under predicted the Modified D_{10} results by at least an order of magnitude. Apparent effective K_s values determined by Equation 1 and also by model calibration (reported in "K_s for Model" column, Table 4) were consistently higher than the Simplified D_{10} and significantly lower than the Modified D_{10} results. Factors affecting the large disparity between the sieve analysis results that yielded the Simplified D_{10} values can be attributed to the presence of large cobbles in lower soils layers that were observed in the soil samples. Large cobbles affect the Modified D_{10} method (increasing it) but do not impact the Simplified D_{10} results. Better sampling methods of the uppermost soil layer, which were difficult due to the presence of vegetation, would likely reduce the variability of these results. Note, however, that grain size infiltration methods do not account for packing (variable soil density) or small-scale layering, and are therefore likely not the best method for determination of hydraulic conductivity values in surface infiltration studies, especially in highly compacted soils. These factors increase the calculated infiltration rates of the soils beyond what is actually found in the field.

Table 5. Recommended Infiltration Rates Based on ASTM D422 (WSDOT 2004)

D_{10} Size from ASTM D422 Soil Gradation Test (mm)	Estimated Long-Term (Design) Infiltration Rate (inch/hour)
≥ 0.4	9
0.3	6.5
0.2	3.5
0.1	2.0
0.05	0.8

Direct K_s measurements were also taken using a Guelph Permeameter (Soilmoisture Equipment Corp), with results reported in Table 4 under the "GP" column. No data were obtained at the US 395 sites as soil conditions prevented successful test well auguring necessary for the standardized test. The Guelph Permeameter matched the modeled K_s values more closely

than the Modified D_{10} method. Regardless, estimation of K_s values is generally difficult and can vary several orders of magnitude depending on sample location and testing methods (Freeze and Cherry 1979) and remains a challenging obstacle in the design of surface infiltration mechanisms such as natural dispersion.

Effects of Slope Angle on Runoff

In general there was no discernable performance differences over the range of slopes evaluated in this study. In fact, the LID areas on the 3:1 and 4:1 slopes outperformed the 6:1 slope, which is much closer to the current WSDOT natural dispersion guidelines for acceptable slope (7:1). This can be attributed to the relatively high microtopographic and microporous characteristics of the test plots.

As stated previously, current design guidance for the use of natural dispersion uses LID area slope rate as a threshold parameter that results in the elimination of certain areas for incorporation as a treatment area or dramatically increases the required length of the LID area. This guidance is not supported by the results of this study; in actually, the most critical design parameter appears to be the infiltrative capacity (and thus K_s) of the soil of the LID area. Similar conclusions that increasing plot slope angle does not necessitate increased runoff have been previously reported in the literature (Barrett et al. 1998c; Deletic 2001b; Joel et al. 2002b; Munoz-Carpena et al. 1999f). Although it is apparent that existing natural dispersion guidance is based on slopes analyzed for stormwater quality control (which focuses on sediment deposition in roadside grass filter strips), Delectic (2001) explained that increased retention time of runoff water on slopes of shallow angles is only important if the soil infiltrative capacity is capable of absorbing the excess runoff during the increased retention time; where soil moisture capacities are large, slope has little effect on runoff (Deletic 2001a). It follows that if full dispersion of overland flow is maintained on embankment slopes, increasing the slope for the range of slopes

evaluated does not decrease the area available for infiltration of that runoff. Additionally, under steady-state saturated soil conditions (as simulated in this research), the key parameter for estimating runoff is K_s.

Although erosion due to flow concentration is considered to be a key drawback in using steeper slopes for runoff treatment, the process involved in sediment transport (erosion) is based on numerous factors, including soil grain size, flow regime and velocity, and slope (Yang 2003); but not slope alone. Although outside the scope of this study, the effects of sediment transport and erosion on various slope angles were not apparent over the range of slopes studied. In fact, no flow concentration or detectable erosion was observed for any simulation test and no erosion was observed at the static site locations where flow concentration did not occur at the pavement edge, even for embankments with minimal vegetation.

Numerical Modeling

Calibration with Mobile Rain Simulation Results

Parameters estimated during field simulations were used as input variables into the Fiedler and Ramirez (2000) 2-D hydrologic model. In general, the estimated K_s values determined by rain-only simulations and Equation 1 showed good agreement with the predictive model output for steady-state runoff. Other parameters, such as the friction factor ($K_{0)}$ and initial soil moisture deficit ($\Delta\theta$) were also used to provide a better fit between the measured and simulated runoff hydrograph. Soil moisture deficit was calculated as described in the Experimental Methods Section. Again, K_s was the most sensitive and effective source parameter used to calibrate the model for both time to runoff, time to peak, and steady-state runoff intensity.

Impervious contributory surface length (unit width) values used in the model were determined by assuming run-on volumes applied in the field were the result of 100% runoff of the simulated rainfall intensity from the roadway. By dividing the applied run-on flow rate

[L^3/T] by the applied rainfall [L/T] and unit width [L^2], an associated impervious roadway length was determined [L]. All impervious roadway surfaces were input with 2% slopes, typical for most highway configurations (WSDOT 2004a). LID area geometry was input as measured in the field.

Results of two calibration model runs are shown in Figure 10 and Figure 11. Due to the simplifications used in the modeling, specifically a uniform LID area slope (without microtopography) and lumped uniform K_s values, time to runoff and time to peak characteristics of the measured runoff hydrographs were the most difficult aspects to duplicate. As mentioned previously, microtopographic features which are responsible for surface storage and interactive infiltration have pronounced effects on runoff. However, since the primary goal of the study was to determine *steady-state* runoff intensities, these aspects were not considered critical to the analysis. As a future research effort, the direct effects of interactive infiltration and microtopography on natural dispersion in the highway environment should be pursued.

Several field rainfall simulations produced no measurable runoff from the LID plots under rain-only events, even though applied intensities (21 to 84mm/hr) far exceeding typical moderate duration storm events. With no runoff data generated under rain-only conditions, calibration based on K_s on these plots was only possible when a run-on (highway runoff) component was included in the field rainfall simulation.

Simplified Modeling Procedure

Use of the Fiedler and Ramirez (2000) numerical model produced accurate steady-state runoff intensities related to measured field simulations (Figure 10 and Figure 11). While a valuable tool in the analysis of natural dispersion performance of roadway embankments, the model is somewhat complicated and computationally intensive and may not be a viable method

for widespread use by highway designers. A simplified equation that estimates natural dispersion design parameters given known (or measurable) variables is desired.

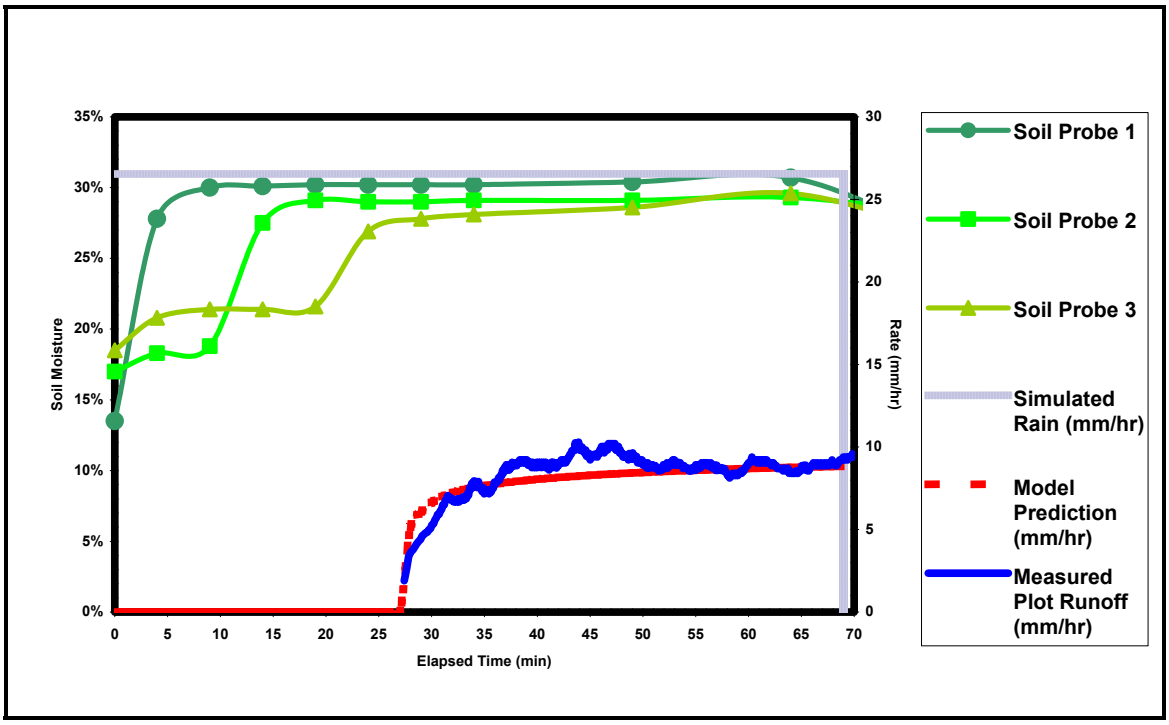

Figure 10. Rainfall/Runoff Hydrograph - Test 6

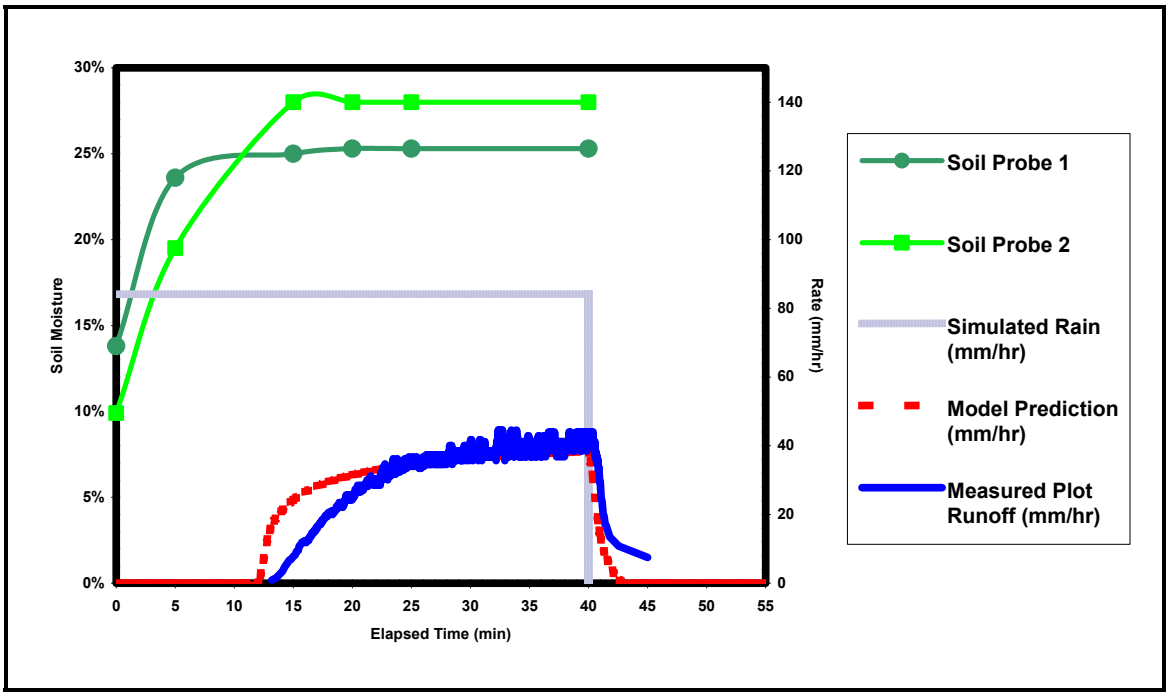

Figure 11. Rainfall/Runoff Hydrograph - Test 16

Current natural dispersion guidelines are not site specific. Additionally, the inclusion of a design rainfall intensity, which varies depending on geographic location for other BMP strategies, is not considered for natural dispersion. This seems to be a significant oversight in the current guidance as highway facilities in the Columbia Basin receive much less precipitation than a majority of western Washington or mountainous locations. Based on this fact, together with the variability of soils throughout the state, a "one size fits all" design approach not based on sound engineering analysis.

Natural Dispersion Design Equation

Typically soil K_s values, roadway width, and embankment slope are known (or measurable) design values. Also, tabulated design storm intensities have been published for all geographic areas in Washington State (WSDOT 2004b). Basing natural dispersion design on these key variables would seem a more responsible and accurate approach than current guidelines. As

shown previously, the most influential physical properties associated with natural dispersion are contributory unit roadway width (hereafter termed "ACP", [L]), rainfall intensity (r_i), and saturated hydraulic conductivity (K_s). The unknown variable to be determined is the length of LID area [L] perpendicular to the roadway. Applying these variables into a simplified flow balance results in Equation 6:

$$\frac{ACP \cdot r_i + LID \cdot (r_i - K_s)}{(ACP + LID)} = q \qquad \textbf{(6)}$$

Where **ACP** and **LID** are lengths of unit width [L^2] with all other variables defined previously. Knowing that the purpose of natural dispersion is to infiltrate all rain and highway runoff, **q** can be set = 0 and Equation 6 can be rearranged to solve for the design parameter **LID** in the form of Equation 7 (hereafter referred to as the LID design equation):

$$LID = \frac{ACP}{\frac{K_s}{r_i} - 1} \qquad \textbf{(7)}$$

Equation 7 is based on the unit width principle applied to this analysis; therefore, since both the **ACP** and **LID** variables have units of [L^2] and are the same width (assumed 1m), by dividing by the unit width we can reduce the units of each variable to that of [L], consistent with the variables being considered. Equally, Equation 7 assumes fully saturated soil conditions with a hydraulic gradient equal to unity (gravity flow).

Multiple simulations using the Fiedler and Ramirez (2000) model were run using various combinations of impervious surface length (ACP), LID area length (LID), K_s, and r_i. Model output was compared to the results of the simplified Equation 6 using the same input variables. Agreement between the two methods was very good, as shown in Figure 12. With all

combinations of realistic field conditions simulated, the equation consistently predicted the resulting runoff to within 6% of that determined by the computer model, although in all cases the differences should be considered minor and is most likely the result of modeling simplifications. Equation 7 is therefore a valid estimator of appropriate LID area length given other site-specific variables. If desired, further conservatism could be applied to Equation 7 by inclusion of a correction factor based on the potential for subsurface return flow as observed in other studies. However, since the use of K_s as the primary infiltration parameter is included in Equation 7, it should be noted that the situation represented by the equation is, in all reality, a very conservative method of analysis.

Determination of design rainfall intensity is critical for the implementation of Equation 7 for natural dispersion design. Since the equation includes only a single intensity value, the basis

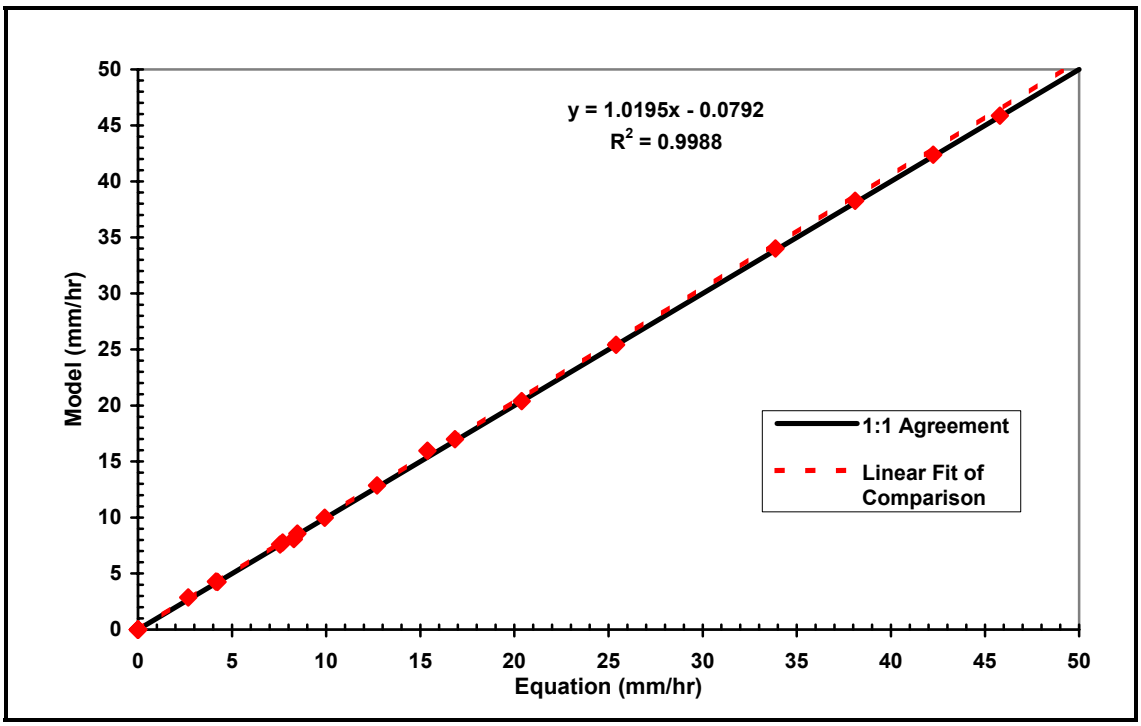

Figure 12. Comparison of Model and Equation 6 for Steady-State Runoff

for its use is from a maximum flow rate standpoint. Therefore, if the peak design rainfall intensity for a given site can be attenuated, all subsequent lower intensities will also be infiltrated in the LID area as long as the embankment soil has the capacity to infiltrate the entire volume. For the same duration, all modeling simulations used to evaluate Equations 6 and 7 assumed fully saturated conditions, therefore K_s does in fact equal the long-term infiltration rate (Chow et al. 1988). However, if hydraulic gradients are reduced below unity due to water mounding in the vadose zone, resulting in a lack of soil water capacity, the actual infiltration rate will be reduced below K_s based on Darcy's Law (Freeze and Cherry 1979; Massman 2003).

The dry soil depth (**L**), necessary to infiltrate the total cumulative infiltrated water depth (**F**) is related to the porosity of the soil (equal to the saturated soil water content) (Freeze and Cherry 1979) and is given by Equation 8 (Chow et al. 1988):

$$L = \frac{F}{\theta_{sat}} \qquad \textbf{(8)}$$

Where θ_{sat} = saturated volumetric soil water content. For soils with a residual water content, $\Delta\theta$ can be used in place of θ_{sat} in Equation 8 to estimate the necessary soil depth. The Fiedler and Ramirez (2000) model provides cumulative infiltration depth as an output. Although a simple single intensity storm event has a predictable relationship between distance from roadway edge and cumulative infiltration (Figure 13), for multiple intensity storms this relationship is quite complicated and requires a full storm analysis. One such numerical simulation was performed using the long-duration design storm hyetograph provided for BMP quantity control design from WSDOE (2004). The results of the model simulation, using a total 36 hour precipitation depth of 27mm with ACP and LID lengths of 6.1m and 3.1m, respectively, is

shown in Figure 14. As no runoff resulted from this configuration, the depth of infiltration at the very downstream end of the LID plot is equal to the total rainfall depth.

For a majority of the mobile simulations performed in this study, the saturated soil moisture content was approximately 30%. Using Equation 8 and the total depth of infiltrated stormwater from Figure 11 (135 cm), it is easy to determine that the soil depth required (with the given properties) must equal at least 4.5m in the vertical direction below the embankment surface at the edge of pavement to fully infiltrate the runoff. Of course this required depth decreases rapidly with distance from the edge of pavement; on highway embankments, the depth of fill material incorporated into the embankment also decreases with distance from the roadway. The model cannot address the effects of not achieving the required depth of infiltration. Therefore further study or modeling techniques are necessary to fully answer questions relating to soil depth requirements for full infiltration of runoff. It may be realistic, however, to require a necessary soil depth equal to the total depth of runoff evenly distributed across the length of the LID area after applying Equation 8.

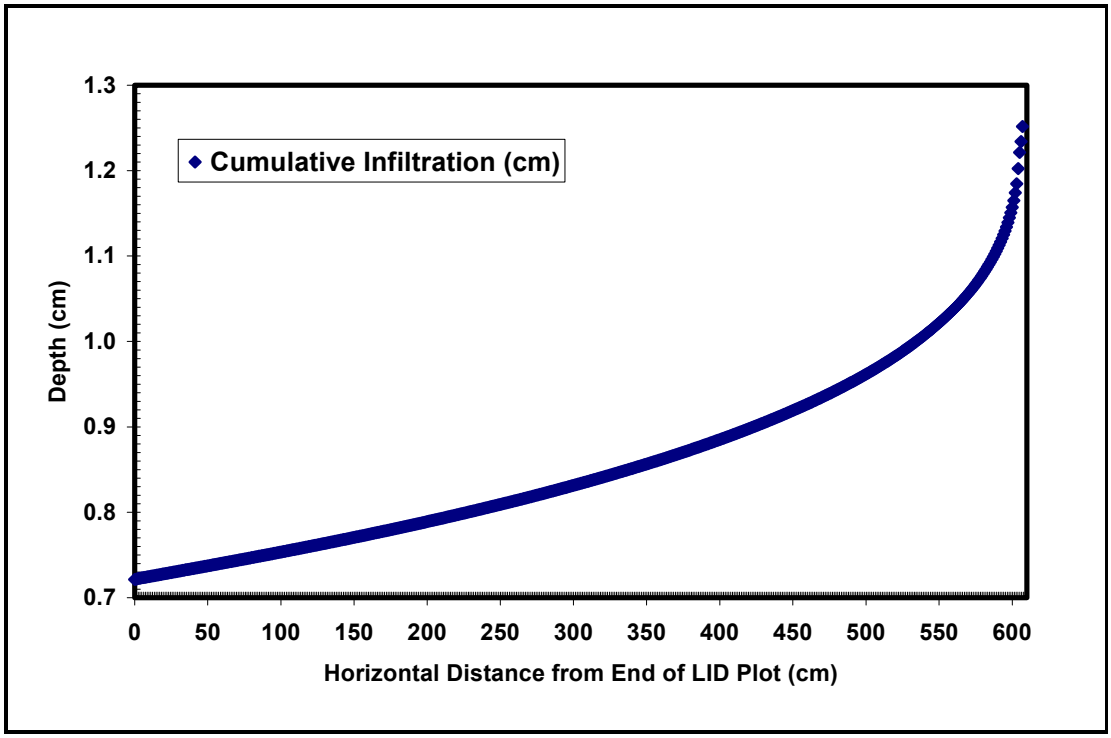

Figure 13. Cumulative Infiltration Across LID Length (Single-Intensity 30 Minute Event)

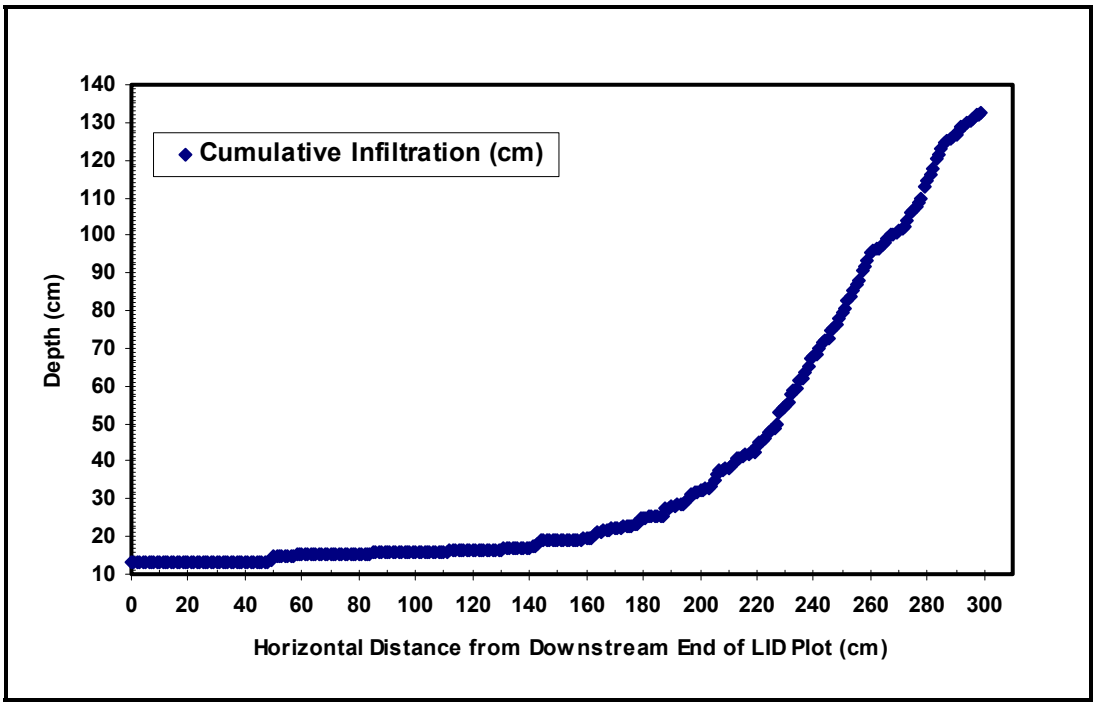

Figure 14. Modeled Cumulative Infiltration Across LID Length (36-Hour Storm)

Evaluation of Existing Regulatory Guidelines

Existing guidelines for natural dispersion design were evaluated using Equation 7. Although the current guidance is not based on design rainfall intensities (a spatial/temporal variable) or variable Ks values, an evaluation of LID scenarios based on the peak 5 minute intensity of the semi-annual 3-hour short-duration thunderstorm (WSDOT 2004b) reveals the current WSDOT guidance varies significantly based on highway location and design variables. This design storm event was chosen based on its high peak intensity and use as the flow-based BMP quality treatment storm event; longer duration quantity treatment design storm events have lower peak intensities. Therefore in a steady-state analysis, if the higher intensity quality treatment design storm is infiltrated, it follows that lower intensity quantity treatment events are also infiltrated within the same LID area length.

Various scenarios to contrast current LID requirements (regardless of embankment slope) against Equation 7 (using the previously selected 3-hour short-duration storm intensity) are shown in Table 6; assumed embankment Ks values have been assigned to illustrate the disparity between the examples. As depicted in Table 7, "N/A" denotes that due to Ks values below the required 102 mm/hr, current WSDOT LID guidance suggests these situations are not appropriate for the use of natural dispersion, although relatively short LID dimensions would satisfy Equation 7. Similarly, where site Ks values exceed the minimum requirement, no reduction in LID length is allowed based on current guidance.

For highway locations high in the Cascade Mountains, such as at Stevens Pass, existing guidance indicates a much shorter LID length as compared to Equation 7 (see TABLE 7). This is due to the higher peak storm intensities found in mountainous areas. For areas such as the Columbia Basin, where peak storm intensities are much smaller than those in the mountains, Equation 7 indicates that existing guidance is too conservative at locations where Ks exceeds

102mm/hr. Unfortunately, should Ks values be anything less than the current minimum value of 102mm/hr, natural dispersion would not be an accepted method of treatment at these locations, even though ample dispersion lengths may be available. Equally, the maximum slope requirement of 7:1 in current guidelines would preclude accounting for any natural dispersion benefit from highway embankments, which (as previously stated) are typically designed to be built at slopes ranging from 6:1 (flattest) to 2:1 (steepest). As shown by this and other studies, for the range of Ks values included, slope angle has little effect on infiltration rates as long as runoff is unconcentrated.

Table 6. Current LID Application Requirements vs. Equation 7

Highway Location	Roadway Width (m)	Embankment K_{sat} Value (mm/hr)	Current WSDOT LID Length Guidance (m)	Equation 7 LID Length Requirement (m)
Stevens Pass	14.0	152	5.0	8.0
Stevens Pass	14.0	102	5.0	16.6
Stevens Pass	6.1	102	3.0	7.2
Wenatchee	14.0	152	5.0	2.4
Wenatchee	14.0	75	N/A	5.9
Wenatchee	6.1	75	N/A	2.6
Moses Lake	14.0	152	5.0	2.1
Moses Lake	14.0	102	5.0	3.4
Moses Lake	6.1	50	N/A	4.0
Spokane	14.0	152	5.0	2.9
Spokane	14.0	102	5.0	4.7
Spokane	6.1	102	3.0	2.1

By basing LID lengths on available infiltration values and temporal rainfall intensities, using Equation 7 shows the existing guidance to be inaccurate in prescribing required dispersion lengths, especially for scenarios where the Ks/ri ratios approach unity and where Ks values are less than currently required (102 mm/hr) where natural dispersion is not allowed. It is apparent that for situations that dominate rural highway settings, particularly those in eastern Washington, such as low storm peak intensities and 2-lane highways, natural dispersion should be applied based on the results of Equation 7. Equally, requiring LID area slopes to be no steeper than 7:1 is not supported by the current research.

CONCLUSIONS

Effective stormwater quantity treatment remains an ongoing challenge for highway engineers due to the expansive linear nature of non-urban roadways. Centralized treatment strategies, such as wet-ponds and infiltration basins require containment and conveyance infrastructure to function effectively. Equally, significant real estate requirements and routine maintenance needs make these BMPs difficult to implement. New concepts in stormwater treatment known as *low impact development*, which focus on decentralized strategies such as natural dispersion, may be a viable solution.

Natural dispersion seeks to treat highway stormwater runoff by allowing non-concentrated flows to infiltrate into pervious roadside areas without the need for conveyance or detention facilities. However, current design guidelines for such measures are based on existing stormwater quality BMP methodologies and have previously not been investigated as to their suitability; in some cases the resulting requirements are too conservative and cannot be met by most rural roadside areas – in other cases, natural dispersion lengths in insufficient. In addition,

these guidelines are based on only two variables and formulated without any empirical data or hydrologic modeling.

This research effort has evaluated the use of natural dispersion at various locations in Washington State. By coupling field experiments with numerical modeling, a relationship between measurable design variables (i.e. saturated hydraulic conductivity, roadway width, rainfall intensity, and roadway embankment (LID) length) has been determined. This relationship is captured by Equation 7 (the LID design equation) and is site specific, allowing highway engineers to tailor natural dispersion requirements to various locations throughout Washington. Equally, the effects of slope on runoff did not correlated through either analysis of field data or numeric modeling. These results indicate that natural dispersion should prove to be a very useful method of stormwater treatment for many major multi-lane highways in eastern Washington as well as most rural arterials throughout the state without the acquisition of additional rights of way. A summary of recommended changes to existing natural dispersion evaluation guidance is as follows:

1) Revises LID slope requirements to include up to 3:1 slopes
2) Incorporate Equation 7 to specify required LID length based on:
    a. Contributory roadway width (ACP)
    b. Measured K_s values
    c. Design rainfall intensities

One remaining challenge in the implementation of the LID design equation is the determination of the saturated hydraulic conductivity related to the LID areas. Current methods of K_s measurement at WSDOT involve the use of soil sieve analyses based on regression data for western Washington soils. While this method is a widely accepted practice for infiltration pond

design, its correlation with surface infiltration values is highly variable and partially dependent on soil sampling procedures and compaction. Similarly, the method currently in use was not intended for surface infiltration facilities. Further study on alternative methods to determine the important K_s parameter, such as direct measurement procedures like the Guelph Permeameter, should therefore be pursued. Regardless, the results of this research clearly produced a reliable method of natural dispersion analysis that should be incorporated into stormwater design procedures in lieu of the current guidelines in Washington State.

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APPENDICES

APPENDIX A

RAINFALL SIMULATION DATA

MOBILE TEST #1 (TEST 1)

9/28/2004
Spokane Static Site
US 2 MP 298.4 - LT

Plot Parameters
Slope: 6:1
Length (cm): 195
Width (cm): 103
Plot Area (m^2): 2.01
Vegitation: sparse ryegrass (50%)
Initial Theta: 10.7%
Final Theta: 27.3%
dtheta: 16.7%

Start Time: 12:40:00
End Time: 13:10:00
Test Duration: *0:30:00*
Model Plot Area (m^2): 10.95

Estimated Ke (from model):

mm/hr	*cm/s*
9.0	2.50E-04

Weather Conditions
Temp: 25C
RH: 60%

Normalized Rates		**Volumetric Rates**	
Max Runoff Rate (mm/hr):	*24.2*	*(L/min):*	*4.41*
Inflow Rate (mm/hr):	*25.4*	*(L/min):*	*4.64*
Runoff Percentage:	*95.2%*		*95.2%*

Month	*day*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
9	28	12	40	0	0	0	0.00	0.0	0.00	0.000	0.000	0.00	0.0
9	28	12	46	24.5	384.50	385	6.41	0.2	0.01	0.001	0.000	0.01	0.2
9	28	12	46	34.5	10.00	395	6.58	6.0	0.32	0.043	0.001	0.26	6.7
9	28	12	46	42.5	8.00	403	6.71	7.5	0.40	0.054	0.002	0.33	8.4
9	28	12	46	49.5	7.00	410	6.83	8.6	0.46	0.062	0.002	0.38	9.6
9	28	12	46	56.5	7.00	417	6.94	8.6	0.46	0.062	0.002	0.38	9.6
9	28	12	47	3	6.50	423	7.05	9.2	0.50	0.066	0.002	0.41	10.3
9	28	12	47	9	6.00	429	7.15	10.0	0.54	0.072	0.002	0.44	11.2
9	28	12	47	15	6.00	435	7.25	10.0	0.54	0.072	0.002	0.44	11.2
9	28	12	47	20.5	5.50	441	7.34	10.9	0.59	0.078	0.002	0.48	12.2
9	28	12	47	25.5	5.00	446	7.43	12.0	0.65	0.086	0.002	0.53	13.4
9	28	12	47	31.5	6.00	452	7.53	10.0	0.54	0.072	0.002	0.44	11.2
9	28	12	47	36	4.50	456	7.60	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	47	41.5	5.50	462	7.69	10.9	0.59	0.078	0.002	0.48	12.2
9	28	12	47	46	4.50	466	7.77	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	47	51.5	5.50	472	7.86	10.9	0.59	0.078	0.002	0.48	12.2
9	28	12	47	56	4.50	476	7.93	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	48	1	5.00	481	8.02	12.0	0.65	0.086	0.002	0.53	13.4
9	28	12	48	6	5.00	486	8.10	12.0	0.65	0.086	0.002	0.53	13.4
9	28	12	48	10.5	4.50	491	8.18	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	48	15	4.50	495	8.25	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	48	19	4.00	499	8.32	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	48	23.5	4.50	504	8.39	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	48	28	4.50	508	8.47	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	48	32.5	4.50	513	8.54	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	48	36.5	4.00	517	8.61	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	48	40.5	4.00	521	8.68	15.0	0.81	0.108	0.003	0.66	16.7

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	12	48	45	4.50	525	8.75	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	48	49	4.00	529	8.82	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	48	53	4.00	533	8.88	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	48	57	4.00	537	8.95	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	1	4.00	541	9.02	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	5	4.00	545	9.08	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	9	4.00	549	9.15	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	12.5	3.50	553	9.21	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	49	16.5	4.00	557	9.28	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	20	3.50	560	9.33	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	49	24	4.00	564	9.40	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	27.5	3.50	568	9.46	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	49	32	4.50	572	9.53	13.3	0.72	0.096	0.003	0.59	14.9
9	28	12	49	35.5	3.50	576	9.59	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	49	39.5	4.00	580	9.66	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	43.5	4.00	584	9.73	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	47.5	4.00	588	9.79	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	49	51	3.50	591	9.85	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	49	54.5	3.50	595	9.91	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	49	58.5	4.00	599	9.98	15.0	0.81	0.108	0.003	0.66	16.7
9	28	12	50	2	3.50	602	10.03	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	5.5	3.50	606	10.09	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	9	3.50	609	10.15	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	12.5	3.50	613	10.21	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	16	3.50	616	10.27	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	19.5	3.50	620	10.33	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	23	3.50	623	10.38	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	26.5	3.50	627	10.44	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	29.5	3.00	630	10.49	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	50	33	3.50	633	10.55	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	36.5	3.50	637	10.61	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	39.5	3.00	640	10.66	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	50	43	3.50	643	10.72	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	46.5	3.50	647	10.78	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	50	3.50	650	10.83	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	50	53	3.00	653	10.88	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	50	56.5	3.50	657	10.94	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	0	3.50	660	11.00	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	3.5	3.50	664	11.06	17.1	0.92	0.123	0.003	0.75	19.1

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	12	51	6.5	3.00	667	11.11	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	10	3.50	670	11.17	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	13	3.00	673	11.22	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	16	3.00	676	11.27	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	19.5	3.50	680	11.33	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	23	3.50	683	11.38	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	26	3.00	686	11.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	29	3.00	689	11.48	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	32.5	3.50	693	11.54	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	35.5	3.00	696	11.59	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	38.5	3.00	699	11.64	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	42	3.50	702	11.70	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	45	3.00	705	11.75	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	48.5	3.50	709	11.81	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	52	3.50	712	11.87	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	51	55	3.00	715	11.92	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	51	58	3.00	718	11.97	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	1.5	3.50	722	12.03	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	52	4.5	3.00	725	12.08	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	7.5	3.00	728	12.13	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	10.5	3.00	731	12.18	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	14	3.50	734	12.23	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	52	17	3.00	737	12.28	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	20	3.00	740	12.33	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	23.5	3.50	744	12.39	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	52	26.5	3.00	747	12.44	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	29.5	3.00	750	12.49	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	33	3.50	753	12.55	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	52	36	3.00	756	12.60	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	39.5	3.50	760	12.66	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	52	42	2.50	762	12.70	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	52	45.5	3.50	766	12.76	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	52	48.5	3.00	769	12.81	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	52	3.50	772	12.87	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	52	55	3.00	775	12.92	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	52	58	3.00	778	12.97	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	1	3.00	781	13.02	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	4.5	3.50	785	13.08	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	53	7.5	3.00	788	13.13	20.0	1.08	0.144	0.004	0.88	22.3

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	12	53	10.5	3.00	791	13.18	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	13.5	3.00	794	13.23	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	17	3.50	797	13.28	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	53	20	3.00	800	13.33	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	23.5	3.50	804	13.39	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	53	26.5	3.00	807	13.44	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	30	3.50	810	13.50	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	53	33	3.00	813	13.55	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	36	3.00	816	13.60	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	39	3.00	819	13.65	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	42.5	3.50	823	13.71	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	53	45.5	3.00	826	13.76	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	48.5	3.00	829	13.81	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	51.5	3.00	832	13.86	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	54.5	3.00	835	13.91	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	53	57.5	3.00	838	13.96	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	1	3.50	841	14.02	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	54	4	3.00	844	14.07	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	7	3.00	847	14.12	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	10	3.00	850	14.17	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	13	3.00	853	14.22	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	16	3.00	856	14.27	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	19.5	3.50	860	14.33	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	54	22.5	3.00	863	14.38	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	25.5	3.00	866	14.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	28.5	3.00	869	14.48	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	31.5	3.00	872	14.53	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	34	2.50	874	14.57	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	54	37.5	3.50	878	14.63	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	54	40	2.50	880	14.67	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	54	43.5	3.50	884	14.73	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	54	46	2.50	886	14.77	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	54	49	3.00	889	14.82	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	52	3.00	892	14.87	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	55	3.00	895	14.92	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	54	58	3.00	898	14.97	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	1	3.00	901	15.02	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	4	3.00	904	15.07	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	7	3.00	907	15.12	20.0	1.08	0.144	0.004	0.88	22.3

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	12	55	10	3.00	910	15.17	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	13.5	3.50	914	15.23	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	55	16	2.50	916	15.27	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	55	19.5	3.50	920	15.33	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	55	22	2.50	922	15.37	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	55	25.5	3.50	926	15.43	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	55	28	2.50	928	15.47	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	55	31.5	3.50	932	15.53	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	55	34	2.50	934	15.57	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	55	37.5	3.50	938	15.63	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	55	40.5	3.00	941	15.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	43.5	3.00	944	15.73	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	46.5	3.00	947	15.78	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	49.5	3.00	950	15.83	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	55	52	2.50	952	15.87	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	55	55.5	3.50	956	15.93	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	55	58	2.50	958	15.97	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	56	1.5	3.50	962	16.03	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	56	4	2.50	964	16.07	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	56	7.5	3.50	968	16.13	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	56	10	2.50	970	16.17	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	56	13.5	3.50	974	16.23	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	56	16	2.50	976	16.27	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	56	19	3.00	979	16.32	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	22	3.00	982	16.37	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	25	3.00	985	16.42	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	28	3.00	988	16.47	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	31	3.00	991	16.52	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	34	3.00	994	16.57	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	37.5	3.50	998	16.63	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	56	40.5	3.00	1001	16.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	43.5	3.00	1004	16.73	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	46.5	3.00	1007	16.78	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	49.5	3.00	1010	16.83	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	52.5	3.00	1013	16.88	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	55.5	3.00	1016	16.93	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	56	58.5	3.00	1019	16.98	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	1.5	3.00	1022	17.03	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	4.5	3.00	1025	17.08	20.0	1.08	0.144	0.004	0.88	22.3

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	12	57	7.5	3.00	1028	17.13	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	10.5	3.00	1031	17.18	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	14	3.50	1034	17.23	17.1	0.92	0.123	0.003	0.75	19.1
9	28	12	57	17	3.00	1037	17.28	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	20	3.00	1040	17.33	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	23	3.00	1043	17.38	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	26	3.00	1046	17.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	29	3.00	1049	17.48	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	32	3.00	1052	17.53	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	34.5	2.50	1055	17.58	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	57	37.5	3.00	1058	17.63	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	40.5	3.00	1061	17.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	43.5	3.00	1064	17.73	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	46.5	3.00	1067	17.78	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	49.5	3.00	1070	17.83	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	52.5	3.00	1073	17.88	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	55.5	3.00	1076	17.93	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	57	58	2.50	1078	17.97	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	58	1	3.00	1081	18.02	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	3.5	2.50	1084	18.06	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	58	6.5	3.00	1087	18.11	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	9	2.50	1089	18.15	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	58	12	3.00	1092	18.20	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	15	3.00	1095	18.25	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	18	3.00	1098	18.30	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	21	3.00	1101	18.35	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	24	3.00	1104	18.40	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	27	3.00	1107	18.45	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	30	3.00	1110	18.50	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	33	3.00	1113	18.55	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	36	3.00	1116	18.60	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	38.5	2.50	1119	18.64	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	58	41.5	3.00	1122	18.69	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	44.5	3.00	1125	18.74	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	47.5	3.00	1128	18.79	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	50.5	3.00	1131	18.84	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	53.5	3.00	1134	18.89	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	56.5	3.00	1137	18.94	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	58	59	2.50	1139	18.98	24.0	1.29	0.173	0.005	1.05	26.8

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	12	59	2	3.00	1142	19.03	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	5	3.00	1145	19.08	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	8	3.00	1148	19.13	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	11	3.00	1151	19.18	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	14	3.00	1154	19.23	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	17	3.00	1157	19.28	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	20	3.00	1160	19.33	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	23	3.00	1163	19.38	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	26	3.00	1166	19.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	29	3.00	1169	19.48	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	32	3.00	1172	19.53	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	35	3.00	1175	19.58	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	37.5	2.50	1178	19.63	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	59	40.5	3.00	1181	19.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	43	2.50	1183	19.72	24.0	1.29	0.173	0.005	1.05	26.8
9	28	12	59	46	3.00	1186	19.77	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	49	3.00	1189	19.82	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	52	3.00	1192	19.87	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	55	3.00	1195	19.92	20.0	1.08	0.144	0.004	0.88	22.3
9	28	12	59	58	3.00	1198	19.97	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	0.5	2.50	1201	20.01	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	0	3.5	3.00	1204	20.06	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	6.5	3.00	1207	20.11	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	9	2.50	1209	20.15	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	0	12	3.00	1212	20.20	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	15	3.00	1215	20.25	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	17.5	2.50	1218	20.29	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	0	20.5	3.00	1221	20.34	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	23	2.50	1223	20.38	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	0	26	3.00	1226	20.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	29	3.00	1229	20.48	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	32	3.00	1232	20.53	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	35	3.00	1235	20.58	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	38	3.00	1238	20.63	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	41	3.00	1241	20.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	44	3.00	1244	20.73	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	47	3.00	1247	20.78	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	50	3.00	1250	20.83	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	0	52.5	2.50	1253	20.88	24.0	1.29	0.173	0.005	1.05	26.8

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	13	0	56	3.50	1256	20.93	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	0	59	3.00	1259	20.98	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	2	3.00	1262	21.03	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	5	3.00	1265	21.08	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	8	3.00	1268	21.13	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	10.5	2.50	1271	21.18	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	1	13.5	3.00	1274	21.23	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	16.5	3.00	1277	21.28	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	20	3.50	1280	21.33	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	1	22.5	2.50	1283	21.38	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	1	25.5	3.00	1286	21.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	28.5	3.00	1289	21.48	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	32	3.50	1292	21.53	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	1	34.5	2.50	1295	21.58	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	1	37.5	3.00	1298	21.63	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	40.5	3.00	1301	21.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	43.5	3.00	1304	21.73	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	46	2.50	1306	21.77	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	1	49	3.00	1309	21.82	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	51.5	2.50	1312	21.86	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	1	54.5	3.00	1315	21.91	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	1	57.5	3.00	1318	21.96	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	0.5	3.00	1321	22.01	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	3.5	3.00	1324	22.06	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	6.5	3.00	1327	22.11	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	9	2.50	1329	22.15	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	2	12.5	3.50	1333	22.21	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	2	15	2.50	1335	22.25	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	2	18	3.00	1338	22.30	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	20.5	2.50	1341	22.34	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	2	23.5	3.00	1344	22.39	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	26	2.50	1346	22.43	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	2	29.5	3.50	1350	22.49	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	2	32	2.50	1352	22.53	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	2	35	3.00	1355	22.58	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	38	3.00	1358	22.63	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	41	3.00	1361	22.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	43.5	2.50	1364	22.73	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	2	46.5	3.00	1367	22.78	20.0	1.08	0.144	0.004	0.88	22.3

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	13	2	49.5	3.00	1370	22.83	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	52.5	3.00	1373	22.88	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	55.5	3.00	1376	22.93	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	2	58.5	3.00	1379	22.98	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	1.5	3.00	1382	23.03	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	4.5	3.00	1385	23.08	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	7	2.50	1387	23.12	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	10.5	3.50	1391	23.18	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	3	13	2.50	1393	23.22	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	16	3.00	1396	23.27	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	19	3.00	1399	23.32	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	21.5	2.50	1402	23.36	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	24	2.50	1404	23.40	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	27	3.00	1407	23.45	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	29.5	2.50	1410	23.49	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	32.5	3.00	1413	23.54	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	35	2.50	1415	23.58	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	38	3.00	1418	23.63	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	40.5	2.50	1421	23.68	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	43	2.50	1423	23.72	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	46	3.00	1426	23.77	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	3	48.5	2.50	1429	23.81	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	51	2.50	1431	23.85	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	3	54.5	3.50	1435	23.91	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	3	57	2.50	1437	23.95	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	0	3.00	1440	24.00	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	2.5	2.50	1443	24.04	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	5.5	3.00	1446	24.09	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	8.5	3.00	1449	24.14	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	11	2.50	1451	24.18	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	13.5	2.50	1454	24.23	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	16.5	3.00	1457	24.28	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	19.5	3.00	1460	24.33	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	22.5	3.00	1463	24.38	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	25	2.50	1465	24.42	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	28	3.00	1468	24.47	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	30.5	2.50	1471	24.51	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	33.5	3.00	1474	24.56	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	36	2.50	1476	24.60	24.0	1.29	0.173	0.005	1.05	26.8

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	13	4	38.5	2.50	1479	24.64	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	41.5	3.00	1482	24.69	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	44.5	3.00	1485	24.74	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	47	2.50	1487	24.78	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	49.5	2.50	1490	24.83	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	52	2.50	1492	24.87	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	4	55	3.00	1495	24.92	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	4	57.5	2.50	1498	24.96	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	0.5	3.00	1501	25.01	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	3	2.50	1503	25.05	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	6	3.00	1506	25.10	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	8.5	2.50	1509	25.14	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	11.5	3.00	1512	25.19	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	14	2.50	1514	25.23	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	17	3.00	1517	25.28	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	19.5	2.50	1520	25.33	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	22	2.50	1522	25.37	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	25	3.00	1525	25.42	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	28	3.00	1528	25.47	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	30.5	2.50	1531	25.51	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	33.5	3.00	1534	25.56	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	36	2.50	1536	25.60	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	39	3.00	1539	25.65	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	41.5	2.50	1542	25.69	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	44.5	3.00	1545	25.74	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	47	2.50	1547	25.78	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	50	3.00	1550	25.83	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	5	52.5	2.50	1553	25.88	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	55	2.50	1555	25.92	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	5	57.5	2.50	1558	25.96	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	0.5	3.00	1561	26.01	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	3	2.50	1563	26.05	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	6	3.00	1566	26.10	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	8.5	2.50	1569	26.14	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	11.5	3.00	1572	26.19	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	14	2.50	1574	26.23	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	17	3.00	1577	26.28	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	19.5	2.50	1580	26.33	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	22.5	3.00	1583	26.38	20.0	1.08	0.144	0.004	0.88	22.3

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	13	6	25.5	3.00	1586	26.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	28.5	3.00	1589	26.48	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	31	2.50	1591	26.52	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	34	3.00	1594	26.57	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	36.5	2.50	1597	26.61	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	39.5	3.00	1600	26.66	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	42	2.50	1602	26.70	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	45	3.00	1605	26.75	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	48	3.00	1608	26.80	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	51	3.00	1611	26.85	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	53.5	2.50	1614	26.89	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	6	56.5	3.00	1617	26.94	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	6	59.5	3.00	1620	26.99	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	2.5	3.00	1623	27.04	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	5	2.50	1625	27.08	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	8	3.00	1628	27.13	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	10.5	2.50	1631	27.18	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	13.5	3.00	1634	27.23	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	16	2.50	1636	27.27	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	19	3.00	1639	27.32	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	21.5	2.50	1642	27.36	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	24.5	3.00	1645	27.41	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	27.5	3.00	1648	27.46	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	30	2.50	1650	27.50	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	33	3.00	1653	27.55	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	35.5	2.50	1656	27.59	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	38.5	3.00	1659	27.64	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	41	2.50	1661	27.68	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	44	3.00	1664	27.73	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	47	3.00	1667	27.78	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	49.5	2.50	1670	27.83	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	52.5	3.00	1673	27.88	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	7	55	2.50	1675	27.92	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	7	58	3.00	1678	27.97	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	0.5	2.50	1681	28.01	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	3	2.50	1683	28.05	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	6	3.00	1686	28.10	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	8.5	2.50	1689	28.14	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	11	2.50	1691	28.18	24.0	1.29	0.173	0.005	1.05	26.8

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	13	8	14	3.00	1694	28.23	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	16.5	2.50	1697	28.28	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	19.5	3.00	1700	28.33	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	22	2.50	1702	28.37	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	24.5	2.50	1705	28.41	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	27	2.50	1707	28.45	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	30	3.00	1710	28.50	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	32.5	2.50	1713	28.54	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	35.5	3.00	1716	28.59	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	38	2.50	1718	28.63	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	41	3.00	1721	28.68	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	43.5	2.50	1724	28.73	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	46.5	3.00	1727	28.78	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	49	2.50	1729	28.82	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	8	52	3.00	1732	28.87	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	55	3.00	1735	28.92	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	8	58	3.00	1738	28.97	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	0.5	2.50	1741	29.01	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	3.5	3.00	1744	29.06	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	6	2.50	1746	29.10	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	9	3.00	1749	29.15	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	11.5	2.50	1752	29.19	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	14.5	3.00	1755	29.24	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	17	2.50	1757	29.28	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	20	3.00	1760	29.33	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	22.5	2.50	1763	29.38	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	25.5	3.00	1766	29.43	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	28	2.50	1768	29.47	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	31	3.00	1771	29.52	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	34	3.00	1774	29.57	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	36.5	2.50	1777	29.61	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	39	2.50	1779	29.65	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	42	3.00	1782	29.70	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	44.5	2.50	1785	29.74	24.0	1.29	0.173	0.005	1.05	26.8
9	28	13	9	47.5	3.00	1788	29.79	20.0	1.08	0.144	0.004	0.88	22.3
9	28	13	9	51	3.50	1791	29.85	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	9	54.5	3.50	1795	29.91	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	9	58	3.50	1798	29.97	17.1	0.92	0.123	0.003	0.75	19.1
9	28	13	10	2.5	4.50	1803	30.04	13.3	0.72	0.096	0.003	0.59	14.9

TEST 1

Month	day	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	13	10	7	4.50	1807	30.12	13.3	0.72	0.096	0.003	0.59	14.9
9	28	13	10	13	6.00	1813	30.22	10.0	0.54	0.072	0.002	0.44	11.2
9	28	13	10	18.5	5.50	1819	30.31	10.9	0.59	0.078	0.002	0.48	12.2
9	28	13	10	25.5	7.00	1826	30.43	8.6	0.46	0.062	0.002	0.38	9.6
9	28	13	10	33.5	8.00	1834	30.56	7.5	0.40	0.054	0.002	0.33	8.4
9	28	13	10	43	9.50	1843	30.72	6.3	0.34	0.045	0.001	0.28	7.0
9	28	13	10	53.5	10.50	1854	30.89	5.7	0.31	0.041	0.001	0.25	6.4
9	28	13	11	6	12.50	1866	31.10	4.8	0.26	0.035	0.001	0.21	5.4
9	28	13	11	19.5	13.50	1880	31.33	4.4	0.24	0.032	0.001	0.20	5.0
9	28	13	11	36.5	17.00	1897	31.61	3.5	0.19	0.025	0.001	0.16	3.9
9	28	13	11	56.5	20.00	1917	31.94	3.0	0.16	0.022	0.001	0.13	3.3
9	28	13	12	23	26.50	1943	32.38	2.3	0.12	0.016	0.000	0.10	2.5
9	28	13	13	6	43.00	1986	33.10	1.4	0.08	0.010	0.000	0.06	1.6

TEST 1

Applied Rain and Runon Quantities

Time (min)	*Rain (mm/hr)*	*Runon (gal/min)*	*Runon (m^3/min)*	*Runon (ft^3/min)*	*Associated Impervious Lenth (m)*	*Associated Impervious Lenth (ft)*	*Total inflow (m3/min)*	*Total inflow (ft3/min)*	*Effective Inflow to Plot Only (mm/hr)*
0	25.4	1.0	3.79E-03	0.134	8.68	28.5	4.64E-03	0.164	138.5
30.00	25.4	1.0	3.79E-03	0.134	8.68	28.5	4.64E-03	0.164	138.5
30.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Calibrated Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)
1	1.0	60	1.00	1.00
2	1.0		1.00	25.4
3	1.0		1.00	
4	1.0		1.00	

TEST 1

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2
12:36	0	9.7%	11.6%
12:45	4.33	26.5%	13.9%
12:50	9.33	26.4%	27.3%
12:55	14.33	26.4%	27.4%
13:00	19.33	26.4%	28.1%
13:05	24.33	26.5%	27.4%
13:40	59.33	24.2%	22.1%

Probe Locations:	from top (cm)
Probe 1:	46
Probe 2:	145

Average Initial Moisture:	**10.7%**
Average Max Moisture:	**27.3%**
dtheta:	**16.7%**

TEST 1

LID 1

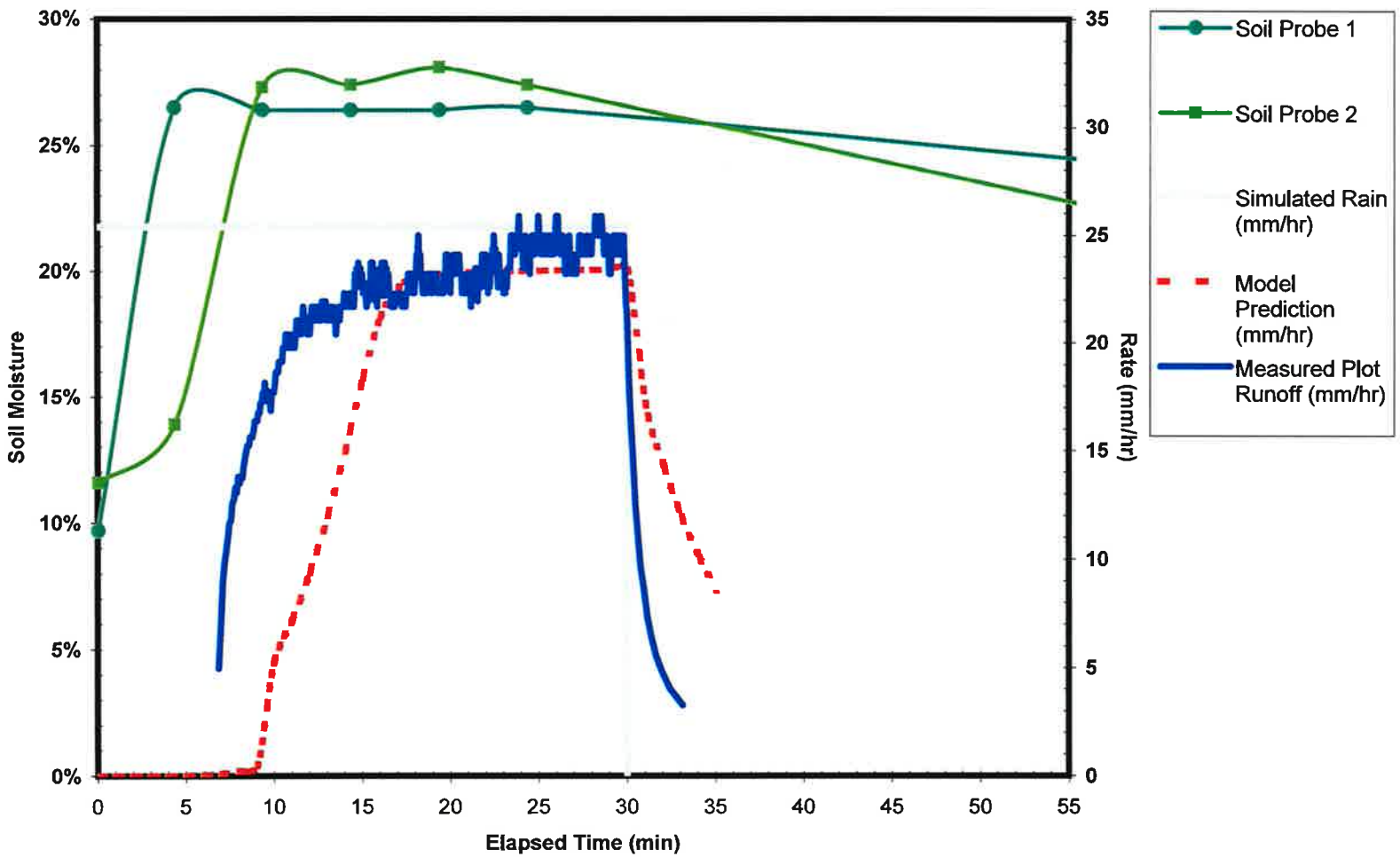
phi:	1.0	*dtheta*	17%
Ks:	2.50E-04	*Ko:*	7500

		EPS		END OF PLOT				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0.00E+00	0.0	0.00E+00	0.0	23.4	24.2	-3.2%
60	1	1.06E-06	0.0	0.00E+00	0.0			
120	2	2.68E-06	0.1	0.00E+00	0.0			
180	3	6.06E-06	0.2	0.00E+00	0.0			
240	4	1.36E-05	0.5	3.00E-08	0.0			
300	5	2.52E-05	0.9	2.50E-07	0.0			
360	6	4.24E-05	1.5	1.03E-06	0.0			
420	7	6.62E-05	2.4	2.86E-06	0.1			
480	8	9.77E-05	3.5	6.42E-06	0.2			
540	9	1.38E-04	5.0	1.25E-05	0.4			
600	10	1.88E-04	6.8	1.47E-04	5.3			
660	11	2.50E-04	9.0	1.99E-04	7.2			
720	12	3.23E-04	11.6	2.61E-04	9.4			
780	13	4.10E-04	14.7	3.32E-04	12.0			
840	14	5.10E-04	18.4	4.15E-04	14.9			
900	15	6.12E-04	22.0	5.09E-04	18.3			
960	16	6.76E-04	24.3	5.89E-04	21.2			
1020	17	7.00E-04	25.2	6.27E-04	22.6			
1080	18	7.07E-04	25.5	6.39E-04	23.0			
1140	19	7.10E-04	25.5	6.44E-04	23.2			
1200	20	7.10E-04	25.6	6.45E-04	23.2			
1260	21	7.11E-04	25.6	6.46E-04	23.3			
1320	22	7.11E-04	25.6	6.47E-04	23.3			
1380	23	7.11E-04	25.6	6.48E-04	23.3			
1440	24	7.11E-04	25.6	6.48E-04	23.3			
1500	25	7.11E-04	25.6	6.48E-04	23.3			
1560	26	7.11E-04	25.6	6.49E-04	23.4			
1620	27	7.11E-04	25.6	6.49E-04	23.4			
1680	28	7.11E-04	25.6	6.49E-04	23.4			
1740	29	7.11E-04	25.6	6.50E-04	23.4			
1800	30	7.11E-04	25.6	6.50E-04	23.4			
1860	31	5.87E-04	21.1	4.78E-04	17.2			
1920	32	4.94E-04	17.8	3.97E-04	14.3			
1980	33	4.21E-04	15.2	3.32E-04	12.0			
2040	34	3.62E-04	13.0	2.80E-04	10.1			
2100	35	3.15E-04	11.3	2.38E-04	8.6			

TEST 1

FIGURE A-1

Rain/Runoff Hydrograph - 1



TEST 1

MOBILE TEST #1 (TEST 2)

9/28/2004
Spokane Static Site
US 2 MP 298.4 - LT

Plot Parameters

Slope:	**6:1**	**Start Time:**	14:42:00
Length (cm):	**192**	**End Time:**	15:40:00
Width (cm):	**102**	**Test Duration:**	***0:58:00***
Plot Area (m^2):	**1.96**	**Model Plot Area (m^2):**	**10.90**
Vegitation:	**sparse ryegrass (50%)**		
Initial Theta:	**1.6%**		
Final Theta:	**25.3%**		
dtheta:	***23.7%***		

Estimated Ke (from model):

mm/hr	*cm/s*
54.0	*1.50E-03*

Normalized Rates		**Volumetric Rates**	
Max Runoff Rate (mm/hr):	***15.8***	***(L/min):***	*2.87*
Inflow Rate (mm/hr):	***25.4***	***(L/min):***	*4.61*
Runoff Percentage:	***62.2%***		*62.2%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
9	28	4	14	42	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
9	28	4	14	48	30.5	390.50	390.50	6.51	0.15	0.01	0.001	0.000	0.01	0.17
9	28	4	14	53	23.5	293.00	683.50	11.39	0.20	0.01	0.001	0.000	0.01	0.23
9	28	4	14	56	24.5	181.00	864.50	14.41	0.33	0.02	0.002	0.000	0.01	0.37
9	28	4	14	59	28	183.50	1048.00	17.47	0.33	0.02	0.002	0.000	0.01	0.37
9	28	4	15	3	6.5	218.50	1266.50	21.11	0.27	0.01	0.002	0.000	0.01	0.31
9	28	4	15	4	58	111.50	1378.00	22.97	0.54	0.03	0.004	0.000	0.02	0.60
9	28	4	15	5	51.5	53.50	1431.50	23.86	1.12	0.06	0.008	0.000	0.05	1.26
9	28	4	15	6	30.5	39.00	1470.50	24.51	1.54	0.08	0.011	0.000	0.07	1.72
9	28	4	15	6	59	28.50	1499.00	24.98	2.11	0.11	0.015	0.000	0.09	2.36
9	28	4	15	7	21.5	22.50	1521.50	25.36	2.67	0.14	0.019	0.001	0.12	2.99
9	28	4	15	7	43.5	22.00	1543.50	25.73	2.73	0.15	0.020	0.001	0.12	3.06
9	28	4	15	8	2.5	19.00	1562.50	26.04	3.16	0.17	0.023	0.001	0.14	3.54
9	28	4	15	8	21.5	19.00	1581.50	26.36	3.16	0.17	0.023	0.001	0.14	3.54
9	28	4	15	8	37.5	16.00	1597.50	26.63	3.75	0.20	0.027	0.001	0.17	4.20
9	28	4	15	8	53.5	16.00	1613.50	26.89	3.75	0.20	0.027	0.001	0.17	4.20
9	28	4	15	9	8	14.50	1628.00	27.13	4.14	0.22	0.030	0.001	0.18	4.64
9	28	4	15	9	23.5	15.50	1643.50	27.39	3.87	0.21	0.028	0.001	0.17	4.34
9	28	4	15	9	37.5	14.00	1657.50	27.63	4.29	0.23	0.031	0.001	0.19	4.80
9	28	4	15	9	52	14.50	1672.00	27.87	4.14	0.22	0.030	0.001	0.18	4.64
9	28	4	15	10	4.5	12.50	1684.50	28.08	4.80	0.26	0.035	0.001	0.21	5.38
9	28	4	15	10	17	12.50	1697.00	28.28	4.80	0.26	0.035	0.001	0.21	5.38
9	28	4	15	10	27.5	10.50	1707.50	28.46	5.71	0.31	0.041	0.001	0.25	6.41
9	28	4	15	10	38.5	11.00	1718.50	28.64	5.45	0.29	0.039	0.001	0.24	6.11
9	28	4	15	10	48.5	10.00	1728.50	28.81	6.00	0.32	0.043	0.001	0.26	6.73
9	28	4	15	10	59.5	11.00	1739.50	28.99	5.45	0.29	0.039	0.001	0.24	6.11
9	28	4	15	11	9.5	10.00	1749.50	29.16	6.00	0.32	0.043	0.001	0.26	6.73
9	28	4	15	11	20.5	11.00	1760.50	29.34	5.45	0.29	0.039	0.001	0.24	6.11
9	28	4	15	11	30.5	10.00	1770.50	29.51	6.00	0.32	0.043	0.001	0.26	6.73
9	28	4	15	11	40.5	10.00	1780.50	29.68	6.00	0.32	0.043	0.001	0.26	6.73
9	28	4	15	11	49	8.50	1789.00	29.82	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	11	59	10.00	1799.00	29.98	6.00	0.32	0.043	0.001	0.26	6.73
9	28	4	15	12	7.5	8.50	1807.50	30.13	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	12	16.5	9.00	1816.50	30.28	6.67	0.36	0.048	0.001	0.29	7.47
9	28	4	15	12	25	8.50	1825.00	30.42	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	12	35	10.00	1835.00	30.58	6.00	0.32	0.043	0.001	0.26	6.73

TEST 2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	4	15	12	44.5	9.50	1844.50	30.74	6.32	0.34	0.045	0.001	0.28	7.08
9	28	4	15	12	55	10.50	1855.00	30.92	5.71	0.31	0.041	0.001	0.25	6.41
9	28	4	15	13	4	9.00	1864.00	31.07	6.67	0.36	0.048	0.001	0.29	7.47
9	28	4	15	13	13.5	9.50	1873.50	31.23	6.32	0.34	0.045	0.001	0.28	7.08
9	28	4	15	13	21.5	8.00	1881.50	31.36	7.50	0.40	0.054	0.002	0.33	8.41
9	28	4	15	13	30.5	9.00	1890.50	31.51	6.67	0.36	0.048	0.001	0.29	7.47
9	28	4	15	13	38	7.50	1898.00	31.63	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	13	46.5	8.50	1906.50	31.78	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	13	54	7.50	1914.00	31.90	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	14	3	9.00	1923.00	32.05	6.67	0.36	0.048	0.001	0.29	7.47
9	28	4	15	14	11.5	8.50	1931.50	32.19	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	14	21	9.50	1941.00	32.35	6.32	0.34	0.045	0.001	0.28	7.08
9	28	4	15	14	30	9.00	1950.00	32.50	6.67	0.36	0.048	0.001	0.29	7.47
9	28	4	15	14	39.5	9.50	1959.50	32.66	6.32	0.34	0.045	0.001	0.28	7.08
9	28	4	15	14	48	8.50	1968.00	32.80	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	14	57	9.00	1977.00	32.95	6.67	0.36	0.048	0.001	0.29	7.47
9	28	4	15	15	5	8.00	1985.00	33.08	7.50	0.40	0.054	0.002	0.33	8.41
9	28	4	15	15	13.5	8.50	1993.50	33.23	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	15	20.5	7.00	2000.50	33.34	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	15	29	8.50	2009.00	33.48	7.06	0.38	0.051	0.001	0.31	7.91
9	28	4	15	15	36	7.00	2016.00	33.60	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	15	44	8.00	2024.00	33.73	7.50	0.40	0.054	0.002	0.33	8.41
9	28	4	15	15	51	7.00	2031.00	33.85	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	15	59	8.00	2039.00	33.98	7.50	0.40	0.054	0.002	0.33	8.41
9	28	4	15	16	6	7.00	2046.00	34.10	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	16	14	8.00	2054.00	34.23	7.50	0.40	0.054	0.002	0.33	8.41
9	28	4	15	16	20.5	6.50	2060.50	34.34	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	16	28	7.50	2068.00	34.47	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	16	35	7.00	2075.00	34.58	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	16	42.5	7.50	2082.50	34.71	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	16	49	6.50	2089.00	34.82	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	16	56	7.00	2096.00	34.93	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	17	2.5	6.50	2102.50	35.04	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	17	9.5	7.00	2109.50	35.16	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	17	16	6.50	2116.00	35.27	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	17	22.5	6.50	2122.50	35.38	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	17	28.5	6.00	2128.50	35.48	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	17	35.5	7.00	2135.50	35.59	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	17	41	5.50	2141.00	35.68	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	17	48	7.00	2148.00	35.80	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	17	54	6.00	2154.00	35.90	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	18	0.5	6.50	2160.50	36.01	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	18	6.5	6.00	2166.50	36.11	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	18	13.5	7.00	2173.50	36.23	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	18	19.5	6.00	2179.50	36.33	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	18	27	7.50	2187.00	36.45	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	18	33	6.00	2193.00	36.55	10.00	0.54	0.072	0.002	0.44	11.21

TEST 2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	4	15	18	40.5	7.50	2200.50	36.68	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	18	46.5	6.00	2206.50	36.78	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	18	54	7.50	2214.00	36.90	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	19	0	6.00	2220.00	37.00	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	19	7	7.00	2227.00	37.12	8.57	0.46	0.062	0.002	0.38	9.61
9	28	4	15	19	12.5	5.50	2232.50	37.21	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	19	19	6.50	2239.00	37.32	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	19	25	6.00	2245.00	37.42	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	19	31.5	6.50	2251.50	37.53	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	19	37	5.50	2257.00	37.62	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	19	43.5	6.50	2263.50	37.73	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	19	49	5.50	2269.00	37.82	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	19	55.5	6.50	2275.50	37.93	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	20	1	5.50	2281.00	38.02	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	20	7.5	6.50	2287.50	38.13	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	20	13	5.50	2293.00	38.22	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	20	19.5	6.50	2299.50	38.33	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	20	24.5	5.00	2304.50	38.41	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	20	31	6.50	2311.00	38.52	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	20	36	5.00	2316.00	38.60	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	20	42.5	6.50	2322.50	38.71	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	20	47.5	5.00	2327.50	38.79	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	20	54	6.50	2334.00	38.90	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	20	59	5.00	2339.00	38.98	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	21	5	6.00	2345.00	39.08	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	21	10	5.00	2350.00	39.17	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	21	16.5	6.50	2356.50	39.28	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	21	21.5	5.00	2361.50	39.36	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	21	27.5	6.00	2367.50	39.46	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	21	32.5	5.00	2372.50	39.54	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	21	38.5	6.00	2378.50	39.64	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	21	43.5	5.00	2383.50	39.73	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	21	49.5	6.00	2389.50	39.83	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	21	54	4.50	2394.00	39.90	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	22	0	6.00	2400.00	40.00	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	22	5	5.00	2405.00	40.08	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	22	11.5	6.50	2411.50	40.19	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	22	16.5	5.00	2416.50	40.28	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	22	22.5	6.00	2422.50	40.38	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	22	28	5.50	2428.00	40.47	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	22	34	6.00	2434.00	40.57	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	22	39	5.00	2439.00	40.65	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	22	45.5	6.50	2445.50	40.76	9.23	0.50	0.066	0.002	0.41	10.35
9	28	4	15	22	50.5	5.00	2450.50	40.84	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	22	56.5	6.00	2456.50	40.94	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	23	1.5	5.00	2461.50	41.03	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	23	7.5	6.00	2467.50	41.13	10.00	0.54	0.072	0.002	0.44	11.21

TEST 2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	4	15	23	12.5	5.00	2472.50	41.21	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	23	18.5	6.00	2478.50	41.31	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	23	23	4.50	2483.00	41.38	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	23	29	6.00	2489.00	41.48	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	23	34	5.00	2494.00	41.57	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	23	39.5	5.50	2499.50	41.66	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	23	45	5.50	2505.00	41.75	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	23	51	6.00	2511.00	41.85	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	23	56	5.00	2516.00	41.93	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	24	2	6.00	2522.00	42.03	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	24	7	5.00	2527.00	42.12	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	24	13	6.00	2533.00	42.22	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	24	18	5.00	2538.00	42.30	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	24	23.5	5.50	2543.50	42.39	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	24	28.5	5.00	2548.50	42.48	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	24	34.5	6.00	2554.50	42.58	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	24	39.5	5.00	2559.50	42.66	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	24	45.5	6.00	2565.50	42.76	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	24	50	4.50	2570.00	42.83	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	24	55.5	5.50	2575.50	42.93	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	25	0.5	5.00	2580.50	43.01	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	25	6.5	6.00	2586.50	43.11	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	25	11.5	5.00	2591.50	43.19	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	25	17	5.50	2597.00	43.28	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	25	22	5.00	2602.00	43.37	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	25	28	6.00	2608.00	43.47	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	25	33	5.00	2613.00	43.55	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	25	39	6.00	2619.00	43.65	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	25	43.5	4.50	2623.50	43.73	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	25	49.5	6.00	2629.50	43.83	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	25	54	4.50	2634.00	43.90	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	26	0	6.00	2640.00	44.00	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	26	4.5	4.50	2644.50	44.08	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	26	10.5	6.00	2650.50	44.18	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	26	15	4.50	2655.00	44.25	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	26	21	6.00	2661.00	44.35	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	26	25.5	4.50	2665.50	44.43	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	26	31	5.50	2671.00	44.52	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	26	36	5.00	2676.00	44.60	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	26	41	5.00	2681.00	44.68	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	26	45.5	4.50	2685.50	44.76	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	26	51	5.50	2691.00	44.85	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	26	55.5	4.50	2695.50	44.93	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	27	1	5.50	2701.00	45.02	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	27	5.5	4.50	2705.50	45.09	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	27	11	5.50	2711.00	45.18	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	27	15.5	4.50	2715.50	45.26	13.33	0.72	0.096	0.003	0.59	14.95

TEST 2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	4	15	27	21	5.50	2721.00	45.35	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	27	26	5.00	2726.00	45.43	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	27	31.5	5.50	2731.50	45.53	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	27	36.5	5.00	2736.50	45.61	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	27	42.5	6.00	2742.50	45.71	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	27	47.5	5.00	2747.50	45.79	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	27	53.5	6.00	2753.50	45.89	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	27	58.5	5.00	2758.50	45.98	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	28	4.5	6.00	2764.50	46.08	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	28	9	4.50	2769.00	46.15	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	28	15	6.00	2775.00	46.25	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	28	19	4.00	2779.00	46.32	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	28	24.5	5.50	2784.50	46.41	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	28	29	4.50	2789.00	46.48	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	28	34	5.00	2794.00	46.57	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	28	38.5	4.50	2798.50	46.64	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	28	43.5	5.00	2803.50	46.73	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	28	47.5	4.00	2807.50	46.79	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	28	52.5	5.00	2812.50	46.88	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	28	56.5	4.00	2816.50	46.94	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	29	1.5	5.00	2821.50	47.03	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	29	5.5	4.00	2825.50	47.09	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	29	10	4.50	2830.00	47.17	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	29	14	4.00	2834.00	47.23	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	29	19	5.00	2839.00	47.32	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	29	22.5	3.50	2842.50	47.38	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	29	27.5	5.00	2847.50	47.46	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	29	31.5	4.00	2851.50	47.53	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	29	36.5	5.00	2856.50	47.61	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	29	40.5	4.00	2860.50	47.68	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	29	45.5	5.00	2865.50	47.76	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	29	49.5	4.00	2869.50	47.83	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	29	54.5	5.00	2874.50	47.91	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	29	58.5	4.00	2878.50	47.98	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	30	3.5	5.00	2883.50	48.06	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	30	8	4.50	2888.00	48.13	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	30	13	5.00	2893.00	48.22	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	30	17.5	4.50	2897.50	48.29	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	30	22.5	5.00	2902.50	48.38	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	30	26.5	4.00	2906.50	48.44	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	30	31.5	5.00	2911.50	48.53	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	30	35.5	4.00	2915.50	48.59	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	30	40.5	5.00	2920.50	48.68	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	30	44.5	4.00	2924.50	48.74	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	30	49.5	5.00	2929.50	48.83	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	30	53.5	4.00	2933.50	48.89	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	30	58.5	5.00	2938.50	48.98	12.00	0.65	0.086	0.002	0.53	13.45

TEST 2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	4	15	31	2.5	4.00	2942.50	49.04	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	31	7.5	5.00	2947.50	49.13	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	31	11.5	4.00	2951.50	49.19	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	31	16	4.50	2956.00	49.27	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	31	20	4.00	2960.00	49.33	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	31	24.5	4.50	2964.50	49.41	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	31	28.5	4.00	2968.50	49.48	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	31	33.5	5.00	2973.50	49.56	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	31	37	3.50	2977.00	49.62	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	31	42	5.00	2982.00	49.70	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	31	46	4.00	2986.00	49.77	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	31	50.5	4.50	2990.50	49.84	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	31	54.5	4.00	2994.50	49.91	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	31	59.5	5.00	2999.50	49.99	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	32	3.5	4.00	3003.50	50.06	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	32	8	4.50	3008.00	50.13	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	32	12.5	4.50	3012.50	50.21	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	32	17	4.50	3017.00	50.28	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	32	21	4.00	3021.00	50.35	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	32	26	5.00	3026.00	50.43	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	32	30	4.00	3030.00	50.50	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	32	34.5	4.50	3034.50	50.58	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	32	38.5	4.00	3038.50	50.64	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	32	43.5	5.00	3043.50	50.73	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	32	47	3.50	3047.00	50.78	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	32	52	5.00	3052.00	50.87	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	32	56	4.00	3056.00	50.93	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	33	0.5	4.50	3060.50	51.01	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	33	4	3.50	3064.00	51.07	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	33	9	5.00	3069.00	51.15	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	33	12.5	3.50	3072.50	51.21	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	33	17	4.50	3077.00	51.28	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	33	21	4.00	3081.00	51.35	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	33	25.5	4.50	3085.50	51.43	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	33	29.5	4.00	3089.50	51.49	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	33	34	4.50	3094.00	51.57	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	33	38	4.00	3098.00	51.63	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	33	42.5	4.50	3102.50	51.71	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	33	46.5	4.00	3106.50	51.78	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	33	51	4.50	3111.00	51.85	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	33	55	4.00	3115.00	51.92	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	33	59.5	4.50	3119.50	51.99	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	34	3.5	4.00	3123.50	52.06	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	34	8.5	5.00	3128.50	52.14	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	34	12.5	4.00	3132.50	52.21	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	34	17.5	5.00	3137.50	52.29	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	34	21.5	4.00	3141.50	52.36	15.00	0.81	0.108	0.003	0.66	16.81

TEST 2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	4	15	34	26.5	5.00	3146.50	52.44	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	34	30.5	4.00	3150.50	52.51	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	34	35.5	5.00	3155.50	52.59	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	34	39.5	4.00	3159.50	52.66	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	34	44	4.50	3164.00	52.73	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	34	48	4.00	3168.00	52.80	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	34	53.5	5.50	3173.50	52.89	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	34	57	3.50	3177.00	52.95	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	35	2	5.00	3182.00	53.03	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	35	6	4.00	3186.00	53.10	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	35	11	5.00	3191.00	53.18	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	35	15	4.00	3195.00	53.25	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	35	19.5	4.50	3199.50	53.33	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	35	23.5	4.00	3203.50	53.39	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	35	28.5	5.00	3208.50	53.48	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	35	32	3.50	3212.00	53.53	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	35	37	5.00	3217.00	53.62	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	35	40.5	3.50	3220.50	53.68	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	35	45.5	5.00	3225.50	53.76	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	35	49	3.50	3229.00	53.82	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	35	54	5.00	3234.00	53.90	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	35	57.5	3.50	3237.50	53.96	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	36	2	4.50	3242.00	54.03	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	36	6	4.00	3246.00	54.10	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	36	10.5	4.50	3250.50	54.18	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	36	14.5	4.00	3254.50	54.24	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	36	19	4.50	3259.00	54.32	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	36	23	4.00	3263.00	54.38	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	36	27.5	4.50	3267.50	54.46	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	36	31.5	4.00	3271.50	54.53	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	36	36	4.50	3276.00	54.60	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	36	40	4.00	3280.00	54.67	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	36	44.5	4.50	3284.50	54.74	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	36	48.5	4.00	3288.50	54.81	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	36	53	4.50	3293.00	54.88	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	36	57	4.00	3297.00	54.95	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	37	1.5	4.50	3301.50	55.03	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	37	5	3.50	3305.00	55.08	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	37	9.5	4.50	3309.50	55.16	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	37	13.5	4.00	3313.50	55.23	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	37	18	4.50	3318.00	55.30	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	37	22	4.00	3322.00	55.37	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	37	26.5	4.50	3326.50	55.44	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	37	30	3.50	3330.00	55.50	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	37	35	5.00	3335.00	55.58	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	37	39	4.00	3339.00	55.65	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	37	43.5	4.50	3343.50	55.73	13.33	0.72	0.096	0.003	0.59	14.95

TEST 2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
9	28	4	15	37	47.5	4.00	3347.50	55.79	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	37	52	4.50	3352.00	55.87	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	37	56	4.00	3356.00	55.93	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	38	0.5	4.50	3360.50	56.01	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	38	4.5	4.00	3364.50	56.08	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	38	9	4.50	3369.00	56.15	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	38	13	4.00	3373.00	56.22	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	38	17.5	4.50	3377.50	56.29	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	38	21.5	4.00	3381.50	56.36	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	38	26	4.50	3386.00	56.43	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	38	30	4.00	3390.00	56.50	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	38	34.5	4.50	3394.50	56.58	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	38	38	3.50	3398.00	56.63	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	38	43	5.00	3403.00	56.72	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	38	46.5	3.50	3406.50	56.78	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	38	51	4.50	3411.00	56.85	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	38	55	4.00	3415.00	56.92	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	38	59	4.00	3419.00	56.98	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	39	2.5	3.50	3422.50	57.04	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	39	7	4.50	3427.00	57.12	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	39	11	4.00	3431.00	57.18	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	39	15.5	4.50	3435.50	57.26	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	39	19	3.50	3439.00	57.32	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	39	23.5	4.50	3443.50	57.39	13.33	0.72	0.096	0.003	0.59	14.95
9	28	4	15	39	27	3.50	3447.00	57.45	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	39	32	5.00	3452.00	57.53	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	39	35.5	3.50	3455.50	57.59	17.14	0.92	0.123	0.003	0.76	19.22
9	28	4	15	39	40.5	5.00	3460.50	57.68	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	39	44.5	4.00	3464.50	57.74	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	39	49.5	5.00	3469.50	57.83	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	39	53.5	4.00	3473.50	57.89	15.00	0.81	0.108	0.003	0.66	16.81
9	28	4	15	39	59	5.50	3479.00	57.98	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	40	4	5.00	3484.00	58.07	12.00	0.65	0.086	0.002	0.53	13.45
9	28	4	15	40	10	6.00	3490.00	58.17	10.00	0.54	0.072	0.002	0.44	11.21
9	28	4	15	40	15.5	5.50	3495.50	58.26	10.91	0.59	0.078	0.002	0.48	12.23
9	28	4	15	40	23.5	8.00	3503.50	58.39	7.50	0.40	0.054	0.002	0.33	8.41
9	28	4	15	40	31	7.50	3511.00	58.52	8.00	0.43	0.058	0.002	0.35	8.97
9	28	4	15	40	42	11.00	3522.00	58.70	5.45	0.29	0.039	0.001	0.24	6.11
9	28	4	15	40	56	14.00	3536.00	58.93	4.29	0.23	0.031	0.001	0.19	4.80
9	28	4	15	41	26.5	30.50	3566.50	59.44	1.97	0.11	0.014	0.000	0.09	2.21
9	28	4	15	42	53.5	87.00	3653.50	60.89	0.69	0.04	0.005	0.000	0.03	0.77
9	28	4	15	46	50.5	237.00	3890.50	64.84	0.25	0.01	0.002	0.000	0.01	0.28
9	28	4	15	48	49	118.50	4009.00	66.82	0.51	0.03	0.004	0.000	0.02	0.57

TEST 2

Applied Rain and Runon Quantities

Time (min)	*Rain (mm/hr)*	*Runon (gal/min)*	*Runon (m^3/min)*	*Runon (ft^3/min)*	*Associated Impervious Lenth (m)*	*Associated Impervious Lenth (ft)*	*Total inflow (m3/min)*	*Total inflow (ft3/min)*	*Effective Inflow to Plot Only (mm/hr)*
0	25.4	1.0	3.79E-03	0.134	8.77	28.8	4.61E-03	0.163	141.38
58.00	25.4	1.0	3.79E-03	0.134	8.77	28.8	4.61E-03	0.163	141.38
58.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Calibrated Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)
1	1.0	60	1.00	1.00
2	1.0		1.00	25.4
3	1.0		1.00	
4	1.0		1.00	

TEST 2

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2
14:45	0	2.4%	0.7%
14:55	10	26.0%	4.0%
15:00	15	25.8%	5.4%
15:05	20	25.8%	21.3%
15:10	25	25.8%	24.5%
15:15	30	25.9%	24.3%
15:20	35	25.9%	24.5%
15:40	55	25.9%	24.5%

Probe Locations:	from top (cm)
Probe 1:	45
Probe 2:	145

Average Initial Moisture:	**1.6%**
Average Max Moisture:	**25.3%**
dtheta:	**23.7%**

TEST 2

LID 2

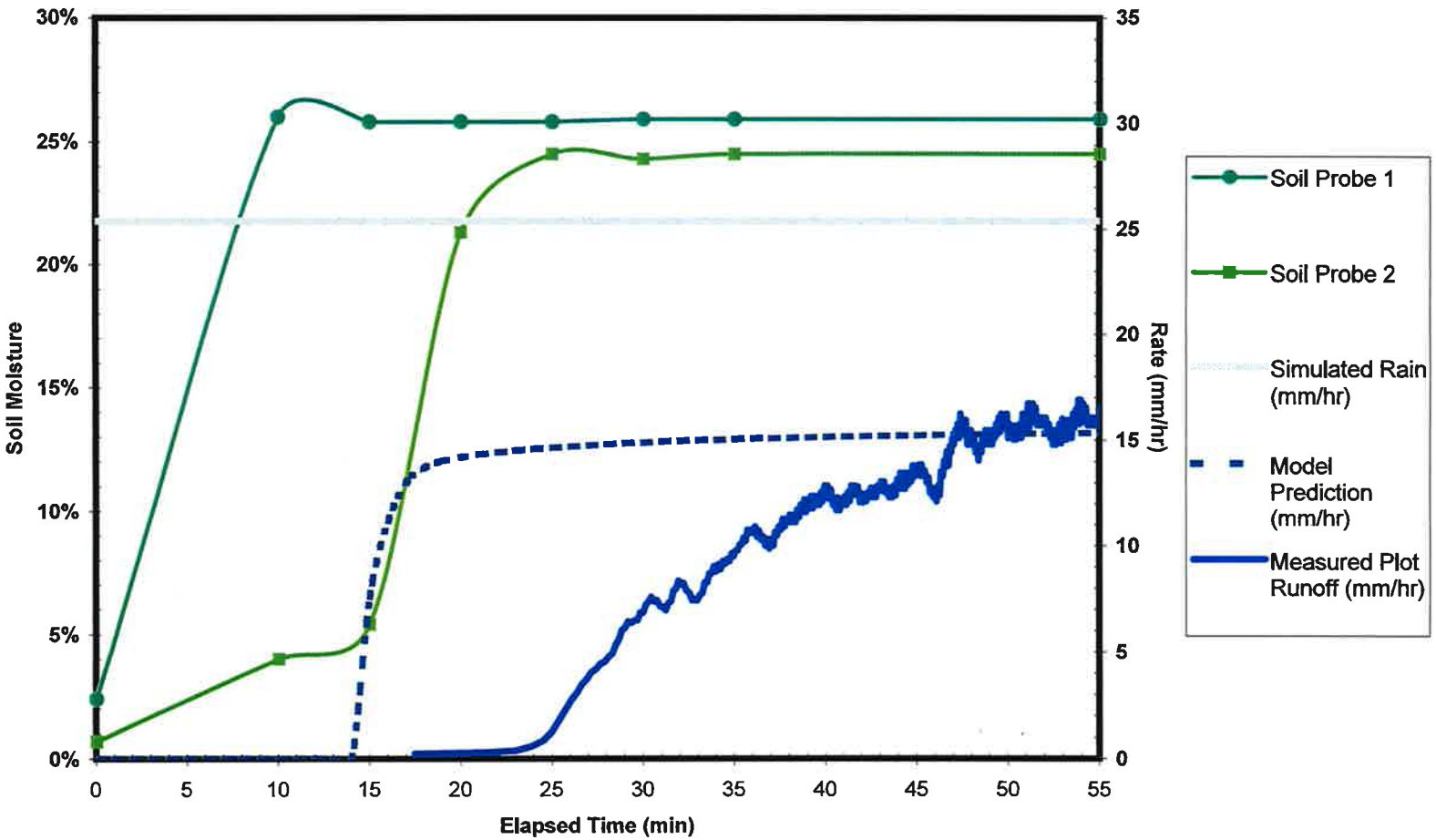
phi:	1.0	dtheta	24%
Ks:	1.50E-03	Ko:	7500

		EPS		END OF PLOT				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0.00E+00	0.0	0.00E+00	0.0	15.4	15.8	-2.7%
60	1	1.10E-06	0.0	0.00E+00	0.0			
120	2	2.35E-06	0.1	0.00E+00	0.0			
180	3	7.50E-06	0.3	0.00E+00	0.0			
240	4	1.36E-05	0.5	0.00E+00	0.0			
300	5	2.49E-05	0.9	0.00E+00	0.0			
360	6	4.19E-05	1.5	0.00E+00	0.0			
420	7	6.54E-05	2.4	0.00E+00	0.0			
480	8	9.66E-05	3.5	0.00E+00	0.0			
540	9	1.37E-04	4.9	0.00E+00	0.0			
600	10	1.86E-04	6.7	0.00E+00	0.0			
660	11	2.47E-04	8.9	0.00E+00	0.0			
720	12	3.19E-04	11.5	0.00E+00	0.0			
780	13	4.05E-04	14.6	0.00E+00	0.0			
840	14	5.05E-04	18.2	0.00E+00	0.0			
900	15	6.08E-04	21.9	2.11E-04	7.6			
960	16	6.73E-04	24.2	3.11E-04	11.2			
1020	17	6.99E-04	25.2	3.61E-04	13.0			
1080	18	7.07E-04	25.5	3.81E-04	13.7			
1140	19	7.10E-04	25.5	3.90E-04	14.0			
1200	20	7.10E-04	25.6	3.94E-04	14.2			
1260	21	7.11E-04	25.6	3.98E-04	14.3			
1320	22	7.11E-04	25.6	4.01E-04	14.4			
1380	23	7.11E-04	25.6	4.03E-04	14.5			
1440	24	7.11E-04	25.6	4.05E-04	14.6			
1500	25	7.11E-04	25.6	4.07E-04	14.6			
1560	26	7.11E-04	25.6	4.08E-04	14.7			
1620	27	7.11E-04	25.6	4.10E-04	14.8			
1680	28	7.11E-04	25.6	4.11E-04	14.8			
1740	29	7.11E-04	25.6	4.12E-04	14.8			
1800	30	7.11E-04	25.6	4.13E-04	14.9			
1860	31	7.11E-04	25.6	4.14E-04	14.9			
1920	32	7.11E-04	25.6	4.15E-04	14.9			
1980	33	7.11E-04	25.6	4.16E-04	15.0			
2040	34	7.11E-04	25.6	4.17E-04	15.0			
2100	35	7.11E-04	25.6	4.18E-04	15.0			
2160	36	7.11E-04	25.6	4.18E-04	15.1			
2220	37	7.11E-04	25.6	4.19E-04	15.1			
2280	38	7.11E-04	25.6	4.20E-04	15.1			
2340	39	7.11E-04	25.6	4.20E-04	15.1			
2400	40	7.11E-04	25.6	4.21E-04	15.1			
2460	41	7.11E-04	25.6	4.21E-04	15.2			
2520	42	7.11E-04	25.6	4.22E-04	15.2			
2580	43	7.11E-04	25.6	4.22E-04	15.2			
2640	44	7.11E-04	25.6	4.23E-04	15.2			
2700	45	7.11E-04	25.6	4.23E-04	15.2			
2760	46	7.11E-04	25.6	4.23E-04	15.2			
2820	47	7.11E-04	25.6	4.24E-04	15.3			
2880	48	7.11E-04	25.6	4.24E-04	15.3			
2940	49	7.11E-04	25.6	4.24E-04	15.3			
3000	50	7.11E-04	25.6	4.25E-04	15.3			
3060	51	7.11E-04	25.6	4.25E-04	15.3			
3120	52	7.11E-04	25.6	4.25E-04	15.3			
3180	53	7.11E-04	25.6	4.26E-04	15.3			
3240	54	7.11E-04	25.6	4.26E-04	15.3			
3300	55	7.11E-04	25.6	4.26E-04	15.3			
3360	56	7.11E-04	25.6	4.26E-04	15.3			
3420	57	7.11E-04	25.6	4.27E-04	15.4			
3480	58	7.11E-04	25.6	4.27E-04	15.4			

TEST 2

FIGURE A-2

Rain/Runoff Hydrograph - 2



TEST 2

MOBILE TEST #2 (TEST 3)

10/3/2004
Spokane Static Site
US 2 MP 298.4 - LT

Plot Parameters

Slope:	6:1	**Start Time:**	12:51:00
Length (cm):	192	**End Time:**	14:00:00
Width (cm):	102	**Test Duration:**	*1:09:00*
Plot Area (m^2):	1.96	**Model Plot Area (m^2):**	10.90
Vegitation:	moderate ryegrass (75%)		
Initial Theta:	8.7%		
Final Theta:	21.9%		
dtheta:	*13.2%*		

Estimated Ke (from plot):

mm/hr	*cm/s*
82.8	*2.30E-03*

Normalized Rates			**Volumetric Rates**
Max Runoff Rate (mm/hr):	*10.7*	*(L/min):*	*1.96*
Inflow Rate (mm/hr):	*25.4*	*(L/min):*	*4.61*
Runoff Percentage:	*42.1%*		*42.4%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	3	2004	12	52	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	3	2004	13	28	43	2203.00	2203.00	36.72	0.03	0.00	0.000	0.000	0.00	0.03
10	3	2004	13	29	18	35.00	2238.00	37.30	1.71	0.09	0.012	0.000	0.08	1.92
10	3	2004	13	29	47	29.00	2267.00	37.78	2.07	0.11	0.015	0.000	0.09	2.32
10	3	2004	13	30	16.5	29.50	2296.50	38.28	2.03	0.11	0.015	0.000	0.09	2.28
10	3	2004	13	30	46	29.50	2326.00	38.77	2.03	0.11	0.015	0.000	0.09	2.28
10	3	2004	13	31	19.5	33.50	2359.50	39.33	1.79	0.10	0.013	0.000	0.08	2.01
10	3	2004	13	31	58	38.50	2398.00	39.97	1.56	0.08	0.011	0.000	0.07	1.75
10	3	2004	13	32	41.5	43.50	2441.50	40.69	1.38	0.07	0.010	0.000	0.06	1.55
10	3	2004	13	33	24	42.50	2484.00	41.40	1.41	0.08	0.010	0.000	0.06	1.58
10	3	2004	13	34	9.5	45.50	2529.50	42.16	1.32	0.07	0.009	0.000	0.06	1.48
10	3	2004	13	34	50.5	41.00	2570.50	42.84	1.46	0.08	0.011	0.000	0.06	1.64
10	3	2004	13	35	32.5	42.00	2612.50	43.54	1.43	0.08	0.010	0.000	0.06	1.60
10	3	2004	13	36	18	45.50	2658.00	44.30	1.32	0.07	0.009	0.000	0.06	1.48
10	3	2004	13	37	13	55.00	2713.00	45.22	1.09	0.06	0.008	0.000	0.05	1.22
10	3	2004	13	38	8	55.00	2768.00	46.13	1.09	0.06	0.008	0.000	0.05	1.22
10	3	2004	13	39	9.5	61.50	2829.50	47.16	0.98	0.05	0.007	0.000	0.04	1.09
10	3	2004	13	40	6.5	57.00	2886.50	48.11	1.05	0.06	0.008	0.000	0.05	1.18
10	3	2004	13	41	12	65.50	2952.00	49.20	0.92	0.05	0.007	0.000	0.04	1.03
10	3	2004	13	42	24.5	72.50	3024.50	50.41	0.83	0.04	0.006	0.000	0.04	0.93
10	3	2004	13	43	48	83.50	3108.00	51.80	0.72	0.04	0.005	0.000	0.03	0.81
10	3	2004	13	45	2.5	74.50	3182.50	53.04	0.81	0.04	0.006	0.000	0.04	0.90
10	3	2004	13	46	8.5	66.00	3248.50	54.14	0.91	0.05	0.007	0.000	0.04	1.02
10	3	2004	13	47	0.5	52.00	3300.50	55.01	1.15	0.06	0.008	0.000	0.05	1.29
10	3	2004	13	47	57	56.50	3357.00	55.95	1.06	0.06	0.008	0.000	0.05	1.19
10	3	2004	13	48	52	55.00	3412.00	56.87	1.09	0.06	0.008	0.000	0.05	1.22
10	3	2004	13	49	52.5	60.50	3472.50	57.88	0.99	0.05	0.007	0.000	0.04	1.11
10	3	2004	13	50	24	31.50	3504.00	58.40	1.90	0.10	0.014	0.000	0.08	2.14
10	3	2004	13	50	33.5	9.50	3513.50	58.56	6.32	0.34	0.045	0.001	0.28	7.08
10	3	2004	13	50	39	5.50	3519.00	58.65	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	50	45.5	6.50	3525.50	58.76	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	50	51	5.50	3531.00	58.85	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	50	57.5	6.50	3537.50	58.96	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	51	3	5.50	3543.00	59.05	10.91	0.59	0.078	0.002	0.48	12.23

TEST 3

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	3	2004	13	51	9.5	6.50	3549.50	59.16	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	51	15.5	6.00	3555.50	59.26	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	51	22.5	7.00	3562.50	59.38	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	51	28.5	6.00	3568.50	59.48	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	51	35.5	7.00	3575.50	59.59	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	51	41.5	6.00	3581.50	59.69	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	51	48.5	7.00	3588.50	59.81	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	51	54.5	6.00	3594.50	59.91	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	52	1.5	7.00	3601.50	60.03	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	52	7.5	6.00	3607.50	60.13	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	52	14.5	7.00	3614.50	60.24	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	52	20.5	6.00	3620.50	60.34	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	52	28	7.50	3628.00	60.47	8.00	0.43	0.058	0.002	0.35	8.97
10	3	2004	13	52	33.5	5.50	3633.50	60.56	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	52	40.5	7.00	3640.50	60.68	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	52	46.5	6.00	3646.50	60.78	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	52	53	6.50	3653.00	60.88	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	52	59	6.00	3659.00	60.98	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	53	5.5	6.50	3665.50	61.09	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	53	11	5.50	3671.00	61.18	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	53	17.5	6.50	3677.50	61.29	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	53	23	5.50	3683.00	61.38	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	53	29.5	6.50	3689.50	61.49	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	53	35.5	6.00	3695.50	61.59	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	53	42	6.50	3702.00	61.70	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	53	48	6.00	3708.00	61.80	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	53	55	7.00	3715.00	61.92	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	54	1	6.00	3721.00	62.02	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	54	8	7.00	3728.00	62.13	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	54	14	6.00	3734.00	62.23	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	54	21	7.00	3741.00	62.35	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	54	27	6.00	3747.00	62.45	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	54	34	7.00	3754.00	62.57	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	54	40.5	6.50	3760.50	62.68	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	54	47.5	7.00	3767.50	62.79	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	54	53.5	6.00	3773.50	62.89	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	55	0.5	7.00	3780.50	63.01	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	55	6.5	6.00	3786.50	63.11	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	55	13.5	7.00	3793.50	63.23	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	55	19	5.50	3799.00	63.32	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	55	26	7.00	3806.00	63.43	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	55	32	6.00	3812.00	63.53	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	55	38.5	6.50	3818.50	63.64	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	55	44.5	6.00	3824.50	63.74	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	55	51.5	7.00	3831.50	63.86	8.57	0.46	0.062	0.002	0.38	9.61

TEST 3

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	3	2004	13	55	57.5	6.00	3837.50	63.96	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	56	4	6.50	3844.00	64.07	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	56	10	6.00	3850.00	64.17	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	56	16.5	6.50	3856.50	64.28	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	56	22.5	6.00	3862.50	64.38	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	56	29	6.50	3869.00	64.48	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	56	34.5	5.50	3874.50	64.58	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	56	41	6.50	3881.00	64.68	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	56	47	6.00	3887.00	64.78	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	56	53.5	6.50	3893.50	64.89	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	56	59	5.50	3899.00	64.98	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	57	5.5	6.50	3905.50	65.09	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	57	11.5	6.00	3911.50	65.19	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	57	18	6.50	3918.00	65.30	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	57	23.5	5.50	3923.50	65.39	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	57	30	6.50	3930.00	65.50	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	57	36	6.00	3936.00	65.60	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	57	42.5	6.50	3942.50	65.71	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	57	48.5	6.00	3948.50	65.81	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	57	55	6.50	3955.00	65.92	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	58	0.5	5.50	3960.50	66.01	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	58	7.5	7.00	3967.50	66.13	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	58	13	5.50	3973.00	66.22	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	58	19.5	6.50	3979.50	66.33	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	58	25	5.50	3985.00	66.42	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	58	32	7.00	3992.00	66.53	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	58	37.5	5.50	3997.50	66.63	10.91	0.59	0.078	0.002	0.48	12.23
10	3	2004	13	58	44.5	7.00	4004.50	66.74	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	58	50.5	6.00	4010.50	66.84	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	58	57	6.50	4017.00	66.95	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	13	59	3	6.00	4023.00	67.05	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	59	10.5	7.50	4030.50	67.18	8.00	0.43	0.058	0.002	0.35	8.97
10	3	2004	13	59	16.5	6.00	4036.50	67.28	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	59	23.5	7.00	4043.50	67.39	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	13	59	29.5	6.00	4049.50	67.49	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	59	37	7.50	4057.00	67.62	8.00	0.43	0.058	0.002	0.35	8.97
10	3	2004	13	59	43	6.00	4063.00	67.72	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	13	59	50.5	7.50	4070.50	67.84	8.00	0.43	0.058	0.002	0.35	8.97
10	3	2004	13	59	56.5	6.00	4076.50	67.94	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	14	0	4	7.50	4084.00	68.07	8.00	0.43	0.058	0.002	0.35	8.97
10	3	2004	14	0	10.5	6.50	4090.50	68.18	9.23	0.50	0.066	0.002	0.41	10.35
10	3	2004	14	0	17.5	7.00	4097.50	68.29	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	14	0	23.5	6.00	4103.50	68.39	10.00	0.54	0.072	0.002	0.44	11.21
10	3	2004	14	0	30.5	7.00	4110.50	68.51	8.57	0.46	0.062	0.002	0.38	9.61
10	3	2004	14	0	36	5.50	4116.00	68.60	10.91	0.59	0.078	0.002	0.48	12.23

TEST 3

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	3	2004	14	0	43.5	7.50	4123.50	68.73	8.00	0.43	0.058	0.002	0.35	8.97
10	3	2004	14	0	51	7.50	4131.00	68.85	8.00	0.43	0.058	0.002	0.35	8.97
10	3	2004	14	1	1	10.00	4141.00	69.02	6.00	0.32	0.043	0.001	0.26	6.73
10	3	2004	14	1	12	11.00	4152.00	69.20	5.45	0.29	0.039	0.001	0.24	6.11
10	3	2004	14	1	30.5	18.50	4170.50	69.51	3.24	0.17	0.023	0.001	0.14	3.64
10	3	2004	14	2	5.5	35.00	4205.50	70.09	1.71	0.09	0.012	0.000	0.08	1.92
10	3	2004	14	4	4.5	119.00	4324.50	72.08	0.50	0.03	0.004	0.000	0.02	0.57

TEST 3

Applied Rain and Runon Quantities

Time (min)	*Rain (mm/hr)*	*Runon (gal/min)*	*Runon (m^3/min)*	*Runon (ft^3/min)*	*Associated Impervious Lenth (m)*	*Associated Impervious Lenth (ft)*	*Total inflow (m3/min)*	*Total inflow (ft3/min)*	*Effective Inflow to Plot Only (mm/hr)*
0	25.4	1.0	3.79E-03	0.134	8.77	28.8	4.61E-03	0.163	141.38
69.00	25.4	1.0	3.79E-03	0.134	8.77	28.8	4.61E-03	0.163	141.38
69.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Calibrated Depth (in)	*Elapsed Time (min)*	*Avg. Intensity*	*Spacial Avg. (in/hr) & (mm/hr)*
1	1.00	60	1.00	1.00
2	1.00		1.00	25.4
3	1.00		1.00	
4	1.00		1.00	
5				
6				

TEST 3

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2
12:50	0	8.0%	9.4%
12:55	2.00	8.5%	10.2%
13:00	7.00	15.4%	10.6%
13:05	12.00	23.1%	10.8%
13:10	17.00	23.2%	11.0%
13:15	22.00	23.2%	11.1%
13:20	27.00	23.2%	20.3%
13:25	32.00	23.2%	20.6%
13:30	37.00	23.1%	20.6%
13:35	42.00	23.1%	20.6%
13:45	52.00	23.1%	20.6%
14:00	67.00	22.7%	20.4%

Probe Locations:	from top (cm)
Probe 1:	45
Probe 2:	145

Average Initial Moisture:	**8.7%**
Average Max Moisture:	**21.9%**
dtheta:	**13.2%**

TEST 3

LID 3

phi:	1	dtheta	13%
Ks:	2.30E-03	Ko:	7500

		EPS		END OF PLOT				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0.00E+00	0.0	0.00E+00	0.0	10.5	10.7	-2.2%
60	1	1.09E-06	0.0	0.00E+00	0.0			
120	2	3.40E-06	0.1	0.00E+00	0.0			
180	3	5.40E-06	0.2	0.00E+00	0.0			
240	4	1.31E-05	0.5	0.00E+00	0.0			
300	5	2.53E-05	0.9	0.00E+00	0.0			
360	6	4.21E-05	1.5	0.00E+00	0.0			
420	7	6.56E-05	2.4	0.00E+00	0.0			
480	8	9.68E-05	3.5	0.00E+00	0.0			
540	9	1.37E-04	4.9	0.00E+00	0.0			
600	10	1.87E-04	6.7	0.00E+00	0.0			
660	11	2.47E-04	8.9	0.00E+00	0.0			
720	12	3.20E-04	11.5	0.00E+00	0.0			
780	13	4.06E-04	14.6	0.00E+00	0.0			
840	14	5.05E-04	18.2	0.00E+00	0.0			
900	15	6.08E-04	21.9	0.00E+00	0.0			
960	16	6.74E-04	24.3	1.74E-04	6.3			
1020	17	6.99E-04	25.2	2.31E-04	8.3			
1080	18	7.07E-04	25.5	2.52E-04	9.1			
1140	19	7.10E-04	25.5	2.61E-04	9.4			
1200	20	7.10E-04	25.6	2.65E-04	9.6			
1260	21	7.11E-04	25.6	2.68E-04	9.7			
1320	22	7.11E-04	25.6	2.71E-04	9.7			
1380	23	7.11E-04	25.6	2.73E-04	9.8			
1440	24	7.11E-04	25.6	2.74E-04	9.9			
1500	25	7.11E-04	25.6	2.76E-04	9.9			
1560	26	7.11E-04	25.6	2.77E-04	10.0			
1620	27	7.11E-04	25.6	2.78E-04	10.0			
1680	28	7.11E-04	25.6	2.79E-04	10.0			
1740	29	7.11E-04	25.6	2.80E-04	10.1			
1800	30	7.11E-04	25.6	2.81E-04	10.1			
1860	31	7.11E-04	25.6	2.81E-04	10.1			
1920	32	7.11E-04	25.6	2.82E-04	10.2			
1980	33	7.11E-04	25.6	2.83E-04	10.2			
2040	34	7.11E-04	25.6	2.83E-04	10.2			
2100	35	7.11E-04	25.6	2.84E-04	10.2			
2160	36	7.11E-04	25.6	2.84E-04	10.2			
2220	37	7.11E-04	25.6	2.85E-04	10.3			
2280	38	7.11E-04	25.6	2.85E-04	10.3			
2340	39	7.11E-04	25.6	2.86E-04	10.3			
2400	40	7.11E-04	25.6	2.86E-04	10.3			
2460	41	7.11E-04	25.6	2.86E-04	10.3			
2520	42	7.11E-04	25.6	2.87E-04	10.3			
2580	43	7.11E-04	25.6	2.87E-04	10.3			
2640	44	7.11E-04	25.6	2.87E-04	10.3			

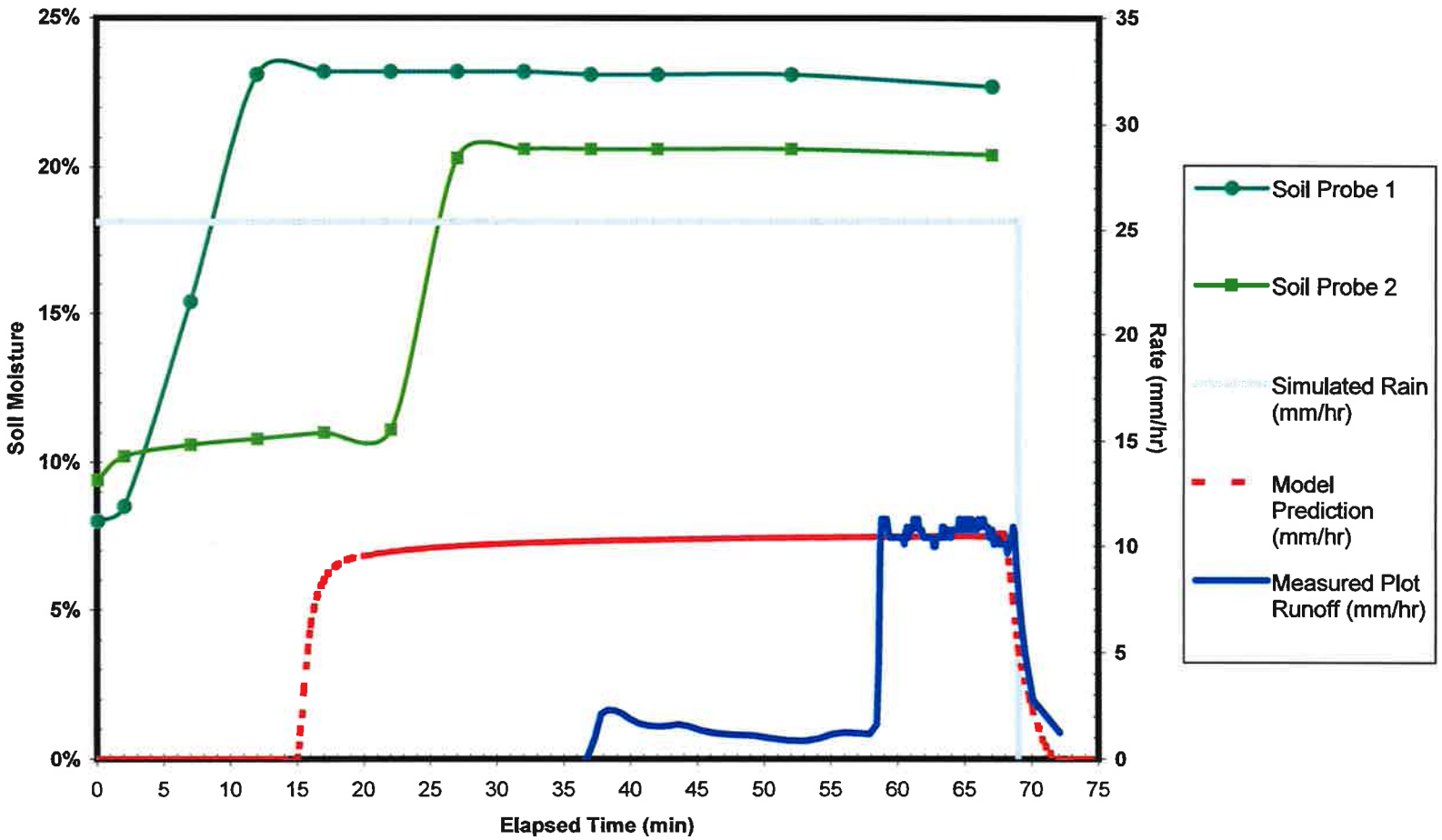
TEST 3

sec	min	EPS cm/sec	EPS mm/hr	END OF PLOT cm/sec	END OF PLOT mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
2700	45	7.11E-04	25.6	2.88E-04	10.4			
2760	46	7.11E-04	25.6	2.88E-04	10.4			
2820	47	7.11E-04	25.6	2.88E-04	10.4			
2880	48	7.11E-04	25.6	2.88E-04	10.4			
2940	49	7.11E-04	25.6	2.89E-04	10.4			
3000	50	7.11E-04	25.6	2.89E-04	10.4			
3060	51	7.11E-04	25.6	2.89E-04	10.4			
3120	52	7.11E-04	25.6	2.89E-04	10.4			
3180	53	7.11E-04	25.6	2.89E-04	10.4			
3240	54	7.11E-04	25.6	2.89E-04	10.4			
3300	55	7.11E-04	25.6	2.90E-04	10.4			
3360	56	7.11E-04	25.6	2.90E-04	10.4			
3420	57	7.11E-04	25.6	2.90E-04	10.4			
3480	58	7.11E-04	25.6	2.90E-04	10.4			
3540	59	7.11E-04	25.6	2.90E-04	10.4			
3600	60	7.11E-04	25.6	2.90E-04	10.5			
3660	61	7.11E-04	25.6	2.91E-04	10.5			
3720	62	7.11E-04	25.6	2.91E-04	10.5			
3780	63	7.11E-04	25.6	2.91E-04	10.5			
3840	64	7.11E-04	25.6	2.91E-04	10.5			
3900	65	7.11E-04	25.6	2.91E-04	10.5			
3960	66	7.11E-04	25.6	2.91E-04	10.5			
4020	67	7.11E-04	25.6	2.91E-04	10.5			
4080	68	7.11E-04	25.6	2.91E-04	10.5			
4140	69	5.87E-04	21.1	1.45E-04	5.2			
4200	70	4.95E-04	17.8	6.93E-05	2.5			
4260	71	4.22E-04	15.2	1.73E-05	0.6			
4320	72	3.63E-04	13.1	0.00E+00	0.0			
4380	73	3.16E-04	11.4	0.00E+00	0.0			
4440	74	2.77E-04	10.0	0.00E+00	0.0			
4500	75	2.45E-04	8.8	0.00E+00	0.0			

TEST 3

FIGURE A-3

Rain/Runoff Hydrograph - 3



TEST 3

MOBILE TEST #3 (TEST 4)

10/8/2004
Spokane Static Site
US 2 MP 298.4 - LT

Plot Parameters

		Start Time:	15:05:00
Slope:	**6:1**	**End Time:**	15:20:00
Length (cm):	**403**	**Test Duration:**	***0:15:00***
Width (cm):	**102**	**Model Plot Area (m^2):**	**13.05**
Plot Area (m^2):	**4.11**		
Vegitation:	**moderate ryegrass (75%)**		
Initial Theta:	**N/A**		
Final Theta:	**N/A**		
dtheta:	***N/A***		

	Normalized Rates		**Volumetric Rates**
Max Runoff Rate (mm/hr):	***17.5***	***(L/min):***	***3.81***
Inflow Rate (mm/hr):	***25.4***	***(L/min):***	***5.53***
Runoff Percentage:	***68.9%***		***68.9%***

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	8	4	15	5	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	8	4	15	8	18	198.00	198.00	3.30	0.30	0.02	0.002	0.000	0.01	0.28
10	8	4	15	8	23	5.00	203.00	3.38	12.00	0.65	0.086	0.002	0.44	11.23
10	8	4	15	8	26.5	3.50	206.50	3.44	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	8	31	4.50	211.00	3.52	13.33	0.72	0.096	0.003	0.49	12.48
10	8	4	15	8	34.5	3.50	214.50	3.58	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	8	39	4.50	219.00	3.65	13.33	0.72	0.096	0.003	0.49	12.48
10	8	4	15	8	42	3.00	222.00	3.70	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	8	45.5	3.50	225.50	3.76	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	8	48.5	3.00	228.50	3.81	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	8	52.5	4.00	232.50	3.88	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	8	55.5	3.00	235.50	3.93	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	8	59	3.50	239.00	3.98	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	9	2.5	3.50	242.50	4.04	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	9	6	3.50	246.00	4.10	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	9	9.5	3.50	249.50	4.16	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	9	13.5	4.00	253.50	4.23	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	9	16.5	3.00	256.50	4.28	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	9	20.5	4.00	260.50	4.34	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	9	24	3.50	264.00	4.40	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	9	28	4.00	268.00	4.47	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	9	31.5	3.50	271.50	4.53	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	9	35.5	4.00	275.50	4.59	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	9	39	3.50	279.00	4.65	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	9	43	4.00	283.00	4.72	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	9	46	3.00	286.00	4.77	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	9	50	4.00	290.00	4.83	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	9	53	3.00	293.00	4.88	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	9	57	4.00	297.00	4.95	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	10	0	3.00	300.00	5.00	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	10	4	4.00	304.00	5.07	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	10	7	3.00	307.00	5.12	20.00	1.08	0.144	0.004	0.74	18.72

TEST 4

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	8	4	15	10	11	4.00	311.00	5.18	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	10	14	3.00	314.00	5.23	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	10	17.5	3.50	317.50	5.29	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	10	21	3.50	321.00	5.35	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	10	24.5	3.50	324.50	5.41	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	10	27.5	3.00	327.50	5.46	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	10	31.5	4.00	331.50	5.53	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	10	34.5	3.00	334.50	5.58	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	10	38	3.50	338.00	5.63	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	10	41	3.00	341.00	5.68	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	10	45	4.00	345.00	5.75	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	10	48	3.00	348.00	5.80	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	10	51.5	3.50	351.50	5.86	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	10	54.5	3.00	354.50	5.91	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	10	58.5	4.00	358.50	5.98	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	11	1.5	3.00	361.50	6.03	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	5.5	4.00	365.50	6.09	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	11	8.5	3.00	368.50	6.14	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	12	3.50	372.00	6.20	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	11	15	3.00	375.00	6.25	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	19	4.00	379.00	6.32	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	11	22	3.00	382.00	6.37	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	25.5	3.50	385.50	6.43	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	11	28.5	3.00	388.50	6.48	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	32.5	4.00	392.50	6.54	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	11	35.5	3.00	395.50	6.59	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	39	3.50	399.00	6.65	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	11	42	3.00	402.00	6.70	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	45.5	3.50	405.50	6.76	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	11	48.5	3.00	408.50	6.81	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	52	3.50	412.00	6.87	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	11	55	3.00	415.00	6.92	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	11	58.5	3.50	418.50	6.98	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	12	1.5	3.00	421.50	7.03	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	5	3.50	425.00	7.08	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	12	8	3.00	428.00	7.13	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	11.5	3.50	431.50	7.19	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	12	14.5	3.00	434.50	7.24	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	18.5	4.00	438.50	7.31	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	12	21.5	3.00	441.50	7.36	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	25	3.50	445.00	7.42	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	12	28	3.00	448.00	7.47	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	31.5	3.50	451.50	7.53	17.14	0.92	0.123	0.003	0.63	16.05

TEST 4

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	8	4	15	12	34.5	3.00	454.50	7.58	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	38.5	4.00	458.50	7.64	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	12	41.5	3.00	461.50	7.69	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	45	3.50	465.00	7.75	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	12	48	3.00	468.00	7.80	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	51.5	3.50	471.50	7.86	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	12	54.5	3.00	474.50	7.91	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	12	58	3.50	478.00	7.97	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	13	1	3.00	481.00	8.02	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	5	4.00	485.00	8.08	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	13	8	3.00	488.00	8.13	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	11.5	3.50	491.50	8.19	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	13	14.5	3.00	494.50	8.24	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	18.5	4.00	498.50	8.31	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	13	21	2.50	501.00	8.35	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	13	25	4.00	505.00	8.42	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	13	28	3.00	508.00	8.47	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	32	4.00	512.00	8.53	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	13	35	3.00	515.00	8.58	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	38.5	3.50	518.50	8.64	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	13	41.5	3.00	521.50	8.69	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	45.5	4.00	525.50	8.76	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	13	48.5	3.00	528.50	8.81	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	52	3.50	532.00	8.87	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	13	55	3.00	535.00	8.92	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	13	58.5	3.50	538.50	8.98	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	14	1.5	3.00	541.50	9.03	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	14	5.5	4.00	545.50	9.09	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	14	8.5	3.00	548.50	9.14	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	14	12	3.50	552.00	9.20	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	14	15	3.00	555.00	9.25	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	14	19	4.00	559.00	9.32	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	14	21.5	2.50	561.50	9.36	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	14	25.5	4.00	565.50	9.43	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	14	28	2.50	568.00	9.47	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	14	32	4.00	572.00	9.53	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	14	34.5	2.50	574.50	9.58	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	14	38	3.50	578.00	9.63	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	14	40.5	2.50	580.50	9.68	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	14	44	3.50	584.00	9.73	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	14	47	3.00	587.00	9.78	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	14	50.5	3.50	590.50	9.84	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	14	53	2.50	593.00	9.88	24.00	1.29	0.173	0.005	0.88	22.47

TEST 4

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	8	4	15	14	56.5	3.50	596.50	9.94	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	14	59.5	3.00	599.50	9.99	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	15	3	3.50	603.00	10.05	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	5.5	2.50	605.50	10.09	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	15	9	3.50	609.00	10.15	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	12	3.00	612.00	10.20	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	15	15.5	3.50	615.50	10.26	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	18	2.50	618.00	10.30	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	15	21.5	3.50	621.50	10.36	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	24.5	3.00	624.50	10.41	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	15	28	3.50	628.00	10.47	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	30.5	2.50	630.50	10.51	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	15	34.5	4.00	634.50	10.58	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	15	37	2.50	637.00	10.62	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	15	40.5	3.50	640.50	10.68	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	43.5	3.00	643.50	10.73	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	15	47	3.50	647.00	10.78	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	49.5	2.50	649.50	10.83	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	15	53	3.50	653.00	10.88	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	15	55.5	2.50	655.50	10.93	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	15	59	3.50	659.00	10.98	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	16	2	3.00	662.00	11.03	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	16	5	3.00	665.00	11.08	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	16	8	3.00	668.00	11.13	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	16	11.5	3.50	671.50	11.19	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	16	14	2.50	674.00	11.23	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	16	17.5	3.50	677.50	11.29	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	16	20	2.50	680.00	11.33	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	16	23.5	3.50	683.50	11.39	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	16	26.5	3.00	686.50	11.44	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	16	29.5	3.00	689.50	11.49	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	16	32.5	3.00	692.50	11.54	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	16	36	3.50	696.00	11.60	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	16	38.5	2.50	698.50	11.64	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	16	42	3.50	702.00	11.70	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	16	45	3.00	705.00	11.75	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	16	48.5	3.50	708.50	11.81	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	16	51	2.50	711.00	11.85	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	16	55	4.00	715.00	11.92	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	16	57.5	2.50	717.50	11.96	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	17	1	3.50	721.00	12.02	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	4	3.00	724.00	12.07	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	7.5	3.50	727.50	12.13	17.14	0.92	0.123	0.003	0.63	16.05

TEST 4

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	8	4	15	17	10.5	3.00	730.50	12.18	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	14	3.50	734.00	12.23	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	17	3.00	737.00	12.28	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	20.5	3.50	740.50	12.34	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	23.5	3.00	743.50	12.39	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	27	3.50	747.00	12.45	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	30	3.00	750.00	12.50	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	33.5	3.50	753.50	12.56	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	36.5	3.00	756.50	12.61	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	40	3.50	760.00	12.67	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	43	3.00	763.00	12.72	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	46.5	3.50	766.50	12.78	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	49.5	3.00	769.50	12.83	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	53	3.50	773.00	12.88	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	17	56	3.00	776.00	12.93	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	17	59.5	3.50	779.50	12.99	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	18	2.5	3.00	782.50	13.04	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	6	3.50	786.00	13.10	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	18	9	3.00	789.00	13.15	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	12.5	3.50	792.50	13.21	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	18	15.5	3.00	795.50	13.26	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	19.5	4.00	799.50	13.33	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	18	22	2.50	802.00	13.37	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	18	26	4.00	806.00	13.43	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	18	29	3.00	809.00	13.48	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	32.5	3.50	812.50	13.54	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	18	35.5	3.00	815.50	13.59	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	39.5	4.00	819.50	13.66	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	18	42.5	3.00	822.50	13.71	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	46	3.50	826.00	13.77	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	18	49	3.00	829.00	13.82	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	53	4.00	833.00	13.88	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	18	56	3.00	836.00	13.93	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	18	59.5	3.50	839.50	13.99	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	19	3	3.50	843.00	14.05	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	19	6.5	3.50	846.50	14.11	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	19	9.5	3.00	849.50	14.16	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	19	13.5	4.00	853.50	14.23	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	19	16.5	3.00	856.50	14.28	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	19	20	3.50	860.00	14.33	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	19	22.5	2.50	862.50	14.38	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	19	26	3.50	866.00	14.43	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	19	28	2.00	868.00	14.47	30.00	1.61	0.216	0.006	1.11	28.08

TEST 4

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	8	4	15	19	31	3.00	871.00	14.52	20.00	1.08	0.144	0.004	0.74	18.72
10	8	4	15	19	33.5	2.50	873.50	14.56	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	19	37	3.50	877.00	14.62	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	19	39.5	2.50	879.50	14.66	24.00	1.29	0.173	0.005	0.88	22.47
10	8	4	15	19	43.5	4.00	883.50	14.73	15.00	0.81	0.108	0.003	0.55	14.04
10	8	4	15	19	47	3.50	887.00	14.78	17.14	0.92	0.123	0.003	0.63	16.05
10	8	4	15	19	52	5.00	892.00	14.87	12.00	0.65	0.086	0.002	0.44	11.23
10	8	4	15	19	56.5	4.50	896.50	14.94	13.33	0.72	0.096	0.003	0.49	12.48
10	8	4	15	20	2	5.50	902.00	15.03	10.91	0.59	0.078	0.002	0.40	10.21

TEST 4

Applied Rain and Runon Quantities

Time (min)	*Rain (mm/hr)*	*Runon (gal/min)*	*Runon (m^3/min)*	*Runon (ft^3/min)*	*Associated Impervious Lenth (m)*	*Associated Impervious Lenth (ft)*	*Total inflow (m3/min)*	*Total inflow (ft3/min)*	*Effective Inflow to Plot Only (mm/hr)*
0	25.4	1.0	3.79E-03	0.134	8.77	28.8	5.53E-03	0.195	80.65
15.00	25.4	1.0	3.79E-03	0.134	8.77	28.8	5.53E-03	0.195	80.65
15.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Calibrated Depth (in)	*Elapsed Time (min)*	*Avg. Intensity*	*Spacial Avg. (in/hr) & (mm/hr)*
1	1.00	60	1.00	1.00
2	1.00		1.00	25.4
3	1.00		1.00	
4	1.00		1.00	
5				
6				

TEST 4

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2

SOIL PROBES NOT INSTALLED DUE TO EXTREMELY HARD SOIL CONDITIONS

Probe Locations:	from top (cm)
Probe 1:	_
Probe 2:	_

Average Initial Moisture:
Average Max Moisture:
dtheta:

TEST 4

LID 15

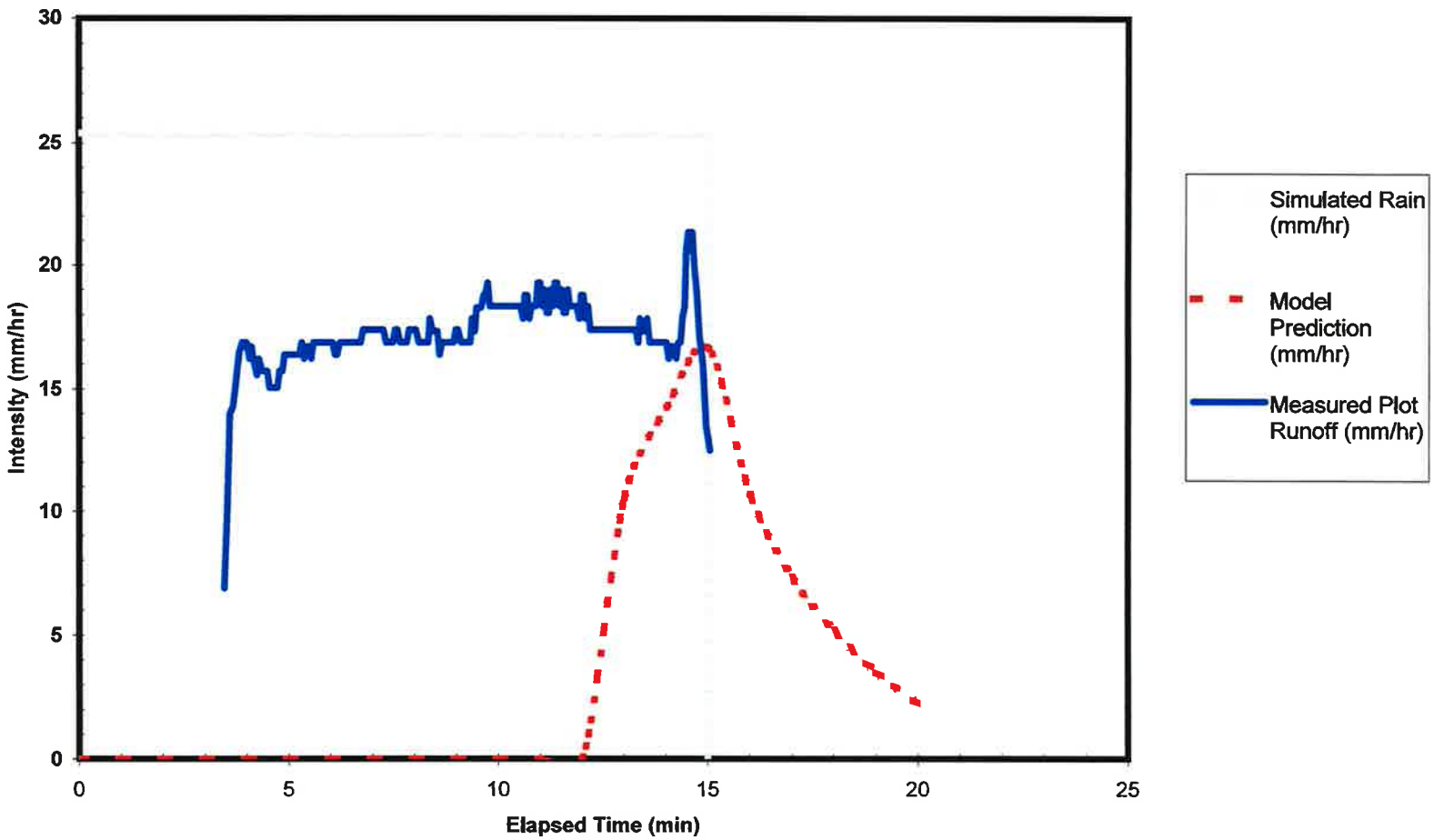
phi:	4	dtheta	15%
Ks:	1.43E-03	Ko:	10000

		EPS		END OF PLOT				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0.00E+00	0.00	0	0	16.6	17.50	-5.0%
60	1	0.00000129	0.05	0	0.0000			
120	2	0.00000381	0.14	0	0.0000			
180	3	9.11E-06	0.33	0	0.0000			
240	4	0.00001937	0.70	0.0000	0.0000			
300	5	**0.00003651**	1.31	**0.0000**	0.0000			
360	6	0	2.23	0	0.0000			
420	7	0.00009718	3.50	0	0.0000			
480	8	0.00014395	5.18	0	0.0000			
540	9	0.00020384	7.34	0	0.0000			
600	10	0.00027848	10.03	0	0.0000			
660	11	0.00036948	13.30	0	0.0000			
720	12	0.00047841	17.22	0	0.0000			
780	13	0.00059956	21.58	0.00029268	10.5365			
840	14	0.00067865	24.43	0.00039539	14.2340			
900	15	0.00070353	25.33	0.00046197	16.6309			
960	16	0.00057159	20.58	0.00029701	10.6924			
1020	17	0.00047201	16.99	0.00020332	7.3195			
1080	18	0.00039497	14.22	0.00014396	5.1826			
1140	19	0.00033484	12.05	0.00009764	3.5150			
1200	20	0.0002873	10.34	0.00006188	2.2277			

TEST 4

FIGURE A-4

Rain/Runoff Hydrograph - 4



TEST 4

MOBILE TEST #4 (TEST 5)

10/12/2004
Spokane Static Site
US 2 - MP 298.4 - LT

Plot Parameters

Slope:	6:1
Length (cm):	403
Width (cm):	103
Plot Area (m^2):	4.15
Vegitation:	sparse ryegrass (40%)
Initial Theta:	3.6%
Final Theta:	24.5%
dtheta:	20.90%

Start Time:	13:50:00
End Time:	14:20:00
Test Duration:	*0:30:00*
Model Plot Area (m^2):	7.63

Estimated Ke (from plot):

mm/hr	*cm/s*
35.3	9.80E-04

Normalized Rates			**Volumetric Rates**
Max Runoff Rate (mm/hr):	31.0	*(L/min):*	3.95
Rain-on Rate to Plot (mm/hr):	65.3	*(L/min):*	8.30
Runoff Percentage:	47.6%		47.6%

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	12	2004	13	50	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
10	12	2004	14	0	17	617.00	617.00	10.28	0.10	0.01	0.001	0.000	0.006	0.156
10	12	2004	14	0	44.5	27.50	644.50	10.74	2.18	0.12	0.016	0.000	0.138	3.494
10	12	2004	14	1	9.5	25.00	669.50	11.16	2.40	0.13	0.017	0.000	0.151	3.843
10	12	2004	14	1	29.5	20.00	689.50	11.49	3.00	0.16	0.022	0.001	0.189	4.804
10	12	2004	14	1	47.5	18.00	707.50	11.79	3.33	0.18	0.024	0.001	0.210	5.338
10	12	2004	14	2	4	16.50	724.00	12.07	3.64	0.20	0.026	0.001	0.229	5.823
10	12	2004	14	2	19.5	15.50	739.50	12.33	3.87	0.21	0.028	0.001	0.244	6.199
10	12	2004	14	2	34	14.50	754.00	12.57	4.14	0.22	0.030	0.001	0.261	6.626
10	12	2004	14	2	48.5	14.50	768.50	12.81	4.14	0.22	0.030	0.001	0.261	6.626
10	12	2004	14	3	1	12.50	781.00	13.02	4.80	0.26	0.035	0.001	0.303	7.686
10	12	2004	14	3	13	12.00	793.00	13.22	5.00	0.27	0.036	0.001	0.315	8.007
10	12	2004	14	3	25	12.00	805.00	13.42	5.00	0.27	0.036	0.001	0.315	8.007
10	12	2004	14	3	36.5	11.50	816.50	13.61	5.22	0.28	0.038	0.001	0.329	8.355
10	12	2004	14	3	47	10.50	827.00	13.78	5.71	0.31	0.041	0.001	0.360	9.150
10	12	2004	14	3	57.5	10.50	837.50	13.96	5.71	0.31	0.041	0.001	0.360	9.150
10	12	2004	14	4	7	9.50	847.00	14.12	6.32	0.34	0.045	0.001	0.398	10.114
10	12	2004	14	4	16.5	9.50	856.50	14.28	6.32	0.34	0.045	0.001	0.398	10.114
10	12	2004	14	4	25.5	9.00	865.50	14.43	6.67	0.36	0.048	0.001	0.420	10.675
10	12	2004	14	4	34.5	9.00	874.50	14.58	6.67	0.36	0.048	0.001	0.420	10.675
10	12	2004	14	4	43.5	9.00	883.50	14.73	6.67	0.36	0.048	0.001	0.420	10.675
10	12	2004	14	4	52	8.50	892.00	14.87	7.06	0.38	0.051	0.001	0.445	11.303
10	12	2004	14	5	0	8.00	900.00	15.00	7.50	0.40	0.054	0.002	0.473	12.010
10	12	2004	14	5	7.5	7.50	907.50	15.13	8.00	0.43	0.058	0.002	0.504	12.810
10	12	2004	14	5	15	7.50	915.00	15.25	8.00	0.43	0.058	0.002	0.504	12.810
10	12	2004	14	5	22	7.00	922.00	15.37	8.57	0.46	0.062	0.002	0.540	13.726
10	12	2004	14	5	29	7.00	929.00	15.48	8.57	0.46	0.062	0.002	0.540	13.726
10	12	2004	14	5	36.5	7.50	936.50	15.61	8.00	0.43	0.058	0.002	0.504	12.810
10	12	2004	14	5	44	7.50	944.00	15.73	8.00	0.43	0.058	0.002	0.504	12.810
10	12	2004	14	5	51.5	7.50	951.50	15.86	8.00	0.43	0.058	0.002	0.504	12.810
10	12	2004	14	5	58.5	7.00	958.50	15.98	8.57	0.46	0.062	0.002	0.540	13.726
10	12	2004	14	6	5	6.50	965.00	16.08	9.23	0.50	0.066	0.002	0.582	14.781
10	12	2004	14	6	11	6.00	971.00	16.18	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	6	17.5	6.50	977.50	16.29	9.23	0.50	0.066	0.002	0.582	14.781
10	12	2004	14	6	23.5	6.00	983.50	16.39	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	6	30	6.50	990.00	16.50	9.23	0.50	0.066	0.002	0.582	14.781

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	6	36	6.00	996.00	16.60	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	6	42	6.00	1002.00	16.70	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	6	48	6.00	1008.00	16.80	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	6	54	6.00	1014.00	16.90	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	7	0	6.00	1020.00	17.00	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	7	6	6.00	1026.00	17.10	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	7	11	5.00	1031.00	17.18	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	7	17	6.00	1037.00	17.28	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	7	22	5.00	1042.00	17.37	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	7	28	6.00	1048.00	17.47	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	7	33	5.00	1053.00	17.55	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	7	38.5	5.50	1058.50	17.64	10.91	0.59	0.078	0.002	0.688	17.469
10	12	2004	14	7	43	4.50	1063.00	17.72	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	7	48.5	5.50	1068.50	17.81	10.91	0.59	0.078	0.002	0.688	17.469
10	12	2004	14	7	53.5	5.00	1073.50	17.89	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	7	59	5.50	1079.00	17.98	10.91	0.59	0.078	0.002	0.688	17.469
10	12	2004	14	8	3.5	4.50	1083.50	18.06	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	8	9	5.50	1089.00	18.15	10.91	0.59	0.078	0.002	0.688	17.469
10	12	2004	14	8	13.5	4.50	1093.50	18.23	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	8	18.5	5.00	1098.50	18.31	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	8	23.5	5.00	1103.50	18.39	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	8	29	5.50	1109.00	18.48	10.91	0.59	0.078	0.002	0.688	17.469
10	12	2004	14	8	33.5	4.50	1113.50	18.56	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	8	38.5	5.00	1118.50	18.64	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	8	42.5	4.00	1122.50	18.71	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	8	47.5	5.00	1127.50	18.79	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	8	52	4.50	1132.00	18.87	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	8	57	5.00	1137.00	18.95	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	9	1	4.00	1141.00	19.02	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	9	6	5.00	1146.00	19.10	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	9	10	4.00	1150.00	19.17	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	9	14.5	4.50	1154.50	19.24	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	9	18.5	4.00	1158.50	19.31	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	9	23	4.50	1163.00	19.38	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	9	27	4.00	1167.00	19.45	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	9	32	5.00	1172.00	19.53	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	9	36	4.00	1176.00	19.60	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	9	40.5	4.50	1180.50	19.68	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	9	44.5	4.00	1184.50	19.74	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	9	49.5	5.00	1189.50	19.83	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	9	53.5	4.00	1193.50	19.89	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	9	58	4.50	1198.00	19.97	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	10	2	4.00	1202.00	20.03	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	10	6.5	4.50	1206.50	20.11	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	10	10.5	4.00	1210.50	20.18	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	10	14.5	4.00	1214.50	20.24	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	10	18	3.50	1218.00	20.30	17.14	0.92	0.123	0.003	1.081	27.451

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	10	22.5	4.50	1222.50	20.38	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	10	26	3.50	1226.00	20.43	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	10	30.5	4.50	1230.50	20.51	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	10	34	3.50	1234.00	20.57	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	10	38.5	4.50	1238.50	20.64	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	10	42	3.50	1242.00	20.70	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	10	46	4.00	1246.00	20.77	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	10	49.5	3.50	1249.50	20.83	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	10	53.5	4.00	1253.50	20.89	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	10	57	3.50	1257.00	20.95	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	11	1	4.00	1261.00	21.02	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	11	4.5	3.50	1264.50	21.08	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	11	8.5	4.00	1268.50	21.14	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	11	11.5	3.00	1271.50	21.19	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	11	15.5	4.00	1275.50	21.26	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	11	19	3.50	1279.00	21.32	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	11	23	4.00	1283.00	21.38	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	11	26	3.00	1286.00	21.43	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	11	30.5	4.50	1290.50	21.51	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	11	33.5	3.00	1293.50	21.56	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	11	37.5	4.00	1297.50	21.63	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	11	41	3.50	1301.00	21.68	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	11	45	4.00	1305.00	21.75	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	11	48.5	3.50	1308.50	21.81	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	11	52	3.50	1312.00	21.87	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	11	55.5	3.50	1315.50	21.93	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	11	59	3.50	1319.00	21.98	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	2.5	3.50	1322.50	22.04	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	6.5	4.00	1326.50	22.11	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	12	9.5	3.00	1329.50	22.16	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	12	13.5	4.00	1333.50	22.23	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	12	16.5	3.00	1336.50	22.28	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	12	20.5	4.00	1340.50	22.34	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	12	23.5	3.00	1343.50	22.39	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	12	27.5	4.00	1347.50	22.46	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	12	31	3.50	1351.00	22.52	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	34.5	3.50	1354.50	22.58	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	38	3.50	1358.00	22.63	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	41.5	3.50	1361.50	22.69	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	45	3.50	1365.00	22.75	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	48.5	3.50	1368.50	22.81	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	51.5	3.00	1371.50	22.86	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	12	55	3.50	1375.00	22.92	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	12	58.5	3.50	1378.50	22.98	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	2	3.50	1382.00	23.03	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	5.5	3.50	1385.50	23.09	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	9	3.50	1389.00	23.15	17.14	0.92	0.123	0.003	1.081	27.451

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	13	12.5	3.50	1392.50	23.21	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	16	3.50	1396.00	23.27	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	19.5	3.50	1399.50	23.33	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	23	3.50	1403.00	23.38	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	26.5	3.50	1406.50	23.44	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	30	3.50	1410.00	23.50	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	33.5	3.50	1413.50	23.56	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	37	3.50	1417.00	23.62	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	40.5	3.50	1420.50	23.68	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	44	3.50	1424.00	23.73	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	13	47	3.00	1427.00	23.78	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	13	51	4.00	1431.00	23.85	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	13	54	3.00	1434.00	23.90	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	13	57.5	3.50	1437.50	23.96	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	1	3.50	1441.00	24.02	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	4.5	3.50	1444.50	24.08	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	7.5	3.00	1447.50	24.13	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	14	11.5	4.00	1451.50	24.19	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	14	14.5	3.00	1454.50	24.24	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	14	18	3.50	1458.00	24.30	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	21.5	3.50	1461.50	24.36	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	25	3.50	1465.00	24.42	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	28	3.00	1468.00	24.47	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	14	31.5	3.50	1471.50	24.53	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	35	3.50	1475.00	24.58	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	38.5	3.50	1478.50	24.64	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	41.5	3.00	1481.50	24.69	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	14	45	3.50	1485.00	24.75	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	14	48	3.00	1488.00	24.80	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	14	52	4.00	1492.00	24.87	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	14	55	3.00	1495.00	24.92	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	14	58.5	3.50	1498.50	24.98	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	1.5	3.00	1501.50	25.03	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	5	3.50	1505.00	25.08	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	8	3.00	1508.00	25.13	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	11.5	3.50	1511.50	25.19	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	14.5	3.00	1514.50	25.24	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	18	3.50	1518.00	25.30	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	21	3.00	1521.00	25.35	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	24.5	3.50	1524.50	25.41	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	27.5	3.00	1527.50	25.46	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	31	3.50	1531.00	25.52	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	34	3.00	1534.00	25.57	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	37.5	3.50	1537.50	25.63	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	40.5	3.00	1540.50	25.68	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	44	3.50	1544.00	25.73	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	47	3.00	1547.00	25.78	20.00	1.08	0.144	0.004	1.261	32.026

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	15	50	3.00	1550.00	25.83	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	53	3.00	1553.00	25.88	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	15	56.5	3.50	1556.50	25.94	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	15	59	2.50	1559.00	25.98	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	16	2.5	3.50	1562.50	26.04	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	16	5.5	3.00	1565.50	26.09	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	9	3.50	1569.00	26.15	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	16	12	3.00	1572.00	26.20	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	15	3.00	1575.00	26.25	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	18	3.00	1578.00	26.30	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	21	3.00	1581.00	26.35	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	24	3.00	1584.00	26.40	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	27	3.00	1587.00	26.45	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	30	3.00	1590.00	26.50	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	33.5	3.50	1593.50	26.56	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	16	36	2.50	1596.00	26.60	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	16	39.5	3.50	1599.50	26.66	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	16	42.5	3.00	1602.50	26.71	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	45.5	3.00	1605.50	26.76	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	48.5	3.00	1608.50	26.81	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	16	52	3.50	1612.00	26.87	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	16	54.5	2.50	1614.50	26.91	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	16	58	3.50	1618.00	26.97	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	17	1	3.00	1621.00	27.02	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	4	3.00	1624.00	27.07	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	7	3.00	1627.00	27.12	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	10.5	3.50	1630.50	27.18	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	17	13.5	3.00	1633.50	27.23	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	16.5	3.00	1636.50	27.28	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	19.5	3.00	1639.50	27.33	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	23	3.50	1643.00	27.38	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	17	26	3.00	1646.00	27.43	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	29.5	3.50	1649.50	27.49	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	17	32	2.50	1652.00	27.53	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	17	35.5	3.50	1655.50	27.59	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	17	38.5	3.00	1658.50	27.64	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	42	3.50	1662.00	27.70	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	17	45	3.00	1665.00	27.75	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	48	3.00	1668.00	27.80	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	51	3.00	1671.00	27.85	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	17	54.5	3.50	1674.50	27.91	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	17	57.5	3.00	1677.50	27.96	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	0.5	3.00	1680.50	28.01	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	3.5	3.00	1683.50	28.06	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	7	3.50	1687.00	28.12	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	18	10	3.00	1690.00	28.17	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	13	3.00	1693.00	28.22	20.00	1.08	0.144	0.004	1.261	32.026

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	18	16	3.00	1696.00	28.27	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	19.5	3.50	1699.50	28.33	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	18	22.5	3.00	1702.50	28.38	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	25.5	3.00	1705.50	28.43	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	28.5	3.00	1708.50	28.48	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	32	3.50	1712.00	28.53	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	18	35	3.00	1715.00	28.58	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	38.5	3.50	1718.50	28.64	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	18	41.5	3.00	1721.50	28.69	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	44.5	3.00	1724.50	28.74	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	47.5	3.00	1727.50	28.79	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	51	3.50	1731.00	28.85	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	18	54	3.00	1734.00	28.90	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	18	57.5	3.50	1737.50	28.96	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	19	0	2.50	1740.00	29.00	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	19	3.5	3.50	1743.50	29.06	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	19	6.5	3.00	1746.50	29.11	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	10	3.50	1750.00	29.17	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	19	12.5	2.50	1752.50	29.21	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	19	16	3.50	1756.00	29.27	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	19	19	3.00	1759.00	29.32	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	22.5	3.50	1762.50	29.38	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	19	25.5	3.00	1765.50	29.43	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	28.5	3.00	1768.50	29.48	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	31.5	3.00	1771.50	29.53	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	35	3.50	1775.00	29.58	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	19	38	3.00	1778.00	29.63	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	41	3.00	1781.00	29.68	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	43.5	2.50	1783.50	29.73	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	19	46.5	3.00	1786.50	29.78	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	49	2.50	1789.00	29.82	24.00	1.29	0.173	0.005	1.513	38.431
10	12	2004	14	19	52	3.00	1792.00	29.87	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	55	3.00	1795.00	29.92	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	19	58.5	3.50	1798.50	29.98	17.14	0.92	0.123	0.003	1.081	27.451
10	12	2004	14	20	1.5	3.00	1801.50	30.03	20.00	1.08	0.144	0.004	1.261	32.026
10	12	2004	14	20	6	4.50	1806.00	30.10	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	20	10	4.00	1810.00	30.17	15.00	0.81	0.108	0.003	0.946	24.020
10	12	2004	14	20	15	5.00	1815.00	30.25	12.00	0.65	0.086	0.002	0.757	19.216
10	12	2004	14	20	19.5	4.50	1819.50	30.33	13.33	0.72	0.096	0.003	0.841	21.351
10	12	2004	14	20	25.5	6.00	1825.50	30.43	10.00	0.54	0.072	0.002	0.630	16.013
10	12	2004	14	20	31	5.50	1831.00	30.52	10.91	0.59	0.078	0.002	0.688	17.469
10	12	2004	14	20	38	7.00	1838.00	30.63	8.57	0.46	0.062	0.002	0.540	13.726
10	12	2004	14	20	44.5	6.50	1844.50	30.74	9.23	0.50	0.066	0.002	0.582	14.781
10	12	2004	14	20	53	8.50	1853.00	30.88	7.06	0.38	0.051	0.001	0.445	11.303
10	12	2004	14	21	2.5	9.50	1862.50	31.04	6.32	0.34	0.045	0.001	0.398	10.114
10	12	2004	14	21	16.5	14.00	1876.50	31.28	4.29	0.23	0.031	0.001	0.270	6.863
10	12	2004	14	21	38	21.50	1898.00	31.63	2.79	0.15	0.020	0.001	0.176	4.469

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	22	40	62.00	1960.00	32.67	0.97	0.05	0.007	0.000	0.061	1.550
10	12	2004	14	25	8.5	148.50	2108.50	35.14	0.40	0.02	0.003	0.000	0.025	0.647

TEST 5

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	65.3	1.0	3.79E-03	0.134	3.38	11.1	8.30E-03	0.293	120.00
30.00	65.3	1.0	3.79E-03	0.134	3.38	11.1	8.30E-03	0.293	120.00
30.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	0.40	15	1.60	1.80	1.18	2.57
2	0.40		1.60	45.7	30.0	65.3
3	0.80		3.20			
4	0.80		3.20			
5	0.20		0.80			
6	0.10		0.40			

TEST 5

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
13:45	0	4.2%	3.2%	3.5%
13:55	5.00	23.3%	9.6%	19.6%
14:00	10.00	24.7%	24.3%	22.5%
14:10	20.00	24.9%	24.7%	23.5%
14:15	25.00	25.0%	24.8%	23.8%
14:20	30.00	25.0%	24.8%	23.8%

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**3.6%**
Average Max Moisture:	**24.5%**
dtheta:	**20.9%**

TEST 5

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)	Time	Intensity
1	0.40	15	1.60	1.73	1.18	2.32	0	44.0
2	0.40		1.60	44.0	29.9	58.9	25.0	44.0
3	0.40		1.60				25.0	0
4	1.00		4.00					
5	0.20		0.80					
6	0.20		0.80					

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
1.39	35.3	9.805E-04

Applied Rain (mm/hr):	58.9
Plot Area (m^2):	4.15
Steady State Runoff (mm/hr):	23.6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	30	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
10	12	2004	14	34	33.5	273.50	273.50	4.56	0.22	0.01	0.002	0.000	0.025	0.646
10	12	2004	14	34	51.5	18.00	291.50	4.86	3.33	0.18	0.024	0.001	0.386	9.812
10	12	2004	14	35	7.5	16.00	307.50	5.13	3.75	0.20	0.027	0.001	0.435	11.038
10	12	2004	14	35	19.5	12.00	319.50	5.33	5.00	0.27	0.036	0.001	0.579	14.718
10	12	2004	14	35	32.5	13.00	332.50	5.54	4.62	0.25	0.033	0.001	0.535	13.586
10	12	2004	14	35	43.5	11.00	343.50	5.73	5.45	0.29	0.039	0.001	0.632	16.056
10	12	2004	14	35	55	11.50	355.00	5.92	5.22	0.28	0.038	0.001	0.605	15.358
10	12	2004	14	36	4.5	9.50	364.50	6.08	6.32	0.34	0.045	0.001	0.732	18.591
10	12	2004	14	36	14	9.50	374.00	6.23	6.32	0.34	0.045	0.001	0.732	18.591
10	12	2004	14	36	23	9.00	383.00	6.38	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	36	32.5	9.50	392.50	6.54	6.32	0.34	0.045	0.001	0.732	18.591
10	12	2004	14	36	41	8.50	401.00	6.68	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	36	50.5	9.50	410.50	6.84	6.32	0.34	0.045	0.001	0.732	18.591
10	12	2004	14	36	59.5	9.00	419.50	6.99	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	37	9.5	10.00	429.50	7.16	6.00	0.32	0.043	0.001	0.695	17.661
10	12	2004	14	37	18	8.50	438.00	7.30	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	37	28	10.00	448.00	7.47	6.00	0.32	0.043	0.001	0.695	17.661
10	12	2004	14	37	36	8.00	456.00	7.60	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	37	45.5	9.50	465.50	7.76	6.32	0.34	0.045	0.001	0.732	18.591
10	12	2004	14	37	54.5	9.00	474.50	7.91	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	38	3.5	9.00	483.50	8.06	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	38	12	8.50	492.00	8.20	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	38	21.5	9.50	501.50	8.36	6.32	0.34	0.045	0.001	0.732	18.591

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	38	30	8.50	510.00	8.50	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	38	40	10.00	520.00	8.67	6.00	0.32	0.043	0.001	0.695	17.661
10	12	2004	14	38	49	9.00	529.00	8.82	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	39	0	11.00	540.00	9.00	5.45	0.29	0.039	0.001	0.632	16.056
10	12	2004	14	39	8.5	8.50	548.50	9.14	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	39	18	9.50	558.00	9.30	6.32	0.34	0.045	0.001	0.732	18.591
10	12	2004	14	39	25.5	7.50	565.50	9.43	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	39	33.5	8.00	573.50	9.56	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	39	41	7.50	581.00	9.68	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	39	49	8.00	589.00	9.82	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	39	57	8.00	597.00	9.95	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	40	5.5	8.50	605.50	10.09	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	40	13.5	8.00	613.50	10.23	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	40	22.5	9.00	622.50	10.38	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	40	30.5	8.00	630.50	10.51	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	40	39.5	9.00	639.50	10.66	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	40	47	7.50	647.00	10.78	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	40	56	9.00	656.00	10.93	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	41	4	8.00	664.00	11.07	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	41	12.5	8.50	672.50	11.21	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	41	20	7.50	680.00	11.33	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	41	28	8.00	688.00	11.47	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	41	35.5	7.50	695.50	11.59	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	41	43.5	8.00	703.50	11.73	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	41	51	7.50	711.00	11.85	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	41	59.5	8.50	719.50	11.99	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	42	7.5	8.00	727.50	12.13	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	42	16	8.50	736.00	12.27	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	42	23.5	7.50	743.50	12.39	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	42	31.5	8.00	751.50	12.53	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	42	39	7.50	759.00	12.65	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	42	47.5	8.50	767.50	12.79	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	42	54.5	7.00	774.50	12.91	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	43	2.5	8.00	782.50	13.04	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	43	10	7.50	790.00	13.17	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	43	18	8.00	798.00	13.30	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	43	25	7.00	805.00	13.42	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	43	33	8.00	813.00	13.55	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	43	40	7.00	820.00	13.67	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	43	48	8.00	828.00	13.80	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	43	55.5	7.50	835.50	13.93	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	44	3	7.50	843.00	14.05	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	44	10	7.00	850.00	14.17	8.57	0.46	0.062	0.002	0.993	25.231

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	44	18	8.00	858.00	14.30	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	44	24.5	6.50	864.50	14.41	9.23	0.50	0.066	0.002	1.070	27.171
10	12	2004	14	44	32	7.50	872.00	14.53	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	44	39	7.00	879.00	14.65	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	44	46.5	7.50	886.50	14.78	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	44	53.5	7.00	893.50	14.89	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	45	1.5	8.00	901.50	15.03	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	45	9	7.50	909.00	15.15	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	45	17.5	8.50	917.50	15.29	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	45	24.5	7.00	924.50	15.41	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	45	32.5	8.00	932.50	15.54	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	45	39.5	7.00	939.50	15.66	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	45	47.5	8.00	947.50	15.79	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	45	54.5	7.00	954.50	15.91	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	46	2.5	8.00	962.50	16.04	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	46	9.5	7.00	969.50	16.16	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	46	17	7.50	977.00	16.28	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	46	24	7.00	984.00	16.40	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	46	31.5	7.50	991.50	16.53	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	46	38.5	7.00	998.50	16.64	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	46	46	7.50	1006.00	16.77	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	46	53	7.00	1013.00	16.88	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	47	1	8.00	1021.00	17.02	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	47	8.5	7.50	1028.50	17.14	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	47	16	7.50	1036.00	17.27	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	47	22.5	6.50	1042.50	17.38	9.23	0.50	0.066	0.002	1.070	27.171
10	12	2004	14	47	30.5	8.00	1050.50	17.51	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	47	37	6.50	1057.00	17.62	9.23	0.50	0.066	0.002	1.070	27.171
10	12	2004	14	47	45	8.00	1065.00	17.75	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	47	52	7.00	1072.00	17.87	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	48	0	8.00	1080.00	18.00	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	48	7	7.00	1087.00	18.12	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	48	15	8.00	1095.00	18.25	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	48	22	7.00	1102.00	18.37	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	48	29.5	7.50	1109.50	18.49	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	48	36.5	7.00	1116.50	18.61	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	48	44	7.50	1124.00	18.73	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	48	51	7.00	1131.00	18.85	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	48	58.5	7.50	1138.50	18.98	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	49	4.5	6.00	1144.50	19.08	10.00	0.54	0.072	0.002	1.159	29.436
10	12	2004	14	49	11	6.50	1151.00	19.18	9.23	0.50	0.066	0.002	1.070	27.171
10	12	2004	14	49	17	6.00	1157.00	19.28	10.00	0.54	0.072	0.002	1.159	29.436
10	12	2004	14	49	24	7.00	1164.00	19.40	8.57	0.46	0.062	0.002	0.993	25.231

TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	49	30	6.00	1170.00	19.50	10.00	0.54	0.072	0.002	1.159	29.436
10	12	2004	14	49	37.5	7.50	1177.50	19.63	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	49	44.5	7.00	1184.50	19.74	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	49	52	7.50	1192.00	19.87	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	49	59	7.00	1199.00	19.98	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	50	7	8.00	1207.00	20.12	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	50	15	8.00	1215.00	20.25	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	50	23.5	8.50	1223.50	20.39	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	50	31	7.50	1231.00	20.52	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	50	39.5	8.50	1239.50	20.66	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	50	47	7.50	1247.00	20.78	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	50	55.5	8.50	1255.50	20.93	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	51	3	7.50	1263.00	21.05	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	51	11.5	8.50	1271.50	21.19	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	51	18.5	7.00	1278.50	21.31	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	51	26.5	8.00	1286.50	21.44	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	51	34	7.50	1294.00	21.57	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	51	41.5	7.50	1301.50	21.69	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	51	49	7.50	1309.00	21.82	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	51	57	8.00	1317.00	21.95	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	52	4	7.00	1324.00	22.07	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	52	12	8.00	1332.00	22.20	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	52	19	7.00	1339.00	22.32	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	52	26.5	7.50	1346.50	22.44	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	52	33.5	7.00	1353.50	22.56	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	52	42	8.50	1362.00	22.70	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	52	49	7.00	1369.00	22.82	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	52	58	9.00	1378.00	22.97	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	53	5.5	7.50	1385.50	23.09	8.00	0.43	0.058	0.002	0.927	23.548
10	12	2004	14	53	14.5	9.00	1394.50	23.24	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	53	22.5	8.00	1402.50	23.38	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	53	31.5	9.00	1411.50	23.53	6.67	0.36	0.048	0.001	0.773	19.624
10	12	2004	14	53	40	8.50	1420.00	23.67	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	53	48.5	8.50	1428.50	23.81	7.06	0.38	0.051	0.001	0.818	20.778
10	12	2004	14	53	55.5	7.00	1435.50	23.93	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	54	3.5	8.00	1443.50	24.06	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	54	10.5	7.00	1450.50	24.18	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	54	18.5	8.00	1458.50	24.31	7.50	0.40	0.054	0.002	0.869	22.077
10	12	2004	14	54	25.5	7.00	1465.50	24.43	8.57	0.46	0.062	0.002	0.993	25.231
10	12	2004	14	54	31.5	6.00	1471.50	24.53	10.00	0.54	0.072	0.002	1.159	29.436
10	12	2004	14	54	36	4.50	1476.00	24.60	13.33	0.72	0.096	0.003	1.545	39.247
10	12	2004	14	54	42.5	6.50	1482.50	24.71	9.23	0.50	0.066	0.002	1.070	27.171
10	12	2004	14	54	48.5	6.00	1488.50	24.81	10.00	0.54	0.072	0.002	1.159	29.436

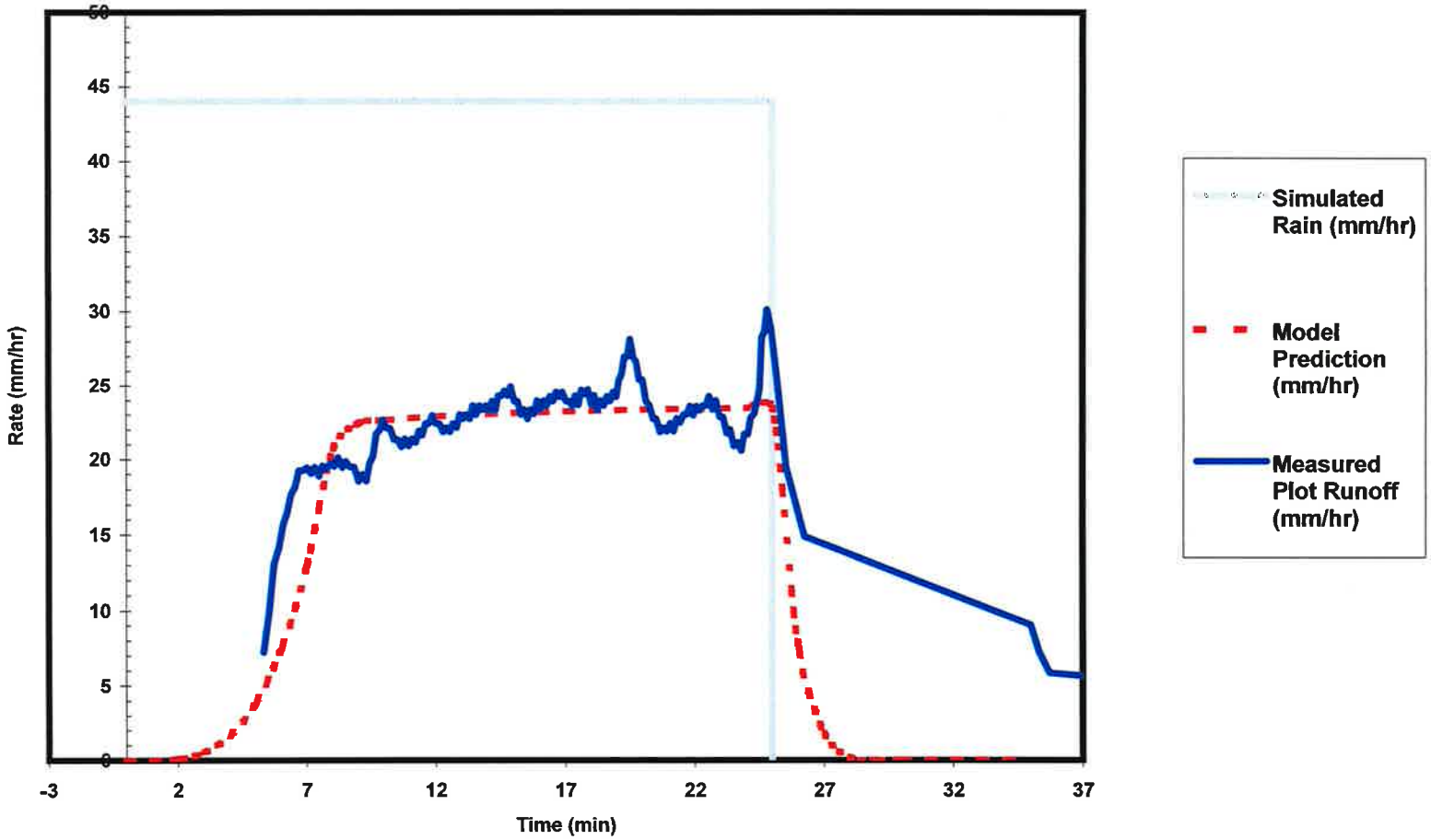
TEST 5

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	12	2004	14	54	58	9.50	1498.00	24.97	6.32	0.34	0.045	0.001	0.732	18.591
10	12	2004	14	55	10.5	12.50	1510.50	25.18	4.80	0.26	0.035	0.001	0.556	14.129
10	12	2004	14	55	32.5	22.00	1532.50	25.54	2.73	0.15	0.020	0.001	0.316	8.028
10	12	2004	14	56	15	42.50	1575.00	26.25	1.41	0.08	0.010	0.000	0.164	4.156
10	12	2004	15	5	0.5	525.50	2100.50	35.01	0.11	0.01	0.001	0.000	0.013	0.336
10	12	2004	15	5	18.5	18.00	2118.50	35.31	3.33	0.18	0.024	0.001	0.386	9.812
10	12	2004	15	5	44	25.50	2144.00	35.73	2.35	0.13	0.017	0.000	0.273	6.926
10	12	2004	15	15	52	608.00	2752.00	45.87	0.10	0.01	0.001	0.000	0.011	0.290

TEST 5

FIGURE A-5

Plot Conductivity Test - 5



TEST 5

LID 5Ke

phi:	*5*	*dtheta*	*1%*
Ks:	*9.70E-04*	*Ko:*	*10000*

sec	min	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
		END OF PLOT				
0	0	0.00E+00	0.00E+00	23.49	23.6	-0.6%
60	1	7.00E-08	2.52E-03			
120	2	2.63E-06	9.47E-02			
180	3	1.49E-05	5.35E-01			
240	4	4.62E-05	1.66E+00			
300	5	**1.07E-04**	3.85E+00			
360	6	2.08E-04	7.50E+00			
420	7	3.61E-04	1.30E+01			
480	8	5.76E-04	2.07E+01			
540	9	6.24E-04	2.24E+01			
600	10	6.29E-04	2.26E+01			
660	11	6.33E-04	2.28E+01			
720	12	6.36E-04	2.29E+01			
780	13	6.39E-04	2.30E+01			
840	14	6.41E-04	2.31E+01			
900	15	6.43E-04	2.31E+01			
960	16	6.44E-04	2.32E+01			
1020	17	6.46E-04	2.32E+01			
1080	18	6.47E-04	2.33E+01			
1140	19	6.48E-04	2.33E+01			
1200	20	6.49E-04	2.34E+01			
1260	21	6.50E-04	2.34E+01			
1320	22	6.50E-04	2.34E+01			
1380	23	6.51E-04	2.34E+01			
1440	24	6.52E-04	2.35E+01			
1500	25	6.52E-04	2.35E+01			
1560	26	2.07E-04	7.45E+00			
1620	27	4.93E-05	1.77E+00			
1680	28	4.67E-06	1.68E-01			
1740	29	1.00E-08	3.60E-04			
1800	30	1.00E-08	3.60E-04			
1860	31	1.00E-08	3.60E-04			
1920	32	1.00E-08	3.60E-04			
1980	33	1.00E-08	3.60E-04			
2040	34	1.00E-08	3.60E-04			
2100	35	1.00E-08	3.60E-04			

TEST 5

LID 5

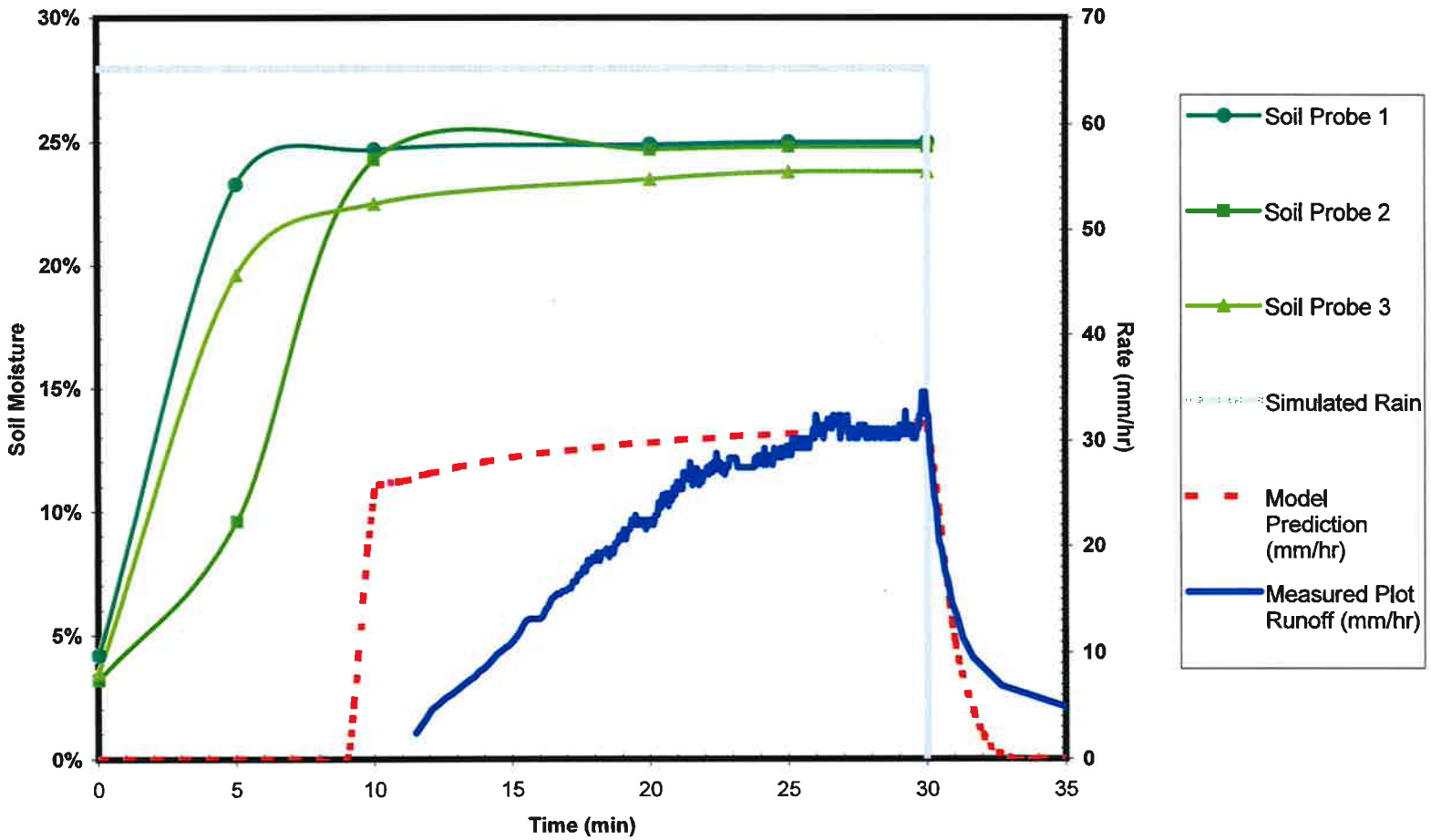
phi:	4	*dtheta*	15%	*slope (x:1):*	6
Ks:	1.60E-03	*Ko:*	10000	*length (cm):*	403

		EPS		END OF LID				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0.00E+00	0.00	0.00E+00	0	31.2	31.0	0.5%
60	1	0.00E+00	0.00	1.00E-08	0.0004			
120	2	1.10E-06	0.04	1.00E-08	0.00			
180	3	1.61E-04	5.79	1.00E-08	0.00			
240	4	3.95E-04	14.21	1.00E-08	0.00			
300	5	7.69E-04	27.68	1.00E-08	0.00			
360	6	1.30E-03	46.87	1.00E-08	0.00			
420	7	1.68E-03	60.50	1.00E-08	0.00			
480	8	1.78E-03	64.23	1.00E-08	0.00			
540	9	1.81E-03	65.07	1.00E-08	0.00			
600	10	1.81E-03	65.28	6.95E-04	25.04			
660	11	1.82E-03	65.35	7.25E-04	26.10			
720	12	1.82E-03	65.38	7.46E-04	26.87			
780	13	1.82E-03	65.40	7.63E-04	27.47			
840	14	1.82E-03	65.42	7.77E-04	27.97			
900	15	1.82E-03	65.43	7.89E-04	28.39			
960	16	1.82E-03	65.44	7.99E-04	28.75			
1020	17	1.82E-03	65.45	8.07E-04	29.07			
1080	18	1.82E-03	65.45	8.15E-04	29.35			
1140	19	1.82E-03	65.46	8.22E-04	29.59			
1200	20	1.82E-03	65.47	8.28E-04	29.81			
1260	21	1.82E-03	65.47	8.34E-04	30.01			
1320	22	1.82E-03	65.48	8.39E-04	30.19			
1380	23	1.82E-03	65.48	8.43E-04	30.36			
1440	24	1.82E-03	65.48	8.47E-04	30.51			
1500	25	1.82E-03	65.49	8.51E-04	30.64			
1560	26	1.82E-03	65.49	8.55E-04	30.77			
1620	27	1.82E-03	65.50	8.58E-04	30.89			
1680	28	1.82E-03	65.50	8.61E-04	31.00			
1740	29	1.82E-03	65.50	8.64E-04	31.10			
1800	30	1.82E-03	65.50	8.67E-04	31.19			
1860	31	1.18E-03	42.52	3.05E-04	10.98			
1920	32	8.34E-04	30.01	6.27E-05	2.26			
1980	33	6.19E-04	22.27	1.94E-06	0.07			
2040	34	4.78E-04	17.20	1.00E-08	0.00			
2100	35	3.81E-04	13.70	1.00E-08	0.00			
2160	36	3.11E-04	11.20	1.00E-08	0.00			
2220	37	2.59E-04	9.34	1.00E-08	0.00			
2280	38	2.20E-04	7.92	1.00E-08	0.00			
2340	39	1.89E-04	6.82	1.00E-08	0.00			
2400	40	1.65E-04	5.93	1.00E-08	0.00			
2460	41	1.45E-04	5.22	1.00E-08	0.00			
2520	42	1.28E-04	4.62	1.00E-08	0.00			
2580	43	1.15E-04	4.13	1.00E-08	0.00			
2640	44	1.03E-04	3.72	1.00E-08	0.00			
2700	45	9.33E-05	3.36	1.00E-08	0.00			

TEST 5

FIGURE A-6

Rain/Runoff Hydrograph - 5



TEST 5

MOBILE TEST #6 (TEST 6)

10/20/2004
Deer Park South
US 395 MP 171.4

Plot Parameters

Slope:	4:1
Length (cm):	400
Width (cm):	105
Plot Area (m^2):	4.20
Vegitation:	sparse ryegrass (40%)
Initial Theta:	16.3%
Final Theta:	29.9%
dtheta:	13.53%

Start Time:	14:11:00
End Time:	15:20:00
Test Duration:	*1:09:00*
Model Plot Area (m^2):	15.32

Estimated Ke (from plot):

mm/hr	*cm/s*
42.0	*1.17E-03*

	Normalized Rates		**Volumetric Rates**
Max Runoff Rate (mm/hr):	*10.0*	*(L/min):*	*2.55*
Rain-on Rate (mm/hr):	*26.5*	*(L/min):*	*6.78*
Runoff Percentage:	*37.5%*		*37.5%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	20	4	14	11	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
10	20	4	14	37	38.5	1598.50	1598.50	26.64	0.04	0.00	0.000	0.000	0.001	0.030
10	20	4	14	37	56	17.50	1616.00	26.93	3.43	0.18	0.025	0.001	0.108	2.734
10	20	4	14	38	10.5	14.50	1630.50	27.18	4.14	0.22	0.030	0.001	0.130	3.299
10	20	4	14	38	24.5	14.00	1644.50	27.41	4.29	0.23	0.031	0.001	0.135	3.417
10	20	4	14	38	37.5	13.00	1657.50	27.63	4.62	0.25	0.033	0.001	0.145	3.680
10	20	4	14	38	50	12.50	1670.00	27.83	4.80	0.26	0.035	0.001	0.151	3.827
10	20	4	14	39	2	12.00	1682.00	28.03	5.00	0.27	0.036	0.001	0.157	3.987
10	20	4	14	39	14	12.00	1694.00	28.23	5.00	0.27	0.036	0.001	0.157	3.987
10	20	4	14	39	25	11.00	1705.00	28.42	5.45	0.29	0.039	0.001	0.171	4.349
10	20	4	14	39	35.5	10.50	1715.50	28.59	5.71	0.31	0.041	0.001	0.179	4.556
10	20	4	14	39	46	10.50	1726.00	28.77	5.71	0.31	0.041	0.001	0.179	4.556
10	20	4	14	39	56.5	10.50	1736.50	28.94	5.71	0.31	0.041	0.001	0.179	4.556
10	20	4	14	40	6	9.50	1746.00	29.10	6.32	0.34	0.045	0.001	0.198	5.036
10	20	4	14	40	16	10.00	1756.00	29.27	6.00	0.32	0.043	0.001	0.188	4.784
10	20	4	14	40	25.5	9.50	1765.50	29.43	6.32	0.34	0.045	0.001	0.198	5.036
10	20	4	14	40	35.5	10.00	1775.50	29.59	6.00	0.32	0.043	0.001	0.188	4.784
10	20	4	14	40	44.5	9.00	1784.50	29.74	6.67	0.36	0.048	0.001	0.209	5.316
10	20	4	14	40	53.5	9.00	1793.50	29.89	6.67	0.36	0.048	0.001	0.209	5.316
10	20	4	14	41	1.5	8.00	1801.50	30.03	7.50	0.40	0.054	0.002	0.235	5.980
10	20	4	14	41	10.5	9.00	1810.50	30.18	6.67	0.36	0.048	0.001	0.209	5.316
10	20	4	14	41	18.5	8.00	1818.50	30.31	7.50	0.40	0.054	0.002	0.235	5.980
10	20	4	14	41	26.5	8.00	1826.50	30.44	7.50	0.40	0.054	0.002	0.235	5.980
10	20	4	14	41	34	7.50	1834.00	30.57	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	41	42	8.00	1842.00	30.70	7.50	0.40	0.054	0.002	0.235	5.980
10	20	4	14	41	49.5	7.50	1849.50	30.83	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	41	57	7.50	1857.00	30.95	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	42	3.5	6.50	1863.50	31.06	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	42	11	7.50	1871.00	31.18	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	42	17.5	6.50	1877.50	31.29	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	42	24.5	7.00	1884.50	31.41	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	42	31	6.50	1891.00	31.52	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	42	38.5	7.50	1898.50	31.64	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	42	45.5	7.00	1905.50	31.76	8.57	0.46	0.062	0.002	0.269	6.834

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	14	42	53	7.50	1913.00	31.88	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	42	59.5	6.50	1919.50	31.99	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	43	7	7.50	1927.00	32.12	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	43	14	7.00	1934.00	32.23	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	43	21.5	7.50	1941.50	32.36	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	43	28	6.50	1948.00	32.47	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	43	35.5	7.50	1955.50	32.59	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	43	42	6.50	1962.00	32.70	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	43	49.5	7.50	1969.50	32.83	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	43	56	6.50	1976.00	32.93	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	44	3.5	7.50	1983.50	33.06	8.00	0.43	0.058	0.002	0.251	6.379
10	20	4	14	44	10	6.50	1990.00	33.17	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	44	17	7.00	1997.00	33.28	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	44	23	6.00	2003.00	33.38	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	44	30	7.00	2010.00	33.50	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	44	35.5	5.50	2015.50	33.59	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	44	42.5	7.00	2022.50	33.71	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	44	48	5.50	2028.00	33.80	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	44	55	7.00	2035.00	33.92	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	45	0.5	5.50	2040.50	34.01	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	45	7	6.50	2047.00	34.12	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	45	13	6.00	2053.00	34.22	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	45	20	7.00	2060.00	34.33	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	45	25.5	5.50	2065.50	34.43	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	45	32.5	7.00	2072.50	34.54	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	45	39	6.50	2079.00	34.65	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	45	46	7.00	2086.00	34.77	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	45	52	6.00	2092.00	34.87	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	45	59	7.00	2099.00	34.98	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	46	5	6.00	2105.00	35.08	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	46	12	7.00	2112.00	35.20	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	46	18.5	6.50	2118.50	35.31	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	46	25.5	7.00	2125.50	35.43	8.57	0.46	0.062	0.002	0.269	6.834
10	20	4	14	46	31.5	6.00	2131.50	35.53	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	46	38	6.50	2138.00	35.63	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	46	44	6.00	2144.00	35.73	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	46	50.5	6.50	2150.50	35.84	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	46	56	5.50	2156.00	35.93	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	47	2.5	6.50	2162.50	36.04	9.23	0.50	0.066	0.002	0.290	7.360
10	20	4	14	47	8.5	6.00	2168.50	36.14	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	47	14.5	6.00	2174.50	36.24	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	47	20	5.50	2180.00	36.33	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	47	26	6.00	2186.00	36.43	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	47	31.5	5.50	2191.50	36.53	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	47	37.5	6.00	2197.50	36.63	10.00	0.54	0.072	0.002	0.314	7.973

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	14	47	42.5	5.00	2202.50	36.71	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	47	48.5	6.00	2208.50	36.81	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	47	53.5	5.00	2213.50	36.89	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	47	59.5	6.00	2219.50	36.99	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	48	4.5	5.00	2224.50	37.08	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	48	10.5	6.00	2230.50	37.18	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	48	15.5	5.00	2235.50	37.26	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	48	21.5	6.00	2241.50	37.36	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	48	26.5	5.00	2246.50	37.44	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	48	32	5.50	2252.00	37.53	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	48	37	5.00	2257.00	37.62	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	48	42.5	5.50	2262.50	37.71	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	48	48	5.50	2268.00	37.80	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	48	53.5	5.50	2273.50	37.89	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	48	58.5	5.00	2278.50	37.98	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	49	4	5.50	2284.00	38.07	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	49	9	5.00	2289.00	38.15	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	49	14.5	5.50	2294.50	38.24	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	49	19.5	5.00	2299.50	38.33	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	49	25	5.50	2305.00	38.42	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	49	30	5.00	2310.00	38.50	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	49	35.5	5.50	2315.50	38.59	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	49	40.5	5.00	2320.50	38.68	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	49	46	5.50	2326.00	38.77	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	49	51	5.00	2331.00	38.85	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	49	56.5	5.50	2336.50	38.94	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	50	1.5	5.00	2341.50	39.03	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	50	7.5	6.00	2347.50	39.13	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	50	12.5	5.00	2352.50	39.21	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	50	18	5.50	2358.00	39.30	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	50	23	5.00	2363.00	39.38	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	50	29	6.00	2369.00	39.48	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	50	34	5.00	2374.00	39.57	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	50	40	6.00	2380.00	39.67	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	50	45	5.00	2385.00	39.75	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	50	50.5	5.50	2390.50	39.84	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	50	55.5	5.00	2395.50	39.93	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	51	1.5	6.00	2401.50	40.03	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	51	6.5	5.00	2406.50	40.11	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	51	12	5.50	2412.00	40.20	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	51	17	5.00	2417.00	40.28	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	51	23	6.00	2423.00	40.38	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	51	28	5.00	2428.00	40.47	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	51	33.5	5.50	2433.50	40.56	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	51	38.5	5.00	2438.50	40.64	12.00	0.65	0.086	0.002	0.377	9.568

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	14	51	44.5	6.00	2444.50	40.74	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	51	49.5	5.00	2449.50	40.83	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	51	55.5	6.00	2455.50	40.93	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	52	0.5	5.00	2460.50	41.01	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	52	6.5	6.00	2466.50	41.11	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	52	11.5	5.00	2471.50	41.19	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	52	17	5.50	2477.00	41.28	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	52	22	5.00	2482.00	41.37	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	52	28	6.00	2488.00	41.47	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	14	52	33	5.00	2493.00	41.55	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	52	38.5	5.50	2498.50	41.64	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	52	44	5.50	2504.00	41.73	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	52	49.5	5.50	2509.50	41.83	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	52	54.5	5.00	2514.50	41.91	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	53	0	5.50	2520.00	42.00	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	53	5	5.00	2525.00	42.08	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	53	10.5	5.50	2530.50	42.18	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	53	15.5	5.00	2535.50	42.26	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	53	21	5.50	2541.00	42.35	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	53	26	5.00	2546.00	42.43	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	53	31.5	5.50	2551.50	42.53	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	53	36.5	5.00	2556.50	42.61	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	53	42	5.50	2562.00	42.70	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	53	47	5.00	2567.00	42.78	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	53	52	5.00	2572.00	42.87	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	53	57	5.00	2577.00	42.95	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	2	5.00	2582.00	43.03	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	7	5.00	2587.00	43.12	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	12	5.00	2592.00	43.20	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	16.5	4.50	2596.50	43.28	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	54	21.5	5.00	2601.50	43.36	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	26.5	5.00	2606.50	43.44	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	31.5	5.00	2611.50	43.53	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	35.5	4.00	2615.50	43.59	15.00	0.81	0.108	0.003	0.471	11.960
10	20	4	14	54	41	5.50	2621.00	43.68	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	54	45.5	4.50	2625.50	43.76	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	54	50.5	5.00	2630.50	43.84	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	54	55	4.50	2635.00	43.92	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	55	0	5.00	2640.00	44.00	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	55	5	5.00	2645.00	44.08	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	55	10	5.00	2650.00	44.17	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	55	14.5	4.50	2654.50	44.24	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	55	19.5	5.00	2659.50	44.33	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	55	24.5	5.00	2664.50	44.41	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	55	30	5.50	2670.00	44.50	10.91	0.59	0.078	0.002	0.342	8.698

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	14	55	34.5	4.50	2674.50	44.58	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	55	40	5.50	2680.00	44.67	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	55	45	5.00	2685.00	44.75	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	55	50	5.00	2690.00	44.83	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	55	55	5.00	2695.00	44.92	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	0.5	5.50	2700.50	45.01	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	56	5.5	5.00	2705.50	45.09	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	10.5	5.00	2710.50	45.18	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	15.5	5.00	2715.50	45.26	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	20.5	5.00	2720.50	45.34	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	25.5	5.00	2725.50	45.43	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	30.5	5.00	2730.50	45.51	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	35.5	5.00	2735.50	45.59	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	41	5.50	2741.00	45.68	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	56	45.5	4.50	2745.50	45.76	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	56	50.5	5.00	2750.50	45.84	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	56	55	4.50	2755.00	45.92	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	57	0.5	5.50	2760.50	46.01	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	57	5	4.50	2765.00	46.08	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	57	10	5.00	2770.00	46.17	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	57	14.5	4.50	2774.50	46.24	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	57	20	5.50	2780.00	46.33	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	57	24.5	4.50	2784.50	46.41	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	57	29.5	5.00	2789.50	46.49	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	57	34	4.50	2794.00	46.57	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	57	39	5.00	2799.00	46.65	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	57	43.5	4.50	2803.50	46.73	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	57	48.5	5.00	2808.50	46.81	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	57	53	4.50	2813.00	46.88	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	57	58	5.00	2818.00	46.97	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	58	2.5	4.50	2822.50	47.04	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	58	7.5	5.00	2827.50	47.13	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	58	12	4.50	2832.00	47.20	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	58	17	5.00	2837.00	47.28	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	58	21.5	4.50	2841.50	47.36	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	58	27	5.50	2847.00	47.45	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	58	31.5	4.50	2851.50	47.53	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	58	36.5	5.00	2856.50	47.61	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	58	41	4.50	2861.00	47.68	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	58	46.5	5.50	2866.50	47.78	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	58	51.5	5.00	2871.50	47.86	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	58	56.5	5.00	2876.50	47.94	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	59	1.5	5.00	2881.50	48.03	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	59	6.5	5.00	2886.50	48.11	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	59	11.5	5.00	2891.50	48.19	12.00	0.65	0.086	0.002	0.377	9.568

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	14	59	17	5.50	2897.00	48.28	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	59	22	5.00	2902.00	48.37	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	59	27	5.00	2907.00	48.45	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	59	32	5.00	2912.00	48.53	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	59	37.5	5.50	2917.50	48.63	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	59	42	4.50	2922.00	48.70	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	14	59	47.5	5.50	2927.50	48.79	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	14	59	52.5	5.00	2932.50	48.88	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	14	59	58	5.50	2938.00	48.97	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	0	2.5	4.50	2942.50	49.04	13.33	0.72	0.096	0.003	0.419	10.631
10	20	4	15	0	8	5.50	2948.00	49.13	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	0	13	5.00	2953.00	49.22	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	0	18.5	5.50	2958.50	49.31	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	0	23.5	5.00	2963.50	49.39	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	0	29	5.50	2969.00	49.48	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	0	34	5.00	2974.00	49.57	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	0	39.5	5.50	2979.50	49.66	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	0	44.5	5.00	2984.50	49.74	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	0	50	5.50	2990.00	49.83	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	0	55	5.00	2995.00	49.92	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	1	1	6.00	3001.00	50.02	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	1	6	5.00	3006.00	50.10	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	1	11.5	5.50	3011.50	50.19	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	1	17	5.50	3017.00	50.28	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	1	22.5	5.50	3022.50	50.38	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	1	27.5	5.00	3027.50	50.46	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	1	33.5	6.00	3033.50	50.56	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	1	38.5	5.00	3038.50	50.64	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	1	44.5	6.00	3044.50	50.74	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	1	49.5	5.00	3049.50	50.83	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	1	55	5.50	3055.00	50.92	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	2	0.5	5.50	3060.50	51.01	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	2	6	5.50	3066.00	51.10	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	2	11.5	5.50	3071.50	51.19	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	2	17	5.50	3077.00	51.28	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	2	22.5	5.50	3082.50	51.38	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	2	28.5	6.00	3088.50	51.48	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	2	33.5	5.00	3093.50	51.56	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	2	39.5	6.00	3099.50	51.66	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	2	44.5	5.00	3104.50	51.74	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	2	50.5	6.00	3110.50	51.84	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	2	55.5	5.00	3115.50	51.93	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	3	1	5.50	3121.00	52.02	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	3	6.5	5.50	3126.50	52.11	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	3	12	5.50	3132.00	52.20	10.91	0.59	0.078	0.002	0.342	8.698

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	3	17	5.00	3137.00	52.28	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	3	23	6.00	3143.00	52.38	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	3	28	5.00	3148.00	52.47	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	3	33.5	5.50	3153.50	52.56	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	3	38.5	5.00	3158.50	52.64	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	3	44	5.50	3164.00	52.73	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	3	49	5.00	3169.00	52.82	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	3	54.5	5.50	3174.50	52.91	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	3	59.5	5.00	3179.50	52.99	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	4	5.5	6.00	3185.50	53.09	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	4	10.5	5.00	3190.50	53.18	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	4	16	5.50	3196.00	53.27	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	4	21	5.00	3201.00	53.35	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	4	26.5	5.50	3206.50	53.44	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	4	32	5.50	3212.00	53.53	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	4	37.5	5.50	3217.50	53.63	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	4	43	5.50	3223.00	53.72	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	4	48.5	5.50	3228.50	53.81	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	4	53.5	5.00	3233.50	53.89	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	4	59.5	6.00	3239.50	53.99	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	5	5	5.50	3245.00	54.08	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	5	10.5	5.50	3250.50	54.18	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	5	16	5.50	3256.00	54.27	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	5	21.5	5.50	3261.50	54.36	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	5	27	5.50	3267.00	54.45	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	5	33	6.00	3273.00	54.55	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	5	38	5.00	3278.00	54.63	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	5	44	6.00	3284.00	54.73	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	5	49	5.00	3289.00	54.82	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	5	55	6.00	3295.00	54.92	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	6	0	5.00	3300.00	55.00	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	6	6	6.00	3306.00	55.10	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	6	11	5.00	3311.00	55.18	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	6	16.5	5.50	3316.50	55.28	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	6	22	5.50	3322.00	55.37	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	6	27.5	5.50	3327.50	55.46	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	6	32.5	5.00	3332.50	55.54	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	6	38	5.50	3338.00	55.63	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	6	43	5.00	3343.00	55.72	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	6	48.5	5.50	3348.50	55.81	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	6	54	5.50	3354.00	55.90	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	6	59.5	5.50	3359.50	55.99	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	7	4.5	5.00	3364.50	56.08	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	7	10	5.50	3370.00	56.17	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	7	15.5	5.50	3375.50	56.26	10.91	0.59	0.078	0.002	0.342	8.698

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	7	21	5.50	3381.00	56.35	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	7	26	5.00	3386.00	56.43	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	7	32	6.00	3392.00	56.53	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	7	37	5.00	3397.00	56.62	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	7	42.5	5.50	3402.50	56.71	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	7	48	5.50	3408.00	56.80	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	7	54	6.00	3414.00	56.90	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	7	59	5.00	3419.00	56.98	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	8	5	6.00	3425.00	57.08	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	8	10	5.00	3430.00	57.17	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	8	16	6.00	3436.00	57.27	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	8	21.5	5.50	3441.50	57.36	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	8	27	5.50	3447.00	57.45	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	8	32.5	5.50	3452.50	57.54	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	8	38	5.50	3458.00	57.63	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	8	43.5	5.50	3463.50	57.73	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	8	49.5	6.00	3469.50	57.83	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	8	55.5	6.00	3475.50	57.93	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	9	1.5	6.00	3481.50	58.03	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	9	7	5.50	3487.00	58.12	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	9	13	6.00	3493.00	58.22	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	9	18.5	5.50	3498.50	58.31	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	9	24.5	6.00	3504.50	58.41	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	9	30	5.50	3510.00	58.50	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	9	36	6.00	3516.00	58.60	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	9	41.5	5.50	3521.50	58.69	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	9	47.5	6.00	3527.50	58.79	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	9	53	5.50	3533.00	58.88	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	9	59	6.00	3539.00	58.98	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	10	4.5	5.50	3544.50	59.08	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	10	5.50	3550.00	59.17	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	15.5	5.50	3555.50	59.26	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	21.5	6.00	3561.50	59.36	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	10	27	5.50	3567.00	59.45	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	32.5	5.50	3572.50	59.54	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	37.5	5.00	3577.50	59.63	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	10	43	5.50	3583.00	59.72	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	48.5	5.50	3588.50	59.81	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	54	5.50	3594.00	59.90	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	10	59	5.00	3599.00	59.98	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	11	4	5.00	3604.00	60.07	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	11	9.5	5.50	3609.50	60.16	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	11	14.5	5.00	3614.50	60.24	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	11	19.5	5.00	3619.50	60.33	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	11	25	5.50	3625.00	60.42	10.91	0.59	0.078	0.002	0.342	8.698

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	11	30	5.00	3630.00	60.50	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	11	35.5	5.50	3635.50	60.59	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	11	40.5	5.00	3640.50	60.68	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	11	46	5.50	3646.00	60.77	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	11	51	5.00	3651.00	60.85	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	11	56.5	5.50	3656.50	60.94	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	12	1.5	5.00	3661.50	61.03	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	12	7	5.50	3667.00	61.12	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	12	12	5.00	3672.00	61.20	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	12	17.5	5.50	3677.50	61.29	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	12	22.5	5.00	3682.50	61.38	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	12	28	5.50	3688.00	61.47	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	12	33	5.00	3693.00	61.55	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	12	38.5	5.50	3698.50	61.64	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	12	43.5	5.00	3703.50	61.73	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	12	49	5.50	3709.00	61.82	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	12	54.5	5.50	3714.50	61.91	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	12	59.5	5.00	3719.50	61.99	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	13	5	5.50	3725.00	62.08	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	10.5	5.50	3730.50	62.18	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	15.5	5.00	3735.50	62.26	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	13	21	5.50	3741.00	62.35	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	26.5	5.50	3746.50	62.44	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	32	5.50	3752.00	62.53	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	37.5	5.50	3757.50	62.63	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	43	5.50	3763.00	62.72	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	48.5	5.50	3768.50	62.81	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	54	5.50	3774.00	62.90	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	13	59.5	5.50	3779.50	62.99	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	14	5	5.50	3785.00	63.08	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	14	10.5	5.50	3790.50	63.18	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	14	16.5	6.00	3796.50	63.28	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	14	21.5	5.00	3801.50	63.36	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	14	27.5	6.00	3807.50	63.46	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	14	33	5.50	3813.00	63.55	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	14	38.5	5.50	3818.50	63.64	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	14	44	5.50	3824.00	63.73	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	14	50	6.00	3830.00	63.83	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	14	55.5	5.50	3835.50	63.93	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	15	1.5	6.00	3841.50	64.03	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	15	7	5.50	3847.00	64.12	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	15	12.5	5.50	3852.50	64.21	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	15	18.5	6.00	3858.50	64.31	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	15	24	5.50	3864.00	64.40	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	15	29.5	5.50	3869.50	64.49	10.91	0.59	0.078	0.002	0.342	8.698

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	15	35.5	6.00	3875.50	64.59	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	15	41	5.50	3881.00	64.68	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	15	46.5	5.50	3886.50	64.78	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	15	52	5.50	3892.00	64.87	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	15	57.5	5.50	3897.50	64.96	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	16	2.5	5.00	3902.50	65.04	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	16	8.5	6.00	3908.50	65.14	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	16	13.5	5.00	3913.50	65.23	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	16	19	5.50	3919.00	65.32	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	16	24.5	5.50	3924.50	65.41	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	16	30.5	6.00	3930.50	65.51	10.00	0.54	0.072	0.002	0.314	7.973
10	20	4	15	16	36	5.50	3936.00	65.60	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	16	41.5	5.50	3941.50	65.69	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	16	46.5	5.00	3946.50	65.78	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	16	52	5.50	3952.00	65.87	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	16	57.5	5.50	3957.50	65.96	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	3	5.50	3963.00	66.05	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	8	5.00	3968.00	66.13	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	17	13.5	5.50	3973.50	66.23	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	19	5.50	3979.00	66.32	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	24.5	5.50	3984.50	66.41	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	29.5	5.00	3989.50	66.49	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	17	35	5.50	3995.00	66.58	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	40.5	5.50	4000.50	66.68	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	46	5.50	4006.00	66.77	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	17	51	5.00	4011.00	66.85	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	17	56.5	5.50	4016.50	66.94	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	2	5.50	4022.00	67.03	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	7.5	5.50	4027.50	67.13	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	12.5	5.00	4032.50	67.21	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	18	18	5.50	4038.00	67.30	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	23.5	5.50	4043.50	67.39	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	29	5.50	4049.00	67.48	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	34	5.00	4054.00	67.57	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	18	39.5	5.50	4059.50	67.66	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	44.5	5.00	4064.50	67.74	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	18	50	5.50	4070.00	67.83	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	18	55	5.00	4075.00	67.92	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	19	0.5	5.50	4080.50	68.01	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	19	6	5.50	4086.00	68.10	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	19	11.5	5.50	4091.50	68.19	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	19	16.5	5.00	4096.50	68.28	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	19	22	5.50	4102.00	68.37	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	19	27	5.00	4107.00	68.45	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	19	32.5	5.50	4112.50	68.54	10.91	0.59	0.078	0.002	0.342	8.698

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	19	37.5	5.00	4117.50	68.63	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	19	42.5	5.00	4122.50	68.71	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	19	48	5.50	4128.00	68.80	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	19	53	5.00	4133.00	68.88	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	19	58	5.00	4138.00	68.97	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	3.5	5.50	4143.50	69.06	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	20	8.5	5.00	4148.50	69.14	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	13.5	5.00	4153.50	69.23	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	18.5	5.00	4158.50	69.31	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	24	5.50	4164.00	69.40	10.91	0.59	0.078	0.002	0.342	8.698
10	20	4	15	20	29	5.00	4169.00	69.48	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	34	5.00	4174.00	69.57	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	39	5.00	4179.00	69.65	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	44	5.00	4184.00	69.73	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	49	5.00	4189.00	69.82	12.00	0.65	0.086	0.002	0.377	9.568
10	20	4	15	20	54.5	5.50	4194.50	69.91	10.91	0.59	0.078	0.002	0.342	8.698

TEST 6

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	26.5	1.3	4.92E-03	0.174	10.59	34.8	6.78E-03	0.239	96.84
69.00	26.5	1.3	4.92E-03	0.174	10.59	34.8	6.78E-03	0.239	96.84
69.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	0.50	15	2.00	1.10	0.47	1.05
2	0.15		0.60	27.9	11.9	26.5
3	0.25		1.00			
4	0.25		1.00			
5	0.25		1.00			
6	0.25		1.00			

TEST 6

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
14:00	0	13.5%	17.0%	18.5%
14:15	4.00	27.8%	18.3%	20.8%
14:20	9.00	30.0%	18.8%	21.4%
14:25	14.00	30.1%	27.5%	21.4%
14:30	19.00	30.2%	29.1%	21.6%
14:35	24.00	30.2%	29.0%	26.9%
14:40	29.00	30.2%	29.0%	27.8%
14:45	34.00	30.2%	29.1%	28.1%
15:00	49.00	30.4%	29.1%	28.6%
15:15	64.00	30.7%	29.3%	29.6%
15:30	79.00	26.4%	28.1%	26.7%

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**16.3%**
Average Max Moisture:	**29.9%**
dtheta:	**13.5%**

TEST 6

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)	Time	Intensity
1	0.80	15	3.20	3.10	0.50	3.38	0	78.7
2	0.65		2.60	78.7	12.8	85.7	20.0	78.7
3	0.90		3.60				20.0	0
4	0.90		3.60					
5	0.60		2.40					
6	0.80		3.20					

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
1.65	42.0	1.166E-03

Applied Rain (mm/hr):	85.7
Plot Area (m^2):	4.20
Steady State Runoff (mm/hr):	43.7

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	45	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
10	20	4	15	48	21	201.00	201.00	3.35	0.30	0.02	0.002	0.000	0.034	0.868
10	20	4	15	48	44	23.00	224.00	3.73	2.61	0.14	0.019	0.001	0.299	7.589
10	20	4	15	48	55	11.00	235.00	3.92	5.45	0.29	0.039	0.001	0.625	15.868
10	20	4	15	49	4.5	9.50	244.50	4.08	6.32	0.34	0.045	0.001	0.723	18.374
10	20	4	15	49	12	7.50	252.00	4.20	8.00	0.43	0.058	0.002	0.916	23.273
10	20	4	15	49	20	8.00	260.00	4.33	7.50	0.40	0.054	0.002	0.859	21.819
10	20	4	15	49	26.5	6.50	266.50	4.44	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	49	33.5	7.00	273.50	4.56	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	49	40.5	7.00	280.50	4.68	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	49	47.5	7.00	287.50	4.79	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	49	54	6.50	294.00	4.90	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	1	7.00	301.00	5.02	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	50	7.5	6.50	307.50	5.13	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	14	6.50	314.00	5.23	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	20	6.00	320.00	5.33	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	26.5	6.50	326.50	5.44	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	32.5	6.00	332.50	5.54	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	38.5	6.00	338.50	5.64	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	43.5	5.00	343.50	5.73	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	50	49.5	6.00	349.50	5.83	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	54.5	5.00	354.50	5.91	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	0.5	6.00	360.50	6.01	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	51	5.5	5.00	365.50	6.09	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	11	5.50	371.00	6.18	10.91	0.59	0.078	0.002	1.249	31.736

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	51	16	5.00	376.00	6.27	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	21	5.00	381.00	6.35	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	26	5.00	386.00	6.43	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	31	5.00	391.00	6.52	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	36	5.00	396.00	6.60	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	40.5	4.50	400.50	6.68	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	51	45.5	5.00	405.50	6.76	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	50	4.50	410.00	6.83	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	51	55	5.00	415.00	6.92	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	59.5	4.50	419.50	6.99	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	4	4.50	424.00	7.07	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	9	5.00	429.00	7.15	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	14	5.00	434.00	7.23	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	19	5.00	439.00	7.32	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	23.5	4.50	443.50	7.39	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	28.5	5.00	448.50	7.48	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	33.5	5.00	453.50	7.56	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	38.5	5.00	458.50	7.64	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	43	4.50	463.00	7.72	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	48	5.00	468.00	7.80	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	52.5	4.50	472.50	7.88	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	57.5	5.00	477.50	7.96	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	2	4.50	482.00	8.03	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	7	5.00	487.00	8.12	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	11.5	4.50	491.50	8.19	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	16.5	5.00	496.50	8.28	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	21	4.50	501.00	8.35	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	26	5.00	506.00	8.43	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	30.5	4.50	510.50	8.51	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	35	4.50	515.00	8.58	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	39.5	4.50	519.50	8.66	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	44	4.50	524.00	8.73	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	48.5	4.50	528.50	8.81	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	53	4.50	533.00	8.88	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	57	4.00	537.00	8.95	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	1.5	4.50	541.50	9.03	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	5.5	4.00	545.50	9.09	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	10	4.50	550.00	9.17	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	14	4.00	554.00	9.23	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	18.5	4.50	558.50	9.31	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	22.5	4.00	562.50	9.38	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	26.5	4.00	566.50	9.44	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	30.5	4.00	570.50	9.51	15.00	0.81	0.108	0.003	1.718	43.637

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	54	35	4.50	575.00	9.58	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	39	4.00	579.00	9.65	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	43	4.00	583.00	9.72	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	46.5	3.50	586.50	9.78	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	54	50.5	4.00	590.50	9.84	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	54.5	4.00	594.50	9.91	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	58	3.50	598.00	9.97	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	2	4.00	602.00	10.03	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	6	4.00	606.00	10.10	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	9.5	3.50	609.50	10.16	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	13.5	4.00	613.50	10.23	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	17	3.50	617.00	10.28	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	21	4.00	621.00	10.35	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	25	4.00	625.00	10.42	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	29	4.00	629.00	10.48	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	32.5	3.50	632.50	10.54	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	37	4.50	637.00	10.62	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	55	41	4.00	641.00	10.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	45	4.00	645.00	10.75	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	49	4.00	649.00	10.82	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	53	4.00	653.00	10.88	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	57	4.00	657.00	10.95	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	1	4.00	661.00	11.02	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	5	4.00	665.00	11.08	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	9	4.00	669.00	11.15	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	12.5	3.50	672.50	11.21	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	17	4.50	677.00	11.28	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	56	20.5	3.50	680.50	11.34	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	24.5	4.00	684.50	11.41	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	28.5	4.00	688.50	11.48	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	32.5	4.00	692.50	11.54	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	36.5	4.00	696.50	11.61	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	40.5	4.00	700.50	11.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	44	3.50	704.00	11.73	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	48	4.00	708.00	11.80	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	52	4.00	712.00	11.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	55.5	3.50	715.50	11.93	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	59	3.50	719.00	11.98	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	3	4.00	723.00	12.05	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	6.5	3.50	726.50	12.11	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	10.5	4.00	730.50	12.18	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	14	3.50	734.00	12.23	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	17.5	3.50	737.50	12.29	17.14	0.92	0.123	0.003	1.963	49.871

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	57	21	3.50	741.00	12.35	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	25	4.00	745.00	12.42	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	28.5	3.50	748.50	12.48	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	32.5	4.00	752.50	12.54	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	36.5	4.00	756.50	12.61	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	40.5	4.00	760.50	12.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	44	3.50	764.00	12.73	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	48	4.00	768.00	12.80	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	52	4.00	772.00	12.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	56	4.00	776.00	12.93	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	59.5	3.50	779.50	12.99	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	4	4.50	784.00	13.07	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	7.5	3.50	787.50	13.13	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	12	4.50	792.00	13.20	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	15.5	3.50	795.50	13.26	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	20	4.50	800.00	13.33	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	23.5	3.50	803.50	13.39	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	28	4.50	808.00	13.47	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	31.5	3.50	811.50	13.53	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	36	4.50	816.00	13.60	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	39.5	3.50	819.50	13.66	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	44	4.50	824.00	13.73	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	47.5	3.50	827.50	13.79	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	52	4.50	832.00	13.87	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	56	4.00	836.00	13.93	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	0	4.00	840.00	14.00	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	4	4.00	844.00	14.07	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	8.5	4.50	848.50	14.14	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	12	3.50	852.00	14.20	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	59	16.5	4.50	856.50	14.28	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	20.5	4.00	860.50	14.34	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	24.5	4.00	864.50	14.41	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	28.5	4.00	868.50	14.48	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	33	4.50	873.00	14.55	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	37	4.00	877.00	14.62	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	41.5	4.50	881.50	14.69	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	46	4.50	886.00	14.77	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	50	4.00	890.00	14.83	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	54	4.00	894.00	14.90	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	58.5	4.50	898.50	14.98	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	2.5	4.00	902.50	15.04	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	7	4.50	907.00	15.12	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	10.5	3.50	910.50	15.18	17.14	0.92	0.123	0.003	1.963	49.871

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	16	0	15	4.50	915.00	15.25	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	18.5	3.50	918.50	15.31	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	0	23	4.50	923.00	15.38	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	27	4.00	927.00	15.45	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	31	4.00	931.00	15.52	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	35	4.00	935.00	15.58	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	39.5	4.50	939.50	15.66	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	43.5	4.00	943.50	15.73	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	48	4.50	948.00	15.80	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	52	4.00	952.00	15.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	56.5	4.50	956.50	15.94	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	0.5	4.00	960.50	16.01	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	5	4.50	965.00	16.08	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	9	4.00	969.00	16.15	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	13.5	4.50	973.50	16.23	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	17.5	4.00	977.50	16.29	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	22	4.50	982.00	16.37	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	26	4.00	986.00	16.43	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	30.5	4.50	990.50	16.51	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	34.5	4.00	994.50	16.58	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	39	4.50	999.00	16.65	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	43.5	4.50	1003.50	16.73	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	48	4.50	1008.00	16.80	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	52	4.00	1012.00	16.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	56.5	4.50	1016.50	16.94	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	1	4.50	1021.00	17.02	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	5.5	4.50	1025.50	17.09	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	10	4.50	1030.00	17.17	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	14.5	4.50	1034.50	17.24	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	19	4.50	1039.00	17.32	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	23.5	4.50	1043.50	17.39	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	27.5	4.00	1047.50	17.46	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	32	4.50	1052.00	17.53	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	36	4.00	1056.00	17.60	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	40	4.00	1060.00	17.67	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	44	4.00	1064.00	17.73	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	48.5	4.50	1068.50	17.81	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	52	3.50	1072.00	17.87	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	2	56.5	4.50	1076.50	17.94	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	0	3.50	1080.00	18.00	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	3	4.5	4.50	1084.50	18.08	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	8	3.50	1088.00	18.13	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	3	12.5	4.50	1092.50	18.21	13.33	0.72	0.096	0.003	1.527	38.789

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	16	3	16.5	4.00	1096.50	18.28	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	20.5	4.00	1100.50	18.34	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	24.5	4.00	1104.50	18.41	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	29	4.50	1109.00	18.48	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	32.5	3.50	1112.50	18.54	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	3	37	4.50	1117.00	18.62	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	41	4.00	1121.00	18.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	45	4.00	1125.00	18.75	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	49	4.00	1129.00	18.82	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	53	4.00	1133.00	18.88	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	57	4.00	1137.00	18.95	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	1	4.00	1141.00	19.02	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	4.5	3.50	1144.50	19.08	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	8.5	4.00	1148.50	19.14	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	12.5	4.00	1152.50	19.21	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	16	3.50	1156.00	19.27	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	19.5	3.50	1159.50	19.33	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	23.5	4.00	1163.50	19.39	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	27.5	4.00	1167.50	19.46	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	31.5	4.00	1171.50	19.53	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	35	3.50	1175.00	19.58	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	39	4.00	1179.00	19.65	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	42.5	3.50	1182.50	19.71	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	46.5	4.00	1186.50	19.78	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	50	3.50	1190.00	19.83	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	54	4.00	1194.00	19.90	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	57.5	3.50	1197.50	19.96	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	5	1.5	4.00	1201.50	20.03	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	5.5	4.00	1205.50	20.09	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	9.5	4.00	1209.50	20.16	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	13	3.50	1213.00	20.22	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	5	17	4.00	1217.00	20.28	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	21	4.00	1221.00	20.35	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	25.5	4.50	1225.50	20.43	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	5	29.5	4.00	1229.50	20.49	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	34	4.50	1234.00	20.57	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	5	39	5.00	1239.00	20.65	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	16	5	44	5.00	1244.00	20.73	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	16	5	49	5.00	1249.00	20.82	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	16	5	54.5	5.50	1254.50	20.91	10.91	0.59	0.078	0.002	1.249	31.736
10	20	4	16	6	0.5	6.00	1260.50	21.01	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	16	6	7	6.50	1267.00	21.12	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	16	6	14	7.00	1274.00	21.23	8.57	0.46	0.062	0.002	0.982	24.936

TEST 6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	16	6	22.5	8.50	1282.50	21.38	7.06	0.38	0.051	0.001	0.808	20.535
10	20	4	16	6	32	9.50	1292.00	21.53	6.32	0.34	0.045	0.001	0.723	18.374
10	20	4	16	6	43	11.00	1303.00	21.72	5.45	0.29	0.039	0.001	0.625	15.868
10	20	4	16	6	56.5	13.50	1316.50	21.94	4.44	0.24	0.032	0.001	0.509	12.930
10	20	4	16	7	13	16.50	1333.00	22.22	3.64	0.20	0.026	0.001	0.416	10.579
10	20	4	16	7	33	20.00	1353.00	22.55	3.00	0.16	0.022	0.001	0.344	8.727
10	20	4	16	7	59.5	26.50	1379.50	22.99	2.26	0.12	0.016	0.000	0.259	6.587
10	20	4	16	8	35.5	36.00	1415.50	23.59	1.67	0.09	0.012	0.000	0.191	4.849
10	20	4	16	9	39	63.50	1479.00	24.65	0.94	0.05	0.007	0.000	0.108	2.749
10	20	4	16	12	9	150.00	1629.00	27.15	0.40	0.02	0.003	0.000	0.046	1.164
10	20	4	16	39	16.5	1627.50	3256.50	54.28	0.04	0.00	0.000	0.000	0.004	0.107

TEST 6

LID 6Ke

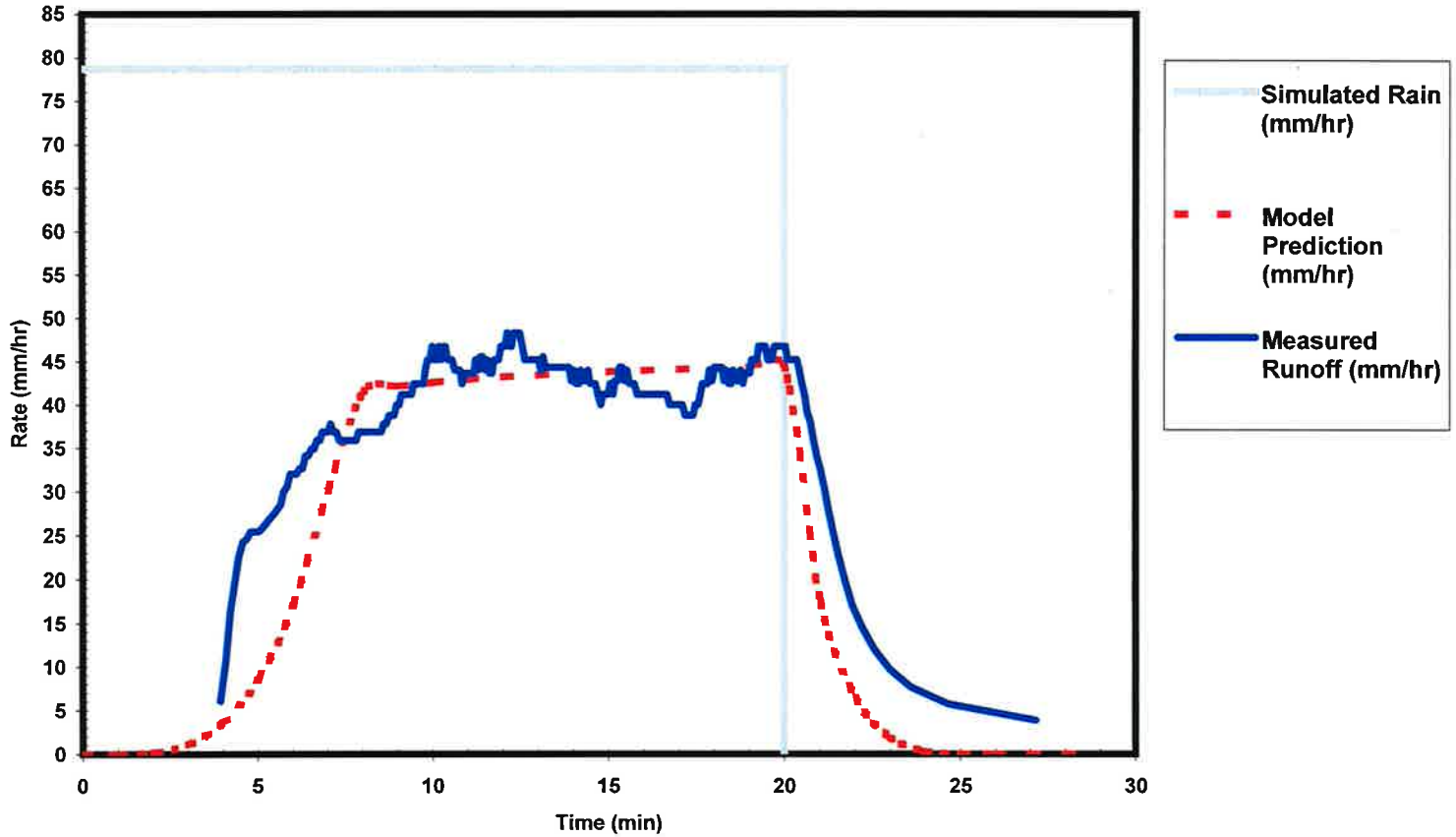
phi:	*0.5*	*dtheta*	*1%*	*slope (x:1):*	4	*dx(horz):*	388
Ks:	*1.17E-03*	*Ko:*	*10000*	*LID length (cm):*	400		

sec	min	END OF PLOT cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.00	44.39	43.7	1.5%
60	1	0.00000009	0.00			
120	2	0.00000479	0.17			
180	3	0.00003009	1.08			
240	4	0.00009881	3.56			
300	5	0.00023694	8.53			
360	6	0.00047228	17.00			
420	7	0.00083384	30.02			
480	8	0.00115366	41.53			
540	9	0.00117139	42.17			
600	10	0.00118355	42.61			
660	11	0.00119306	42.95			
720	12	0.00120074	43.23			
780	13	0.00120711	43.46			
840	14	0.00121249	43.65			
900	15	0.00121711	43.82			
960	16	0.00122111	43.96			
1020	17	0.00122462	44.09			
1080	18	0.00122772	44.20			
1140	19	0.00123049	44.30			
1200	20	0.00123297	44.39			
1260	21	0.00048532	17.47			
1320	22	0.00017826	6.42			
1380	23	0.00005259	1.89			
1440	24	0.00000862	0.31			
1500	25	0.00000009	0.00			
1560	26	0.00000001	0.00			
1620	27	0.00000001	0.00			
1680	28	0.00000001	0.00			
1740	29	0.00000001	0.00			
1800	30	0.00000001	0.00			

TEST 6

FIGURE A-7

Plot Conductivity Test - 6
(from Test 7)



TEST 6

LID 6

phi:	4	*dtheta*	15%	*slope (x:1):*	4
Ks:	1.75E-03	*Ko:*	10000	*length (cm):*	400

		EPS		END OF LID				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.00	0	0.00	8.7	10.0	-12.8%
60	1	0	0.00	0	0.00			
120	2	0	0.00	0	0.00			
180	3	0	0.00	0	0.00			
240	4	0.00000056	0.02	0	0.00			
300	5	0.0000073	0.26	0	0.00			
360	6	0.00000746	0.27	0	0.00			
420	7	0.00001123	0.40	0	0.00			
480	8	0.00001833	0.66	0	0.00			
540	9	0.00002578	0.93	0	0.00			
600	10	0.00003484	1.25	0	0.00			
660	11	0.00004583	1.65	0	0.00			
720	12	0.00005894	2.12	0	0.00			
780	13	0.00007435	2.68	0	0.00			
840	14	0.00009227	3.32	0	0.00			
900	15	0.00011289	4.06	0	0.00			
960	16	0.00013639	4.91	0	0.00			
1020	17	0.00016297	5.87	0	0.00			
1080	18	0.00019281	6.94	0	0.00			
1140	19	0.00022611	8.14	0	0.00			
1200	20	0.00026306	9.47	0	0.00			
1260	21	0.00030384	10.94	0	0.00			
1320	22	0.00034865	12.55	0	0.00			
1380	23	0.00039768	14.32	0	0.00			
1440	24	0.00045106	16.24	0	0.00			
1500	25	0.00050837	18.30	0	0.00			
1560	26	0.00056673	20.40	0	0.00			
1620	27	0.00061981	22.31	0	0.00			
1680	28	0.00066174	23.82	0.000143	5.15			
1740	29	0.00069115	24.88	0.000169	6.08			
1800	30	0.00071022	25.57	0.000184	6.63			
1860	31	0.00072203	25.99	0.000194	6.99			
1920	32	0.0007292	26.25	0.000201	7.23			
1980	33	0.00073352	26.41	0.000206	7.41			
2040	34	0.00073612	26.50	0.00021	7.54			
2100	35	0.0007377	26.56	0.000213	7.66			
2160	36	0.00073867	26.59	0.000215	7.75			
2220	37	0.00073926	26.61	0.000218	7.84			
2280	38	0.00073964	26.63	0.00022	7.91			
2340	39	0.00073987	26.64	0.000222	7.98			
2400	40	0.00074003	26.64	0.000223	8.04			
2460	41	0.00074013	26.64	0.000225	8.10			
2520	42	0.00074019	26.65	0.000226	8.15			
2580	43	0.00074024	26.65	0.000228	8.20			
2640	44	0.00074027	26.65	0.000229	8.24			
2700	45	0.00074029	26.65	0.00023	8.28			
2760	46	0.00074031	26.65	0.000231	8.32			
2820	47	0.00074032	26.65	0.000232	8.36			
2880	48	0.00074033	26.65	0.000233	8.39			
2940	49	0.00074033	26.65	0.000234	8.43			
3000	50	0.00074034	26.65	0.000235	8.46			

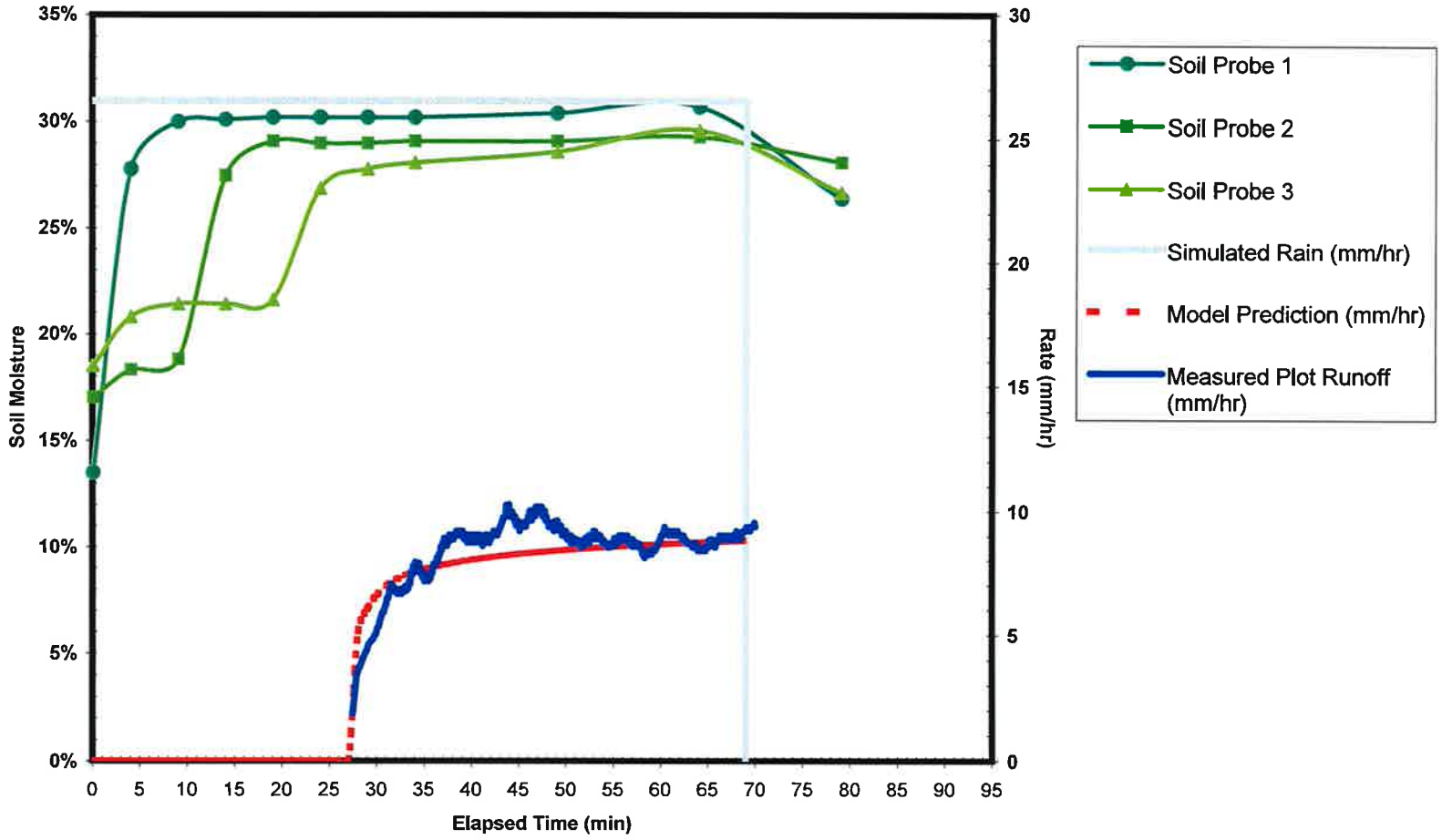
TEST 6

		EPS		END OF LID				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
3060	51	0.00074035	26.65	0.000236	8.49			
3120	52	0.00074035	26.65	0.000236	8.51			
3180	53	0.00074035	26.65	0.000237	8.54			
3240	54	0.00074036	26.65	0.000238	8.56			
3300	55	0.00074036	26.65	0.000239	8.59			
3360	56	0.00074036	26.65	0.000239	8.61			
3420	57	0.00074037	26.65	0.00024	8.63			
3480	58	0.00074037	26.65	0.00024	8.65			
3540	59	0.00074037	26.65	0.000241	8.67			
3600	60	0.00074037	26.65	0.000241	8.69			
3660	61	0.00074038	26.65	0.000242	8.71			
3720	62	0.00074038	26.65	0.000242	8.73			
3780	63	0.00074038	26.65	0.000243	8.74			
3840	64	0.00074038	26.65	0.000243	8.76			
3900	65	0.00074039	26.65	0.000244	8.77			
3960	66	0.00074039	26.65	0.000244	8.79			
4020	67	0.00074039	26.65	0.000245	8.80			
4080	68	0.00074039	26.65	0.000245	8.82			
4140	69	0.0007404	26.65	0.000245	8.83			

TEST 6

FIGURE A-8

Rain/Runoff Hydrograph - 6



TEST 6

MOBILE TEST #6 (TEST 7)

10/20/2004
Deer Park South
US 395 MP 171.4

Plot Parameters

Slope:	**4:1**	**Start Time:**	15:45:00
Length (cm):	**400**	**End Time:**	16:05:00
Width (cm):	**105**	**Test Duration:**	***0:20:00***
Plot Area (m^2):	**4.20**	**Model Plot Area (m^2):**	**4.20**
Vegitation:	**heavy ryegrass (90%)**		
Initial Theta:	**22.3%**		
Final Theta:	**28.5%**		
dtheta:	***6.2%***		

Estimated Ke (from plot):

mm/hr	*cm/s*
17.4	*4.83E-04*

	Normalized Rates		**Volumetric Rates**
Max Runoff Rate (mm/hr):	***42.7***	***(L/min):***	*2.99*
Rain-on Rate (mm/hr):	***72.4***	***(L/min):***	*5.07*
Runoff Percentage:	***59.0%***		*59.0%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	20	4	15	45	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
10	20	4	15	48	21	201.00	201.00	3.35	0.30	0.02	0.002	0.000	0.034	0.868
10	20	4	15	48	44	23.00	224.00	3.73	2.61	0.14	0.019	0.001	0.299	7.589
10	20	4	15	48	55	11.00	235.00	3.92	5.45	0.29	0.039	0.001	0.625	15.868
10	20	4	15	49	4.5	9.50	244.50	4.08	6.32	0.34	0.045	0.001	0.723	18.374
10	20	4	15	49	12	7.50	252.00	4.20	8.00	0.43	0.058	0.002	0.916	23.273
10	20	4	15	49	20	8.00	260.00	4.33	7.50	0.40	0.054	0.002	0.859	21.819
10	20	4	15	49	26.5	6.50	266.50	4.44	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	49	33.5	7.00	273.50	4.56	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	49	40.5	7.00	280.50	4.68	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	49	47.5	7.00	287.50	4.79	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	49	54	6.50	294.00	4.90	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	1	7.00	301.00	5.02	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	50	7.5	6.50	307.50	5.13	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	14	6.50	314.00	5.23	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	20	6.00	320.00	5.33	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	26.5	6.50	326.50	5.44	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	50	32.5	6.00	332.50	5.54	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	38.5	6.00	338.50	5.64	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	43.5	5.00	343.50	5.73	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	50	49.5	6.00	349.50	5.83	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	50	54.5	5.00	354.50	5.91	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	0.5	6.00	360.50	6.01	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	51	5.5	5.00	365.50	6.09	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	11	5.50	371.00	6.18	10.91	0.59	0.078	0.002	1.249	31.736
10	20	4	15	51	16	5.00	376.00	6.27	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	21	5.00	381.00	6.35	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	26	5.00	386.00	6.43	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	31	5.00	391.00	6.52	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	36	5.00	396.00	6.60	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	40.5	4.50	400.50	6.68	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	51	45.5	5.00	405.50	6.76	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	51	50	4.50	410.00	6.83	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	51	55	5.00	415.00	6.92	12.00	0.65	0.086	0.002	1.374	34.910

TEST 7

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	51	59.5	4.50	419.50	6.99	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	4	4.50	424.00	7.07	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	9	5.00	429.00	7.15	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	14	5.00	434.00	7.23	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	19	5.00	439.00	7.32	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	23.5	4.50	443.50	7.39	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	28.5	5.00	448.50	7.48	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	33.5	5.00	453.50	7.56	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	38.5	5.00	458.50	7.64	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	43	4.50	463.00	7.72	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	48	5.00	468.00	7.80	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	52	52.5	4.50	472.50	7.88	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	52	57.5	5.00	477.50	7.96	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	2	4.50	482.00	8.03	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	7	5.00	487.00	8.12	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	11.5	4.50	491.50	8.19	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	16.5	5.00	496.50	8.28	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	21	4.50	501.00	8.35	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	26	5.00	506.00	8.43	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	53	30.5	4.50	510.50	8.51	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	35	4.50	515.00	8.58	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	39.5	4.50	519.50	8.66	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	44	4.50	524.00	8.73	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	48.5	4.50	528.50	8.81	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	53	4.50	533.00	8.88	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	53	57	4.00	537.00	8.95	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	1.5	4.50	541.50	9.03	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	5.5	4.00	545.50	9.09	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	10	4.50	550.00	9.17	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	14	4.00	554.00	9.23	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	18.5	4.50	558.50	9.31	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	22.5	4.00	562.50	9.38	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	26.5	4.00	566.50	9.44	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	30.5	4.00	570.50	9.51	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	35	4.50	575.00	9.58	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	54	39	4.00	579.00	9.65	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	43	4.00	583.00	9.72	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	46.5	3.50	586.50	9.78	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	54	50.5	4.00	590.50	9.84	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	54.5	4.00	594.50	9.91	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	54	58	3.50	598.00	9.97	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	2	4.00	602.00	10.03	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	6	4.00	606.00	10.10	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	9.5	3.50	609.50	10.16	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	13.5	4.00	613.50	10.23	15.00	0.81	0.108	0.003	1.718	43.637

TEST 7

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	55	17	3.50	617.00	10.28	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	21	4.00	621.00	10.35	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	25	4.00	625.00	10.42	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	29	4.00	629.00	10.48	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	32.5	3.50	632.50	10.54	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	55	37	4.50	637.00	10.62	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	55	41	4.00	641.00	10.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	45	4.00	645.00	10.75	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	49	4.00	649.00	10.82	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	53	4.00	653.00	10.88	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	55	57	4.00	657.00	10.95	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	1	4.00	661.00	11.02	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	5	4.00	665.00	11.08	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	9	4.00	669.00	11.15	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	12.5	3.50	672.50	11.21	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	17	4.50	677.00	11.28	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	56	20.5	3.50	680.50	11.34	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	24.5	4.00	684.50	11.41	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	28.5	4.00	688.50	11.48	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	32.5	4.00	692.50	11.54	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	36.5	4.00	696.50	11.61	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	40.5	4.00	700.50	11.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	44	3.50	704.00	11.73	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	48	4.00	708.00	11.80	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	52	4.00	712.00	11.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	56	55.5	3.50	715.50	11.93	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	56	59	3.50	719.00	11.98	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	3	4.00	723.00	12.05	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	6.5	3.50	726.50	12.11	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	10.5	4.00	730.50	12.18	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	14	3.50	734.00	12.23	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	17.5	3.50	737.50	12.29	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	21	3.50	741.00	12.35	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	25	4.00	745.00	12.42	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	28.5	3.50	748.50	12.48	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	32.5	4.00	752.50	12.54	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	36.5	4.00	756.50	12.61	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	40.5	4.00	760.50	12.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	44	3.50	764.00	12.73	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	57	48	4.00	768.00	12.80	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	52	4.00	772.00	12.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	56	4.00	776.00	12.93	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	57	59.5	3.50	779.50	12.99	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	4	4.50	784.00	13.07	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	7.5	3.50	787.50	13.13	17.14	0.92	0.123	0.003	1.963	49.871

TEST 7

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	58	12	4.50	792.00	13.20	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	15.5	3.50	795.50	13.26	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	20	4.50	800.00	13.33	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	23.5	3.50	803.50	13.39	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	28	4.50	808.00	13.47	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	31.5	3.50	811.50	13.53	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	36	4.50	816.00	13.60	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	39.5	3.50	819.50	13.66	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	44	4.50	824.00	13.73	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	47.5	3.50	827.50	13.79	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	58	52	4.50	832.00	13.87	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	58	56	4.00	836.00	13.93	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	0	4.00	840.00	14.00	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	4	4.00	844.00	14.07	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	8.5	4.50	848.50	14.14	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	12	3.50	852.00	14.20	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	15	59	16.5	4.50	856.50	14.28	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	20.5	4.00	860.50	14.34	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	24.5	4.00	864.50	14.41	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	28.5	4.00	868.50	14.48	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	33	4.50	873.00	14.55	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	37	4.00	877.00	14.62	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	41.5	4.50	881.50	14.69	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	46	4.50	886.00	14.77	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	15	59	50	4.00	890.00	14.83	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	54	4.00	894.00	14.90	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	15	59	58.5	4.50	898.50	14.98	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	2.5	4.00	902.50	15.04	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	7	4.50	907.00	15.12	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	10.5	3.50	910.50	15.18	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	0	15	4.50	915.00	15.25	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	18.5	3.50	918.50	15.31	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	0	23	4.50	923.00	15.38	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	27	4.00	927.00	15.45	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	31	4.00	931.00	15.52	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	35	4.00	935.00	15.58	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	39.5	4.50	939.50	15.66	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	43.5	4.00	943.50	15.73	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	48	4.50	948.00	15.80	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	0	52	4.00	952.00	15.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	0	56.5	4.50	956.50	15.94	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	0.5	4.00	960.50	16.01	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	5	4.50	965.00	16.08	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	9	4.00	969.00	16.15	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	13.5	4.50	973.50	16.23	13.33	0.72	0.096	0.003	1.527	38.789

TEST 7

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	16	1	17.5	4.00	977.50	16.29	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	22	4.50	982.00	16.37	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	26	4.00	986.00	16.43	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	30.5	4.50	990.50	16.51	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	34.5	4.00	994.50	16.58	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	39	4.50	999.00	16.65	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	43.5	4.50	1003.50	16.73	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	48	4.50	1008.00	16.80	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	1	52	4.00	1012.00	16.87	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	1	56.5	4.50	1016.50	16.94	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	1	4.50	1021.00	17.02	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	5.5	4.50	1025.50	17.09	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	10	4.50	1030.00	17.17	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	14.5	4.50	1034.50	17.24	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	19	4.50	1039.00	17.32	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	23.5	4.50	1043.50	17.39	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	27.5	4.00	1047.50	17.46	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	32	4.50	1052.00	17.53	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	36	4.00	1056.00	17.60	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	40	4.00	1060.00	17.67	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	44	4.00	1064.00	17.73	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	2	48.5	4.50	1068.50	17.81	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	2	52	3.50	1072.00	17.87	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	2	56.5	4.50	1076.50	17.94	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	0	3.50	1080.00	18.00	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	3	4.5	4.50	1084.50	18.08	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	8	3.50	1088.00	18.13	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	3	12.5	4.50	1092.50	18.21	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	16.5	4.00	1096.50	18.28	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	20.5	4.00	1100.50	18.34	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	24.5	4.00	1104.50	18.41	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	29	4.50	1109.00	18.48	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	32.5	3.50	1112.50	18.54	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	3	37	4.50	1117.00	18.62	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	3	41	4.00	1121.00	18.68	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	45	4.00	1125.00	18.75	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	49	4.00	1129.00	18.82	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	53	4.00	1133.00	18.88	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	3	57	4.00	1137.00	18.95	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	1	4.00	1141.00	19.02	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	4.5	3.50	1144.50	19.08	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	8.5	4.00	1148.50	19.14	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	12.5	4.00	1152.50	19.21	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	16	3.50	1156.00	19.27	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	19.5	3.50	1159.50	19.33	17.14	0.92	0.123	0.003	1.963	49.871

TEST 7

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	16	4	23.5	4.00	1163.50	19.39	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	27.5	4.00	1167.50	19.46	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	31.5	4.00	1171.50	19.53	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	35	3.50	1175.00	19.58	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	39	4.00	1179.00	19.65	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	42.5	3.50	1182.50	19.71	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	46.5	4.00	1186.50	19.78	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	50	3.50	1190.00	19.83	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	4	54	4.00	1194.00	19.90	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	4	57.5	3.50	1197.50	19.96	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	5	1.5	4.00	1201.50	20.03	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	5.5	4.00	1205.50	20.09	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	9.5	4.00	1209.50	20.16	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	13	3.50	1213.00	20.22	17.14	0.92	0.123	0.003	1.963	49.871
10	20	4	16	5	17	4.00	1217.00	20.28	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	21	4.00	1221.00	20.35	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	25.5	4.50	1225.50	20.43	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	5	29.5	4.00	1229.50	20.49	15.00	0.81	0.108	0.003	1.718	43.637
10	20	4	16	5	34	4.50	1234.00	20.57	13.33	0.72	0.096	0.003	1.527	38.789
10	20	4	16	5	39	5.00	1239.00	20.65	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	16	5	44	5.00	1244.00	20.73	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	16	5	49	5.00	1249.00	20.82	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	16	5	54.5	5.50	1254.50	20.91	10.91	0.59	0.078	0.002	1.249	31.736
10	20	4	16	6	0.5	6.00	1260.50	21.01	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	16	6	7	6.50	1267.00	21.12	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	16	6	14	7.00	1274.00	21.23	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	16	6	22.5	8.50	1282.50	21.38	7.06	0.38	0.051	0.001	0.808	20.535
10	20	4	16	6	32	9.50	1292.00	21.53	6.32	0.34	0.045	0.001	0.723	18.374
10	20	4	16	6	43	11.00	1303.00	21.72	5.45	0.29	0.039	0.001	0.625	15.868
10	20	4	16	6	56.5	13.50	1316.50	21.94	4.44	0.24	0.032	0.001	0.509	12.930
10	20	4	16	7	13	16.50	1333.00	22.22	3.64	0.20	0.026	0.001	0.416	10.579
10	20	4	16	7	33	20.00	1353.00	22.55	3.00	0.16	0.022	0.001	0.344	8.727
10	20	4	16	7	59.5	26.50	1379.50	22.99	2.26	0.12	0.016	0.000	0.259	6.587
10	20	4	16	8	35.5	36.00	1415.50	23.59	1.67	0.09	0.012	0.000	0.191	4.849
10	20	4	16	9	39	63.50	1479.00	24.65	0.94	0.05	0.007	0.000	0.108	2.749
10	20	4	16	12	9	150.00	1629.00	27.15	0.40	0.02	0.003	0.000	0.046	1.164
10	20	4	16	39	16.5	1627.50	3256.50	54.28	0.04	0.00	0.000	0.000	0.004	0.107

TEST 7

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	72.4	0.0	0.00E+00	0.000	0.00	0.0	5.07E-03	0.179	72.4
20.00	72.4	0.0	0.00E+00	0.000	0.00	0.0	5.07E-03	0.179	72.4
20.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	0.80	15	3.20	2.67	0.93	2.85
2	0.65		2.60	67.7	23.5	72.4
3	0.90		3.60			
4	0.60		2.40			
5	0.80		3.20			
6	0.25		1.00			

TEST 7

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
15:45	0	19.0%	24.0%	24.0%
15:50	5.00	25.8%	28.9%	28.1%
15:55	10.00	27.6%	28.8%	27.8%
16:00	15.00	28.5%	28.5%	27.8%
16:05	20.00	28.5%	28.5%	28.0%

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**22.3%**
Average Max Moisture:	**28.5%**
dtheta:	**6.2%**

TEST 7

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)	Time	Intensity
1	0.50	15	2.00	1.10	0.47	1.05	0	27.9
2	0.15		0.60	27.9	11.9	26.5	15.0	27.9
3	0.25		1.00				15.0	0
4	0.25		1.00					
5	0.25		1.00					
6	0.25		1.00					

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
0.68	17.4	4.826E-04

Applied Rain (mm/hr):	27.9
Plot Area (m^2):	4.20
Steady State Runoff (mm/hr):	9.2

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	20	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
10	20	4	15	20	59.5	59.50	59.50	0.99	1.01	0.05	0.007	0.000	0.115	2.934
10	20	4	15	21	5	5.50	65.00	1.08	10.91	0.59	0.078	0.002	1.249	31.736
10	20	4	15	21	10	5.00	70.00	1.17	12.00	0.65	0.086	0.002	1.374	34.910
10	20	4	15	21	15.5	5.50	75.50	1.26	10.91	0.59	0.078	0.002	1.249	31.736
10	20	4	15	21	21.5	6.00	81.50	1.36	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	21	27.5	6.00	87.50	1.46	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	21	33.5	6.00	93.50	1.56	10.00	0.54	0.072	0.002	1.145	29.091
10	20	4	15	21	40.5	7.00	100.50	1.68	8.57	0.46	0.062	0.002	0.982	24.936
10	20	4	15	21	47	6.50	107.00	1.78	9.23	0.50	0.066	0.002	1.057	26.854
10	20	4	15	21	54.5	7.50	114.50	1.91	8.00	0.43	0.058	0.002	0.916	23.273
10	20	4	15	22	2	7.50	122.00	2.03	8.00	0.43	0.058	0.002	0.916	23.273
10	20	4	15	22	10	8.00	130.00	2.17	7.50	0.40	0.054	0.002	0.859	21.819
10	20	4	15	22	18.5	8.50	138.50	2.31	7.06	0.38	0.051	0.001	0.808	20.535
10	20	4	15	22	27.5	9.00	147.50	2.46	6.67	0.36	0.048	0.001	0.764	19.394
10	20	4	15	22	37	9.50	157.00	2.62	6.32	0.34	0.045	0.001	0.723	18.374
10	20	4	15	22	47	10.00	167.00	2.78	6.00	0.32	0.043	0.001	0.687	17.455
10	20	4	15	22	56.5	9.50	176.50	2.94	6.32	0.34	0.045	0.001	0.723	18.374
10	20	4	15	23	8	11.50	188.00	3.13	5.22	0.28	0.038	0.001	0.598	15.178
10	20	4	15	23	18.5	10.50	198.50	3.31	5.71	0.31	0.041	0.001	0.654	16.624
10	20	4	15	23	31	12.50	211.00	3.52	4.80	0.26	0.035	0.001	0.550	13.964
10	20	4	15	23	42	11.00	222.00	3.70	5.45	0.29	0.039	0.001	0.625	15.868
10	20	4	15	23	55.5	13.50	235.50	3.93	4.44	0.24	0.032	0.001	0.509	12.930
10	20	4	15	24	7	11.50	247.00	4.12	5.22	0.28	0.038	0.001	0.598	15.178
10	20	4	15	24	22	15.00	262.00	4.37	4.00	0.22	0.029	0.001	0.458	11.637
10	20	4	15	24	35	13.00	275.00	4.58	4.62	0.25	0.033	0.001	0.529	13.427

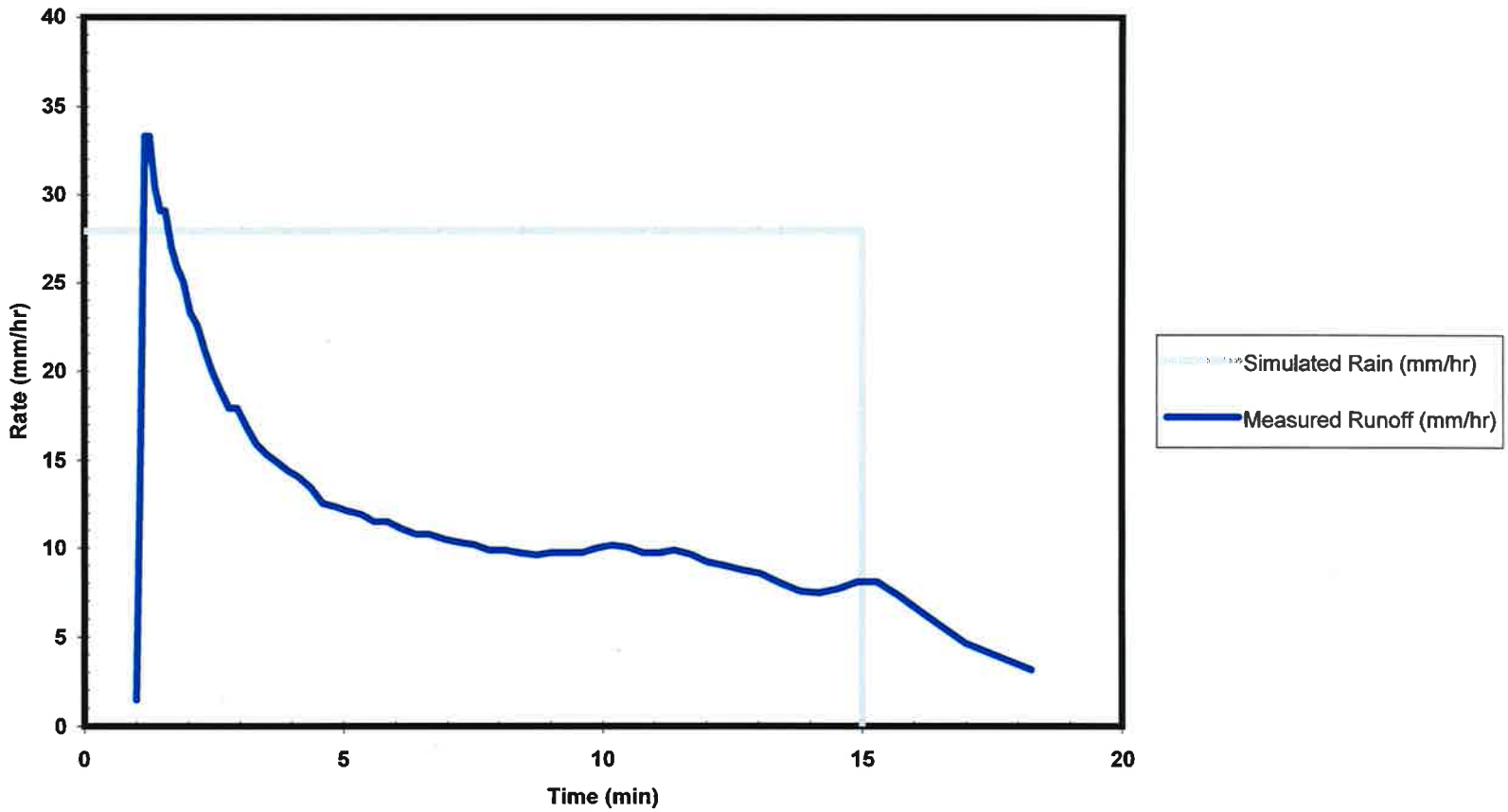
TEST 7

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	20	4	15	24	50.5	15.50	290.50	4.84	3.87	0.21	0.028	0.001	0.443	11.261
10	20	4	15	25	4	13.50	304.00	5.07	4.44	0.24	0.032	0.001	0.509	12.930
10	20	4	15	25	20	16.00	320.00	5.33	3.75	0.20	0.027	0.001	0.430	10.909
10	20	4	15	25	34.5	14.50	334.50	5.58	4.14	0.22	0.030	0.001	0.474	12.038
10	20	4	15	25	50.5	16.00	350.50	5.84	3.75	0.20	0.027	0.001	0.430	10.909
10	20	4	15	26	6	15.50	366.00	6.10	3.87	0.21	0.028	0.001	0.443	11.261
10	20	4	15	26	23	17.00	383.00	6.38	3.53	0.19	0.025	0.001	0.404	10.268
10	20	4	15	26	38.5	15.50	398.50	6.64	3.87	0.21	0.028	0.001	0.443	11.261
10	20	4	15	26	56.5	18.00	416.50	6.94	3.33	0.18	0.024	0.001	0.382	9.697
10	20	4	15	27	12.5	16.00	432.50	7.21	3.75	0.20	0.027	0.001	0.430	10.909
10	20	4	15	27	31	18.50	451.00	7.52	3.24	0.17	0.023	0.001	0.371	9.435
10	20	4	15	27	48	17.00	468.00	7.80	3.53	0.19	0.025	0.001	0.404	10.268
10	20	4	15	28	6.5	18.50	486.50	8.11	3.24	0.17	0.023	0.001	0.371	9.435
10	20	4	15	28	24	17.50	504.00	8.40	3.43	0.18	0.025	0.001	0.393	9.974
10	20	4	15	28	43	19.00	523.00	8.72	3.16	0.17	0.023	0.001	0.362	9.187
10	20	4	15	29	0	17.00	540.00	9.00	3.53	0.19	0.025	0.001	0.404	10.268
10	20	4	15	29	19	19.00	559.00	9.32	3.16	0.17	0.023	0.001	0.362	9.187
10	20	4	15	29	36	17.00	576.00	9.60	3.53	0.19	0.025	0.001	0.404	10.268
10	20	4	15	29	54	18.00	594.00	9.90	3.33	0.18	0.024	0.001	0.382	9.697
10	20	4	15	30	10.5	16.50	610.50	10.18	3.64	0.20	0.026	0.001	0.416	10.579
10	20	4	15	30	29	18.50	629.00	10.48	3.24	0.17	0.023	0.001	0.371	9.435
10	20	4	15	30	46.5	17.50	646.50	10.78	3.43	0.18	0.025	0.001	0.393	9.974
10	20	4	15	31	5	18.50	665.00	11.08	3.24	0.17	0.023	0.001	0.371	9.435
10	20	4	15	31	22	17.00	682.00	11.37	3.53	0.19	0.025	0.001	0.404	10.268
10	20	4	15	31	41.5	19.50	701.50	11.69	3.08	0.17	0.022	0.001	0.352	8.951
10	20	4	15	32	0	18.50	720.00	12.00	3.24	0.17	0.023	0.001	0.371	9.435
10	20	4	15	32	20.5	20.50	740.50	12.34	2.93	0.16	0.021	0.001	0.335	8.515
10	20	4	15	32	40	19.50	760.00	12.67	3.08	0.17	0.022	0.001	0.352	8.951
10	20	4	15	33	1.5	21.50	781.50	13.03	2.79	0.15	0.020	0.001	0.320	8.119
10	20	4	15	33	23.5	22.00	803.50	13.39	2.73	0.15	0.020	0.001	0.312	7.934
10	20	4	15	33	48	24.50	828.00	13.80	2.45	0.13	0.018	0.000	0.280	7.124
10	20	4	15	34	10.5	22.50	850.50	14.18	2.67	0.14	0.019	0.001	0.305	7.758
10	20	4	15	34	33.5	23.00	873.50	14.56	2.61	0.14	0.019	0.001	0.299	7.589
10	20	4	15	34	54	20.50	894.00	14.90	2.93	0.16	0.021	0.001	0.335	8.515
10	20	4	15	35	17	23.00	917.00	15.28	2.61	0.14	0.019	0.001	0.299	7.589
10	20	4	15	35	42	25.00	942.00	15.70	2.40	0.13	0.017	0.000	0.275	6.982
10	20	4	15	36	15	33.00	975.00	16.25	1.82	0.10	0.013	0.000	0.208	5.289
10	20	4	15	36	59	44.00	1019.00	16.98	1.36	0.07	0.010	0.000	0.156	3.967
10	20	4	15	38	15	76.00	1095.00	18.25	0.79	0.04	0.006	0.000	0.090	2.297

TEST 7

FIGURE A-9

Plot Conductivity Test - 7



TEST 7

LID 7

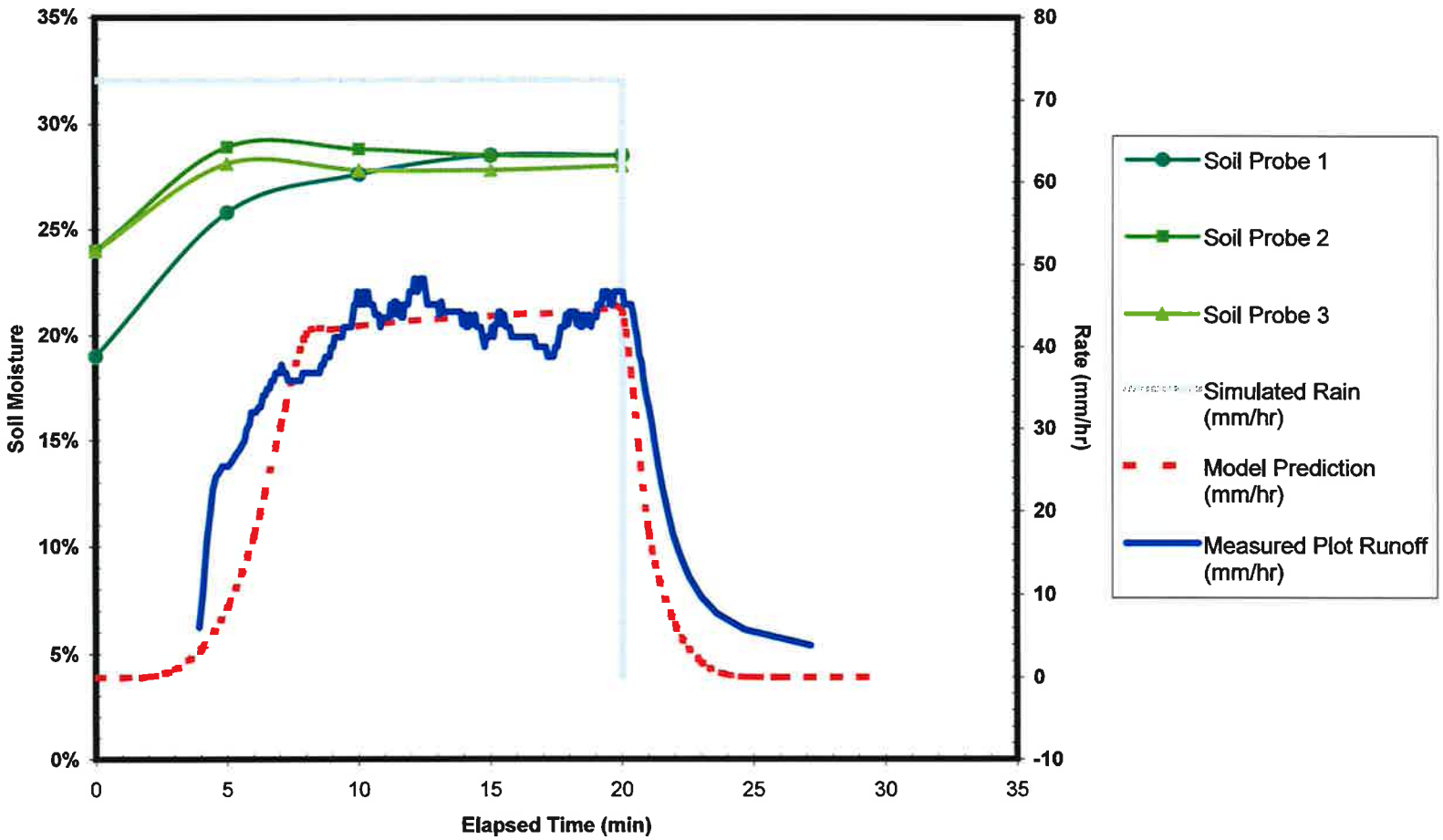
phi:	4	*dtheta*	15%	*slope (x:1):*	4
Ks:	1.10E-03	*Ko:*	10000	*length (cm):*	400

		EPS		END OF LID				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	N/A	N/A	0	0	44.4	42.7	3.9%
60	1	N/A	N/A	0.00000009	0.0032			
120	2	N/A	N/A	0.00000479	0.17			
180	3	N/A	N/A	0.00003009	1.08			
240	4	N/A	N/A	0.00009881	3.56			
300	5	N/A	N/A	0.00023694	8.53			
360	6	N/A	N/A	0.00047228	17.00			
420	7	N/A	N/A	0.00083384	30.02			
480	8	N/A	N/A	0.00115366	41.53			
540	9	N/A	N/A	0.00117139	42.17			
600	10	N/A	N/A	0.00118355	42.61			
660	11	N/A	N/A	0.00119306	42.95			
720	12	N/A	N/A	0.00120074	43.23			
780	13	N/A	N/A	0.00120711	43.46			
840	14	N/A	N/A	0.00121249	43.65			
900	15	N/A	N/A	0.00121711	43.82			
960	16	N/A	N/A	0.00122111	43.96			
1020	17	N/A	N/A	0.00122462	44.09			
1080	18	N/A	N/A	0.00122772	44.20			
1140	19	N/A	N/A	0.00123049	44.30			
1200	20	N/A	N/A	0.00123297	44.39			
1260	21	N/A	N/A	0.00048532	17.47			
1320	22	N/A	N/A	0.00017826	6.42			
1380	23	N/A	N/A	0.00005259	1.89			
1440	24	N/A	N/A	0.00000862	0.31			
1500	25	N/A	N/A	0.00000009	0.00			
1560	26	N/A	N/A	0.00000001	0.00			
1620	27	N/A	N/A	0.00000001	0.00			
1680	28	N/A	N/A	0.00000001	0.00			
1740	29	N/A	N/A	0.00000001	0.00			
1800	30	N/A	N/A	0.00000001	0.00			

TEST 7

FIGURE A-10

Rain/Runoff Hydrograph - 7



TEST 7

10/24/2004
Deer Park South
US 395 MP 171.4 RT

Plot Parameters

Slope:	4:1
Length (cm):	400
Width (cm):	105
Plot Area (m^2):	4.20
Vegitation:	heavy ryegrass (90%)
Initial Theta:	16.3%
Final Theta:	29.0%
dtheta:	12.7%

Start Time:	13:25
End Time:	14:10
Test Duration:	*0:45:00*
Model Plot Area (m^2):	14.09

Estimated Ke (from plot):

mm/hr	*cm/s*
21.9	*6.09E-04*

Normalized Rates			Volumetric Rates
Max Runoff Rate (mm/hr):	*11.2*	*(L/min):*	*2.63*
Rain-on Rate (mm/hr):	*29.8*	*(L/min):*	*7.01*
Runoff Percentage:	*37.5%*		*37.5%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	24	4	13	25	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.000	0.000
10	24	4	13	53	57.5	1737.50	1737.50	28.96	0.03	0.00	0.000	0.000	0.001	0.030
10	24	4	13	54	17	19.50	1757.00	29.28	3.08	0.17	0.022	0.001	0.105	2.668
10	24	4	13	54	33.5	16.50	1773.50	29.56	3.64	0.20	0.026	0.001	0.124	3.153
10	24	4	13	54	45.5	12.00	1785.50	29.76	5.00	0.27	0.036	0.001	0.171	4.335
10	24	4	13	54	58	12.50	1798.00	29.97	4.80	0.26	0.035	0.001	0.164	4.161
10	24	4	13	55	8.5	10.50	1808.50	30.14	5.71	0.31	0.041	0.001	0.195	4.954
10	24	4	13	55	19	10.50	1819.00	30.32	5.71	0.31	0.041	0.001	0.195	4.954
10	24	4	13	55	28.5	9.50	1828.50	30.48	6.32	0.34	0.045	0.001	0.216	5.476
10	24	4	13	55	38	9.50	1838.00	30.63	6.32	0.34	0.045	0.001	0.216	5.476
10	24	4	13	55	47	9.00	1847.00	30.78	6.67	0.36	0.048	0.001	0.228	5.780
10	24	4	13	55	56.5	9.50	1856.50	30.94	6.32	0.34	0.045	0.001	0.216	5.476
10	24	4	13	56	5	8.50	1865.00	31.08	7.06	0.38	0.051	0.001	0.241	6.120
10	24	4	13	56	14.5	9.50	1874.50	31.24	6.32	0.34	0.045	0.001	0.216	5.476
10	24	4	13	56	23	8.50	1883.00	31.38	7.06	0.38	0.051	0.001	0.241	6.120
10	24	4	13	56	32	9.00	1892.00	31.53	6.67	0.36	0.048	0.001	0.228	5.780
10	24	4	13	56	41	9.00	1901.00	31.68	6.67	0.36	0.048	0.001	0.228	5.780
10	24	4	13	56	50	9.00	1910.00	31.83	6.67	0.36	0.048	0.001	0.228	5.780
10	24	4	13	56	58	8.00	1918.00	31.97	7.50	0.40	0.054	0.002	0.256	6.502
10	24	4	13	57	6.5	8.50	1926.50	32.11	7.06	0.38	0.051	0.001	0.241	6.120
10	24	4	13	57	14.5	8.00	1934.50	32.24	7.50	0.40	0.054	0.002	0.256	6.502
10	24	4	13	57	23	8.50	1943.00	32.38	7.06	0.38	0.051	0.001	0.241	6.120
10	24	4	13	57	30.5	7.50	1950.50	32.51	8.00	0.43	0.058	0.002	0.273	6.936
10	24	4	13	57	39	8.50	1959.00	32.65	7.06	0.38	0.051	0.001	0.241	6.120
10	24	4	13	57	46	7.00	1966.00	32.77	8.57	0.46	0.062	0.002	0.293	7.431
10	24	4	13	57	54	8.00	1974.00	32.90	7.50	0.40	0.054	0.002	0.256	6.502
10	24	4	13	58	1	7.00	1981.00	33.02	8.57	0.46	0.062	0.002	0.293	7.431
10	24	4	13	58	9	8.00	1989.00	33.15	7.50	0.40	0.054	0.002	0.256	6.502
10	24	4	13	58	16	7.00	1996.00	33.27	8.57	0.46	0.062	0.002	0.293	7.431
10	24	4	13	58	23.5	7.50	2003.50	33.39	8.00	0.43	0.058	0.002	0.273	6.936
10	24	4	13	58	30	6.50	2010.00	33.50	9.23	0.50	0.066	0.002	0.315	8.003
10	24	4	13	58	37.5	7.50	2017.50	33.63	8.00	0.43	0.058	0.002	0.273	6.936
10	24	4	13	58	43.5	6.00	2023.50	33.73	10.00	0.54	0.072	0.002	0.341	8.670
10	24	4	13	58	50.5	7.00	2030.50	33.84	8.57	0.46	0.062	0.002	0.293	7.431
10	24	4	13	58	57	6.50	2037.00	33.95	9.23	0.50	0.066	0.002	0.315	8.003

TEST 8

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	13	59	4	7.00	2044.00	34.07	8.57	0.46	0.062	0.002	0.293	7.431
10	24	4	13	59	10.5	6.50	2050.50	34.18	9.23	0.50	0.066	0.002	0.315	8.003
10	24	4	13	59	17	6.50	2057.00	34.28	9.23	0.50	0.066	0.002	0.315	8.003
10	24	4	13	59	23	6.00	2063.00	34.38	10.00	0.54	0.072	0.002	0.341	8.670
10	24	4	13	59	30	7.00	2070.00	34.50	8.57	0.46	0.062	0.002	0.293	7.431
10	24	4	13	59	36	6.00	2076.00	34.60	10.00	0.54	0.072	0.002	0.341	8.670
10	24	4	13	59	42.5	6.50	2082.50	34.71	9.23	0.50	0.066	0.002	0.315	8.003
10	24	4	13	59	48	5.50	2088.00	34.80	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	13	59	54.5	6.50	2094.50	34.91	9.23	0.50	0.066	0.002	0.315	8.003
10	24	4	13	59	59.5	5.00	2099.50	34.99	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	0	5.5	6.00	2105.50	35.09	10.00	0.54	0.072	0.002	0.341	8.670
10	24	4	14	0	11	5.50	2111.00	35.18	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	0	16.5	5.50	2116.50	35.28	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	0	21.5	5.00	2121.50	35.36	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	0	27.5	6.00	2127.50	35.46	10.00	0.54	0.072	0.002	0.341	8.670
10	24	4	14	0	32	4.50	2132.00	35.53	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	0	37.5	5.50	2137.50	35.63	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	0	42.5	5.00	2142.50	35.71	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	0	47.5	5.00	2147.50	35.79	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	0	52	4.50	2152.00	35.87	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	0	57.5	5.50	2157.50	35.96	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	1	1.5	4.00	2161.50	36.03	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	1	7	5.50	2167.00	36.12	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	1	11.5	4.50	2171.50	36.19	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	1	16.5	5.00	2176.50	36.28	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	1	21	4.50	2181.00	36.35	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	1	26.5	5.50	2186.50	36.44	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	1	31	4.50	2191.00	36.52	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	1	36.5	5.50	2196.50	36.61	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	1	41	4.50	2201.00	36.68	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	1	46.5	5.50	2206.50	36.78	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	1	51.5	5.00	2211.50	36.86	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	1	56.5	5.00	2216.50	36.94	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	2	1.5	5.00	2221.50	37.03	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	2	7	5.50	2227.00	37.12	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	2	11.5	4.50	2231.50	37.19	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	2	17	5.50	2237.00	37.28	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	2	21.5	4.50	2241.50	37.36	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	2	27	5.50	2247.00	37.45	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	2	31.5	4.50	2251.50	37.53	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	2	37	5.50	2257.00	37.62	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	2	41.5	4.50	2261.50	37.69	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	2	47	5.50	2267.00	37.78	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	2	52	5.00	2272.00	37.87	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	2	57.5	5.50	2277.50	37.96	10.91	0.59	0.078	0.002	0.372	9.458

TEST 8

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	3	2	4.50	2282.00	38.03	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	3	7.5	5.50	2287.50	38.13	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	3	12	4.50	2292.00	38.20	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	3	17.5	5.50	2297.50	38.29	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	3	21.5	4.00	2301.50	38.36	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	3	26.5	5.00	2306.50	38.44	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	3	31	4.50	2311.00	38.52	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	3	36	5.00	2316.00	38.60	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	3	41	5.00	2321.00	38.68	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	3	46	5.00	2326.00	38.77	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	3	50.5	4.50	2330.50	38.84	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	3	56	5.50	2336.00	38.93	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	4	0.5	4.50	2340.50	39.01	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	4	5.5	5.00	2345.50	39.09	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	4	10	4.50	2350.00	39.17	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	4	15.5	5.50	2355.50	39.26	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	4	19.5	4.00	2359.50	39.33	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	4	24.5	5.00	2364.50	39.41	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	4	29	4.50	2369.00	39.48	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	4	34	5.00	2374.00	39.57	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	4	38	4.00	2378.00	39.63	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	4	43	5.00	2383.00	39.72	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	4	47.5	4.50	2387.50	39.79	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	4	52.5	5.00	2392.50	39.88	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	4	57	4.50	2397.00	39.95	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	5	2	5.00	2402.00	40.03	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	5	6	4.00	2406.00	40.10	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	5	11	5.00	2411.00	40.18	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	5	15.5	4.50	2415.50	40.26	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	5	21	5.50	2421.00	40.35	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	5	25.5	4.50	2425.50	40.43	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	5	30.5	5.00	2430.50	40.51	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	5	35	4.50	2435.00	40.58	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	5	40	5.00	2440.00	40.67	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	5	44.5	4.50	2444.50	40.74	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	5	49.5	5.00	2449.50	40.83	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	5	54	4.50	2454.00	40.90	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	5	59	5.00	2459.00	40.98	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	6	3.5	4.50	2463.50	41.06	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	6	8.5	5.00	2468.50	41.14	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	6	13	4.50	2473.00	41.22	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	6	18	5.00	2478.00	41.30	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	6	22	4.00	2482.00	41.37	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	6	27	5.00	2487.00	41.45	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	6	31	4.00	2491.00	41.52	15.00	0.81	0.108	0.003	0.512	13.005

TEST 8

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	6	36	5.00	2496.00	41.60	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	6	40	4.00	2500.00	41.67	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	6	45	5.00	2505.00	41.75	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	6	49	4.00	2509.00	41.82	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	6	54	5.00	2514.00	41.90	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	6	58	4.00	2518.00	41.97	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	7	3	5.00	2523.00	42.05	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	7	7	4.00	2527.00	42.12	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	7	12	5.00	2532.00	42.20	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	7	16	4.00	2536.00	42.27	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	7	21	5.00	2541.00	42.35	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	7	25	4.00	2545.00	42.42	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	7	30.5	5.50	2550.50	42.51	10.91	0.59	0.078	0.002	0.372	9.458
10	24	4	14	7	34.5	4.00	2554.50	42.58	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	7	39.5	5.00	2559.50	42.66	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	7	44	4.50	2564.00	42.73	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	7	49	5.00	2569.00	42.82	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	7	53	4.00	2573.00	42.88	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	7	58	5.00	2578.00	42.97	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	8	2	4.00	2582.00	43.03	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	8	7	5.00	2587.00	43.12	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	8	11	4.00	2591.00	43.18	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	8	16	5.00	2596.00	43.27	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	8	20	4.00	2600.00	43.33	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	8	24.5	4.50	2604.50	43.41	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	8	28.5	4.00	2608.50	43.48	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	8	33.5	5.00	2613.50	43.56	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	8	37.5	4.00	2617.50	43.63	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	8	42	4.50	2622.00	43.70	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	8	46	4.00	2626.00	43.77	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	8	50.5	4.50	2630.50	43.84	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	8	54	3.50	2634.00	43.90	17.14	0.92	0.123	0.003	0.585	14.862
10	24	4	14	8	59	5.00	2639.00	43.98	12.00	0.65	0.086	0.002	0.410	10.404
10	24	4	14	9	2.5	3.50	2642.50	44.04	17.14	0.92	0.123	0.003	0.585	14.862
10	24	4	14	9	7	4.50	2647.00	44.12	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	9	11	4.00	2651.00	44.18	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	9	15.5	4.50	2655.50	44.26	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	9	19.5	4.00	2659.50	44.33	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	9	24	4.50	2664.00	44.40	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	9	28	4.00	2668.00	44.47	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	9	32.5	4.50	2672.50	44.54	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	9	36	3.50	2676.00	44.60	17.14	0.92	0.123	0.003	0.585	14.862
10	24	4	14	9	40.5	4.50	2680.50	44.68	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	9	44.5	4.00	2684.50	44.74	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	9	49	4.50	2689.00	44.82	13.33	0.72	0.096	0.003	0.455	11.560

TEST 8

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	9	52.5	3.50	2692.50	44.88	17.14	0.92	0.123	0.003	0.585	14.862
10	24	4	14	9	57	4.50	2697.00	44.95	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	10	0.5	3.50	2700.50	45.01	17.14	0.92	0.123	0.003	0.585	14.862
10	24	4	14	10	5	4.50	2705.00	45.08	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	10	8.5	3.50	2708.50	45.14	17.14	0.92	0.123	0.003	0.585	14.862
10	24	4	14	10	13	4.50	2713.00	45.22	13.33	0.72	0.096	0.003	0.455	11.560
10	24	4	14	10	17	4.00	2717.00	45.28	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	10	21	4.00	2721.00	45.35	15.00	0.81	0.108	0.003	0.512	13.005
10	24	4	14	10	25	4.00	2725.00	45.42	15.00	0.81	0.108	0.003	0.512	13.005

TEST 8

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	29.8	1.3	4.92E-03	0.174	9.42	30.9	7.01E-03	0.248	100.1
45.00	29.8	1.3	4.92E-03	0.174	9.42	30.9	7.01E-03	0.248	100.1
45.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	0.15	15	0.60	1.27	0.56	1.18
2	0.25		1.00	32.2	14.2	29.8
3	0.25		1.00			
4	0.30		1.20			
5	0.40		1.60			
6	0.55		2.20			

TEST 8

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
13:19	0	13.5%	17.0%	18.5%
13:30	5.00	27.8%	18.3%	20.8%
13:35	10.00	30.0%	18.8%	21.4%
13:40	15.00	30.1%	27.5%	21.4%
13:50	25.00	30.2%	29.1%	21.6%
13:55	30.00	30.2%	29.0%	26.9%
14:00	35.00	30.2%	29.0%	27.8%
14:10	45.00	30.2%	29.0%	27.8%

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**16.3%**
Average Max Moisture:	**29.0%**
dtheta:	**12.7%**

TEST 8

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)	Time	Intensity
1	0.18	15	0.72	1.39	0.567615	1.38	0	35.4
2	0.23		0.92	35.4		34.9	23.0	35.4
3	0.28		1.12				23.0	0
4	0.40		1.60					
5	0.45		1.80					
6	0.55		2.20					

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
0.86	21.9	6.086E-04

Applied Rain (mm/hr): **34.9**
Plot Area (m^2): **4.20**
Steady State Runoff (mm/hr): **13.0**

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	10	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	24	4	14	10	29	29.00	29.00	0.48	2.07	0.11	0.015	0.000	0.24	6.02
10	24	4	14	10	32.5	3.50	32.50	0.54	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	10	37	4.50	37.00	0.62	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	40.5	3.50	40.50	0.68	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	10	45	4.50	45.00	0.75	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	48	3.00	48.00	0.80	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	10	52.5	4.50	52.50	0.88	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	56	3.50	56.00	0.93	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	0	4.00	60.00	1.00	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	3.5	3.50	63.50	1.06	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	7.5	4.00	67.50	1.13	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	11	3.50	71.00	1.18	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	15	4.00	75.00	1.25	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	18	3.00	78.00	1.30	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	11	22.5	4.50	82.50	1.38	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	25.5	3.00	85.50	1.43	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	11	30	4.50	90.00	1.50	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	33.5	3.50	93.50	1.56	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	38	4.50	98.00	1.63	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	42	4.00	102.00	1.70	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	46.5	4.50	106.50	1.78	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	51	4.50	111.00	1.85	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	55.5	4.50	115.50	1.93	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	0	4.50	120.00	2.00	13.33	0.72	0.096	0.003	1.53	38.79

TEST 8

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	12	5.5	5.50	125.50	2.09	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	12	10	4.50	130.00	2.17	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	15.5	5.50	135.50	2.26	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	12	20	4.50	140.00	2.33	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	26	6.00	146.00	2.43	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	12	31	5.00	151.00	2.52	12.00	0.65	0.086	0.002	1.37	34.91
10	24	4	14	12	37	6.00	157.00	2.62	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	12	42	5.00	162.00	2.70	12.00	0.65	0.086	0.002	1.37	34.91
10	24	4	14	12	48.5	6.50	168.50	2.81	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	12	54	5.50	174.00	2.90	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	13	1	7.00	181.00	3.02	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	7	6.00	187.00	3.12	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	13	14	7.00	194.00	3.23	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	20.5	6.50	200.50	3.34	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	13	27.5	7.00	207.50	3.46	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	34.5	7.00	214.50	3.58	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	42.5	8.00	222.50	3.71	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	13	49.5	7.00	229.50	3.83	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	57.5	8.00	237.50	3.96	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	4.5	7.00	244.50	4.08	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	12.5	8.00	252.50	4.21	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	19.5	7.00	259.50	4.33	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	27.5	8.00	267.50	4.46	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	34	6.50	274.00	4.57	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	14	41.5	7.50	281.50	4.69	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	14	48.5	7.00	288.50	4.81	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	56.5	8.00	296.50	4.94	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	15	3.5	7.00	303.50	5.06	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	15	11.5	8.00	311.50	5.19	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	15	19	7.50	319.00	5.32	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	15	27.5	8.50	327.50	5.46	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	15	35	7.50	335.00	5.58	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	15	44	9.00	344.00	5.73	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	15	52	8.00	352.00	5.87	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	16	1	9.00	361.00	6.02	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	8.5	7.50	368.50	6.14	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	16	17.5	9.00	377.50	6.29	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	25.5	8.00	385.50	6.43	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	16	34.5	9.00	394.50	6.58	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	43	8.50	403.00	6.72	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	16	52.5	9.50	412.50	6.88	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	17	1	8.50	421.00	7.02	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	17	11	10.00	431.00	7.18	6.00	0.32	0.043	0.001	0.69	17.45

TEST 8

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	17	20	9.00	440.00	7.33	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	17	30.5	10.50	450.50	7.51	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	17	40.5	10.00	460.50	7.68	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	17	52	11.50	472.00	7.87	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	18	2	10.00	482.00	8.03	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	18	13.5	11.50	493.50	8.23	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	18	24.5	11.00	504.50	8.41	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	18	36.5	12.00	516.50	8.61	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	18	47.5	11.00	527.50	8.79	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	19	0	12.50	540.00	9.00	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	19	12	12.00	552.00	9.20	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	19	25	13.00	565.00	9.42	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	19	37.5	12.50	577.50	9.63	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	19	52.5	15.00	592.50	9.88	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	20	6	13.50	606.00	10.10	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	20	21.5	15.50	621.50	10.36	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	20	35.5	14.00	635.50	10.59	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	20	52	16.50	652.00	10.87	3.64	0.20	0.026	0.001	0.42	10.58
10	24	4	14	21	7.5	15.50	667.50	11.13	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	21	25	17.50	685.00	11.42	3.43	0.18	0.025	0.001	0.39	9.97
10	24	4	14	21	41	16.00	701.00	11.68	3.75	0.20	0.027	0.001	0.43	10.91
10	24	4	14	21	58.5	17.50	718.50	11.98	3.43	0.18	0.025	0.001	0.39	9.97
10	24	4	14	22	14	15.50	734.00	12.23	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	22	30	16.00	750.00	12.50	3.75	0.20	0.027	0.001	0.43	10.91
10	24	4	14	22	43.5	13.50	763.50	12.73	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	22	58.5	15.00	778.50	12.98	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	23	11.5	13.00	791.50	13.19	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	23	25.5	14.00	805.50	13.43	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	23	37.5	12.00	817.50	13.63	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	23	50.5	13.00	830.50	13.84	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	24	2	11.50	842.00	14.03	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	24	14.5	12.50	854.50	14.24	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	24	24.5	10.00	864.50	14.41	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	24	36.5	12.00	876.50	14.61	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	24	46.5	10.00	886.50	14.78	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	24	58	11.50	898.00	14.97	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	25	8	10.00	908.00	15.13	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	25	19	11.00	919.00	15.32	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	25	28.5	9.50	928.50	15.48	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	25	39.5	11.00	939.50	15.66	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	25	49	9.50	949.00	15.82	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	26	0.5	11.50	960.50	16.01	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	26	10.5	10.00	970.50	16.18	6.00	0.32	0.043	0.001	0.69	17.45

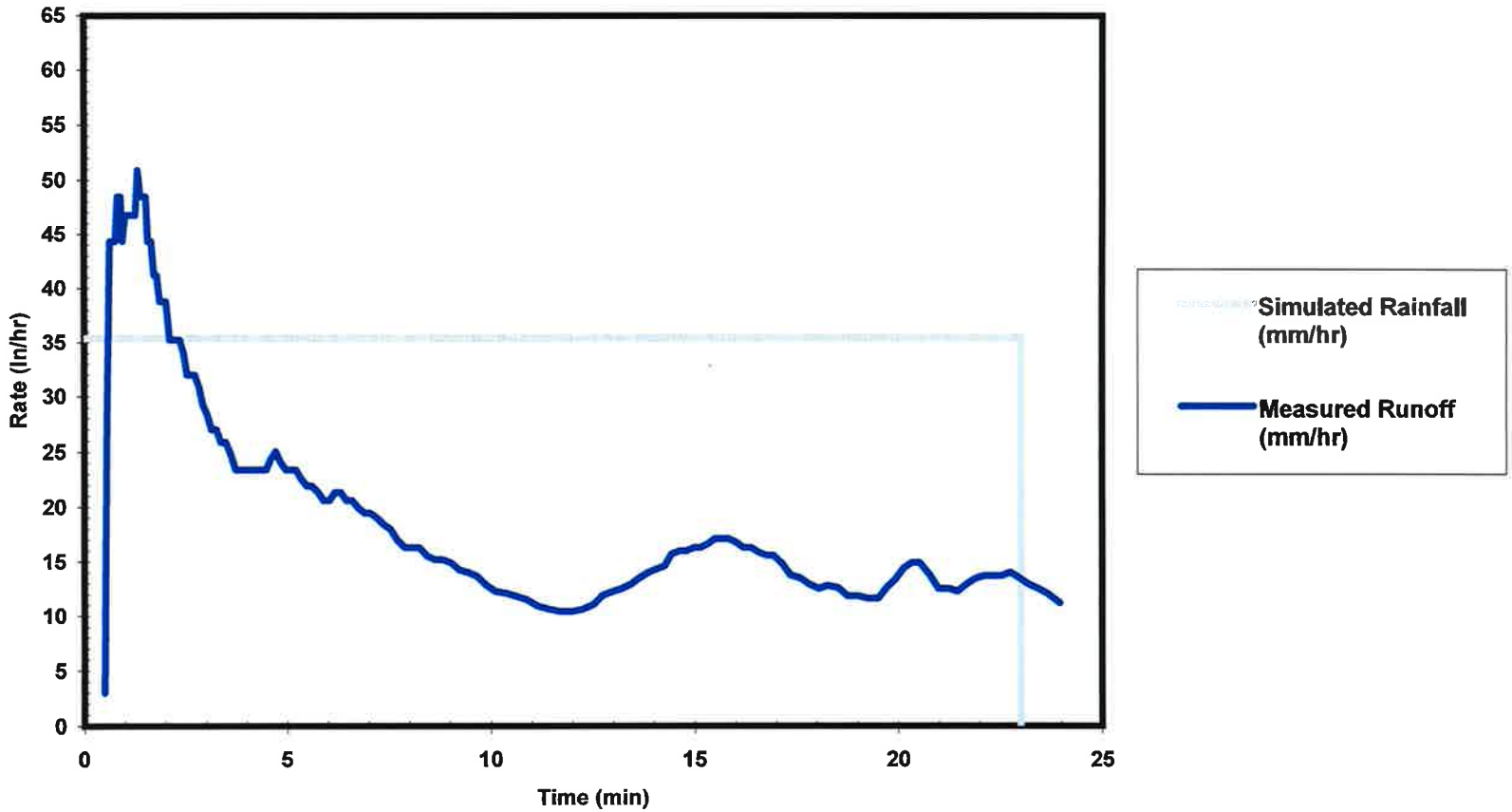
TEST 8

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	26	22	11.50	982.00	16.37	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	26	32.5	10.50	992.50	16.54	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	26	44.5	12.00	1004.50	16.74	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	26	55	10.50	1015.00	16.92	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	27	8.5	13.50	1028.50	17.14	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	27	20.5	12.00	1040.50	17.34	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	27	34.5	14.00	1054.50	17.58	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	27	47.5	13.00	1067.50	17.79	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	28	2.5	15.00	1082.50	18.04	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	28	15	12.50	1095.00	18.25	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	28	30.5	15.50	1110.50	18.51	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	28	44.5	14.00	1124.50	18.74	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	29	0	15.50	1140.00	19.00	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	29	14.5	14.50	1154.50	19.24	4.14	0.22	0.030	0.001	0.47	12.04
10	24	4	14	29	30	15.50	1170.00	19.50	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	29	42.5	12.50	1182.50	19.71	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	29	56	13.50	1196.00	19.93	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	30	7	11.00	1207.00	20.12	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	30	19.5	12.50	1219.50	20.33	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	30	30.5	11.00	1230.50	20.51	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	30	45.5	15.00	1245.50	20.76	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	30	58.5	13.00	1258.50	20.98	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	31	13.5	15.00	1273.50	21.23	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	31	27	13.50	1287.00	21.45	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	31	40.5	13.50	1300.50	21.68	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	31	53	12.50	1313.00	21.88	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	32	6	13.00	1326.00	22.10	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	32	18.5	12.50	1338.50	22.31	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	32	31.5	13.00	1351.50	22.53	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	32	43.5	12.00	1363.50	22.73	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	32	57.5	14.00	1377.50	22.96	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	33	10.5	13.00	1390.50	23.18	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	33	25.5	15.00	1405.50	23.43	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	33	39.5	14.00	1419.50	23.66	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	33	57	17.50	1437.00	23.95	3.43	0.18	0.025	0.001	0.39	9.97

TEST 8

FIGURE A-11

Plot Conductivity Test - 8



TEST 8

LID 8Ke

phi:	*5*	*dtheta*	*1%*
Ks:	*6.10E-04*	*Ko:*	*10000*

sec	min	END OF PLOT cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0	12.7	13.0	-2.7%
60	1	0.00000001	0.0004			
120	2	0.00000065	0.0234			
180	3	0.00000363	0.1307			
240	4	0.0000112	0.4032			
300	5	0.00002584	0.9302			
360	6	0.00005014	1.8050			
420	7	0.00008674	3.1226			
480	8	0.00013837	4.9813			
540	9	0.00020775	7.4790			
600	10	0.00029765	10.7154			
660	11	0.00034091	12.2728			
720	12	0.00034296	12.3466			
780	13	0.00034455	12.4038			
840	14	0.00034584	12.4502			
900	15	0.00034692	12.4891			
960	16	0.00034782	12.5215			
1020	17	0.0003486	12.5496			
1080	18	0.00034928	12.5741			
1140	19	0.00034988	12.5957			
1200	20	0.0003504	12.6144			
1260	21	0.00035088	12.6317			
1320	22	0.0003513	12.6468			
1380	23	0.00035168	12.6605			

TEST 8

LID 8

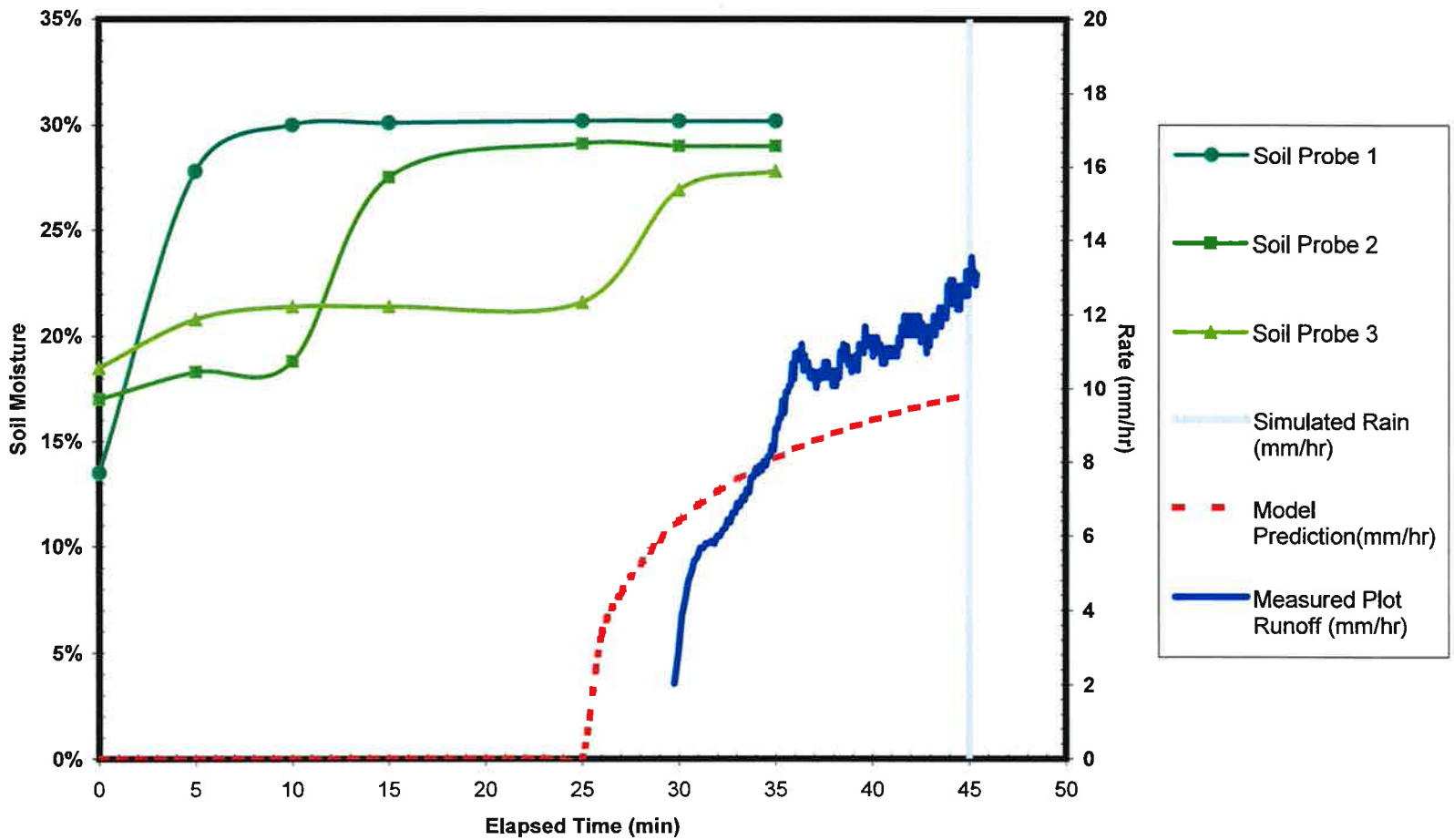
phi:	4	*dtheta*	15%
Ks:	1.45E-03	*Ko:*	10000

		EPS		END OF PLOT				
sec	**min**	**cm/sec**	**mm/hr**	**cm/sec**	**mm/hr**	**Max Runoff (mm/hr)**	**Actual Runoff (mm/hr)**	**% Difference**
0	0	0	0.00	0	0	9.8	11.19	-12.2%
60	1	0	0.00	0	0.0000			
120	2	0.00000263	0.09	0	0.0000			
180	3	2.17E-06	0.08	0	0.0000			
240	4	0.00000924	0.33	0.0000	0.0000			
300	5	**0.0000192**	0.69	**0.0000**	0.0000			
360	6	0	1.18	0	0.0000			
420	7	0.00005061	1.82	0	0.0000			
480	8	0.00007423	2.67	0	0.0000			
540	9	0.00010443	3.76	0	0.0000			
600	10	0.00014203	5.11	0	0.0000			
660	11	0.00018783	6.76	0	0.0000			
720	12	0.00024264	8.74	0	0.0000			
780	13	0.00030729	11.06	0	0.0000			
840	14	0.00038258	13.77	0	0.0000			
900	15	0.00046932	16.90	0	0.0000			
960	16	0.000568	20.45	0	0.0000			
1020	17	0.0006719	24.19	0	0.0000			
1080	18	0.00075384	27.14	0	0.0000			
1140	19	0.00079899	28.76	0	0.0000			
1200	20	0.00081917	29.49	0	0.0000			
1260	21	0.00082753	29.79	0	0.0000			
1320	22	0.00083097	29.91	0	0.0000			
1380	23	0.00083242	29.97	0	0.0000			
1440	24	0.00083304	29.99	0	0.0000			
1500	25	0.00083332	30.00	0	0.0000			
1560	26	0.00083346	30.00	0.00009319	3.3548			
1620	27	0.00083353	30.01	0.00012374	4.4546			
1680	28	0.00083356	30.01	0.00014582	5.2495			
1740	29	0.00083358	30.01	0.00016314	5.8730			
1800	30	0.0008336	30.01	0.0001774	6.3864			
1860	31	0.00083361	30.01	0.0001895	6.8220			
1920	32	0.00083362	30.01	0.0002	7.2000			
1980	33	0.00083362	30.01	0.00020925	7.5330			
2040	34	0.00083363	30.01	0.00021749	7.8296			
2100	35	0.00083363	30.01	0.0002249	8.0964			
2160	36	0.00083364	30.01	0.00023161	8.3380			
2220	37	0.00083364	30.01	0.00023774	8.5586			
2280	38	0.00083365	30.01	0.00024335	8.7606			
2340	39	0.00083365	30.01	0.00024853	8.9471			
2400	40	0.00083365	30.01	0.00025331	9.1192			
2460	41	0.00083366	30.01	0.00025775	9.2790			
2520	42	0.00083366	30.01	0.00026189	9.4280			
2580	43	0.00083367	30.01	0.00026576	9.5674			
2640	44	0.00083367	30.01	0.00026938	9.6977			
2700	45	0.00083367	30.01	0.00027278	9.8201			

TEST 8

FIGURE A-12

Rain/Runoff Hydrograph - 8



TEST 8

MOBILE TEST #7 (TEST 9)

10/24/2004
Deer Park South
US 395 MP 171.4 RT

Plot Parameters

Slope:	4:1
Length (cm):	400
Width (cm):	105
Plot Area (m^2):	4.20
Vegitation:	heavy ryegrass (90%)
Initial Theta:	20.9%
Final Theta:	28.7%
dtheta:	7.8%

Start Time:	14:45
End Time:	15:10
Test Duration:	*0:25:00*
Model Plot Area (m^2):	9.86

Estimated Ke (from plot):

mm/hr	*cm/s*
21.9	*6.09E-04*

Normalized Rates			**Volumetric Rates**
Max Runoff Rate (mm/hr):	*20.7*	*(L/min):*	*3.40*
Rain-on Rate (mm/hr):	*80.3*	*(L/min):*	*13.19*
Runoff Percentage:	*25.8%*		*25.8%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	24	4	14	45	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	24	4	14	49	1	241.00	241.00	4.02	0.25	0.01	0.002	0.000	0.01	0.31
10	24	4	14	49	18.5	17.50	258.50	4.31	3.43	0.18	0.025	0.001	0.17	4.25
10	24	4	14	49	35	16.50	275.00	4.58	3.64	0.20	0.026	0.001	0.18	4.51
10	24	4	14	49	47.5	12.50	287.50	4.79	4.80	0.26	0.035	0.001	0.23	5.95
10	24	4	14	50	0.5	13.00	300.50	5.01	4.62	0.25	0.033	0.001	0.23	5.72
10	24	4	14	50	11.5	11.00	311.50	5.19	5.45	0.29	0.039	0.001	0.27	6.76
10	24	4	14	50	22.5	11.00	322.50	5.38	5.45	0.29	0.039	0.001	0.27	6.76
10	24	4	14	50	32	9.50	332.00	5.53	6.32	0.34	0.045	0.001	0.31	7.83
10	24	4	14	50	41.5	9.50	341.50	5.69	6.32	0.34	0.045	0.001	0.31	7.83
10	24	4	14	50	49	7.50	349.00	5.82	8.00	0.43	0.058	0.002	0.39	9.91
10	24	4	14	50	57.5	8.50	357.50	5.96	7.06	0.38	0.051	0.001	0.34	8.75
10	24	4	14	51	4.5	7.00	364.50	6.08	8.57	0.46	0.062	0.002	0.42	10.62
10	24	4	14	51	12.5	8.00	372.50	6.21	7.50	0.40	0.054	0.002	0.37	9.29
10	24	4	14	51	19	6.50	379.00	6.32	9.23	0.50	0.066	0.002	0.45	11.44
10	24	4	14	51	26	7.00	386.00	6.43	8.57	0.46	0.062	0.002	0.42	10.62
10	24	4	14	51	32.5	6.50	392.50	6.54	9.23	0.50	0.066	0.002	0.45	11.44
10	24	4	14	51	39.5	7.00	399.50	6.66	8.57	0.46	0.062	0.002	0.42	10.62
10	24	4	14	51	45.5	6.00	405.50	6.76	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	51	52.5	7.00	412.50	6.88	8.57	0.46	0.062	0.002	0.42	10.62
10	24	4	14	51	58.5	6.00	418.50	6.98	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	52	5.5	7.00	425.50	7.09	8.57	0.46	0.062	0.002	0.42	10.62
10	24	4	14	52	11.5	6.00	431.50	7.19	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	52	18.5	7.00	438.50	7.31	8.57	0.46	0.062	0.002	0.42	10.62
10	24	4	14	52	24.5	6.00	444.50	7.41	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	52	31	6.50	451.00	7.52	9.23	0.50	0.066	0.002	0.45	11.44
10	24	4	14	52	37	6.00	457.00	7.62	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	52	43.5	6.50	463.50	7.73	9.23	0.50	0.066	0.002	0.45	11.44
10	24	4	14	52	49	5.50	469.00	7.82	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	52	55.5	6.50	475.50	7.93	9.23	0.50	0.066	0.002	0.45	11.44
10	24	4	14	53	1	5.50	481.00	8.02	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	53	7.5	6.50	487.50	8.13	9.23	0.50	0.066	0.002	0.45	11.44
10	24	4	14	53	13	5.50	493.00	8.22	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	53	19	6.00	499.00	8.32	10.00	0.54	0.072	0.002	0.49	12.39

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	53	24.5	5.50	504.50	8.41	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	53	30.5	6.00	510.50	8.51	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	53	35.5	5.00	515.50	8.59	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	53	41.5	6.00	521.50	8.69	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	53	47	5.50	527.00	8.78	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	53	53	6.00	533.00	8.88	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	53	58	5.00	538.00	8.97	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	54	4	6.00	544.00	9.07	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	54	9	5.00	549.00	9.15	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	54	15	6.00	555.00	9.25	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	54	19.5	4.50	559.50	9.33	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	54	25.5	6.00	565.50	9.43	10.00	0.54	0.072	0.002	0.49	12.39
10	24	4	14	54	30	4.50	570.00	9.50	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	54	35.5	5.50	575.50	9.59	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	54	40	4.50	580.00	9.67	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	54	45.5	5.50	585.50	9.76	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	54	50	4.50	590.00	9.83	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	54	55.5	5.50	595.50	9.93	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	55	0	4.50	600.00	10.00	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	55	5	5.00	605.00	10.08	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	55	10	5.00	610.00	10.17	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	55	15	5.00	615.00	10.25	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	55	19.5	4.50	619.50	10.33	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	55	25	5.50	625.00	10.42	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	55	29.5	4.50	629.50	10.49	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	55	35	5.50	635.00	10.58	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	55	39.5	4.50	639.50	10.66	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	55	44.5	5.00	644.50	10.74	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	55	49	4.50	649.00	10.82	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	55	54.5	5.50	654.50	10.91	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	55	58.5	4.00	658.50	10.98	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	56	4	5.50	664.00	11.07	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	56	8.5	4.50	668.50	11.14	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	56	13.5	5.00	673.50	11.23	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	56	18	4.50	678.00	11.30	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	56	23	5.00	683.00	11.38	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	56	27	4.00	687.00	11.45	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	56	32	5.00	692.00	11.53	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	56	36	4.00	696.00	11.60	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	56	41	5.00	701.00	11.68	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	56	45.5	4.50	705.50	11.76	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	56	50.5	5.00	710.50	11.84	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	56	54.5	4.00	714.50	11.91	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	56	59	4.50	719.00	11.98	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	57	3.5	4.50	723.50	12.06	13.33	0.72	0.096	0.003	0.65	16.52

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	57	8	4.50	728.00	12.13	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	57	12	4.00	732.00	12.20	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	57	17	5.00	737.00	12.28	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	57	21	4.00	741.00	12.35	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	57	26	5.00	746.00	12.43	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	57	30	4.00	750.00	12.50	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	57	35	5.00	755.00	12.58	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	57	39	4.00	759.00	12.65	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	57	44	5.00	764.00	12.73	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	57	48	4.00	768.00	12.80	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	57	53	5.00	773.00	12.88	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	57	57	4.00	777.00	12.95	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	58	2	5.00	782.00	13.03	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	58	6	4.00	786.00	13.10	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	58	11	5.00	791.00	13.18	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	58	15	4.00	795.00	13.25	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	58	20	5.00	800.00	13.33	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	58	24	4.00	804.00	13.40	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	58	29	5.00	809.00	13.48	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	58	33	4.00	813.00	13.55	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	58	38	5.00	818.00	13.63	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	58	42	4.00	822.00	13.70	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	58	46.5	4.50	826.50	13.78	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	58	50.5	4.00	830.50	13.84	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	58	55	4.50	835.00	13.92	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	14	58	58.5	3.50	838.50	13.98	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	14	59	3.5	5.00	843.50	14.06	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	59	7	3.50	847.00	14.12	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	14	59	12	5.00	852.00	14.20	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	59	15.5	3.50	855.50	14.26	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	14	59	20.5	5.00	860.50	14.34	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	59	24.5	4.00	864.50	14.41	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	59	29.5	5.00	869.50	14.49	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	59	33.5	4.00	873.50	14.56	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	59	38.5	5.00	878.50	14.64	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	14	59	42.5	4.00	882.50	14.71	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	59	48	5.50	888.00	14.80	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	14	59	52	4.00	892.00	14.87	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	14	59	57.5	5.50	897.50	14.96	10.91	0.59	0.078	0.002	0.53	13.52
10	24	4	15	0	1.5	4.00	901.50	15.03	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	0	6.5	5.00	906.50	15.11	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	15	0	10.5	4.00	910.50	15.18	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	0	15.5	5.00	915.50	15.26	12.00	0.65	0.086	0.002	0.59	14.87
10	24	4	15	0	19.5	4.00	919.50	15.33	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	0	24.5	5.00	924.50	15.41	12.00	0.65	0.086	0.002	0.59	14.87

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	15	0	28.5	4.00	928.50	15.48	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	0	33	4.50	933.00	15.55	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	0	37	4.00	937.00	15.62	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	0	41.5	4.50	941.50	15.69	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	0	45	3.50	945.00	15.75	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	0	49.5	4.50	949.50	15.83	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	0	53	3.50	953.00	15.88	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	0	57.5	4.50	957.50	15.96	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	1	3.50	961.00	16.02	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	1	5.5	4.50	965.50	16.09	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	9	3.50	969.00	16.15	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	1	13.5	4.50	973.50	16.23	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	17	3.50	977.00	16.28	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	1	21.5	4.50	981.50	16.36	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	25	3.50	985.00	16.42	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	1	29.5	4.50	989.50	16.49	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	33	3.50	993.00	16.55	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	1	37.5	4.50	997.50	16.63	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	40.5	3.00	1000.50	16.68	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	1	45	4.50	1005.00	16.75	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	48.5	3.50	1008.50	16.81	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	1	53	4.50	1013.00	16.88	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	1	56.5	3.50	1016.50	16.94	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	2	1	4.50	1021.00	17.02	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	2	4.5	3.50	1024.50	17.08	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	2	8.5	4.00	1028.50	17.14	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	2	12	3.50	1032.00	17.20	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	2	16.5	4.50	1036.50	17.28	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	2	20	3.50	1040.00	17.33	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	2	24.5	4.50	1044.50	17.41	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	2	28	3.50	1048.00	17.47	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	2	32	4.00	1052.00	17.53	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	2	36	4.00	1056.00	17.60	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	2	40	4.00	1060.00	17.67	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	2	44	4.00	1064.00	17.73	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	2	48	4.00	1068.00	17.80	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	2	52	4.00	1072.00	17.87	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	2	56	4.00	1076.00	17.93	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	3	0	4.00	1080.00	18.00	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	3	4	4.00	1084.00	18.07	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	3	7.5	3.50	1087.50	18.13	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	3	12	4.50	1092.00	18.20	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	3	16	4.00	1096.00	18.27	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	3	20	4.00	1100.00	18.33	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	3	24	4.00	1104.00	18.40	15.00	0.81	0.108	0.003	0.73	18.59

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	15	3	28.5	4.50	1108.50	18.48	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	3	32	3.50	1112.00	18.53	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	3	36	4.00	1116.00	18.60	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	3	39.5	3.50	1119.50	18.66	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	3	44	4.50	1124.00	18.73	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	3	47.5	3.50	1127.50	18.79	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	3	51.5	4.00	1131.50	18.86	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	3	55	3.50	1135.00	18.92	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	3	59.5	4.50	1139.50	18.99	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	4	3	3.50	1143.00	19.05	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	7	4.00	1147.00	19.12	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	4	10.5	3.50	1150.50	19.18	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	14.5	4.00	1154.50	19.24	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	4	18	3.50	1158.00	19.30	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	22	4.00	1162.00	19.37	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	4	25.5	3.50	1165.50	19.43	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	29.5	4.00	1169.50	19.49	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	4	33	3.50	1173.00	19.55	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	37	4.00	1177.00	19.62	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	4	40.5	3.50	1180.50	19.68	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	44.5	4.00	1184.50	19.74	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	4	48	3.50	1188.00	19.80	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	52	4.00	1192.00	19.87	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	4	55.5	3.50	1195.50	19.93	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	4	59.5	4.00	1199.50	19.99	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	5	3	3.50	1203.00	20.05	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	5	7	4.00	1207.00	20.12	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	5	10.5	3.50	1210.50	20.18	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	5	14.5	4.00	1214.50	20.24	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	5	18	3.50	1218.00	20.30	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	5	22	4.00	1222.00	20.37	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	5	25.5	3.50	1225.50	20.43	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	5	29	3.50	1229.00	20.48	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	5	32.5	3.50	1232.50	20.54	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	5	36.5	4.00	1236.50	20.61	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	5	39.5	3.00	1239.50	20.66	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	5	43.5	4.00	1243.50	20.73	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	5	47	3.50	1247.00	20.78	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	5	51	4.00	1251.00	20.85	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	5	54	3.00	1254.00	20.90	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	5	58	4.00	1258.00	20.97	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	6	1.5	3.50	1261.50	21.03	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	6	5.5	4.00	1265.50	21.09	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	6	8.5	3.00	1268.50	21.14	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	6	12.5	4.00	1272.50	21.21	15.00	0.81	0.108	0.003	0.73	18.59

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	15	6	16	3.50	1276.00	21.27	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	6	20	4.00	1280.00	21.33	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	6	23.5	3.50	1283.50	21.39	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	6	27.5	4.00	1287.50	21.46	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	6	30.5	3.00	1290.50	21.51	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	6	34.5	4.00	1294.50	21.58	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	6	38	3.50	1298.00	21.63	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	6	42	4.00	1302.00	21.70	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	6	45	3.00	1305.00	21.75	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	6	49.5	4.50	1309.50	21.83	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	6	52.5	3.00	1312.50	21.88	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	6	57	4.50	1317.00	21.95	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	7	0	3.00	1320.00	22.00	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	7	4	4.00	1324.00	22.07	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	7	7.5	3.50	1327.50	22.13	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	7	11.5	4.00	1331.50	22.19	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	7	15	3.50	1335.00	22.25	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	7	19.5	4.50	1339.50	22.33	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	7	22.5	3.00	1342.50	22.38	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	7	27	4.50	1347.00	22.45	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	7	30	3.00	1350.00	22.50	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	7	34	4.00	1354.00	22.57	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	7	37.5	3.50	1357.50	22.63	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	7	41.5	4.00	1361.50	22.69	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	7	45	3.50	1365.00	22.75	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	7	49.5	4.50	1369.50	22.83	13.33	0.72	0.096	0.003	0.65	16.52
10	24	4	15	7	52.5	3.00	1372.50	22.88	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	7	56.5	4.00	1376.50	22.94	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	0	3.50	1380.00	23.00	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	8	4	4.00	1384.00	23.07	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	7.5	3.50	1387.50	23.13	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	8	11.5	4.00	1391.50	23.19	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	14.5	3.00	1394.50	23.24	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	8	18.5	4.00	1398.50	23.31	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	22	3.50	1402.00	23.37	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	8	26	4.00	1406.00	23.43	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	29	3.00	1409.00	23.48	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	8	33	4.00	1413.00	23.55	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	36	3.00	1416.00	23.60	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	8	40	4.00	1420.00	23.67	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	43.5	3.50	1423.50	23.73	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	8	47.5	4.00	1427.50	23.79	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	50.5	3.00	1430.50	23.84	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	8	54.5	4.00	1434.50	23.91	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	8	57.5	3.00	1437.50	23.96	20.00	1.08	0.144	0.004	0.98	24.79

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	15	9	1.5	4.00	1441.50	24.03	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	9	5	3.50	1445.00	24.08	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	8.5	3.50	1448.50	24.14	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	12	3.50	1452.00	24.20	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	15.5	3.50	1455.50	24.26	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	19	3.50	1459.00	24.32	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	22.5	3.50	1462.50	24.38	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	26	3.50	1466.00	24.43	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	29.5	3.50	1469.50	24.49	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	33	3.50	1473.00	24.55	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	37	4.00	1477.00	24.62	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	9	40	3.00	1480.00	24.67	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	9	44	4.00	1484.00	24.73	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	9	47	3.00	1487.00	24.78	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	9	51	4.00	1491.00	24.85	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	9	54.5	3.50	1494.50	24.91	17.14	0.92	0.123	0.003	0.84	21.24
10	24	4	15	9	58.5	4.00	1498.50	24.98	15.00	0.81	0.108	0.003	0.73	18.59
10	24	4	15	10	1.5	3.00	1501.50	25.03	20.00	1.08	0.144	0.004	0.98	24.79
10	24	4	15	10	5.5	4.00	1505.50	25.09	15.00	0.81	0.108	0.003	0.73	18.59

TEST 9

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	80.3	2.0	7.57E-03	0.267	5.39	17.7	1.32E-02	0.466	188.42
25.00	80.3	2.0	7.57E-03	0.267	5.39	17.7	1.32E-02	0.466	188.42
25.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	0.68	15	2.72	3.16	0.41	3.37
2	0.65		2.60	80.3	10.4	85.6
3	0.87		3.48			
4	0.90		3.60			
5	0.80		3.20			
6	0.84		3.36			

TEST 9

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
14:45	0	16.3%	22.9%	23.5%
14:50	5.00	20.0%	28.0%	27.1%
14:55	10.00	25.2%	28.4%	27.5%
15:00	15.00	26.4%	28.4%	27.8%
15:05	20.00	27.4%	28.5%	28.0%
15:10	25.00	27.5%	28.3%	27.8%
15:15	30.00	29.5%	28.5%	27.9%
15:20	35.00	29.5%	28.7%	28.0%
15:25	40.00	25.6%	27.7%	26.0%
15:30	45.00	24.6%	27.0%	25.6%

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**20.9%**
Average Max Moisture:	**28.7%**
dtheta:	**7.8%**

TEST 9

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY / TEST 8 DATA)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)	Time	Intensity
1	0.18	15	0.72	1.39	0.567615	1.38	0	35.4
2	0.23		0.92	35.4		34.9	23.0	35.4
3	0.28		1.12				23.0	0
4	0.40		1.60					
5	0.45		1.80					
6	0.55		2.20					

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
0.86	21.9	6.086E-04

Applied Rain (mm/hr):	34.9
Plot Area (m^2):	4.20
Steady State Runoff (mm/hr):	13.0

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	10	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	24	4	14	10	29	29.00	29.00	0.48	2.07	0.11	0.015	0.000	0.24	6.02
10	24	4	14	10	32.5	3.50	32.50	0.54	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	10	37	4.50	37.00	0.62	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	40.5	3.50	40.50	0.68	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	10	45	4.50	45.00	0.75	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	48	3.00	48.00	0.80	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	10	52.5	4.50	52.50	0.88	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	56	3.50	56.00	0.93	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	0	4.00	60.00	1.00	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	3.5	3.50	63.50	1.06	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	7.5	4.00	67.50	1.13	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	11	3.50	71.00	1.18	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	15	4.00	75.00	1.25	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	18	3.00	78.00	1.30	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	11	22.5	4.50	82.50	1.38	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	25.5	3.00	85.50	1.43	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	11	30	4.50	90.00	1.50	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	33.5	3.50	93.50	1.56	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	38	4.50	98.00	1.63	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	42	4.00	102.00	1.70	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	46.5	4.50	106.50	1.78	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	51	4.50	111.00	1.85	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	55.5	4.50	115.50	1.93	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	0	4.50	120.00	2.00	13.33	0.72	0.096	0.003	1.53	38.79

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	12	5.5	5.50	125.50	2.09	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	12	10	4.50	130.00	2.17	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	15.5	5.50	135.50	2.26	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	12	20	4.50	140.00	2.33	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	26	6.00	146.00	2.43	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	12	31	5.00	151.00	2.52	12.00	0.65	0.086	0.002	1.37	34.91
10	24	4	14	12	37	6.00	157.00	2.62	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	12	42	5.00	162.00	2.70	12.00	0.65	0.086	0.002	1.37	34.91
10	24	4	14	12	48.5	6.50	168.50	2.81	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	12	54	5.50	174.00	2.90	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	13	1	7.00	181.00	3.02	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	7	6.00	187.00	3.12	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	13	14	7.00	194.00	3.23	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	20.5	6.50	200.50	3.34	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	13	27.5	7.00	207.50	3.46	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	34.5	7.00	214.50	3.58	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	42.5	8.00	222.50	3.71	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	13	49.5	7.00	229.50	3.83	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	57.5	8.00	237.50	3.96	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	4.5	7.00	244.50	4.08	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	12.5	8.00	252.50	4.21	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	19.5	7.00	259.50	4.33	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	27.5	8.00	267.50	4.46	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	34	6.50	274.00	4.57	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	14	41.5	7.50	281.50	4.69	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	14	48.5	7.00	288.50	4.81	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	56.5	8.00	296.50	4.94	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	15	3.5	7.00	303.50	5.06	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	15	11.5	8.00	311.50	5.19	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	15	19	7.50	319.00	5.32	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	15	27.5	8.50	327.50	5.46	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	15	35	7.50	335.00	5.58	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	15	44	9.00	344.00	5.73	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	15	52	8.00	352.00	5.87	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	16	1	9.00	361.00	6.02	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	8.5	7.50	368.50	6.14	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	16	17.5	9.00	377.50	6.29	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	25.5	8.00	385.50	6.43	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	16	34.5	9.00	394.50	6.58	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	43	8.50	403.00	6.72	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	16	52.5	9.50	412.50	6.88	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	17	1	8.50	421.00	7.02	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	17	11	10.00	431.00	7.18	6.00	0.32	0.043	0.001	0.69	17.45

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	17	20	9.00	440.00	7.33	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	17	30.5	10.50	450.50	7.51	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	17	40.5	10.00	460.50	7.68	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	17	52	11.50	472.00	7.87	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	18	2	10.00	482.00	8.03	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	18	13.5	11.50	493.50	8.23	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	18	24.5	11.00	504.50	8.41	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	18	36.5	12.00	516.50	8.61	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	18	47.5	11.00	527.50	8.79	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	19	0	12.50	540.00	9.00	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	19	12	12.00	552.00	9.20	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	19	25	13.00	565.00	9.42	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	19	37.5	12.50	577.50	9.63	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	19	52.5	15.00	592.50	9.88	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	20	6	13.50	606.00	10.10	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	20	21.5	15.50	621.50	10.36	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	20	35.5	14.00	635.50	10.59	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	20	52	16.50	652.00	10.87	3.64	0.20	0.026	0.001	0.42	10.58
10	24	4	14	21	7.5	15.50	667.50	11.13	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	21	25	17.50	685.00	11.42	3.43	0.18	0.025	0.001	0.39	9.97
10	24	4	14	21	41	16.00	701.00	11.68	3.75	0.20	0.027	0.001	0.43	10.91
10	24	4	14	21	58.5	17.50	718.50	11.98	3.43	0.18	0.025	0.001	0.39	9.97
10	24	4	14	22	14	15.50	734.00	12.23	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	22	30	16.00	750.00	12.50	3.75	0.20	0.027	0.001	0.43	10.91
10	24	4	14	22	43.5	13.50	763.50	12.73	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	22	58.5	15.00	778.50	12.98	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	23	11.5	13.00	791.50	13.19	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	23	25.5	14.00	805.50	13.43	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	23	37.5	12.00	817.50	13.63	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	23	50.5	13.00	830.50	13.84	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	24	2	11.50	842.00	14.03	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	24	14.5	12.50	854.50	14.24	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	24	24.5	10.00	864.50	14.41	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	24	36.5	12.00	876.50	14.61	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	24	46.5	10.00	886.50	14.78	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	24	58	11.50	898.00	14.97	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	25	8	10.00	908.00	15.13	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	25	19	11.00	919.00	15.32	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	25	28.5	9.50	928.50	15.48	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	25	39.5	11.00	939.50	15.66	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	25	49	9.50	949.00	15.82	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	26	0.5	11.50	960.50	16.01	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	26	10.5	10.00	970.50	16.18	6.00	0.32	0.043	0.001	0.69	17.45

TEST 9

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	26	22	11.50	982.00	16.37	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	26	32.5	10.50	992.50	16.54	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	26	44.5	12.00	1004.50	16.74	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	26	55	10.50	1015.00	16.92	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	27	8.5	13.50	1028.50	17.14	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	27	20.5	12.00	1040.50	17.34	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	27	34.5	14.00	1054.50	17.58	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	27	47.5	13.00	1067.50	17.79	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	28	2.5	15.00	1082.50	18.04	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	28	15	12.50	1095.00	18.25	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	28	30.5	15.50	1110.50	18.51	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	28	44.5	14.00	1124.50	18.74	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	29	0	15.50	1140.00	19.00	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	29	14.5	14.50	1154.50	19.24	4.14	0.22	0.030	0.001	0.47	12.04
10	24	4	14	29	30	15.50	1170.00	19.50	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	29	42.5	12.50	1182.50	19.71	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	29	56	13.50	1196.00	19.93	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	30	7	11.00	1207.00	20.12	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	30	19.5	12.50	1219.50	20.33	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	30	30.5	11.00	1230.50	20.51	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	30	45.5	15.00	1245.50	20.76	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	30	58.5	13.00	1258.50	20.98	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	31	13.5	15.00	1273.50	21.23	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	31	27	13.50	1287.00	21.45	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	31	40.5	13.50	1300.50	21.68	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	31	53	12.50	1313.00	21.88	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	32	6	13.00	1326.00	22.10	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	32	18.5	12.50	1338.50	22.31	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	32	31.5	13.00	1351.50	22.53	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	32	43.5	12.00	1363.50	22.73	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	32	57.5	14.00	1377.50	22.96	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	33	10.5	13.00	1390.50	23.18	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	33	25.5	15.00	1405.50	23.43	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	33	39.5	14.00	1419.50	23.66	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	33	57	17.50	1437.00	23.95	3.43	0.18	0.025	0.001	0.39	9.97

TEST 9

LID 8Ks

phi:	*5*	*dtheta*	*1%*
Ks:	*6.10E-04*	*Ko:*	*10000*

sec	min	END OF PLOT cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0	12.7	13.0	-2.7%
60	1	0.00000001	0.0004			
120	2	0.00000065	0.0234			
180	3	0.00000363	0.1307			
240	4	0.0000112	0.4032			
300	5	0.00002584	0.9302			
360	6	0.00005014	1.8050			
420	7	0.00008674	3.1226			
480	8	0.00013837	4.9813			
540	9	0.00020775	7.4790			
600	10	0.00029765	10.7154			
660	11	0.00034091	12.2728			
720	12	0.00034296	12.3466			
780	13	0.00034455	12.4038			
840	14	0.00034584	12.4502			
900	15	0.00034692	12.4891			
960	16	0.00034782	12.5215			
1020	17	0.0003486	12.5496			
1080	18	0.00034928	12.5741			
1140	19	0.00034988	12.5957			
1200	20	0.0003504	12.6144			
1260	21	0.00035088	12.6317			
1320	22	0.0003513	12.6468			
1380	23	0.00035168	12.6605			

LID 9

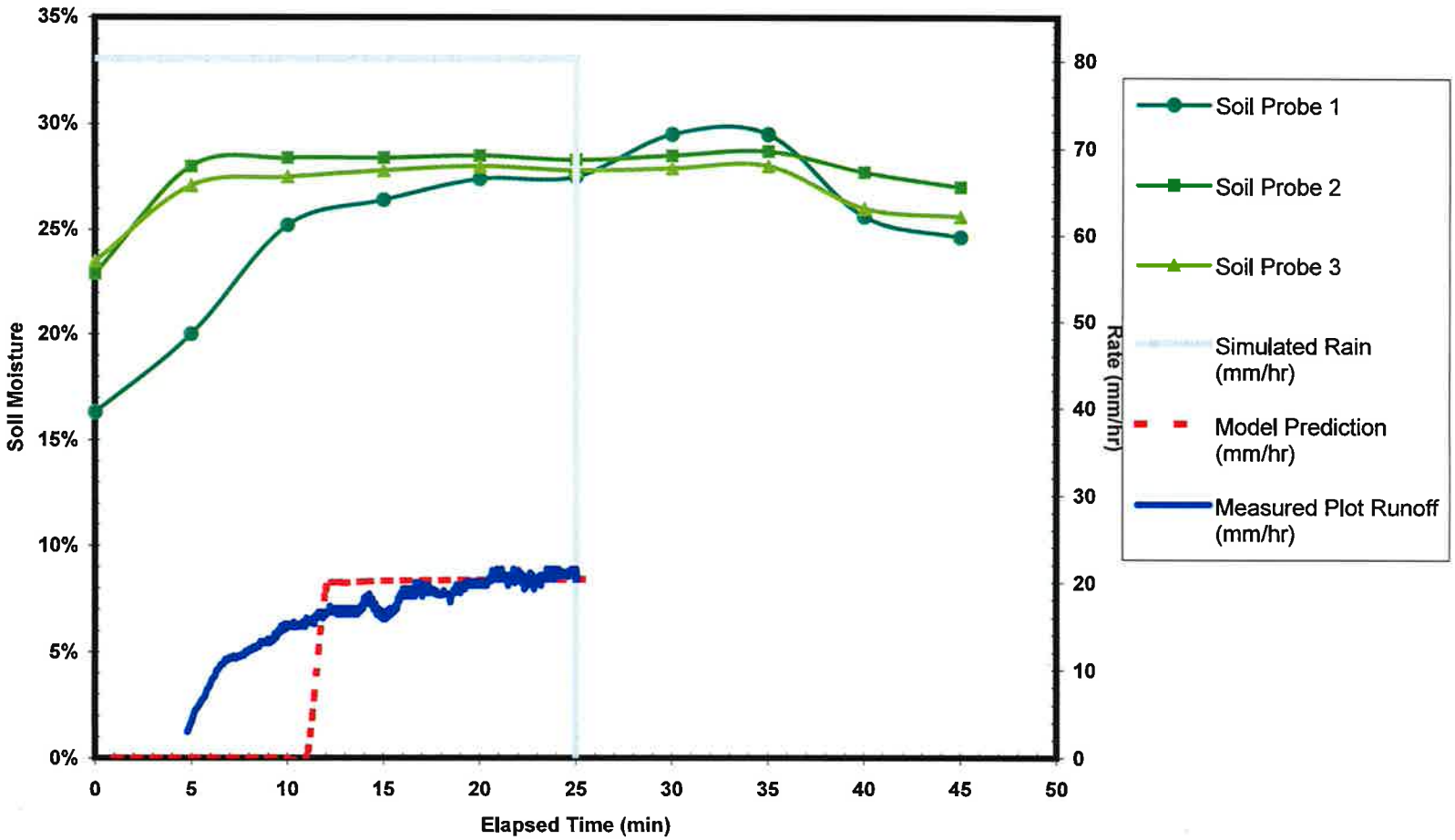
phi:	1.0	*dtheta*	15%
Ks:	4.25E-03	*Ko:*	10000

		EPS		END OF PLOT				
sec	**min**	**cm/sec**	**mm/hr**	**cm/sec**	**mm/hr**	**Max Runoff (mm/hr)**	**Actual Runoff (mm/hr)**	**% Difference**
0	0	0.00E+00	0.0	0.00E+00	0.0	20.4	20.7	-1.6%
60	1	1.24E-05	0.4	0.00E+00	0.0			
120	2	5.16E-05	1.9	0.00E+00	0.0			
180	3	1.49E-04	5.4	0.00E+00	0.0			
240	4	3.44E-04	12.4	0.00E+00	0.0			
300	5	6.67E-04	24.0	0.00E+00	0.0			
360	6	1.16E-03	41.6	0.00E+00	0.0			
420	7	1.77E-03	63.7	0.00E+00	0.0			
480	8	2.11E-03	76.0	0.00E+00	0.0			
540	9	2.20E-03	79.3	0.00E+00	0.0			
600	10	2.23E-03	80.1	5.39E-04	19.4			
660	11	2.23E-03	80.3	5.55E-04	20.0			
720	12	2.23E-03	80.4	5.60E-04	20.1			
780	13	2.23E-03	80.4	5.61E-04	20.2			
840	14	2.23E-03	80.4	5.62E-04	20.2			
900	15	2.23E-03	80.4	5.63E-04	20.3			
960	16	2.23E-03	80.4	5.64E-04	20.3			
1020	17	2.23E-03	80.4	5.64E-04	20.3			
1080	18	2.23E-03	80.4	5.64E-04	20.3			
1140	19	2.23E-03	80.4	5.65E-04	20.3			
1200	20	2.23E-03	80.4	5.65E-04	20.3			
1260	21	2.23E-03	80.4	5.65E-04	20.4			
1320	22	2.23E-03	80.4	5.66E-04	20.4			
1380	23	2.23E-03	80.4	5.66E-04	20.4			
1440	24	2.23E-03	80.4	5.66E-04	20.4			
1500	25	2.23E-03	80.4	5.66E-04	20.4			

TEST 9

FIGURE A-13

Rain/Runoff Hydrograph - 9



TEST 9

MOBILE TEST #8 (TEST 10)

10/26/2004
Deer Park South
US 395 MP 171.4 RT

Plot Parameters

Slope:	4:1
Length (cm):	400
Width (cm):	105
Plot Area (m^2):	4.20
Vegitation:	heavy ryegrass (90%)
Initial Theta:	18.4%
Final Theta:	28.5%
dtheta:	10.1%

Start Time:	12:25
End Time:	13:07
Test Duration:	0:42:00
Model Plot Area (m^2):	13.41

Estimated Ke (from plot):

mm/hr	*cm/s*
21.9	6.09E-04

Normalized Rates			Volumetric Rates
Max Runoff Rate (mm/hr):	14.8	(L/min):	3.31
Rain-on Rate (mm/hr):	32.1	(L/min):	7.16
Runoff Percentage:	46.3%		46.3%

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	26	4	12	25	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	26	4	12	42	26.5	1046.50	1046.50	17.44	0.06	0.00	0.000	0.000	0.00	0.05
10	26	4	12	42	39.5	13.00	1059.50	17.66	4.62	0.25	0.033	0.001	0.17	4.20
10	26	4	12	42	49.5	10.00	1069.50	17.83	6.00	0.32	0.043	0.001	0.22	5.47
10	26	4	12	43	0	10.50	1080.00	18.00	5.71	0.31	0.041	0.001	0.20	5.21
10	26	4	12	43	9	9.00	1089.00	18.15	6.67	0.36	0.048	0.001	0.24	6.07
10	26	4	12	43	18.5	9.50	1098.50	18.31	6.32	0.34	0.045	0.001	0.23	5.75
10	26	4	12	43	26.5	8.00	1106.50	18.44	7.50	0.40	0.054	0.002	0.27	6.83
10	26	4	12	43	35.5	9.00	1115.50	18.59	6.67	0.36	0.048	0.001	0.24	6.07
10	26	4	12	43	43.5	8.00	1123.50	18.73	7.50	0.40	0.054	0.002	0.27	6.83
10	26	4	12	43	51.5	8.00	1131.50	18.86	7.50	0.40	0.054	0.002	0.27	6.83
10	26	4	12	43	59.5	8.00	1139.50	18.99	7.50	0.40	0.054	0.002	0.27	6.83
10	26	4	12	44	8	8.50	1148.00	19.13	7.06	0.38	0.051	0.001	0.25	6.43
10	26	4	12	44	15.5	7.50	1155.50	19.26	8.00	0.43	0.058	0.002	0.29	7.29
10	26	4	12	44	23.5	8.00	1163.50	19.39	7.50	0.40	0.054	0.002	0.27	6.83
10	26	4	12	44	30.5	7.00	1170.50	19.51	8.57	0.46	0.062	0.002	0.31	7.81
10	26	4	12	44	38	7.50	1178.00	19.63	8.00	0.43	0.058	0.002	0.29	7.29
10	26	4	12	44	44.5	6.50	1184.50	19.74	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	44	52	7.50	1192.00	19.87	8.00	0.43	0.058	0.002	0.29	7.29
10	26	4	12	44	58	6.00	1198.00	19.97	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	45	5.5	7.50	1205.50	20.09	8.00	0.43	0.058	0.002	0.29	7.29
10	26	4	12	45	12	6.50	1212.00	20.20	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	45	19	7.00	1219.00	20.32	8.57	0.46	0.062	0.002	0.31	7.81
10	26	4	12	45	25.5	6.50	1225.50	20.43	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	45	32.5	7.00	1232.50	20.54	8.57	0.46	0.062	0.002	0.31	7.81
10	26	4	12	45	38.5	6.00	1238.50	20.64	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	45	45.5	7.00	1245.50	20.76	8.57	0.46	0.062	0.002	0.31	7.81
10	26	4	12	45	51.5	6.00	1251.50	20.86	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	45	58.5	7.00	1258.50	20.98	8.57	0.46	0.062	0.002	0.31	7.81
10	26	4	12	46	4.5	6.00	1264.50	21.08	10.00	0.54	0.072	0.002	0.36	9.11

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	12	46	11	6.50	1271.00	21.18	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	46	17	6.00	1277.00	21.28	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	46	23.5	6.50	1283.50	21.39	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	46	29	5.50	1289.00	21.48	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	46	35	6.00	1295.00	21.58	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	46	40.5	5.50	1300.50	21.68	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	46	47	6.50	1307.00	21.78	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	46	52	5.00	1312.00	21.87	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	46	58.5	6.50	1318.50	21.98	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	47	3.5	5.00	1323.50	22.06	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	47	10	6.50	1330.00	22.17	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	12	47	15	5.00	1335.00	22.25	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	47	21	6.00	1341.00	22.35	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	47	26.5	5.50	1346.50	22.44	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	47	32.5	6.00	1352.50	22.54	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	47	37.5	5.00	1357.50	22.63	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	47	43.5	6.00	1363.50	22.73	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	47	48.5	5.00	1368.50	22.81	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	47	54.5	6.00	1374.50	22.91	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	47	59	4.50	1379.00	22.98	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	48	5	6.00	1385.00	23.08	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	48	9.5	4.50	1389.50	23.16	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	48	15.5	6.00	1395.50	23.26	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	48	20	4.50	1400.00	23.33	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	48	25.5	5.50	1405.50	23.43	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	48	30	4.50	1410.00	23.50	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	48	35.5	5.50	1415.50	23.59	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	48	40.5	5.00	1420.50	23.68	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	48	46	5.50	1426.00	23.77	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	48	50.5	4.50	1430.50	23.84	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	48	56	5.50	1436.00	23.93	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	49	0.5	4.50	1440.50	24.01	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	49	6	5.50	1446.00	24.10	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	49	10.5	4.50	1450.50	24.18	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	49	16.5	6.00	1456.50	24.28	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	49	21	4.50	1461.00	24.35	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	49	26	5.00	1466.00	24.43	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	49	30.5	4.50	1470.50	24.51	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	49	36	5.50	1476.00	24.60	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	49	41	5.00	1481.00	24.68	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	49	46	5.00	1486.00	24.77	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	49	51	5.00	1491.00	24.85	12.00	0.65	0.086	0.002	0.43	10.93

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	12	49	56.5	5.50	1496.50	24.94	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	50	1	4.50	1501.00	25.02	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	50	6.5	5.50	1506.50	25.11	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	50	11	4.50	1511.00	25.18	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	50	17	6.00	1517.00	25.28	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	50	22	5.00	1522.00	25.37	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	50	27.5	5.50	1527.50	25.46	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	50	32.5	5.00	1532.50	25.54	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	50	38.5	6.00	1538.50	25.64	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	50	43	4.50	1543.00	25.72	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	50	48.5	5.50	1548.50	25.81	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	50	53.5	5.00	1553.50	25.89	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	50	59	5.50	1559.00	25.98	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	51	3.5	4.50	1563.50	26.06	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	51	9	5.50	1569.00	26.15	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	51	13.5	4.50	1573.50	26.23	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	51	19.5	6.00	1579.50	26.33	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	12	51	24	4.50	1584.00	26.40	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	51	29.5	5.50	1589.50	26.49	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	51	34	4.50	1594.00	26.57	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	51	39	5.00	1599.00	26.65	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	51	43.5	4.50	1603.50	26.73	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	51	49	5.50	1609.00	26.82	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	51	53.5	4.50	1613.50	26.89	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	51	58.5	5.00	1618.50	26.98	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	52	3	4.50	1623.00	27.05	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	52	8	5.00	1628.00	27.13	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	52	12.5	4.50	1632.50	27.21	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	52	18	5.50	1638.00	27.30	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	52	22.5	4.50	1642.50	27.38	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	52	27.5	5.00	1647.50	27.46	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	52	31.5	4.00	1651.50	27.53	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	52	37	5.50	1657.00	27.62	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	12	52	41	4.00	1661.00	27.68	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	52	46	5.00	1666.00	27.77	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	52	50.5	4.50	1670.50	27.84	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	52	55.5	5.00	1675.50	27.93	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	53	0	4.50	1680.00	28.00	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	53	5	5.00	1685.00	28.08	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	53	9	4.00	1689.00	28.15	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	53	14	5.00	1694.00	28.23	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	53	18.5	4.50	1698.50	28.31	13.33	0.72	0.096	0.003	0.48	12.15

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	12	53	23.5	5.00	1703.50	28.39	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	53	27.5	4.00	1707.50	28.46	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	53	32.5	5.00	1712.50	28.54	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	53	36.5	4.00	1716.50	28.61	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	53	41.5	5.00	1721.50	28.69	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	53	45.5	4.00	1725.50	28.76	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	53	50.5	5.00	1730.50	28.84	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	53	54.5	4.00	1734.50	28.91	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	53	59	4.50	1739.00	28.98	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	54	3	4.00	1743.00	29.05	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	54	8	5.00	1748.00	29.13	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	54	12	4.00	1752.00	29.20	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	54	16.5	4.50	1756.50	29.28	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	54	20	3.50	1760.00	29.33	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	54	25	5.00	1765.00	29.42	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	54	28.5	3.50	1768.50	29.48	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	54	33	4.50	1773.00	29.55	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	54	37	4.00	1777.00	29.62	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	54	41.5	4.50	1781.50	29.69	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	54	45.5	4.00	1785.50	29.76	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	54	50	4.50	1790.00	29.83	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	54	53.5	3.50	1793.50	29.89	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	54	58	4.50	1798.00	29.97	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	55	2	4.00	1802.00	30.03	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	55	6.5	4.50	1806.50	30.11	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	55	10	3.50	1810.00	30.17	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	55	15	5.00	1815.00	30.25	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	55	18.5	3.50	1818.50	30.31	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	55	23	4.50	1823.00	30.38	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	55	27	4.00	1827.00	30.45	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	55	31.5	4.50	1831.50	30.53	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	55	35	3.50	1835.00	30.58	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	55	39.5	4.50	1839.50	30.66	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	55	43.5	4.00	1843.50	30.73	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	55	48	4.50	1848.00	30.80	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	55	51.5	3.50	1851.50	30.86	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	55	56	4.50	1856.00	30.93	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	56	0	4.00	1860.00	31.00	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	56	4.5	4.50	1864.50	31.08	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	56	8.5	4.00	1868.50	31.14	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	56	13	4.50	1873.00	31.22	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	56	17	4.00	1877.00	31.28	15.00	0.81	0.108	0.003	0.54	13.67

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	12	56	21.5	4.50	1881.50	31.36	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	56	25.5	4.00	1885.50	31.43	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	56	30	4.50	1890.00	31.50	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	56	34	4.00	1894.00	31.57	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	56	38.5	4.50	1898.50	31.64	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	56	42.5	4.00	1902.50	31.71	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	56	47	4.50	1907.00	31.78	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	56	51	4.00	1911.00	31.85	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	56	56	5.00	1916.00	31.93	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	56	59.5	3.50	1919.50	31.99	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	57	4.5	5.00	1924.50	32.08	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	57	8	3.50	1928.00	32.13	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	57	12.5	4.50	1932.50	32.21	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	57	16.5	4.00	1936.50	32.28	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	57	21	4.50	1941.00	32.35	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	57	25	4.00	1945.00	32.42	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	57	29.5	4.50	1949.50	32.49	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	57	33	3.50	1953.00	32.55	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	57	38	5.00	1958.00	32.63	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	12	57	41.5	3.50	1961.50	32.69	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	57	46	4.50	1966.00	32.77	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	57	49.5	3.50	1969.50	32.83	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	57	54	4.50	1974.00	32.90	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	57	57.5	3.50	1977.50	32.96	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	58	2	4.50	1982.00	33.03	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	58	5.5	3.50	1985.50	33.09	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	58	10	4.50	1990.00	33.17	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	58	13.5	3.50	1993.50	33.23	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	58	18	4.50	1998.00	33.30	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	58	21.5	3.50	2001.50	33.36	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	58	26	4.50	2006.00	33.43	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	58	30	4.00	2010.00	33.50	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	58	34	4.00	2014.00	33.57	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	58	37.5	3.50	2017.50	33.63	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	58	42	4.50	2022.00	33.70	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	58	45.5	3.50	2025.50	33.76	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	58	50	4.50	2030.00	33.83	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	58	53.5	3.50	2033.50	33.89	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	58	58	4.50	2038.00	33.97	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	59	1.5	3.50	2041.50	34.03	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	59	5.5	4.00	2045.50	34.09	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	59	9	3.50	2049.00	34.15	17.14	0.92	0.123	0.003	0.61	15.62

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	12	59	13	4.00	2053.00	34.22	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	59	16.5	3.50	2056.50	34.28	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	59	21	4.50	2061.00	34.35	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	59	24.5	3.50	2064.50	34.41	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	59	28.5	4.00	2068.50	34.48	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	59	32	3.50	2072.00	34.53	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	59	36.5	4.50	2076.50	34.61	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	59	39.5	3.00	2079.50	34.66	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	12	59	44	4.50	2084.00	34.73	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	12	59	47.5	3.50	2087.50	34.79	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	59	51.5	4.00	2091.50	34.86	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	12	59	55	3.50	2095.00	34.92	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	12	59	59.5	4.50	2099.50	34.99	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	0	3	3.50	2103.00	35.05	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	0	7.5	4.50	2107.50	35.13	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	0	11	3.50	2111.00	35.18	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	0	15	4.00	2115.00	35.25	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	0	18.5	3.50	2118.50	35.31	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	0	23	4.50	2123.00	35.38	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	0	26.5	3.50	2126.50	35.44	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	0	30.5	4.00	2130.50	35.51	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	0	34	3.50	2134.00	35.57	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	0	38.5	4.50	2138.50	35.64	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	0	42	3.50	2142.00	35.70	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	0	46.5	4.50	2146.50	35.78	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	0	50	3.50	2150.00	35.83	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	0	54.5	4.50	2154.50	35.91	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	0	57.5	3.00	2157.50	35.96	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	1	2	4.50	2162.00	36.03	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	1	5.5	3.50	2165.50	36.09	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	1	10	4.50	2170.00	36.17	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	1	13.5	3.50	2173.50	36.23	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	1	17.5	4.00	2177.50	36.29	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	1	21	3.50	2181.00	36.35	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	1	25.5	4.50	2185.50	36.43	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	1	28.5	3.00	2188.50	36.48	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	1	33	4.50	2193.00	36.55	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	1	36	3.00	2196.00	36.60	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	1	40.5	4.50	2200.50	36.68	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	1	43.5	3.00	2203.50	36.73	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	1	47.5	4.00	2207.50	36.79	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	1	51	3.50	2211.00	36.85	17.14	0.92	0.123	0.003	0.61	15.62

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	13	1	55	4.00	2215.00	36.92	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	1	58	3.00	2218.00	36.97	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	2	2.5	4.50	2222.50	37.04	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	2	5.5	3.00	2225.50	37.09	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	2	9.5	4.00	2229.50	37.16	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	2	12.5	3.00	2232.50	37.21	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	2	16.5	4.00	2236.50	37.28	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	2	20	3.50	2240.00	37.33	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	2	24	4.00	2244.00	37.40	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	2	27	3.00	2247.00	37.45	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	2	31	4.00	2251.00	37.52	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	2	34	3.00	2254.00	37.57	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	2	38	4.00	2258.00	37.63	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	2	41.5	3.50	2261.50	37.69	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	2	45	3.50	2265.00	37.75	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	2	48.5	3.50	2268.50	37.81	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	2	52.5	4.00	2272.50	37.88	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	2	55.5	3.00	2275.50	37.93	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	2	59.5	4.00	2279.50	37.99	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	3	2.5	3.00	2282.50	38.04	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	3	7	4.50	2287.00	38.12	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	3	10	3.00	2290.00	38.17	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	3	14	4.00	2294.00	38.23	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	3	17	3.00	2297.00	38.28	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	3	21.5	4.50	2301.50	38.36	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	3	24.5	3.00	2304.50	38.41	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	3	29	4.50	2309.00	38.48	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	3	32	3.00	2312.00	38.53	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	3	36	4.00	2316.00	38.60	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	3	39.5	3.50	2319.50	38.66	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	3	44	4.50	2324.00	38.73	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	3	47	3.00	2327.00	38.78	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	3	51.5	4.50	2331.50	38.86	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	3	54.5	3.00	2334.50	38.91	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	3	59	4.50	2339.00	38.98	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	4	2.5	3.50	2342.50	39.04	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	4	6.5	4.00	2346.50	39.11	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	4	10	3.50	2350.00	39.17	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	4	14	4.00	2354.00	39.23	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	4	17.5	3.50	2357.50	39.29	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	4	21.5	4.00	2361.50	39.36	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	4	25	3.50	2365.00	39.42	17.14	0.92	0.123	0.003	0.61	15.62

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	13	4	29	4.00	2369.00	39.48	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	4	32.5	3.50	2372.50	39.54	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	4	36.5	4.00	2376.50	39.61	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	4	39.5	3.00	2379.50	39.66	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	4	44	4.50	2384.00	39.73	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	4	47	3.00	2387.00	39.78	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	4	51	4.00	2391.00	39.85	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	4	54.5	3.50	2394.50	39.91	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	4	58.5	4.00	2398.50	39.98	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	2	3.50	2402.00	40.03	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	5	6	4.00	2406.00	40.10	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	9.5	3.50	2409.50	40.16	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	5	13.5	4.00	2413.50	40.23	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	17	3.50	2417.00	40.28	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	5	21	4.00	2421.00	40.35	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	24	3.00	2424.00	40.40	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	5	28	4.00	2428.00	40.47	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	31.5	3.50	2431.50	40.53	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	5	35.5	4.00	2435.50	40.59	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	38.5	3.00	2438.50	40.64	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	5	42.5	4.00	2442.50	40.71	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	45.5	3.00	2445.50	40.76	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	5	49.5	4.00	2449.50	40.83	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	52.5	3.00	2452.50	40.88	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	5	56.5	4.00	2456.50	40.94	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	5	59.5	3.00	2459.50	40.99	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	6	3	3.50	2463.00	41.05	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	6	6.5	3.50	2466.50	41.11	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	6	10	3.50	2470.00	41.17	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	6	13	3.00	2473.00	41.22	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	6	17	4.00	2477.00	41.28	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	6	20	3.00	2480.00	41.33	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	6	24	4.00	2484.00	41.40	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	6	27	3.00	2487.00	41.45	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	6	31	4.00	2491.00	41.52	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	6	34	3.00	2494.00	41.57	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	6	38	4.00	2498.00	41.63	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	6	41	3.00	2501.00	41.68	20.00	1.08	0.144	0.004	0.72	18.22
10	26	4	13	6	45	4.00	2505.00	41.75	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	6	48.5	3.50	2508.50	41.81	17.14	0.92	0.123	0.003	0.61	15.62
10	26	4	13	6	53	4.50	2513.00	41.88	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	6	56.5	3.50	2516.50	41.94	17.14	0.92	0.123	0.003	0.61	15.62

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	13	7	1	4.50	2521.00	42.02	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	7	5	4.00	2525.00	42.08	15.00	0.81	0.108	0.003	0.54	13.67
10	26	4	13	7	10	5.00	2530.00	42.17	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	13	7	14.5	4.50	2534.50	42.24	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	7	20	5.50	2540.00	42.33	10.91	0.59	0.078	0.002	0.39	9.94
10	26	4	13	7	24.5	4.50	2544.50	42.41	13.33	0.72	0.096	0.003	0.48	12.15
10	26	4	13	7	30.5	6.00	2550.50	42.51	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	13	7	35.5	5.00	2555.50	42.59	12.00	0.65	0.086	0.002	0.43	10.93
10	26	4	13	7	42	6.50	2562.00	42.70	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	13	7	48	6.00	2568.00	42.80	10.00	0.54	0.072	0.002	0.36	9.11
10	26	4	13	7	55	7.00	2575.00	42.92	8.57	0.46	0.062	0.002	0.31	7.81
10	26	4	13	8	1.5	6.50	2581.50	43.03	9.23	0.50	0.066	0.002	0.33	8.41
10	26	4	13	8	9.5	8.00	2589.50	43.16	7.50	0.40	0.054	0.002	0.27	6.83
10	26	4	13	8	16.5	7.00	2596.50	43.28	8.57	0.46	0.062	0.002	0.31	7.81
10	26	4	13	8	26	9.50	2606.00	43.43	6.32	0.34	0.045	0.001	0.23	5.75
10	26	4	13	8	34	8.00	2614.00	43.57	7.50	0.40	0.054	0.002	0.27	6.83
10	26	4	13	8	44.5	10.50	2624.50	43.74	5.71	0.31	0.041	0.001	0.20	5.21
10	26	4	13	8	54	9.50	2634.00	43.90	6.32	0.34	0.045	0.001	0.23	5.75
10	26	4	13	9	5	11.00	2645.00	44.08	5.45	0.29	0.039	0.001	0.20	4.97
10	26	4	13	9	15.5	10.50	2655.50	44.26	5.71	0.31	0.041	0.001	0.20	5.21
10	26	4	13	9	28	12.50	2668.00	44.47	4.80	0.26	0.035	0.001	0.17	4.37
10	26	4	13	9	39.5	11.50	2679.50	44.66	5.22	0.28	0.038	0.001	0.19	4.75
10	26	4	13	9	53.5	14.00	2693.50	44.89	4.29	0.23	0.031	0.001	0.15	3.90
10	26	4	13	10	7	13.50	2707.00	45.12	4.44	0.24	0.032	0.001	0.16	4.05
10	26	4	13	10	23	16.00	2723.00	45.38	3.75	0.20	0.027	0.001	0.13	3.42
10	26	4	13	10	38	15.00	2738.00	45.63	4.00	0.22	0.029	0.001	0.14	3.64
10	26	4	13	10	56.5	18.50	2756.50	45.94	3.24	0.17	0.023	0.001	0.12	2.95
10	26	4	13	11	13.5	17.00	2773.50	46.23	3.53	0.19	0.025	0.001	0.13	3.22
10	26	4	13	11	34	20.50	2794.00	46.57	2.93	0.16	0.021	0.001	0.10	2.67
10	26	4	13	11	53.5	19.50	2813.50	46.89	3.08	0.17	0.022	0.001	0.11	2.80
10	26	4	13	12	17.5	24.00	2837.50	47.29	2.50	0.13	0.018	0.001	0.09	2.28
10	26	4	13	12	40	22.50	2860.00	47.67	2.67	0.14	0.019	0.001	0.10	2.43
10	26	4	13	13	7	27.00	2887.00	48.12	2.22	0.12	0.016	0.000	0.08	2.02
10	26	4	13	13	32	25.00	2912.00	48.53	2.40	0.13	0.017	0.000	0.09	2.19
10	26	4	13	14	3	31.00	2943.00	49.05	1.94	0.10	0.014	0.000	0.07	1.76
10	26	4	13	14	33.5	30.50	2973.50	49.56	1.97	0.11	0.014	0.000	0.07	1.79
10	26	4	13	15	10	36.50	3010.00	50.17	1.64	0.09	0.012	0.000	0.06	1.50
10	26	4	13	15	46.5	36.50	3046.50	50.78	1.64	0.09	0.012	0.000	0.06	1.50
10	26	4	13	16	32	45.50	3092.00	51.53	1.32	0.07	0.009	0.000	0.05	1.20
10	26	4	13	17	19	47.00	3139.00	52.32	1.28	0.07	0.009	0.000	0.05	1.16
10	26	4	13	18	21.5	62.50	3201.50	53.36	0.96	0.05	0.007	0.000	0.03	0.87
10	26	4	13	19	39	77.50	3279.00	54.65	0.77	0.04	0.006	0.000	0.03	0.71

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	26	4	13	22	0.5	141.50	3420.50	57.01	0.42	0.02	0.003	0.000	0.02	0.39
10	26	4	13	23	45.5	105.00	3525.50	58.76	0.57	0.03	0.004	0.000	0.02	0.52

TEST 10

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	32.1	1.3	4.92E-03	0.174	8.77	28.8	7.16E-03	0.253	102.36
42.00	32.1	1.3	4.92E-03	0.174	8.77	28.8	7.16E-03	0.253	102.36
42.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	0.50	15	2.00	1.39	0.45	1.26
2	0.48		1.92	35.2	11.5	32.1
3	0.28		1.12			
4	0.30		1.20			
5	0.24		0.96			
6	0.28		1.12			

TEST 10

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
12:25	0	19.0%	17.3%	18.8%
12:30	5.00	28.9%	17.6%	19.9%
12:35	10.00	28.8%	28.0%	20.2%
12:40	15.00	28.9%	27.9%	28.1%
12:45	20.00	28.9%	27.8%	28.1%
12:50	25.00	28.9%	28.2%	28.1%
12:55	30.00	28.8%	28.4%	28.2%
13:00	35.00	28.9%	28.3%	28.1%
13:07	42.00	28.7%	28.2%	27.9%

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**18.4%**
Average Max Moisture:	**28.5%**
dtheta:	**10.1%**

TEST 10

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY / TEST 8 DATA)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)	Time	Intensity
1	0.18	15	0.72	1.39	0.567615	1.38	0	35.4
2	0.23		0.92	35.4		34.9	23.0	35.4
3	0.28		1.12				23.0	0
4	0.40		1.60					
5	0.45		1.80					
6	0.55		2.20					

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
0.86	21.9	6.086E-04

Applied Rain (mm/hr):	34.9
Plot Area (m^2):	4.20
Steady State Runoff (mm/hr):	13.0

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	10	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	24	4	14	10	29	29.00	29.00	0.48	2.07	0.11	0.015	0.000	0.24	6.02
10	24	4	14	10	32.5	3.50	32.50	0.54	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	10	37	4.50	37.00	0.62	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	40.5	3.50	40.50	0.68	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	10	45	4.50	45.00	0.75	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	48	3.00	48.00	0.80	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	10	52.5	4.50	52.50	0.88	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	10	56	3.50	56.00	0.93	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	0	4.00	60.00	1.00	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	3.5	3.50	63.50	1.06	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	7.5	4.00	67.50	1.13	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	11	3.50	71.00	1.18	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	15	4.00	75.00	1.25	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	18	3.00	78.00	1.30	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	11	22.5	4.50	82.50	1.38	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	25.5	3.00	85.50	1.43	20.00	1.08	0.144	0.004	2.29	58.18
10	24	4	14	11	30	4.50	90.00	1.50	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	33.5	3.50	93.50	1.56	17.14	0.92	0.123	0.003	1.96	49.87
10	24	4	14	11	38	4.50	98.00	1.63	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	42	4.00	102.00	1.70	15.00	0.81	0.108	0.003	1.72	43.64
10	24	4	14	11	46.5	4.50	106.50	1.78	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	51	4.50	111.00	1.85	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	11	55.5	4.50	115.50	1.93	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	0	4.50	120.00	2.00	13.33	0.72	0.096	0.003	1.53	38.79

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	12	5.5	5.50	125.50	2.09	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	12	10	4.50	130.00	2.17	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	15.5	5.50	135.50	2.26	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	12	20	4.50	140.00	2.33	13.33	0.72	0.096	0.003	1.53	38.79
10	24	4	14	12	26	6.00	146.00	2.43	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	12	31	5.00	151.00	2.52	12.00	0.65	0.086	0.002	1.37	34.91
10	24	4	14	12	37	6.00	157.00	2.62	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	12	42	5.00	162.00	2.70	12.00	0.65	0.086	0.002	1.37	34.91
10	24	4	14	12	48.5	6.50	168.50	2.81	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	12	54	5.50	174.00	2.90	10.91	0.59	0.078	0.002	1.25	31.74
10	24	4	14	13	1	7.00	181.00	3.02	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	7	6.00	187.00	3.12	10.00	0.54	0.072	0.002	1.15	29.09
10	24	4	14	13	14	7.00	194.00	3.23	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	20.5	6.50	200.50	3.34	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	13	27.5	7.00	207.50	3.46	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	34.5	7.00	214.50	3.58	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	42.5	8.00	222.50	3.71	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	13	49.5	7.00	229.50	3.83	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	13	57.5	8.00	237.50	3.96	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	4.5	7.00	244.50	4.08	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	12.5	8.00	252.50	4.21	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	19.5	7.00	259.50	4.33	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	27.5	8.00	267.50	4.46	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	14	34	6.50	274.00	4.57	9.23	0.50	0.066	0.002	1.06	26.85
10	24	4	14	14	41.5	7.50	281.50	4.69	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	14	48.5	7.00	288.50	4.81	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	14	56.5	8.00	296.50	4.94	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	15	3.5	7.00	303.50	5.06	8.57	0.46	0.062	0.002	0.98	24.94
10	24	4	14	15	11.5	8.00	311.50	5.19	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	15	19	7.50	319.00	5.32	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	15	27.5	8.50	327.50	5.46	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	15	35	7.50	335.00	5.58	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	15	44	9.00	344.00	5.73	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	15	52	8.00	352.00	5.87	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	16	1	9.00	361.00	6.02	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	8.5	7.50	368.50	6.14	8.00	0.43	0.058	0.002	0.92	23.27
10	24	4	14	16	17.5	9.00	377.50	6.29	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	25.5	8.00	385.50	6.43	7.50	0.40	0.054	0.002	0.86	21.82
10	24	4	14	16	34.5	9.00	394.50	6.58	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	16	43	8.50	403.00	6.72	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	16	52.5	9.50	412.50	6.88	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	17	1	8.50	421.00	7.02	7.06	0.38	0.051	0.001	0.81	20.54
10	24	4	14	17	11	10.00	431.00	7.18	6.00	0.32	0.043	0.001	0.69	17.45

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	17	20	9.00	440.00	7.33	6.67	0.36	0.048	0.001	0.76	19.39
10	24	4	14	17	30.5	10.50	450.50	7.51	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	17	40.5	10.00	460.50	7.68	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	17	52	11.50	472.00	7.87	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	18	2	10.00	482.00	8.03	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	18	13.5	11.50	493.50	8.23	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	18	24.5	11.00	504.50	8.41	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	18	36.5	12.00	516.50	8.61	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	18	47.5	11.00	527.50	8.79	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	19	0	12.50	540.00	9.00	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	19	12	12.00	552.00	9.20	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	19	25	13.00	565.00	9.42	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	19	37.5	12.50	577.50	9.63	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	19	52.5	15.00	592.50	9.88	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	20	6	13.50	606.00	10.10	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	20	21.5	15.50	621.50	10.36	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	20	35.5	14.00	635.50	10.59	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	20	52	16.50	652.00	10.87	3.64	0.20	0.026	0.001	0.42	10.58
10	24	4	14	21	7.5	15.50	667.50	11.13	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	21	25	17.50	685.00	11.42	3.43	0.18	0.025	0.001	0.39	9.97
10	24	4	14	21	41	16.00	701.00	11.68	3.75	0.20	0.027	0.001	0.43	10.91
10	24	4	14	21	58.5	17.50	718.50	11.98	3.43	0.18	0.025	0.001	0.39	9.97
10	24	4	14	22	14	15.50	734.00	12.23	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	22	30	16.00	750.00	12.50	3.75	0.20	0.027	0.001	0.43	10.91
10	24	4	14	22	43.5	13.50	763.50	12.73	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	22	58.5	15.00	778.50	12.98	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	23	11.5	13.00	791.50	13.19	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	23	25.5	14.00	805.50	13.43	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	23	37.5	12.00	817.50	13.63	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	23	50.5	13.00	830.50	13.84	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	24	2	11.50	842.00	14.03	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	24	14.5	12.50	854.50	14.24	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	24	24.5	10.00	864.50	14.41	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	24	36.5	12.00	876.50	14.61	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	24	46.5	10.00	886.50	14.78	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	24	58	11.50	898.00	14.97	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	25	8	10.00	908.00	15.13	6.00	0.32	0.043	0.001	0.69	17.45
10	24	4	14	25	19	11.00	919.00	15.32	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	25	28.5	9.50	928.50	15.48	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	25	39.5	11.00	939.50	15.66	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	25	49	9.50	949.00	15.82	6.32	0.34	0.045	0.001	0.72	18.37
10	24	4	14	26	0.5	11.50	960.50	16.01	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	26	10.5	10.00	970.50	16.18	6.00	0.32	0.043	0.001	0.69	17.45

TEST 10

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	24	4	14	26	22	11.50	982.00	16.37	5.22	0.28	0.038	0.001	0.60	15.18
10	24	4	14	26	32.5	10.50	992.50	16.54	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	26	44.5	12.00	1004.50	16.74	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	26	55	10.50	1015.00	16.92	5.71	0.31	0.041	0.001	0.65	16.62
10	24	4	14	27	8.5	13.50	1028.50	17.14	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	27	20.5	12.00	1040.50	17.34	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	27	34.5	14.00	1054.50	17.58	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	27	47.5	13.00	1067.50	17.79	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	28	2.5	15.00	1082.50	18.04	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	28	15	12.50	1095.00	18.25	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	28	30.5	15.50	1110.50	18.51	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	28	44.5	14.00	1124.50	18.74	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	29	0	15.50	1140.00	19.00	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	29	14.5	14.50	1154.50	19.24	4.14	0.22	0.030	0.001	0.47	12.04
10	24	4	14	29	30	15.50	1170.00	19.50	3.87	0.21	0.028	0.001	0.44	11.26
10	24	4	14	29	42.5	12.50	1182.50	19.71	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	29	56	13.50	1196.00	19.93	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	30	7	11.00	1207.00	20.12	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	30	19.5	12.50	1219.50	20.33	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	30	30.5	11.00	1230.50	20.51	5.45	0.29	0.039	0.001	0.62	15.87
10	24	4	14	30	45.5	15.00	1245.50	20.76	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	30	58.5	13.00	1258.50	20.98	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	31	13.5	15.00	1273.50	21.23	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	31	27	13.50	1287.00	21.45	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	31	40.5	13.50	1300.50	21.68	4.44	0.24	0.032	0.001	0.51	12.93
10	24	4	14	31	53	12.50	1313.00	21.88	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	32	6	13.00	1326.00	22.10	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	32	18.5	12.50	1338.50	22.31	4.80	0.26	0.035	0.001	0.55	13.96
10	24	4	14	32	31.5	13.00	1351.50	22.53	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	32	43.5	12.00	1363.50	22.73	5.00	0.27	0.036	0.001	0.57	14.55
10	24	4	14	32	57.5	14.00	1377.50	22.96	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	33	10.5	13.00	1390.50	23.18	4.62	0.25	0.033	0.001	0.53	13.43
10	24	4	14	33	25.5	15.00	1405.50	23.43	4.00	0.22	0.029	0.001	0.46	11.64
10	24	4	14	33	39.5	14.00	1419.50	23.66	4.29	0.23	0.031	0.001	0.49	12.47
10	24	4	14	33	57	17.50	1437.00	23.95	3.43	0.18	0.025	0.001	0.39	9.97

TEST 10

LID 10

phi:	4	*dtheta*	15%
Ks:	1.40E-03	*Ko:*	15000

		EPS		END OF PLOT				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.00	0	0.00	14.5	14.8	-1.9%
60	1	0	0.00	0	0.00			
120	2	0.00000291	0.10	0	0.00			
180	3	0.00001045	0.38	0	0.00			
240	4	0.00001499	0.54	0	0.00			
300	5	0.00002891	1.04	0	0.00			
360	6	0.00004353	1.57	0	0.00			
420	7	0.00006813	2.45	0	0.00			
480	8	0.00009968	3.59	0	0.00			
540	9	0.00014013	5.04	0	0.00			
600	10	0.0001905	6.86	0	0.00			
660	11	0.00025187	9.07	0	0.00			
720	12	0.00032534	11.71	0	0.00			
780	13	0.00041199	14.83	0	0.00			
840	14	0.0005129	18.46	0	0.00			
900	15	0.00062837	22.62	0	0.00			
960	16	0.00074527	26.83	0	0.00			
1020	17	0.00082805	29.81	0	0.00			
1080	18	0.00086922	31.29	0	0.00			
1140	19	0.00088648	31.91	0.000284	10.22			
1200	20	0.00089337	32.16	0.000314	11.29			
1260	21	0.00089614	32.26	0.00033	11.88			
1320	22	0.00089728	32.30	0.000341	12.27			
1380	23	0.00089778	32.32	0.000349	12.55			
1440	24	0.000898	32.33	0.000355	12.79			
1500	25	0.00089811	32.33	0.000361	12.99			
1560	26	0.00089816	32.33	0.000366	13.16			
1620	27	0.00089819	32.33	0.00037	13.31			
1680	28	0.00089821	32.34	0.000374	13.45			
1740	29	0.00089823	32.34	0.000377	13.58			
1800	30	0.00089824	32.34	0.00038	13.69			
1860	31	0.00089825	32.34	0.000383	13.79			
1920	32	0.00089825	32.34	0.000386	13.89			
1980	33	0.00089826	32.34	0.000388	13.98			
2040	34	0.00089827	32.34	0.000391	14.06			
2100	35	0.00089827	32.34	0.000393	14.13			
2160	36	0.00089828	32.34	0.000395	14.20			
2220	37	0.00089828	32.34	0.000396	14.27			
2280	38	0.00089829	32.34	0.000398	14.33			
2340	39	0.00089829	32.34	0.0004	14.39			
2400	40	0.0008983	32.34	0.000401	14.44			
2460	41	0.0008983	32.34	0.000403	14.50			
2520	42	0.00089831	32.34	0.000404	14.54			
2580	43	0.00074961	26.99	0.000227	8.18			
2640	44	0.00063881	23.00	0.000104	3.73			
2700	45	0.00054988	19.80	4.62E-05	1.66			
2760	46	0.00047775	17.20	1.12E-05	0.40			
2820	47	0.00041869	15.07	9E-08	0.00			
2880	48	0.00036986	13.31	0	0.00			
2940	49	0.00032911	11.85	0	0.00			
3000	50	0.00029482	10.61	0	0.00			
3060	51	0.00026572	9.57	0	0.00			

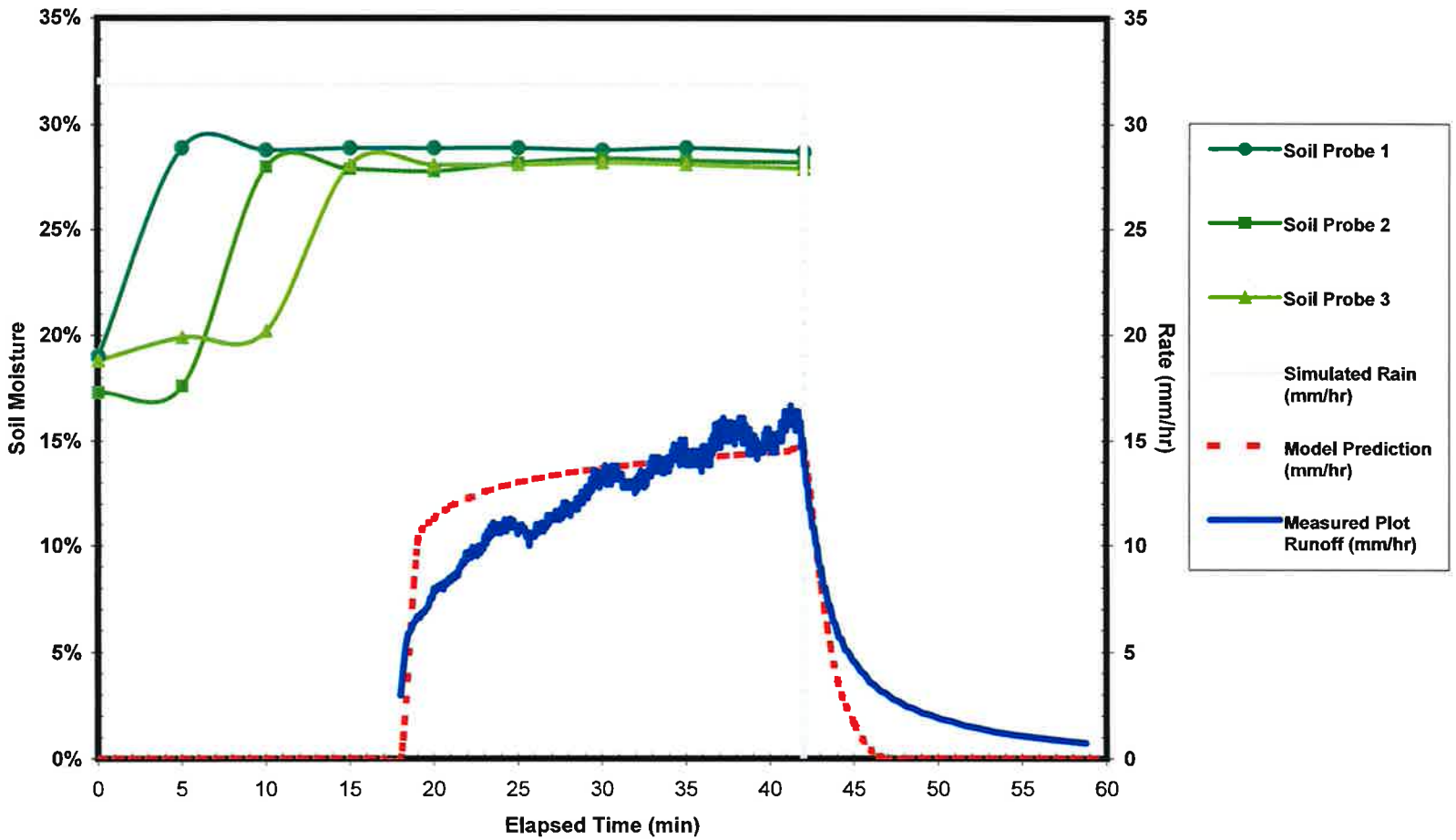
TEST 10

sec	min	EPS cm/sec	EPS mm/hr	END OF PLOT cm/sec	END OF PLOT mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
3120	52	0.00024083	8.67	0	0.00			
3180	53	0.00021939	7.90	0	0.00			
3240	54	0.00020079	7.23	0	0.00			
3300	55	0.00018456	6.64	0	0.00			
3360	56	0.00017031	6.13	0	0.00			
3420	57	0.00015773	5.68	0	0.00			
3480	58	0.00014657	5.28	0	0.00			
3540	59	0.0001366	4.92	0	0.00			
3600	60	0.00012767	4.60	0	0.00			

TEST 10

FIGURE A-14

Rain/Runoff Hydrograph - 10



TEST 10

MOBILE TEST #9 (TEST 11)

11/11/2004
Latah Crk. South
US 195 MP 171.4 RT

Plot Parameters

Slope:	**4:1**	**Start Time:**	13:50:00
Length (cm):	**390**	**End Time:**	15:00:00
Width (cm):	**100**	**Test Duration:**	***1:10:00***
Plot Area (m^2):	**3.90**	**Model Plot Area (m^2):**	**11.68**
Vegitation:	**sparse ryegrass (40-50%)**		
Initial Theta:	**1.8%**		
Final Theta:	**13.2%**		
dtheta:	***11.4%***		

Estimated Ke (from plot):

mm/hr	*cm/s*
#REF!	*#REF!*

Normalized Rates		**Volumetric Rates**	
Max Runoff Rate (mm/hr):	***0.0***	***(L/min):***	*0.00*
Inflow Rate (mm/hr):	***37.9***	***(L/min):***	*7.39*
Runoff Percentage:	***0.0%***		*0.0%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	26	4	13	50	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00

NO RUNOFF

TEST 11

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	37.9	1.3	4.92E-03	0.174	7.78	25.5	7.39E-03	0.261	113.64
70.00	37.9	1.3	4.92E-03	0.174	7.78	25.5	7.39E-03	0.261	113.64
70.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	0.59	15	2.36	1.49	0.49	1.34
2	0.45		1.80	37.9	12.4	33.9
3	0.30		1.20			
4	0.30		1.20			
5	0.30		1.20			
6	0.30		1.20			

TEST 11

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
13:49	**0**	0.7%	1.6%	3.1%
13:50	0.00	5.1%	2.3%	4.0%
13:55	5.00	9.8%	5.7%	5.6%
14:00	10.00	10.7%	9.1%	9.7%
14:05	15.00	10.7%	10.1%	11.2%
14:10	20.00	10.3%	9.9%	12.4%
14:15	25.00	10.6%	14.5%	12.4%
14:20	30.00	10.9%	15.0%	12.5%
14:25	35.00	10.8%	15.1%	12.5%
14:30	40.00	10.8%	15.2%	12.5%
14:35	45.00	11.5%	15.3%	12.6%
14:40	50.00	11.5%	15.3%	12.6%
14:55	65.00	11.7%	15.3%	12.5%

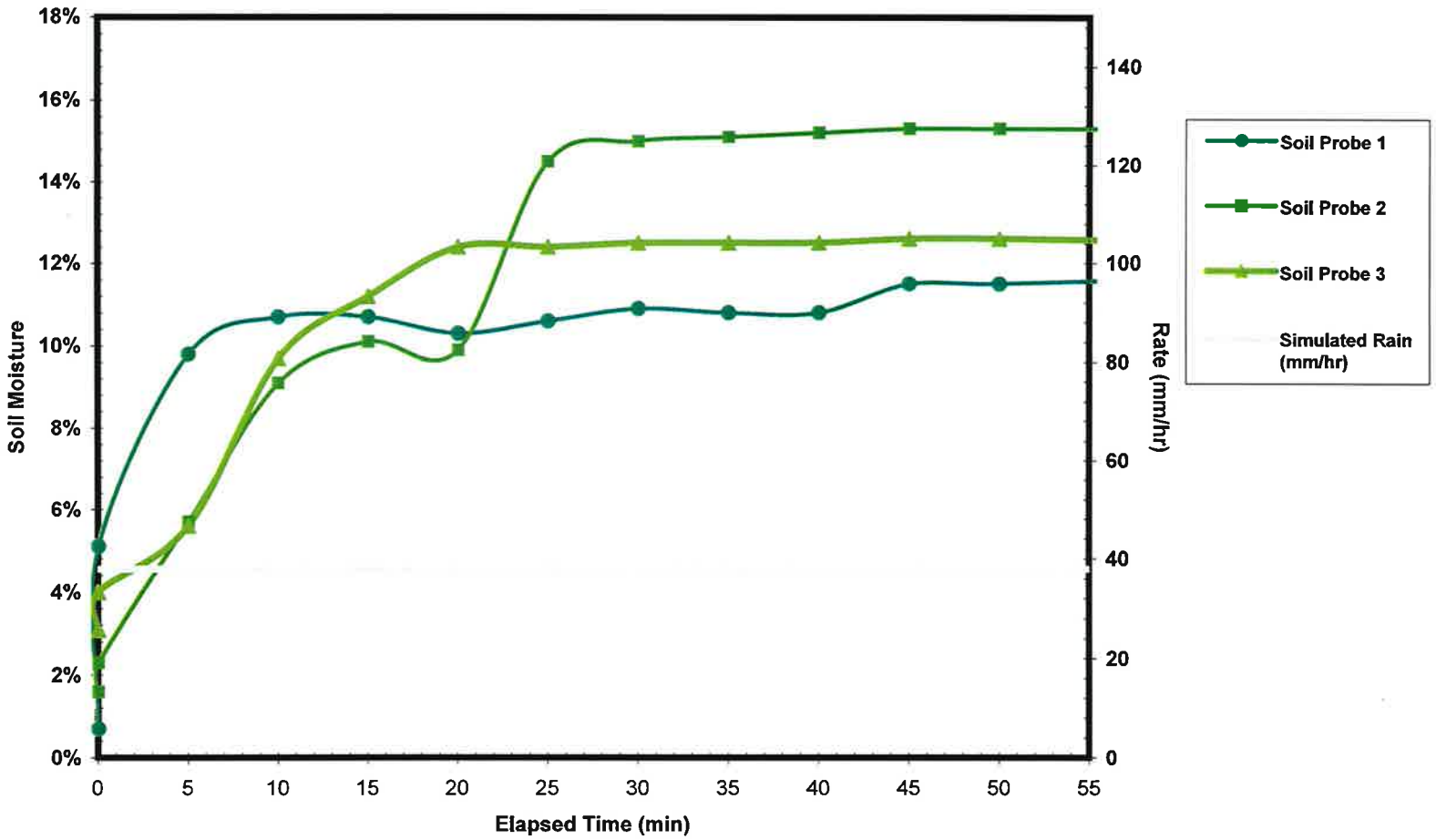
Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**1.8%**
Average Max Moisture:	**13.2%**
dtheta:	**11.4%**

TEST 11

FIGURE A-15

Rain/Runoff Hydrograph - 11



TEST 11

MOBILE TEST #10 (TEST 12)

10/27/2004
Deer Park South
US 395 MP 171.4 RT

Plot Parameters

Slope:	4:1	Start Time:	12:00:00
Length (cm):	400	End Time:	12:30:00
Width (cm):	102	Test Duration:	*0:30:00*
Plot Area (m^2):	4.08	Model Plot Area (m^2):	12.09
Vegitation:	spares ryegrass (25%)		
Initial Theta:	5.2%		
Final Theta:	13.7%		
dtheta:	8.4%		

			Volumetric Rates
Max Runoff Rate (mm/hr):	*0.2*	*(L/min):*	*0.03*
Rain-on Rate (mm/hr):	*70.9*	*(L/min):*	*14.28*
Runoff Percentage:	*0.2%*		*0.2%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	27	4	12	0	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	27	4	12	11	15.5	675.50	675.50	11.26	0.09	0.00	0.001	0.000	0.00	0.09
10	27	4	12	15	37.5	262.00	937.50	15.63	0.23	0.01	0.002	0.000	0.01	0.23
10	27	4	12	26	19	641.50	1579.00	26.32	0.09	0.01	0.001	0.000	0.00	0.09
10	27	4	12	32	0.5	341.50	1920.50	32.01	0.18	0.01	0.001	0.000	0.01	0.18

TEST 12

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	70.9	2.5	9.46E-03	0.334	7.86	25.8	1.43E-02	0.504	210.04
30.00	70.9	2.5	9.46E-03	0.334	7.86	25.8	1.43E-02	0.504	210.04
30.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	1.22	30	2.44	2.79	0.45	2.83
2	1.05		2.10	70.9	11.5	72.0
3	1.40		2.80			
4	1.47		2.94			
5	1.65		3.30			
6	1.58		3.16			

TEST 12

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
12:00	0	3.3%	6.0%	6.4%
12:05	5.00	8.5%	12.7%	11.9%
12:10	10.00	11.5%	14.9%	13.3%
12:15	15.00	11.9%	15.5%	13.6%
12:20	20.00	11.8%	14.9%	13.5%
12:25	25.00	11.7%	14.8%	13.6%
12:30	30.00	10.7%	13.6%	12.1%

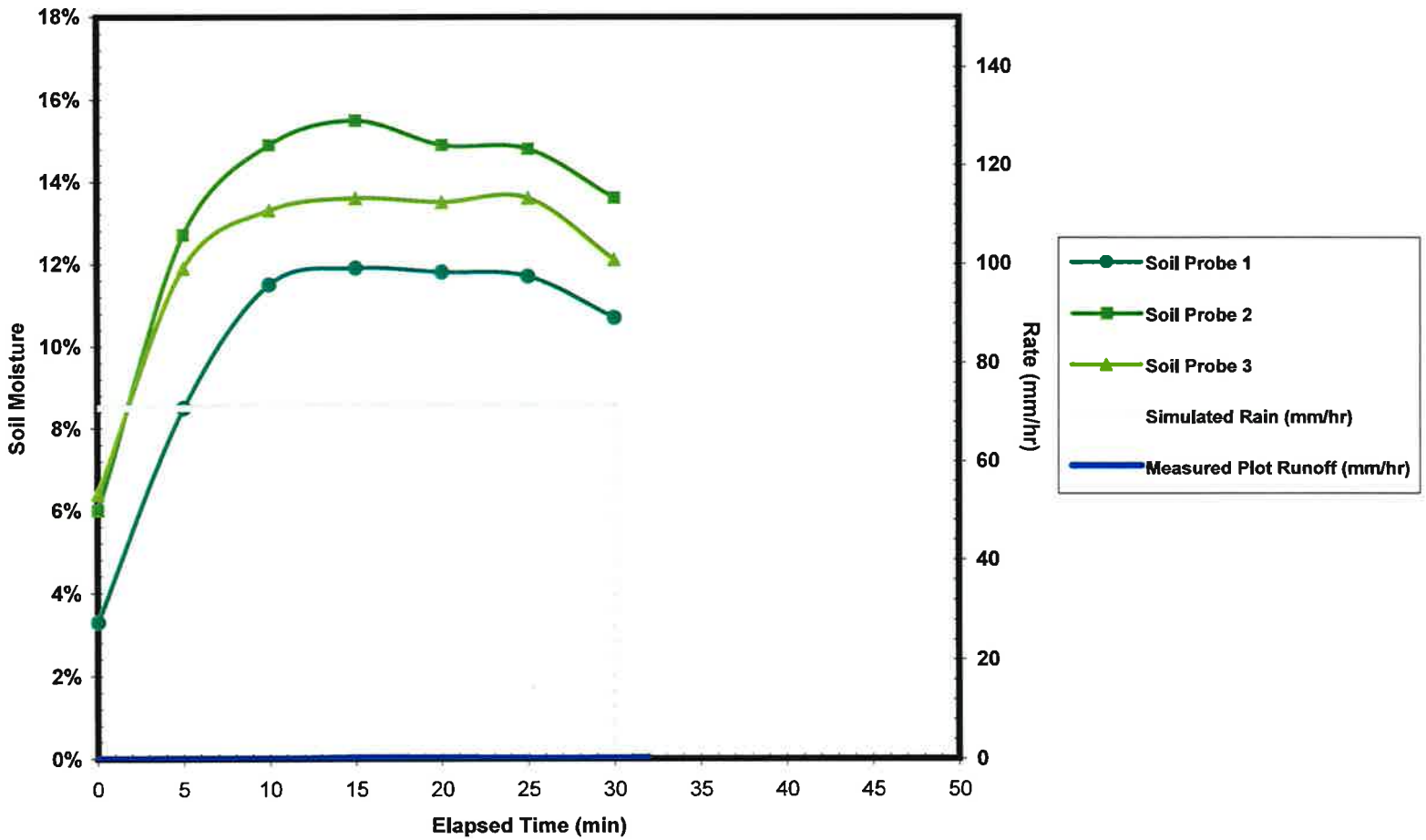
Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**5.2%**
Average Max Moisture:	**13.7%**
dtheta:	**8.4%**

TEST 12

FIGURE A-16

Rain/Runoff Hydrograph - 12



TEST 12

MOBILE TEST #10 (TEST 13)

10/27/2004
Deer Park South
US 395 MP 171.4 RT

Plot Parameters

Slope:	**4:1**	**Start Time:**	13:00:00
Length (cm):	**200**	**End Time:**	13:30:00
Width (cm):	**102**	**Test Duration:**	***0:30:00***
Plot Area (m^2):	**2.04**	**Model Plot Area (m^2):**	**10.56**
Vegitation:	**spares ryegrass (25%)**		
Initial Theta:	**7.7%**		
Final Theta:	**18.2%**		
dtheta:	***10.5%***		

Estimated Ke (from plot):

mm/hr	***cm/s***

Normalized Rates			**Volumetric Rates**
Max Runoff Rate (mm/hr):	***1.6***	***(L/min):***	*0.43*
Rain-on Rate (mm/hr):	***66.7***	***(L/min):***	*11.73*
Runoff Percentage:	***2.3%***		*3.6%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	27	4	13	0	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	27	4	13	5	34	334.00	334.00	5.57	0.18	0.01	0.001	0.000	0.01	0.21
10	27	4	13	6	3.5	29.50	363.50	6.06	2.03	0.11	0.015	0.000	0.09	2.35
10	27	4	13	6	26.5	23.00	386.50	6.44	2.61	0.14	0.019	0.001	0.12	3.02
10	27	4	13	6	49.5	23.00	409.50	6.83	2.61	0.14	0.019	0.001	0.12	3.02
10	27	4	13	7	15	25.50	435.00	7.25	2.35	0.13	0.017	0.000	0.11	2.72
10	27	4	13	7	36	21.00	456.00	7.60	2.86	0.15	0.021	0.001	0.13	3.31
10	27	4	13	7	57.5	21.50	477.50	7.96	2.79	0.15	0.020	0.001	0.13	3.23
10	27	4	13	8	26	28.50	506.00	8.43	2.11	0.11	0.015	0.000	0.10	2.44
10	27	4	13	9	9	43.00	549.00	9.15	1.40	0.08	0.010	0.000	0.06	1.62
10	27	4	13	9	53.5	44.50	593.50	9.89	1.35	0.07	0.010	0.000	0.06	1.56
10	27	4	13	11	6	72.50	666.00	11.10	0.83	0.04	0.006	0.000	0.04	0.96
10	27	4	13	12	42	96.00	762.00	12.70	0.63	0.03	0.004	0.000	0.03	0.72
10	27	4	13	15	18	156.00	918.00	15.30	0.38	0.02	0.003	0.000	0.02	0.45
10	27	4	13	16	39	81.00	999.00	16.65	0.74	0.04	0.005	0.000	0.03	0.86
10	27	4	13	17	39	60.00	1059.00	17.65	1.00	0.05	0.007	0.000	0.05	1.16
10	27	4	13	19	26.5	107.50	1166.50	19.44	0.56	0.03	0.004	0.000	0.03	0.65
10	27	4	13	21	48	141.50	1308.00	21.80	0.42	0.02	0.003	0.000	0.02	0.49
10	27	4	13	23	17.5	89.50	1397.50	23.29	0.67	0.04	0.005	0.000	0.03	0.78
10	27	4	13	24	17.5	60.00	1457.50	24.29	1.00	0.05	0.007	0.000	0.05	1.16
10	27	4	13	25	34	76.50	1534.00	25.57	0.78	0.04	0.006	0.000	0.04	0.91
10	27	4	13	27	53.5	139.50	1673.50	27.89	0.43	0.02	0.003	0.000	0.02	0.50
10	27	4	13	29	28.5	95.00	1768.50	29.48	0.63	0.03	0.005	0.000	0.03	0.73
10	27	4	13	31	34.5	126.00	1894.50	31.58	0.48	0.03	0.003	0.000	0.02	0.55
10	27	4	13	49	27	1072.50	2967.00	49.45	0.06	0.00	0.000	0.000	0.00	0.06
10	27	4	14	33	55.5	2668.50	5635.50	93.93	0.02	0.00	0.000	0.000	0.00	0.03

TEST 13

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	66.7	2.5	9.46E-03	0.334	8.35	27.4	1.17E-02	0.414	345.02
30.00	66.7	2.5	9.46E-03	0.334	8.35	27.4	1.17E-02	0.414	345.02
30.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.
1	1.30	30	2.60	2.63	0.05
2	1.35		2.70	66.7	1.27
3	1.30		2.60		
4	1.30		2.60		

TEST 13

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
13:00	0	7.0%	8.3%	
13:05	5.00	19.2%	17.1%	
13:10	10.00	18.8%	16.8%	
13:15	15.00	18.6%	16.4%	
13:20	20.00	18.7%	15.8%	
13:25	25.00	18.6%	15.7%	
13:30	30.00	18.6%	15.7%	
13:45	45.00	7.7%	6.5%	

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**7.7%**
Average Max Moisture:	**18.2%**
dtheta:	**10.5%**

TEST 13

LID 13

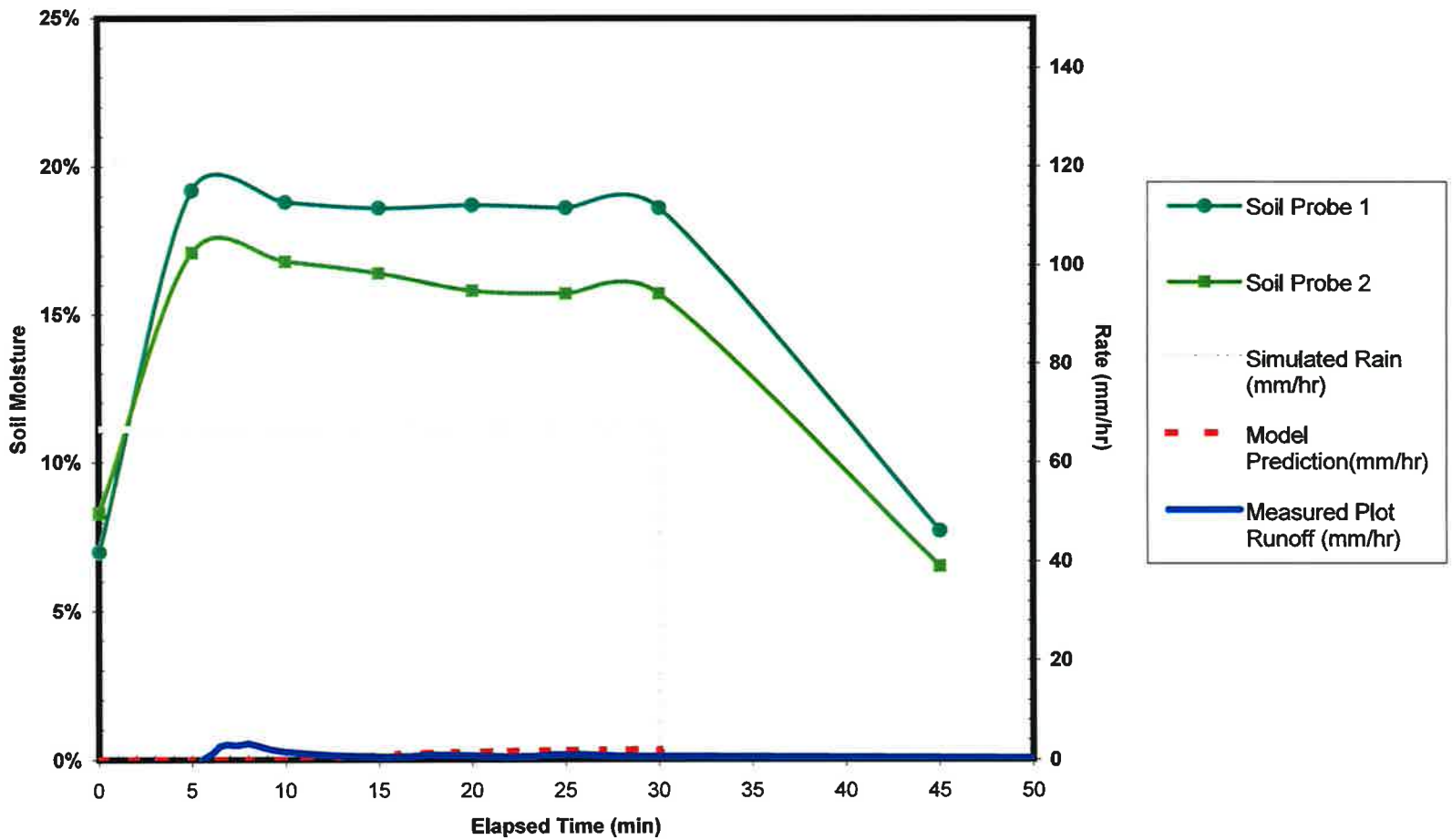
phi:	2.0	*dtheta*	10%
Ks:	9.25E-03	*Ko:*	15000

		EPS		END OF PLOT				
sec	**min**	**cm/sec**	**mm/hr**	**cm/sec**	**mm/hr**	**Max Runoff (mm/hr)**	**Actual Runoff (mm/hr)**	**% Difference**
0	0	0	0.0	0	0.0	2.0	1.6	26.7%
60	1	1.10E-07	0.0	0.00E+00	0.0			
120	2	2.04E-05	0.7	0.00E+00	0.0			
180	3	5.51E-05	2.0	0.00E+00	0.0			
240	4	1.23E-04	4.4	0.00E+00	0.0			
300	5	2.32E-04	8.3	0.00E+00	0.0			
360	6	3.92E-04	14.1	0.00E+00	0.0			
420	7	6.14E-04	22.1	0.00E+00	0.0			
480	8	9.09E-04	32.7	0.00E+00	0.0			
540	9	1.28E-03	46.2	0.00E+00	0.0			
600	10	1.64E-03	58.9	0.00E+00	0.0			
660	11	1.80E-03	64.7	0.00E+00	0.0			
720	12	1.84E-03	66.4	0.00E+00	0.0			
780	13	1.86E-03	66.9	0.00E+00	0.0			
840	14	1.86E-03	67.0	1.44E-05	0.5			
900	15	1.86E-03	67.1	2.45E-05	0.9			
960	16	1.86E-03	67.1	3.07E-05	1.1			
1020	17	1.86E-03	67.1	3.51E-05	1.3			
1080	18	1.86E-03	67.1	3.85E-05	1.4			
1140	19	1.86E-03	67.1	4.11E-05	1.5			
1200	20	1.86E-03	67.1	4.33E-05	1.6			
1260	21	1.86E-03	67.1	4.52E-05	1.6			
1320	22	1.86E-03	67.1	4.68E-05	1.7			
1380	23	1.86E-03	67.1	4.83E-05	1.7			
1440	24	1.86E-03	67.1	4.95E-05	1.8			
1500	25	1.86E-03	67.1	5.06E-05	1.8			
1560	26	1.86E-03	67.1	5.16E-05	1.9			
1620	27	1.86E-03	67.1	5.25E-05	1.9			
1680	28	1.86E-03	67.1	5.33E-05	1.9			
1740	29	1.86E-03	67.1	5.40E-05	1.9			
1800	30	1.86E-03	67.1	5.47E-05	2.0			
1860	31	1.40E-03	50.2	0.00E+00	0.0			
1920	32	1.09E-03	39.2	0.00E+00	0.0			
1980	33	8.71E-04	31.4	0.00E+00	0.0			
2040	34	7.13E-04	25.7	0.00E+00	0.0			
2100	35	5.94E-04	21.4	0.00E+00	0.0			

TEST 13

FIGURE A-17

Rain/Runoff Hydrograph - 13



TEST 13

MOBILE TEST #11 (TEST 14)

10/29/2004
Latah Crk. South
US 195 MP 93.4 LT

Plot Parameters

Slope:	3:1
Length (cm):	400
Width (cm):	102
Plot Area (m^2):	4.08
Vegitation:	moderate ryegrass (60%)
Initial Theta:	4.1%
Final Theta:	23.1%
dtheta:	*18.9%*

Start Time:	13:45:00
End Time:	14:45:00
Test Duration:	*1:00:00*
Model Plot Area (m^2):	13.06

Estimated Ke (from plot):

mm/hr	*cm/s*
76.6	*2.13E-03*

	Normalized Rates		**Volumetric Rates**
Max Runoff Rate (mm/hr):	*0.2*	*(L/min):*	*0.03*
Rain-on Rate (mm/hr):	*32.0*	*(L/min):*	*7.16*
Runoff Percentage:	*0.5%*		*0.5%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
10	29	4	13	45	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	29	4	13	53	35.5	515.50	515.50	8.59	0.12	0.01	0.001	0.000	0.00	0.11
10	29	4	14	5	44.5	729.00	1244.50	20.74	0.08	0.00	0.001	0.000	0.00	0.08
10	29	4	14	9	15.5	211.00	1455.50	24.26	0.28	0.02	0.002	0.000	0.01	0.27
10	29	4	14	13	14.5	239.00	1694.50	28.24	0.25	0.01	0.002	0.000	0.01	0.23
10	29	4	14	21	22.5	488.00	2182.50	36.38	0.12	0.01	0.001	0.000	0.00	0.12
10	29	4	14	27	36	373.50	2556.00	42.60	0.16	0.01	0.001	0.000	0.01	0.15
10	29	4	14	40	44	788.00	3344.00	55.73	0.08	0.00	0.001	0.000	0.00	0.07
10	29	4	14	52	17.5	693.50	4037.50	67.29	0.09	0.00	0.001	0.000	0.00	0.08

TEST 14

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	32.9	1.3	4.92E-03	0.174	8.80	28.9	7.16E-03	0.253	105.26
60.00	32.9	1.3	4.92E-03	0.174	8.80	28.9	7.16E-03	0.253	105.26
60.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)
1	1.10	60	1.10	1.26	0.16	1.30
2	1.05		1.05	32.0	4.0	32.9
3	1.40		1.40			
4	1.25		1.25			
5	1.45		1.45			
6	1.30		1.30			

TEST 14

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
13:45	0	3.7%	5.7%	3.0%
13:50	5.00	3.8%	7.9%	3.9%
13:55	10.00	5.2%	9.3%	5.6%
14:05	20.00	10.4%	13.9%	10.4%
14:10	25.00	13.1%	17.3%	17.4%
14:15	30.00	15.4%	18.9%	15.1%
14:20	35.00	15.8%	20.3%	19.1%
14:25	40.00	19.0%	21.9%	21.9%
14:30	45.00	19.6%	24.0%	20.4%
14:35	50.00	17.5%	25.6%	21.0%
14:40	55.00	18.5%	25.9%	22.3%
14:45	60.00	19.0%	26.6%	23.0%

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**4.1%**
Average Max Moisture:	**23.1%**
dtheta:	**18.9%**

TEST 14

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.	Weighted Avg. (in/hr) & (mm/hr)	Time	Intensity
1	2.00	38	3.16	3.09	0.33	3.19	0	78.5
2	2.20		3.47	78.5	8.5	81.1	38.0	78.5
3	2.05		3.24				38.0	0
4	2.10		3.32					
5	1.70		2.68					
6	1.70		2.68					

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
3.01	76.6	2.126E-03

Applied Rain (mm/hr):	81.1
Plot Area (m^2):	4.08
Steady State Runoff (mm/hr):	4.6

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	29	4	15	22	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
10	29	4	15	28	4.5	364.50	364.50	6.08	0.16	0.01	0.001	0.000	0.02	0.49
10	29	4	15	28	54	49.50	414.00	6.90	1.21	0.07	0.009	0.000	0.14	3.63
10	29	4	15	30	0.5	66.50	480.50	8.01	0.90	0.05	0.006	0.000	0.11	2.70
10	29	4	15	30	52.5	52.00	532.50	8.88	1.15	0.06	0.008	0.000	0.14	3.46
10	29	4	15	31	40	47.50	580.00	9.67	1.26	0.07	0.009	0.000	0.15	3.78
10	29	4	15	32	40.5	60.50	640.50	10.68	0.99	0.05	0.007	0.000	0.12	2.97
10	29	4	15	34	26.5	106.00	746.50	12.44	0.57	0.03	0.004	0.000	0.07	1.70
10	29	4	15	35	28.5	62.00	808.50	13.48	0.97	0.05	0.007	0.000	0.11	2.90
10	29	4	15	36	15	46.50	855.00	14.25	1.29	0.07	0.009	0.000	0.15	3.86
10	29	4	15	36	53	38.00	893.00	14.88	1.58	0.08	0.011	0.000	0.19	4.73
10	29	4	15	37	32.5	39.50	932.50	15.54	1.52	0.08	0.011	0.000	0.18	4.55
10	29	4	15	38	8.5	36.00	968.50	16.14	1.67	0.09	0.012	0.000	0.20	4.99
10	29	4	15	38	57.5	49.00	1017.50	16.96	1.22	0.07	0.009	0.000	0.14	3.67
10	29	4	15	39	43.5	46.00	1063.50	17.73	1.30	0.07	0.009	0.000	0.15	3.91
10	29	4	15	40	31	47.50	1111.00	18.52	1.26	0.07	0.009	0.000	0.15	3.78
10	29	4	15	41	8.5	37.50	1148.50	19.14	1.60	0.09	0.012	0.000	0.19	4.79
10	29	4	15	41	53	44.50	1193.00	19.88	1.35	0.07	0.010	0.000	0.16	4.04
10	29	4	15	42	33.5	40.50	1233.50	20.56	1.48	0.08	0.011	0.000	0.17	4.44
10	29	4	15	43	16	42.50	1276.00	21.27	1.41	0.08	0.010	0.000	0.17	4.23
10	29	4	15	43	51	35.00	1311.00	21.85	1.71	0.09	0.012	0.000	0.20	5.13
10	29	4	15	44	23	32.00	1343.00	22.38	1.88	0.10	0.013	0.000	0.22	5.62
10	29	4	15	44	52	29.00	1372.00	22.87	2.07	0.11	0.015	0.000	0.24	6.20
10	29	4	15	45	35	43.00	1415.00	23.58	1.40	0.08	0.010	0.000	0.16	4.18
10	29	4	15	46	18.5	43.50	1458.50	24.31	1.38	0.07	0.010	0.000	0.16	4.13

TEST 14

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
10	29	4	15	47	1.5	43.00	1501.50	25.03	1.40	0.08	0.010	0.000	0.16	4.18
10	29	4	15	47	40	38.50	1540.00	25.67	1.56	0.08	0.011	0.000	0.18	4.67
10	29	4	15	48	25	45.00	1585.00	26.42	1.33	0.07	0.010	0.000	0.16	3.99
10	29	4	15	49	4.5	39.50	1624.50	27.08	1.52	0.08	0.011	0.000	0.18	4.55
10	29	4	15	49	51.5	47.00	1671.50	27.86	1.28	0.07	0.009	0.000	0.15	3.82
10	29	4	15	50	42.5	51.00	1722.50	28.71	1.18	0.06	0.008	0.000	0.14	3.52
10	29	4	15	51	30.5	48.00	1770.50	29.51	1.25	0.07	0.009	0.000	0.15	3.74
10	29	4	15	52	4.5	34.00	1804.50	30.08	1.76	0.09	0.013	0.000	0.21	5.28
10	29	4	15	52	41	36.50	1841.00	30.68	1.64	0.09	0.012	0.000	0.19	4.92
10	29	4	15	53	14	33.00	1874.00	31.23	1.82	0.10	0.013	0.000	0.21	5.44
10	29	4	15	53	50	36.00	1910.00	31.83	1.67	0.09	0.012	0.000	0.20	4.99
10	29	4	15	54	24.5	34.50	1944.50	32.41	1.74	0.09	0.013	0.000	0.21	5.21
10	29	4	15	55	0.5	36.00	1980.50	33.01	1.67	0.09	0.012	0.000	0.20	4.99
10	29	4	15	55	28	27.50	2008.00	33.47	2.18	0.12	0.016	0.000	0.26	6.53
10	29	4	15	55	56	28.00	2036.00	33.93	2.14	0.12	0.015	0.000	0.25	6.42
10	29	4	15	56	19.5	23.50	2059.50	34.33	2.55	0.14	0.018	0.001	0.30	7.65
10	29	4	15	56	43.5	24.00	2083.50	34.73	2.50	0.13	0.018	0.001	0.29	7.49
10	29	4	15	57	5	21.50	2105.00	35.08	2.79	0.15	0.020	0.001	0.33	8.36
10	29	4	15	57	28.5	23.50	2128.50	35.48	2.55	0.14	0.018	0.001	0.30	7.65
10	29	4	15	57	51.5	23.00	2151.50	35.86	2.61	0.14	0.019	0.001	0.31	7.81
10	29	4	15	58	19	27.50	2179.00	36.32	2.18	0.12	0.016	0.000	0.26	6.53
10	29	4	15	58	43	24.00	2203.00	36.72	2.50	0.13	0.018	0.001	0.29	7.49
10	29	4	15	59	15	32.00	2235.00	37.25	1.88	0.10	0.013	0.000	0.22	5.62
10	29	4	15	59	52	37.00	2272.00	37.87	1.62	0.09	0.012	0.000	0.19	4.86
10	29	4	16	0	39	47.00	2319.00	38.65	1.28	0.07	0.009	0.000	0.15	3.82

TEST 14

LID 14Ke

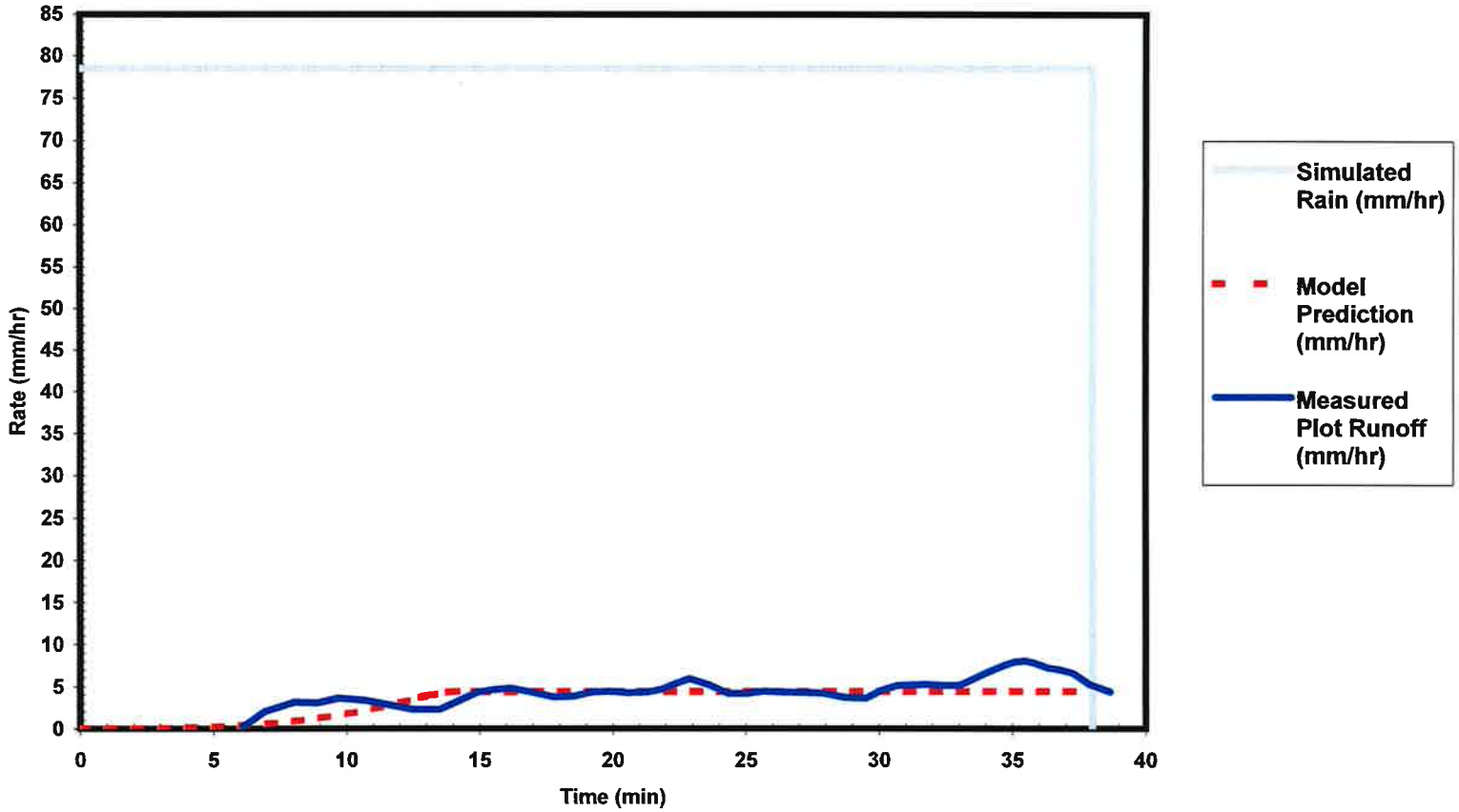
phi:	*0.5*	*dtheta*	*1%*	*slope (x:1):*	3
Ks:	*2.13E-03*	*Ko:*	*10000*	*LID length (cm):*	400

sec	min	END OF PLOT cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0.00E+00	0.00	4.41	4.6	-3.3%
60	1	2.00E-08	0.00			
120	2	2.80E-07	0.01			
180	3	1.09E-06	0.04			
240	4	2.75E-06	0.10			
300	5	**5.59E-06**	0.20			
360	6	9.92E-06	0.36			
420	7	1.61E-05	0.58			
480	8	2.44E-05	0.88			
540	9	3.52E-05	1.27			
600	10	4.88E-05	1.76			
660	11	6.55E-05	2.36			
720	12	8.56E-05	3.08			
780	13	1.10E-04	3.94			
840	14	1.22E-04	4.39			
900	15	1.22E-04	4.39			
960	16	1.22E-04	4.39			
1020	17	1.22E-04	4.39			
1080	18	1.22E-04	4.40			
1140	19	1.22E-04	4.40			
1200	20	1.22E-04	4.40			
1260	21	1.22E-04	4.40			
1320	22	1.22E-04	4.40			
1380	23	1.22E-04	4.40			
1440	24	1.22E-04	4.40			
1500	25	1.22E-04	4.40			
1560	26	1.22E-04	4.40			
1620	27	1.22E-04	4.40			
1680	28	1.22E-04	4.41			
1740	29	1.22E-04	4.41			
1800	30	1.22E-04	4.41			
1860	31	1.22E-04	4.41			
1920	32	1.22E-04	4.41			
1980	33	1.22E-04	4.41			
2040	34	1.22E-04	4.41			
2100	35	1.22E-04	4.41			
2160	36	1.22E-04	4.41			
2220	37	1.22E-04	4.41			
2280	38	1.22E-04	4.41			

TEST 14

FIGURE A-18

Plot Conductivity Test - 14



TEST 14

LID 14

phi:	4	*dtheta*	15%
Ks:	3.50E-03	*Ko:*	10000

		EPS		END OF LID				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.0	0	0.0	0.5	0.2	213.0%
60	1	0.00000063	0.0	0	0.0			
120	2	0.00000839	0.3	0	0.0			
180	3	0.0000095	0.3	0	0.0			
240	4	0.000031	1.1	0	0.0			
300	5	0.00005504	2.0	0	0.0			
360	6	0.00009081	3.3	0	0.0			
420	7	0.00014148	5.1	0	0.0			
480	8	0.00020883	7.5	0	0.0			
540	9	0.00029511	10.6	0	0.0			
600	10	0.00040263	14.5	0	0.0			
660	11	0.00053374	19.2	0	0.0			
720	12	0.00068925	24.8	0	0.0			
780	13	0.00083093	29.9	0	0.0			
840	14	0.00089574	32.2	0	0.0			
900	15	0.00091457	32.9	0	0.0			
960	16	0.00091952	33.1	0	0.0			
1020	17	0.00092088	33.2	0	0.0			
1080	18	0.00092127	33.2	0	0.0			
1140	19	0.00092136	33.2	0	0.0			
1200	20	0.00092136	33.2	0	0.0			
1260	21	0.00092136	33.2	0	0.0			
1320	22	0.00092137	33.2	0	0.0			
1380	23	0.00092137	33.2	0	0.0			
1440	24	0.00092139	33.2	0	0.0			
1500	25	0.0009214	33.2	0	0.0			
1560	26	0.00092142	33.2	0	0.0			
1620	27	0.00092143	33.2	0	0.0			
1680	28	0.00092145	33.2	0	0.0			
1740	29	0.00092147	33.2	0	0.0			
1800	30	0.00092148	33.2	0	0.0			
1860	31	0.00092149	33.2	0.00000001	0.0			
1920	32	0.0009215	33.2	0.00000128	0.0			
1980	33	0.00092151	33.2	0.00000234	0.1			
2040	34	0.00092152	33.2	0.00000327	0.1			
2100	35	0.00092153	33.2	0.00000411	0.1			
2160	36	0.00092153	33.2	0.00000488	0.2			
2220	37	0.00092154	33.2	0.00000558	0.2			
2280	38	0.00092154	33.2	0.00000623	0.2			
2340	39	0.00092155	33.2	0.00000684	0.2			
2400	40	0.00092155	33.2	0.00000739	0.3			
2460	41	0.00092155	33.2	0.00000792	0.3			
2520	42	0.00092156	33.2	0.0000084	0.3			
2580	43	0.00092156	33.2	0.00000886	0.3			
2640	44	0.00092156	33.2	0.00000929	0.3			
2700	45	0.00092156	33.2	0.0000097	0.3			
2760	46	0.00092157	33.2	0.00001008	0.4			
2820	47	0.00092157	33.2	0.00001044	0.4			
2880	48	0.00092157	33.2	0.00001078	0.4			
2940	49	0.00092157	33.2	0.0000111	0.4			
3000	50	0.00092158	33.2	0.00001141	0.4			
3060	51	0.00092158	33.2	0.0000117	0.4			
3120	52	0.00092158	33.2	0.00001198	0.4			
3180	53	0.00092158	33.2	0.00001224	0.4			

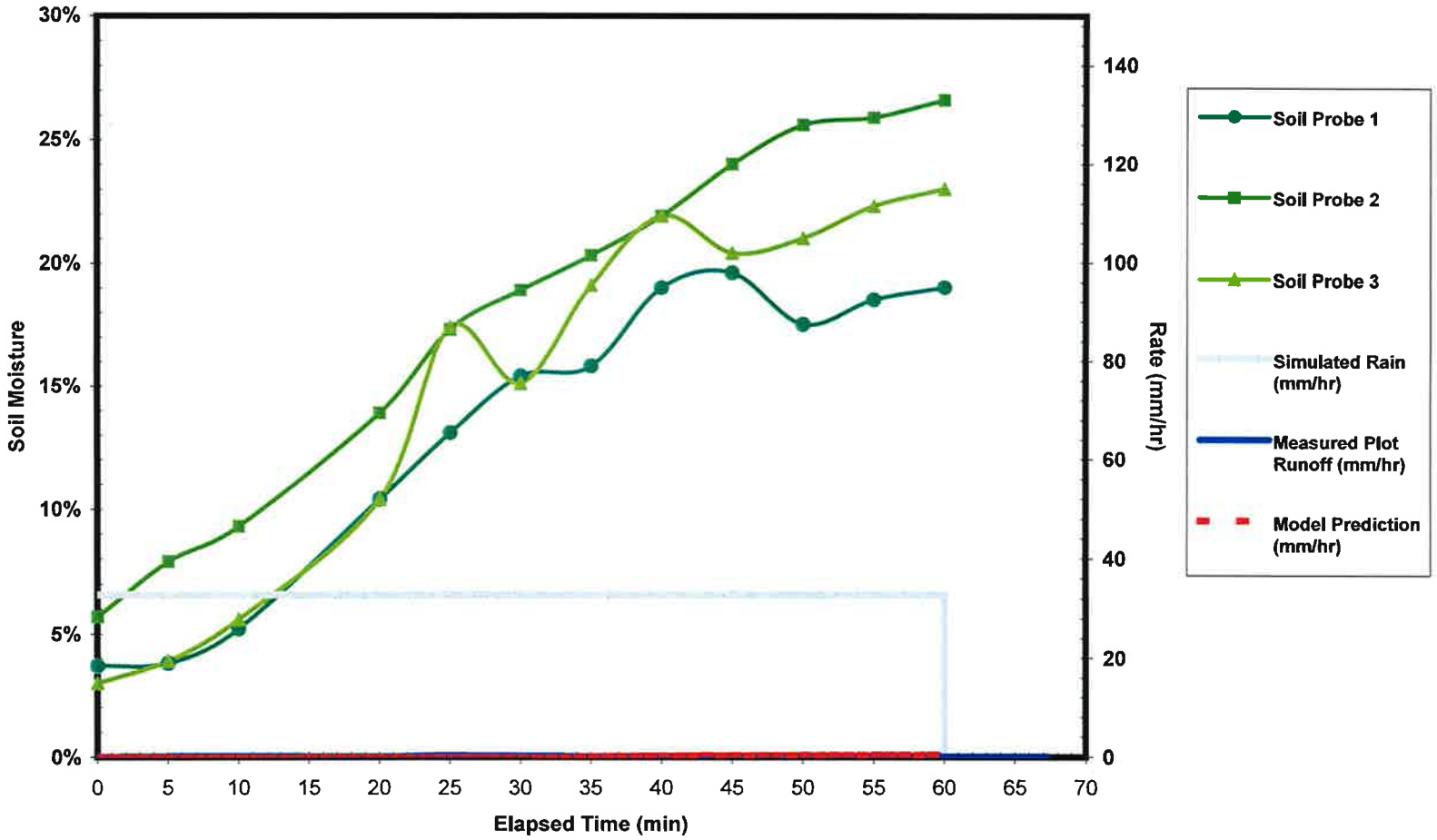
TEST 14

sec	min	EPS cm/sec	EPS mm/hr	END OF LID cm/sec	END OF LID mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
3240	54	0.00092158	33.2	0.00001249	0.4			
3300	55	0.00092158	33.2	0.00001274	0.5			
3360	56	0.00092159	33.2	0.00001297	0.5			
3420	57	0.00092159	33.2	0.00001319	0.5			
3480	58	0.00092159	33.2	0.0000134	0.5			
3540	59	0.00092159	33.2	0.0000136	0.5			
3600	60	0.00092159	33.2	0.0000138	0.5			

TEST 14

FIGURE A-19

Rain/Runoff Hydrograph - 14



TEST 14

MOBILE TEST #12 (TEST 15)

11/5/2004
Latah Crk. South
US 195 MP 93.4 LT

Plot Parameters

Slope:	3:1	**Start Time:**	12:15:00
Length (cm):	200	**End Time:**	13:07:00
Width (cm):	101	**Test Duration:**	*0:52:00*
Plot Area (m^2):	2.02	**Model Plot Area (m^2):**	16.28
Vegitation:	moderate ryegrass (60%)		
Initial Theta:	6.7%		
Final Theta:	28.4%		
dtheta:	21.7%		

Estimated Ke (from plot):

mm/hr	*cm/s*
66.7	1.85E-03

			Volumetric Rates
Max Runoff Rate (mm/hr):	*0.0*	*(L/min):*	*0.00*
Rain-on Rate (mm/hr):	*20.7*	*(L/min):*	*5.62*
Runoff Percentage:	*0.0%*		*0.0%*

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
11	5	4	14	39	22	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00

NO RUNOFF

TEST 15

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	20.7	1.3	4.92E-03	0.174	14.12	46.3	5.62E-03	0.198	166.87
52.00	20.7	1.3	4.92E-03	0.174	14.12	46.3	5.62E-03	0.198	166.87
52.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.
1	0.80	60	0.80	0.82	0.09
2	0.70		0.70	20.7	2.2
3	0.88		0.88		
4	0.88		0.88		
5					
6					

TEST 15

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
12:15	0.00	6.7%	6.7%	
12:20	5.00	9.0%	13.8%	
12:25	10.00	11.9%	18.0%	
12:30	15.00	14.8%	24.1%	
12:35	20.00	15.9%	26.5%	
12:40	25.00	21.4%	27.3%	
12:45	30.00	25.0%	27.3%	
12:50	35.00	28.6%	27.4%	
12:55	40.00	29.3%	27.3%	
13:00	45.00	29.4%	27.3%	
13:05	50.00	29.4%	27.2%	

Probe Locations:	from top (cm)
Probe 1:	100
Probe 2:	200
Probe 3:	300

Average Initial Moisture:	**6.7%**
Average Max Moisture:	**28.4%**
dtheta:	**21.7%**

TEST 15

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.
1	2.65	55	2.89	2.70	0.25
2	2.60		2.84	68.6	6.25
3	2.15		2.35		
4	2.50		2.73		
5					
6					

Time	Intensity
0	68.6
55.0	68.6
55.0	0

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
2.63	66.7	1.853E-03

Steady Runoff (mm/hr):	1.83
Applied Rain (mm/hr):	68.6
Plot Area (m^2):	2.02

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	5	4	13	30	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
11	5	4	13	43	59.5	839.50	839.50	13.99	0.07	0.00	0.001	0.000	0.02	0.43
11	5	4	13	47	39	219.50	1059.00	17.65	0.27	0.01	0.002	0.000	0.07	1.65
11	5	4	13	51	22	223.00	1282.00	21.37	0.27	0.01	0.002	0.000	0.06	1.63
11	5	4	13	54	34	192.00	1474.00	24.57	0.31	0.02	0.002	0.000	0.07	1.89
11	5	4	13	57	29.5	175.50	1649.50	27.49	0.34	0.02	0.002	0.000	0.08	2.07
11	5	4	14	0	14.5	165.00	1814.50	30.24	0.36	0.02	0.003	0.000	0.09	2.20
11	5	4	14	3	17	182.50	1997.00	33.28	0.33	0.02	0.002	0.000	0.08	1.99
11	5	4	14	5	53	156.00	2153.00	35.88	0.38	0.02	0.003	0.000	0.09	2.33
11	5	4	14	9	8.5	195.50	2348.50	39.14	0.31	0.02	0.002	0.000	0.07	1.86
11	5	4	14	12	48.5	220.00	2568.50	42.81	0.27	0.01	0.002	0.000	0.06	1.65
11	5	4	14	16	52.5	244.00	2812.50	46.88	0.25	0.01	0.002	0.000	0.06	1.49
11	5	4	14	20	23.5	211.00	3023.50	50.39	0.28	0.02	0.002	0.000	0.07	1.72
11	5	4	14	24	26.5	243.00	3266.50	54.44	0.25	0.01	0.002	0.000	0.06	1.49
11	5	4	14	38	13	826.50	4093.00	68.22	0.07	0.00	0.001	0.000	0.02	0.44

TEST 15

LID 15Ke

phi:	*0.5*	*dtheta*	*1%*	*slope (x:1):*	**3**
Ks:	*1.69E-03*	*Ko:*	*10000*	*LID length (cm):*	**200**

END OF PLOT

sec	min	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.00	1.99	1.83	9.0%
60	1	0.00000002	0.00			
120	2	0.00000002	0.00			
180	3	0.00000002	0.00			
240	4	**0.00000002**	0.00			
300	5	0	0.00			
360	6	0.00000008	0.00			
420	7	0.0000002	0.01			
480	8	0.00000039	0.01			
540	9	0.0000007	0.03			
600	10	0.00000113	0.04			
660	11	0.00000169	0.06			
720	12	0.00000244	0.09			
780	13	0.00000339	0.12			
840	14	0.00000457	0.16			
900	15	0.00000601	0.22			
960	16	0.00000773	0.28			
1020	17	0.00000978	0.35			
1080	18	0.00001217	0.44			
1140	19	0.00001495	0.54			
1200	20	0.00001812	0.65			
1260	21	0.00002174	0.78			
1320	22	0.00002582	0.93			
1380	23	0.0000304	1.09			
1440	24	0.0000355	1.28			
1500	25	0.00004115	1.48			
1560	26	0.00004722	1.70			
1620	27	0.00005169	1.86			
1680	28	0.00005314	1.91			
1740	29	0.0000534	1.92			
1800	30	0.00005355	1.93			
1860	31	0.0000537	1.93			
1920	32	0.00005384	1.94			
1980	33	0.00005397	1.94			
2040	34	0.00005409	1.95			
2100	35	0.0000542	1.95			
2160	36	0.0000543	1.95			
2220	37	0.0000544	1.96			
2280	38	0.00005449	1.96			
2340	39	0.00005457	1.96			
2400	40	0.00005465	1.97			
2460	41	0.00005472	1.97			
2520	42	0.00005479	1.97			

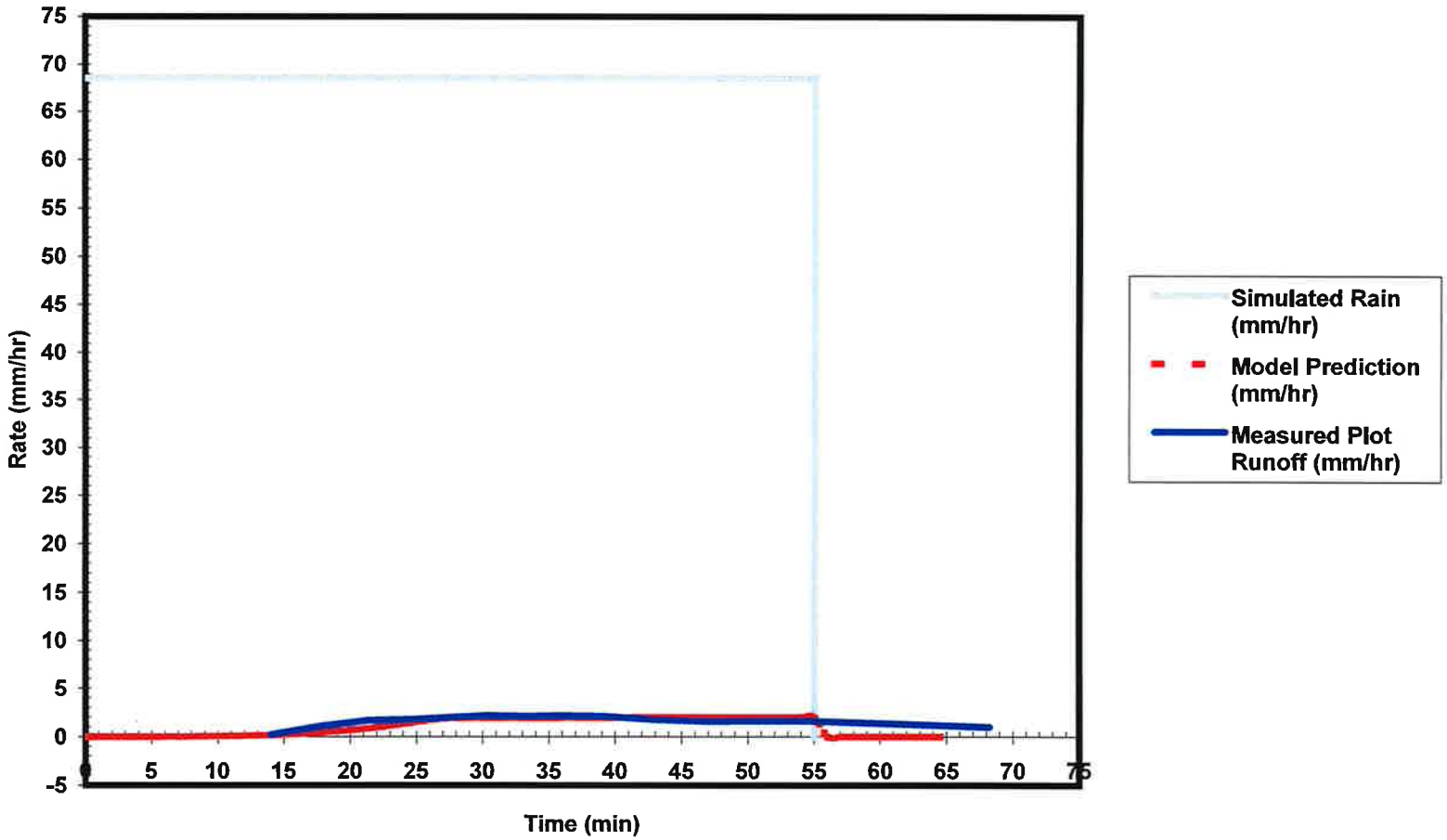
TEST 15

sec	min	END OF PLOT cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
2580	43	0.00005485	1.97			
2640	44	0.00005491	1.98			
2700	45	0.00005497	1.98			
2760	46	0.00005502	1.98			
2820	47	0.00005508	1.98			
2880	48	0.00005512	1.98			
2940	49	0.00005517	1.99			
3000	50	0.00005522	1.99			
3060	51	0.00005526	1.99			
3120	52	0.0000553	1.99			
3180	53	0.00005534	1.99			
3240	54	0.00005537	1.99			
3300	55	0.00005541	1.99			
3360	56	0.00000002	0.00			
3420	57	0.00000002	0.00			
3480	58	0.00000002	0.00			
3540	59	0.00000002	0.00			
3600	60	0.00000002	0.00			
3660	61	0.00000002	0.00			
3720	62	0.00000002	0.00			
3780	63	0.00000002	0.00			
3840	64	0.00000002	0.00			
3900	65	0.00000002	0.00			

TEST 15

FIGURE A-20

Plot Conductivity Test - 15



TEST 15

LID 15

phi:	*0.5*	*dtheta*	*1%*	*slope (x:1):*	3
Ks:	*1.69E-03*	*Ko:*	*10000*	*LID length (cm):*	200

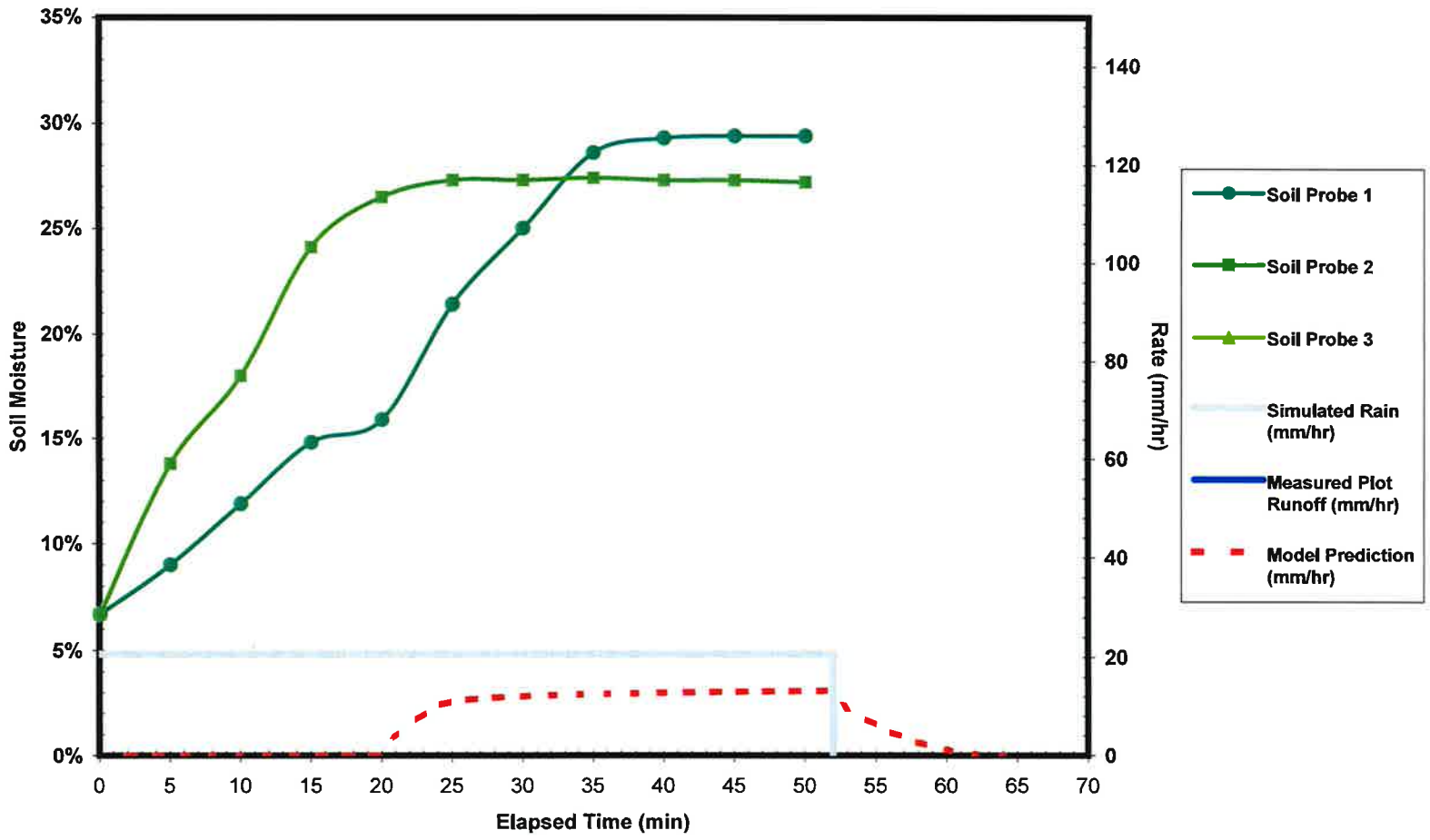
END OF PLOT

sec	min	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.00	20.83	1.83	1038.1%
60	1	0.00000002	0.00			
120	2	0	0.00	0.00	0.00	
180	3	0	0.00	0.00	0.00	
240	4	0	0.00	0.00	0.00	
300	5	0.00000782	0.28	0.00	0.00	
360	6	0.0000061	0.22	0.00	0.00	
420	7	0.0000134	0.48	0.00	0.00	
480	8	0.00002533	0.91	0.00	0.00	
540	9	0.00003443	1.24	0.00	0.00	
600	10	0.00004624	1.66	0.00	0.00	
660	11	0.00006169	2.22	0.00	0.00	
720	12	0.00008009	2.88	0.00	0.00	
780	13	0.00010176	3.66	0.00	0.00	
840	14	0.00012699	4.57	0.00	0.00	
900	15	0.00015607	5.62	0.00	0.00	
960	16	0.00018927	6.81	0.00	0.00	
1020	17	0.00022685	8.17	0.00	0.00	
1080	18	0.00026907	9.69	0.00	0.00	
1140	19	0.00031615	11.38	0.00	0.00	
1200	20	0.00036844	13.26	0.00	0.00	
1260	21	0.00042605	15.34	0.00	3.67	
1320	22	0.00048555	17.48	0.00	6.30	
1380	23	0.00053279	19.18	0.00	8.60	
1440	24	0.00055892	20.12	0.00	10.12	
1500	25	0.00057035	20.53	0.00	10.93	
1560	26	0.00057492	20.70	0.00	11.36	
1620	27	0.00057673	20.76	0.00	11.62	
1680	28	0.00057747	20.79	0.00	11.81	
1740	29	0.00057779	20.80	0.00	11.95	
1800	30	0.00057794	20.81	0.00	12.07	
1860	31	0.00057803	20.81	0.00	12.18	
1920	32	0.00057809	20.81	0.00	12.27	
1980	33	0.00057814	20.81	0.00	12.36	
2040	34	0.00057818	20.81	0.00	12.44	
2100	35	0.00057821	20.82	0.00	12.51	
2160	36	0.00057824	20.82	0.00	12.57	
2220	37	0.00057827	20.82	0.00	12.63	
2280	38	0.0005783	20.82	0.00	12.69	
2340	39	0.00057832	20.82	0.00	12.74	
2400	40	0.00057835	20.82	0.00	12.79	
2460	41	0.00057837	20.82	0.00	12.84	
2520	42	0.00057838	20.82	0.00	12.88	
2580	43	0.0005784	20.82	0.00	12.92	

2640	44	0.00057842	20.82	0.00	12.96
2700	45	0.00057843	20.82	0.00	12.99
2760	46	0.00057845	20.82	0.00	13.03
2820	47	0.00057846	20.82	0.00	13.06
2880	48	0.00057847	20.82	0.00	13.09
2940	49	0.00057848	20.83	0.00	13.12
3000	50	0.00057849	20.83	0.00	13.15
3060	51	0.0005785	20.83	0.00	13.17
3120	52	0.00057851	20.83	0.00	13.20
3180	53	0.00050713	18.26	0.00	9.53
3240	54	0.00044967	16.19	0.00	7.69
3300	55	0.00040088	14.43	0.00	6.13
3360	56	0.00035923	12.93	0.00	4.80
3420	57	0.00032351	11.65	0.00	3.66
3480	58	0.00029271	10.54	0.00	2.69
3540	59	0.00026602	9.58	0.00	1.87
3600	60	0.00024278	8.74	0.00	1.16
3660	61	0.00022244	8.01	0.00	0.58
3720	62	0.00020456	7.36	0.00	0.14
3780	63	0.00018876	6.80	0.00	0.00
3840	64	0.00017475	6.29	0.00	0.00
3900	65	0.00016227	5.84	0.00	0.00

FIGURE A-21

Rain/Runoff Hydrograph - 15



TEST 15

MOBILE TEST #13 (TEST 16)

11/11/2004
Latah Crk. South
US 195 MP 93.4 LT

Plot Parameters

Slope:	3:1
Length (cm):	200
Width (cm):	101
Plot Area (m^2):	2.02
Vegitation:	moderate ryegrass (75%)
Initial Theta:	11.9%
Final Theta:	26.7%
dtheta:	14.8%

Start Time:	12:10:00
End Time:	12:50:00
Test Duration:	*0:40:00*
Model Plot Area (m^2):	8.77

Estimated Ke (from plot):

mm/hr	*cm/s*
66.7	1.85E-03

	Normalized Rates		Volumetric Rates
Max Runoff Rate (mm/hr):	*39.8*	*(L/min):*	5.82
Inflow Rate (mm/hr):	*84.1*	*(L/min):*	12.30
Runoff Percentage:	*47.3%*		47.3%

Month	*day*	*Year*	*Hour*	*Minute*	*Second*	*Interval*	*Total, sec*	*Total, min*	*tips/min*	*gal/min*	*ft^3/min*	*m^3/min*	in/hr	mm/hr
11	11	4	12	10	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
11	11	4	12	20	10.5	610.50	610.50	10.18	0.10	0.01	0.001	0.000	0.01	0.14
11	11	4	12	21	18	67.50	678.00	11.30	0.89	0.05	0.006	0.000	0.05	1.24
11	11	4	12	22	22.5	64.50	742.50	12.38	0.93	0.05	0.007	0.000	0.05	1.30
11	11	4	12	23	10	47.50	790.00	13.17	1.26	0.07	0.009	0.000	0.07	1.76
11	11	4	12	23	34	24.00	814.00	13.57	2.50	0.13	0.018	0.001	0.14	3.48
11	11	4	12	23	50	16.00	830.00	13.83	3.75	0.20	0.027	0.001	0.21	5.22
11	11	4	12	24	5	15.00	845.00	14.08	4.00	0.22	0.029	0.001	0.22	5.57
11	11	4	12	24	16	11.00	856.00	14.27	5.45	0.29	0.039	0.001	0.30	7.60
11	11	4	12	24	28.5	12.50	868.50	14.48	4.80	0.26	0.035	0.001	0.26	6.69
11	11	4	12	24	38.5	10.00	878.50	14.64	6.00	0.32	0.043	0.001	0.33	8.36
11	11	4	12	24	50.5	12.00	890.50	14.84	5.00	0.27	0.036	0.001	0.27	6.97
11	11	4	12	24	59.5	9.00	899.50	14.99	6.67	0.36	0.048	0.001	0.37	9.29
11	11	4	12	25	8.5	9.00	908.50	15.14	6.67	0.36	0.048	0.001	0.37	9.29
11	11	4	12	25	15.5	7.00	915.50	15.26	8.57	0.46	0.062	0.002	0.47	11.94
11	11	4	12	25	24	8.50	924.00	15.40	7.06	0.38	0.051	0.001	0.39	9.83
11	11	4	12	25	30	6.00	930.00	15.50	10.00	0.54	0.072	0.002	0.55	13.93
11	11	4	12	25	37.5	7.50	937.50	15.63	8.00	0.43	0.058	0.002	0.44	11.14
11	11	4	12	25	44	6.50	944.00	15.73	9.23	0.50	0.066	0.002	0.51	12.86
11	11	4	12	25	51.5	7.50	951.50	15.86	8.00	0.43	0.058	0.002	0.44	11.14
11	11	4	12	25	58	6.50	958.00	15.97	9.23	0.50	0.066	0.002	0.51	12.86
11	11	4	12	26	5.5	7.50	965.50	16.09	8.00	0.43	0.058	0.002	0.44	11.14
11	11	4	12	26	11	5.50	971.00	16.18	10.91	0.59	0.078	0.002	0.60	15.20
11	11	4	12	26	18	7.00	978.00	16.30	8.57	0.46	0.062	0.002	0.47	11.94
11	11	4	12	26	23	5.00	983.00	16.38	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	26	29.5	6.50	989.50	16.49	9.23	0.50	0.066	0.002	0.51	12.86
11	11	4	12	26	34.5	5.00	994.50	16.58	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	26	40.5	6.00	1000.50	16.68	10.00	0.54	0.072	0.002	0.55	13.93
11	11	4	12	26	45.5	5.00	1005.50	16.76	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	26	51	5.50	1011.00	16.85	10.91	0.59	0.078	0.002	0.60	15.20
11	11	4	12	26	55.5	4.50	1015.50	16.93	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	27	1	5.50	1021.00	17.02	10.91	0.59	0.078	0.002	0.60	15.20
11	11	4	12	27	5.5	4.50	1025.50	17.09	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	27	10.5	5.00	1030.50	17.18	12.00	0.65	0.086	0.002	0.66	16.72

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	27	15	4.50	1035.00	17.25	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	27	20	5.00	1040.00	17.33	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	27	24	4.00	1044.00	17.40	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	27	29	5.00	1049.00	17.48	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	27	33	4.00	1053.00	17.55	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	27	37.5	4.50	1057.50	17.63	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	27	41.5	4.00	1061.50	17.69	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	27	46	4.50	1066.00	17.77	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	27	50	4.00	1070.00	17.83	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	27	54.5	4.50	1074.50	17.91	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	27	58	3.50	1078.00	17.97	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	28	2.5	4.50	1082.50	18.04	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	28	6.5	4.00	1086.50	18.11	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	28	10.5	4.00	1090.50	18.18	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	28	14.5	4.00	1094.50	18.24	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	28	19	4.50	1099.00	18.32	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	28	22.5	3.50	1102.50	18.38	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	28	27	4.50	1107.00	18.45	13.33	0.72	0.096	0.003	0.73	18.57
11	11	4	12	28	30.5	3.50	1110.50	18.51	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	28	34.5	4.00	1114.50	18.58	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	28	38	3.50	1118.00	18.63	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	28	42	4.00	1122.00	18.70	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	28	45.5	3.50	1125.50	18.76	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	28	49.5	4.00	1129.50	18.83	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	28	52.5	3.00	1132.50	18.88	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	28	56.5	4.00	1136.50	18.94	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	29	0	3.50	1140.00	19.00	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	29	4	4.00	1144.00	19.07	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	29	7.5	3.50	1147.50	19.13	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	29	11.5	4.00	1151.50	19.19	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	29	14.5	3.00	1154.50	19.24	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	29	18.5	4.00	1158.50	19.31	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	29	21.5	3.00	1161.50	19.36	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	29	25	3.50	1165.00	19.42	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	29	28	3.00	1168.00	19.47	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	29	32	4.00	1172.00	19.53	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	29	35	3.00	1175.00	19.58	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	29	38.5	3.50	1178.50	19.64	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	29	41.5	3.00	1181.50	19.69	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	29	45.5	4.00	1185.50	19.76	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	29	48.5	3.00	1188.50	19.81	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	29	52.5	4.00	1192.50	19.88	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	29	55.5	3.00	1195.50	19.93	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	29	59	3.50	1199.00	19.98	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	2	3.00	1202.00	20.03	20.00	1.08	0.144	0.004	1.10	27.86

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	30	5.5	3.50	1205.50	20.09	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	8.5	3.00	1208.50	20.14	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	30	12	3.50	1212.00	20.20	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	14.5	2.50	1214.50	20.24	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	30	18	3.50	1218.00	20.30	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	21	3.00	1221.00	20.35	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	30	24.5	3.50	1224.50	20.41	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	27	2.50	1227.00	20.45	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	30	30.5	3.50	1230.50	20.51	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	33.5	3.00	1233.50	20.56	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	30	37	3.50	1237.00	20.62	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	39.5	2.50	1239.50	20.66	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	30	43	3.50	1243.00	20.72	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	30	46	3.00	1246.00	20.77	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	30	49	3.00	1249.00	20.82	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	30	52	3.00	1252.00	20.87	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	30	55	3.00	1255.00	20.92	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	30	58	3.00	1258.00	20.97	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	1	3.00	1261.00	21.02	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	3.5	2.50	1263.50	21.06	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	6.5	3.00	1266.50	21.11	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	9.5	3.00	1269.50	21.16	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	12.5	3.00	1272.50	21.21	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	15	2.50	1275.00	21.25	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	18.5	3.50	1278.50	21.31	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	31	21	2.50	1281.00	21.35	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	24	3.00	1284.00	21.40	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	26.5	2.50	1286.50	21.44	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	29.5	3.00	1289.50	21.49	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	32	2.50	1292.00	21.53	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	35.5	3.50	1295.50	21.59	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	31	38	2.50	1298.00	21.63	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	41	3.00	1301.00	21.68	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	43.5	2.50	1303.50	21.73	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	47	3.50	1307.00	21.78	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	31	49.5	2.50	1309.50	21.83	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	52.5	3.00	1312.50	21.88	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	31	55	2.50	1315.00	21.92	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	31	58.5	3.50	1318.50	21.98	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	32	1	2.50	1321.00	22.02	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	32	4	3.00	1324.00	22.07	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	32	6.5	2.50	1326.50	22.11	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	32	10	3.50	1330.00	22.17	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	32	12.5	2.50	1332.50	22.21	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	32	15.5	3.00	1335.50	22.26	20.00	1.08	0.144	0.004	1.10	27.86

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	32	18	2.50	1338.00	22.30	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	32	21.5	3.50	1341.50	22.36	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	32	23.5	2.00	1343.50	22.39	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	32	27	3.50	1347.00	22.45	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	32	29.5	2.50	1349.50	22.49	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	32	32.5	3.00	1352.50	22.54	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	32	34.5	2.00	1354.50	22.58	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	32	38	3.50	1358.00	22.63	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	32	40	2.00	1360.00	22.67	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	32	43.5	3.50	1363.50	22.73	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	32	45.5	2.00	1365.50	22.76	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	32	48.5	3.00	1368.50	22.81	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	32	51	2.50	1371.00	22.85	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	32	54	3.00	1374.00	22.90	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	32	56.5	2.50	1376.50	22.94	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	32	59.5	3.00	1379.50	22.99	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	1.5	2.00	1381.50	23.03	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	33	4.5	3.00	1384.50	23.08	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	7	2.50	1387.00	23.12	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	33	9.5	2.50	1389.50	23.16	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	33	12	2.50	1392.00	23.20	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	33	15	3.00	1395.00	23.25	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	17	2.00	1397.00	23.28	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	33	20	3.00	1400.00	23.33	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	22	2.00	1402.00	23.37	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	33	25	3.00	1405.00	23.42	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	27	2.00	1407.00	23.45	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	33	30	3.00	1410.00	23.50	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	32.5	2.50	1412.50	23.54	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	33	35.5	3.00	1415.50	23.59	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	37.5	2.00	1417.50	23.63	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	33	40.5	3.00	1420.50	23.68	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	42.5	2.00	1422.50	23.71	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	33	45.5	3.00	1425.50	23.76	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	47.5	2.00	1427.50	23.79	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	33	50.5	3.00	1430.50	23.84	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	33	53	2.50	1433.00	23.88	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	33	55.5	2.50	1435.50	23.93	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	33	58	2.50	1438.00	23.97	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	34	0.5	2.50	1440.50	24.01	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	34	2.5	2.00	1442.50	24.04	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	5.5	3.00	1445.50	24.09	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	7.5	2.00	1447.50	24.13	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	10.5	3.00	1450.50	24.18	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	13	2.50	1453.00	24.22	24.00	1.29	0.173	0.005	1.32	33.43

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	34	15.5	2.50	1455.50	24.26	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	34	17.5	2.00	1457.50	24.29	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	20.5	3.00	1460.50	24.34	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	22.5	2.00	1462.50	24.38	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	25.5	3.00	1465.50	24.43	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	27.5	2.00	1467.50	24.46	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	30.5	3.00	1470.50	24.51	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	32.5	2.00	1472.50	24.54	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	35.5	3.00	1475.50	24.59	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	37.5	2.00	1477.50	24.63	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	40	2.50	1480.00	24.67	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	34	42.5	2.50	1482.50	24.71	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	34	45	2.50	1485.00	24.75	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	34	47	2.00	1487.00	24.78	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	50	3.00	1490.00	24.83	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	52	2.00	1492.00	24.87	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	55	3.00	1495.00	24.92	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	34	57	2.00	1497.00	24.95	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	34	59.5	2.50	1499.50	24.99	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	2	2.50	1502.00	25.03	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	4.5	2.50	1504.50	25.08	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	6.5	2.00	1506.50	25.11	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	9.5	3.00	1509.50	25.16	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	35	11.5	2.00	1511.50	25.19	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	14.5	3.00	1514.50	25.24	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	35	16.5	2.00	1516.50	25.28	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	19	2.50	1519.00	25.32	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	21.5	2.50	1521.50	25.36	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	24	2.50	1524.00	25.40	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	26	2.00	1526.00	25.43	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	29	3.00	1529.00	25.48	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	35	31	2.00	1531.00	25.52	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	34	3.00	1534.00	25.57	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	35	36	2.00	1536.00	25.60	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	39	3.00	1539.00	25.65	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	35	41	2.00	1541.00	25.68	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	44	3.00	1544.00	25.73	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	35	46	2.00	1546.00	25.77	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	49	3.00	1549.00	25.82	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	35	51	2.00	1551.00	25.85	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	35	53.5	2.50	1553.50	25.89	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	56	2.50	1556.00	25.93	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	35	58.5	2.50	1558.50	25.98	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	36	0.5	2.00	1560.50	26.01	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	3.5	3.00	1563.50	26.06	20.00	1.08	0.144	0.004	1.10	27.86

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	36	5.5	2.00	1565.50	26.09	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	8.5	3.00	1568.50	26.14	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	36	10.5	2.00	1570.50	26.18	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	13	2.50	1573.00	26.22	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	36	15	2.00	1575.00	26.25	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	18	3.00	1578.00	26.30	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	36	20	2.00	1580.00	26.33	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	23	3.00	1583.00	26.38	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	36	25	2.00	1585.00	26.42	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	27.5	2.50	1587.50	26.46	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	36	29.5	2.00	1589.50	26.49	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	32.5	3.00	1592.50	26.54	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	36	34.5	2.00	1594.50	26.58	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	37.5	3.00	1597.50	26.63	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	36	39.5	2.00	1599.50	26.66	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	42	2.50	1602.00	26.70	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	36	44	2.00	1604.00	26.73	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	47	3.00	1607.00	26.78	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	36	49	2.00	1609.00	26.82	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	51.5	2.50	1611.50	26.86	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	36	53.5	2.00	1613.50	26.89	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	36	56.5	3.00	1616.50	26.94	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	36	58.5	2.00	1618.50	26.98	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	1.5	3.00	1621.50	27.03	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	37	3.5	2.00	1623.50	27.06	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	6	2.50	1626.00	27.10	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	37	8	2.00	1628.00	27.13	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	11	3.00	1631.00	27.18	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	37	13	2.00	1633.00	27.22	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	16	3.00	1636.00	27.27	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	37	18	2.00	1638.00	27.30	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	20.5	2.50	1640.50	27.34	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	37	22.5	2.00	1642.50	27.38	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	25.5	3.00	1645.50	27.43	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	37	27.5	2.00	1647.50	27.46	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	30.5	3.00	1650.50	27.51	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	37	32.5	2.00	1652.50	27.54	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	35	2.50	1655.00	27.58	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	37	37	2.00	1657.00	27.62	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	40	3.00	1660.00	27.67	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	37	42	2.00	1662.00	27.70	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	44.5	2.50	1664.50	27.74	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	37	46.5	2.00	1666.50	27.78	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	49.5	3.00	1669.50	27.83	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	37	51.5	2.00	1671.50	27.86	30.00	1.61	0.216	0.006	1.65	41.79

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	37	54	2.50	1674.00	27.90	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	37	56	2.00	1676.00	27.93	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	37	59	3.00	1679.00	27.98	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	38	1	2.00	1681.00	28.02	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	3.5	2.50	1683.50	28.06	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	5.5	2.00	1685.50	28.09	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	8	2.50	1688.00	28.13	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	10	2.00	1690.00	28.17	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	13	3.00	1693.00	28.22	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	38	14.5	1.50	1694.50	28.24	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	38	17.5	3.00	1697.50	28.29	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	38	19.5	2.00	1699.50	28.33	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	22	2.50	1702.00	28.37	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	24	2.00	1704.00	28.40	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	27	3.00	1707.00	28.45	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	38	29	2.00	1709.00	28.48	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	31.5	2.50	1711.50	28.53	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	33.5	2.00	1713.50	28.56	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	36	2.50	1716.00	28.60	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	38	2.00	1718.00	28.63	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	41	3.00	1721.00	28.68	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	38	43	2.00	1723.00	28.72	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	45.5	2.50	1725.50	28.76	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	47.5	2.00	1727.50	28.79	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	50	2.50	1730.00	28.83	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	52	2.00	1732.00	28.87	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	54.5	2.50	1734.50	28.91	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	38	56.5	2.00	1736.50	28.94	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	38	59	2.50	1739.00	28.98	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	1	2.00	1741.00	29.02	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	3.5	2.50	1743.50	29.06	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	5.5	2.00	1745.50	29.09	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	8.5	3.00	1748.50	29.14	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	39	10.5	2.00	1750.50	29.18	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	13	2.50	1753.00	29.22	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	15	2.00	1755.00	29.25	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	17.5	2.50	1757.50	29.29	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	19.5	2.00	1759.50	29.33	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	22	2.50	1762.00	29.37	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	24	2.00	1764.00	29.40	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	27	3.00	1767.00	29.45	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	39	28.5	1.50	1768.50	29.48	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	39	31.5	3.00	1771.50	29.53	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	39	33.5	2.00	1773.50	29.56	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	36	2.50	1776.00	29.60	24.00	1.29	0.173	0.005	1.32	33.43

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	39	38	2.00	1778.00	29.63	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	40.5	2.50	1780.50	29.68	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	42.5	2.00	1782.50	29.71	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	45	2.50	1785.00	29.75	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	47	2.00	1787.00	29.78	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	49.5	2.50	1789.50	29.83	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	39	51.5	2.00	1791.50	29.86	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	39	54.5	3.00	1794.50	29.91	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	39	56	1.50	1796.00	29.93	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	39	59	3.00	1799.00	29.98	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	40	0.5	1.50	1800.50	30.01	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	40	3.5	3.00	1803.50	30.06	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	40	5.5	2.00	1805.50	30.09	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	8	2.50	1808.00	30.13	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	10	2.00	1810.00	30.17	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	12.5	2.50	1812.50	30.21	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	14.5	2.00	1814.50	30.24	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	17	2.50	1817.00	30.28	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	19	2.00	1819.00	30.32	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	21.5	2.50	1821.50	30.36	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	23.5	2.00	1823.50	30.39	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	26	2.50	1826.00	30.43	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	28	2.00	1828.00	30.47	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	30.5	2.50	1830.50	30.51	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	32.5	2.00	1832.50	30.54	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	35	2.50	1835.00	30.58	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	37	2.00	1837.00	30.62	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	40	3.00	1840.00	30.67	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	40	41.5	1.50	1841.50	30.69	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	40	44.5	3.00	1844.50	30.74	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	40	46	1.50	1846.00	30.77	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	40	49	3.00	1849.00	30.82	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	40	51	2.00	1851.00	30.85	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	53.5	2.50	1853.50	30.89	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	40	55.5	2.00	1855.50	30.93	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	40	58	2.50	1858.00	30.97	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	0	2.00	1860.00	31.00	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	2.5	2.50	1862.50	31.04	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	4	1.50	1864.00	31.07	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	41	6.5	2.50	1866.50	31.11	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	8.5	2.00	1868.50	31.14	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	11	2.50	1871.00	31.18	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	13	2.00	1873.00	31.22	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	15.5	2.50	1875.50	31.26	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	17.5	2.00	1877.50	31.29	30.00	1.61	0.216	0.006	1.65	41.79

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	41	20	2.50	1880.00	31.33	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	22	2.00	1882.00	31.37	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	24.5	2.50	1884.50	31.41	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	26.5	2.00	1886.50	31.44	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	29	2.50	1889.00	31.48	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	31	2.00	1891.00	31.52	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	33.5	2.50	1893.50	31.56	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	35.5	2.00	1895.50	31.59	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	38	2.50	1898.00	31.63	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	40	2.00	1900.00	31.67	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	42.5	2.50	1902.50	31.71	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	44.5	2.00	1904.50	31.74	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	47	2.50	1907.00	31.78	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	49	2.00	1909.00	31.82	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	51.5	2.50	1911.50	31.86	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	53.5	2.00	1913.50	31.89	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	41	56	2.50	1916.00	31.93	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	41	58	2.00	1918.00	31.97	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	42	0.5	2.50	1920.50	32.01	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	42	2.5	2.00	1922.50	32.04	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	42	5	2.50	1925.00	32.08	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	42	7	2.00	1927.00	32.12	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	42	10	3.00	1930.00	32.17	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	11.5	1.50	1931.50	32.19	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	14.5	3.00	1934.50	32.24	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	16	1.50	1936.00	32.27	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	19	3.00	1939.00	32.32	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	20.5	1.50	1940.50	32.34	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	23.5	3.00	1943.50	32.39	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	25	1.50	1945.00	32.42	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	28	3.00	1948.00	32.47	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	29.5	1.50	1949.50	32.49	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	32.5	3.00	1952.50	32.54	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	34	1.50	1954.00	32.57	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	37	3.00	1957.00	32.62	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	38.5	1.50	1958.50	32.64	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	41.5	3.00	1961.50	32.69	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	43	1.50	1963.00	32.72	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	45.5	2.50	1965.50	32.76	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	42	47.5	2.00	1967.50	32.79	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	42	50	2.50	1970.00	32.83	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	42	52	2.00	1972.00	32.87	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	42	55	3.00	1975.00	32.92	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	42	56.5	1.50	1976.50	32.94	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	42	59	2.50	1979.00	32.98	24.00	1.29	0.173	0.005	1.32	33.43

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	43	1	2.00	1981.00	33.02	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	43	3.5	2.50	1983.50	33.06	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	5.5	2.00	1985.50	33.09	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	43	8	2.50	1988.00	33.13	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	10	2.00	1990.00	33.17	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	43	12.5	2.50	1992.50	33.21	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	14.5	2.00	1994.50	33.24	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	43	17	2.50	1997.00	33.28	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	18.5	1.50	1998.50	33.31	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	43	21.5	3.00	2001.50	33.36	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	43	23	1.50	2003.00	33.38	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	43	26	3.00	2006.00	33.43	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	43	27.5	1.50	2007.50	33.46	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	43	30	2.50	2010.00	33.50	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	32	2.00	2012.00	33.53	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	43	34.5	2.50	2014.50	33.58	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	36.5	2.00	2016.50	33.61	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	43	39	2.50	2019.00	33.65	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	41	2.00	2021.00	33.68	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	43	43.5	2.50	2023.50	33.73	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	45	1.50	2025.00	33.75	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	43	48	3.00	2028.00	33.80	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	43	49.5	1.50	2029.50	33.83	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	43	52.5	3.00	2032.50	33.88	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	43	54	1.50	2034.00	33.90	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	43	56.5	2.50	2036.50	33.94	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	43	58.5	2.00	2038.50	33.98	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	1	2.50	2041.00	34.02	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	3	2.00	2043.00	34.05	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	5.5	2.50	2045.50	34.09	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	7.5	2.00	2047.50	34.13	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	10	2.50	2050.00	34.17	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	12	2.00	2052.00	34.20	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	14.5	2.50	2054.50	34.24	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	16.5	2.00	2056.50	34.28	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	19	2.50	2059.00	34.32	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	21	2.00	2061.00	34.35	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	23.5	2.50	2063.50	34.39	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	25	1.50	2065.00	34.42	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	44	27.5	2.50	2067.50	34.46	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	29.5	2.00	2069.50	34.49	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	32	2.50	2072.00	34.53	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	34	2.00	2074.00	34.57	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	36.5	2.50	2076.50	34.61	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	38.5	2.00	2078.50	34.64	30.00	1.61	0.216	0.006	1.65	41.79

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	44	41	2.50	2081.00	34.68	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	43	2.00	2083.00	34.72	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	45.5	2.50	2085.50	34.76	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	47	1.50	2087.00	34.78	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	44	50	3.00	2090.00	34.83	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	44	51.5	1.50	2091.50	34.86	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	44	54	2.50	2094.00	34.90	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	44	56	2.00	2096.00	34.93	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	44	58.5	2.50	2098.50	34.98	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	0.5	2.00	2100.50	35.01	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	3	2.50	2103.00	35.05	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	5	2.00	2105.00	35.08	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	7.5	2.50	2107.50	35.13	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	9.5	2.00	2109.50	35.16	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	12	2.50	2112.00	35.20	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	14	2.00	2114.00	35.23	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	16.5	2.50	2116.50	35.28	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	18	1.50	2118.00	35.30	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	45	20.5	2.50	2120.50	35.34	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	22.5	2.00	2122.50	35.38	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	25	2.50	2125.00	35.42	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	27	2.00	2127.00	35.45	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	29.5	2.50	2129.50	35.49	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	31.5	2.00	2131.50	35.53	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	34	2.50	2134.00	35.57	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	36	2.00	2136.00	35.60	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	38.5	2.50	2138.50	35.64	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	40	1.50	2140.00	35.67	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	45	43	3.00	2143.00	35.72	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	45	44.5	1.50	2144.50	35.74	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	45	47	2.50	2147.00	35.78	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	49	2.00	2149.00	35.82	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	51.5	2.50	2151.50	35.86	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	53.5	2.00	2153.50	35.89	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	45	56	2.50	2156.00	35.93	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	45	58	2.00	2158.00	35.97	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	46	0.5	2.50	2160.50	36.01	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	2.5	2.00	2162.50	36.04	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	46	5	2.50	2165.00	36.08	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	6.5	1.50	2166.50	36.11	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	46	9.5	3.00	2169.50	36.16	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	46	11	1.50	2171.00	36.18	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	46	13.5	2.50	2173.50	36.23	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	15.5	2.00	2175.50	36.26	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	46	18	2.50	2178.00	36.30	24.00	1.29	0.173	0.005	1.32	33.43

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	46	20	2.00	2180.00	36.33	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	46	22.5	2.50	2182.50	36.38	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	24	1.50	2184.00	36.40	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	46	27	3.00	2187.00	36.45	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	46	28.5	1.50	2188.50	36.48	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	46	31	2.50	2191.00	36.52	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	33	2.00	2193.00	36.55	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	46	35.5	2.50	2195.50	36.59	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	37	1.50	2197.00	36.62	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	46	39.5	2.50	2199.50	36.66	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	41.5	2.00	2201.50	36.69	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	46	44	2.50	2204.00	36.73	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	45.5	1.50	2205.50	36.76	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	46	48	2.50	2208.00	36.80	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	50	2.00	2210.00	36.83	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	46	52.5	2.50	2212.50	36.88	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	46	54	1.50	2214.00	36.90	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	46	57	3.00	2217.00	36.95	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	46	58.5	1.50	2218.50	36.98	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	47	1	2.50	2221.00	37.02	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	3	2.00	2223.00	37.05	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	5.5	2.50	2225.50	37.09	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	7	1.50	2227.00	37.12	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	47	9.5	2.50	2229.50	37.16	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	11.5	2.00	2231.50	37.19	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	14	2.50	2234.00	37.23	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	16	2.00	2236.00	37.27	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	18.5	2.50	2238.50	37.31	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	20	1.50	2240.00	37.33	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	47	22.5	2.50	2242.50	37.38	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	24.5	2.00	2244.50	37.41	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	27	2.50	2247.00	37.45	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	29	2.00	2249.00	37.48	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	31.5	2.50	2251.50	37.53	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	33	1.50	2253.00	37.55	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	47	35.5	2.50	2255.50	37.59	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	37.5	2.00	2257.50	37.63	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	40	2.50	2260.00	37.67	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	42	2.00	2262.00	37.70	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	44.5	2.50	2264.50	37.74	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	46	1.50	2266.00	37.77	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	47	48.5	2.50	2268.50	37.81	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	50.5	2.00	2270.50	37.84	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	47	53	2.50	2273.00	37.88	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	55	2.00	2275.00	37.92	30.00	1.61	0.216	0.006	1.65	41.79

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	47	57.5	2.50	2277.50	37.96	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	47	59.5	2.00	2279.50	37.99	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	1.5	2.00	2281.50	38.03	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	3.5	2.00	2283.50	38.06	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	6	2.50	2286.00	38.10	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	8	2.00	2288.00	38.13	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	10.5	2.50	2290.50	38.18	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	12	1.50	2292.00	38.20	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	48	14.5	2.50	2294.50	38.24	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	16.5	2.00	2296.50	38.28	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	19	2.50	2299.00	38.32	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	20.5	1.50	2300.50	38.34	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	48	23	2.50	2303.00	38.38	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	25	2.00	2305.00	38.42	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	27.5	2.50	2307.50	38.46	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	29	1.50	2309.00	38.48	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	48	31.5	2.50	2311.50	38.53	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	33.5	2.00	2313.50	38.56	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	35.5	2.00	2315.50	38.59	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	37.5	2.00	2317.50	38.63	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	40	2.50	2320.00	38.67	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	42	2.00	2322.00	38.70	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	44	2.00	2324.00	38.73	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	46	2.00	2326.00	38.77	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	48.5	2.50	2328.50	38.81	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	50	1.50	2330.00	38.83	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	48	52.5	2.50	2332.50	38.88	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	54.5	2.00	2334.50	38.91	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	48	57	2.50	2337.00	38.95	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	48	58.5	1.50	2338.50	38.98	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	1	2.50	2341.00	39.02	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	3	2.00	2343.00	39.05	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	49	5.5	2.50	2345.50	39.09	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	7	1.50	2347.00	39.12	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	9.5	2.50	2349.50	39.16	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	11.5	2.00	2351.50	39.19	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	49	14	2.50	2354.00	39.23	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	15.5	1.50	2355.50	39.26	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	18.5	3.00	2358.50	39.31	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	49	20	1.50	2360.00	39.33	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	22.5	2.50	2362.50	39.38	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	24.5	2.00	2364.50	39.41	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	49	27	2.50	2367.00	39.45	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	28.5	1.50	2368.50	39.48	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	31	2.50	2371.00	39.52	24.00	1.29	0.173	0.005	1.32	33.43

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	49	32.5	1.50	2372.50	39.54	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	35	2.50	2375.00	39.58	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	37	2.00	2377.00	39.62	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	49	39.5	2.50	2379.50	39.66	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	41	1.50	2381.00	39.68	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	43.5	2.50	2383.50	39.73	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	45.5	2.00	2385.50	39.76	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	49	47.5	2.00	2387.50	39.79	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	49	49.5	2.00	2389.50	39.83	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	49	52	2.50	2392.00	39.87	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	53.5	1.50	2393.50	39.89	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	49	56	2.50	2396.00	39.93	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	49	57.5	1.50	2397.50	39.96	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	50	0	2.50	2400.00	40.00	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	2	2.00	2402.00	40.03	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	4.5	2.50	2404.50	40.08	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	6	1.50	2406.00	40.10	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	50	8.5	2.50	2408.50	40.14	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	10.5	2.00	2410.50	40.18	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	13	2.50	2413.00	40.22	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	14.5	1.50	2414.50	40.24	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	50	17	2.50	2417.00	40.28	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	19	2.00	2419.00	40.32	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	21.5	2.50	2421.50	40.36	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	23	1.50	2423.00	40.38	40.00	2.15	0.288	0.008	2.19	55.72
11	11	4	12	50	25.5	2.50	2425.50	40.43	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	27.5	2.00	2427.50	40.46	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	30	2.50	2430.00	40.50	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	32	2.00	2432.00	40.53	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	34.5	2.50	2434.50	40.58	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	36.5	2.00	2436.50	40.61	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	39.5	3.00	2439.50	40.66	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	50	41.5	2.00	2441.50	40.69	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	44.5	3.00	2444.50	40.74	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	50	46.5	2.00	2446.50	40.78	30.00	1.61	0.216	0.006	1.65	41.79
11	11	4	12	50	50	3.50	2450.00	40.83	17.14	0.92	0.123	0.003	0.94	23.88
11	11	4	12	50	52.5	2.50	2452.50	40.88	24.00	1.29	0.173	0.005	1.32	33.43
11	11	4	12	50	56.5	4.00	2456.50	40.94	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	50	59.5	3.00	2459.50	40.99	20.00	1.08	0.144	0.004	1.10	27.86
11	11	4	12	51	4.5	5.00	2464.50	41.08	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	51	8.5	4.00	2468.50	41.14	15.00	0.81	0.108	0.003	0.82	20.90
11	11	4	12	51	14	5.50	2474.00	41.23	10.91	0.59	0.078	0.002	0.60	15.20
11	11	4	12	51	19	5.00	2479.00	41.32	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	51	24	5.00	2484.00	41.40	12.00	0.65	0.086	0.002	0.66	16.72
11	11	4	12	51	30	6.00	2490.00	41.50	10.00	0.54	0.072	0.002	0.55	13.93

TEST 16

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	11	4	12	51	47	17.00	2507.00	41.78	3.53	0.19	0.025	0.001	0.19	4.92
11	11	4	12	52	33	46.00	2553.00	42.55	1.30	0.07	0.009	0.000	0.07	1.82
11	11	4	12	55	0	147.00	2700.00	45.00	0.41	0.02	0.003	0.000	0.00	0.00

TEST 16

Applied Rain and Runon Quantities

Time (min)	Rain (mm/hr)	Runon (gal/min)	Runon (m^3/min)	Runon (ft^3/min)	Associated Impervious Lenth (m)	Associated Impervious Lenth (ft)	Total inflow (m3/min)	Total inflow (ft3/min)	Effective Inflow to Plot Only (mm/hr)
0	84.1	2.5	9.46E-03	0.334	6.68	21.9	1.23E-02	0.434	365.20
40.00	84.1	2.5	9.46E-03	0.334	6.68	21.9	1.23E-02	0.434	365.20
40.00	0.0	0.0	0.0		0.0	0.0	0.0		0.0

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.
1	2.58	40	3.87	3.31	0.55
2	2.45		3.68	84.1	14.0
3	1.80		2.70		
4	2.00		3.00		
5					
6					

TEST 16

SOIL MOISTURE PROBE READINGS

Time (actual)	Time min	Probe 1	Probe 2	Probe 3
12:10	0.00	13.8%	9.9%	
12:15	5.00	23.6%	19.5%	
12:25	15.00	25.0%	28.0%	
12:30	20.00	25.3%	28.0%	
12:35	25.00	25.3%	28.0%	
12:50	40.00	25.3%	28.0%	

Probe Locations:	from top (cm)
Probe 1:	65
Probe 2:	135

Average Initial Moisture:	**11.9%**
Average Max Moisture:	**26.7%**
dtheta:	**14.8%**

TEST 16

PLOT HYDRAULIC CONDUCTIVITY ESTIMATION (RAIN-ONLY / TEST 15 DATA)

Rainfall Verification

Gauge #	Measured Depth (in)	Elapsed Time (min)	Avg. Intensity	Spacial Avg. (in/hr) & (mm/hr)	Std. Dev.
1	2.65	55	2.89	2.70	0.25
2	2.60		2.84	68.6	6.25
3	2.15		2.35		
4	2.50		2.73		
5					
6					

Time	Intensity
0	68.6
55.0	68.6
55.0	0

Ke (in/hr)	Ke (mm/hr)	Ke (cm/sec)
2.63	66.7	1.853E-03

Applied Rain (mm/hr):	68.6
Plot Area (m^2):	2.02
Steady Runoff (mm/hr):	1.83

Month	day	Year	Hour	Minute	Second	Interval	Total, sec	Total, min	tips/min	gal/min	ft^3/min	m^3/min	in/hr	mm/hr
11	5	4	13	30	0	0	0.00	0.00	0.00	0.00	0.000	0.000	0.00	0.00
11	5	4	13	43	59.5	839.50	839.50	13.99	0.07	0.00	0.001	0.000	0.02	0.43
11	5	4	13	47	39	219.50	1059.00	17.65	0.27	0.01	0.002	0.000	0.07	1.65
11	5	4	13	51	22	223.00	1282.00	21.37	0.27	0.01	0.002	0.000	0.06	1.63
11	5	4	13	54	34	192.00	1474.00	24.57	0.31	0.02	0.002	0.000	0.07	1.89
11	5	4	13	57	29.5	175.50	1649.50	27.49	0.34	0.02	0.002	0.000	0.08	2.07
11	5	4	14	0	14.5	165.00	1814.50	30.24	0.36	0.02	0.003	0.000	0.09	2.20
11	5	4	14	3	17	182.50	1997.00	33.28	0.33	0.02	0.002	0.000	0.08	1.99
11	5	4	14	5	53	156.00	2153.00	35.88	0.38	0.02	0.003	0.000	0.09	2.33
11	5	4	14	9	8.5	195.50	2348.50	39.14	0.31	0.02	0.002	0.000	0.07	1.86
11	5	4	14	12	48.5	220.00	2568.50	42.81	0.27	0.01	0.002	0.000	0.06	1.65
11	5	4	14	16	52.5	244.00	2812.50	46.88	0.25	0.01	0.002	0.000	0.06	1.49
11	5	4	14	20	23.5	211.00	3023.50	50.39	0.28	0.02	0.002	0.000	0.07	1.72
11	5	4	14	24	26.5	243.00	3266.50	54.44	0.25	0.01	0.002	0.000	0.06	1.49
11	5	4	14	38	13	826.50	4093.00	68.22	0.07	0.00	0.001	0.000	0.02	0.44

TEST 16

LID 15Ke

phi:	*0.5*	*dtheta*	*1%*	*slope (x:1):*	3
Ks:	*1.83E-03*	*Ko:*	*10000*	*LID length (cm):*	200

END OF PLOT

sec	min	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.00	1.93	1.83	5.7%
60	1	0.00000002	0.00			
120	2	0.00000002	0.00			
180	3	0.00000002	0.00			
240	4	**0.00000002**	0.00			
300	5	0	0.00			
360	6	0.00000007	0.00			
420	7	0.00000017	0.01			
480	8	0.00000033	0.01			
540	9	0.00000061	0.02			
600	10	0.00000099	0.04			
660	11	0.00000149	0.05			
720	12	0.00000215	0.08			
780	13	0.000003	0.11			
840	14	0.00000405	0.15			
900	15	0.00000533	0.19			
960	16	0.00000688	0.25			
1020	17	0.00000871	0.31			
1080	18	0.00001085	0.39			
1140	19	0.00001334	0.48			
1200	20	0.00001619	0.58			
1260	21	0.00001944	0.70			
1320	22	0.00002312	0.83			
1380	23	0.00002723	0.98			
1440	24	0.00003183	1.15			
1500	25	0.00003692	1.33			
1560	26	0.00004254	1.53			
1620	27	0.00004797	1.73			
1680	28	0.00005096	1.83			
1740	29	0.00005169	1.86			
1800	30	0.00005187	1.87			
1860	31	0.00005201	1.87			
1920	32	0.00005215	1.88			
1980	33	0.00005228	1.88			
2040	34	0.00005241	1.89			
2100	35	0.00005252	1.89			
2160	36	0.00005262	1.89			
2220	37	0.00005272	1.90			
2280	38	0.00005281	1.90			
2340	39	0.00005289	1.90			
2400	40	0.00005297	1.91			
2460	41	0.00005304	1.91			
2520	42	0.00005311	1.91			

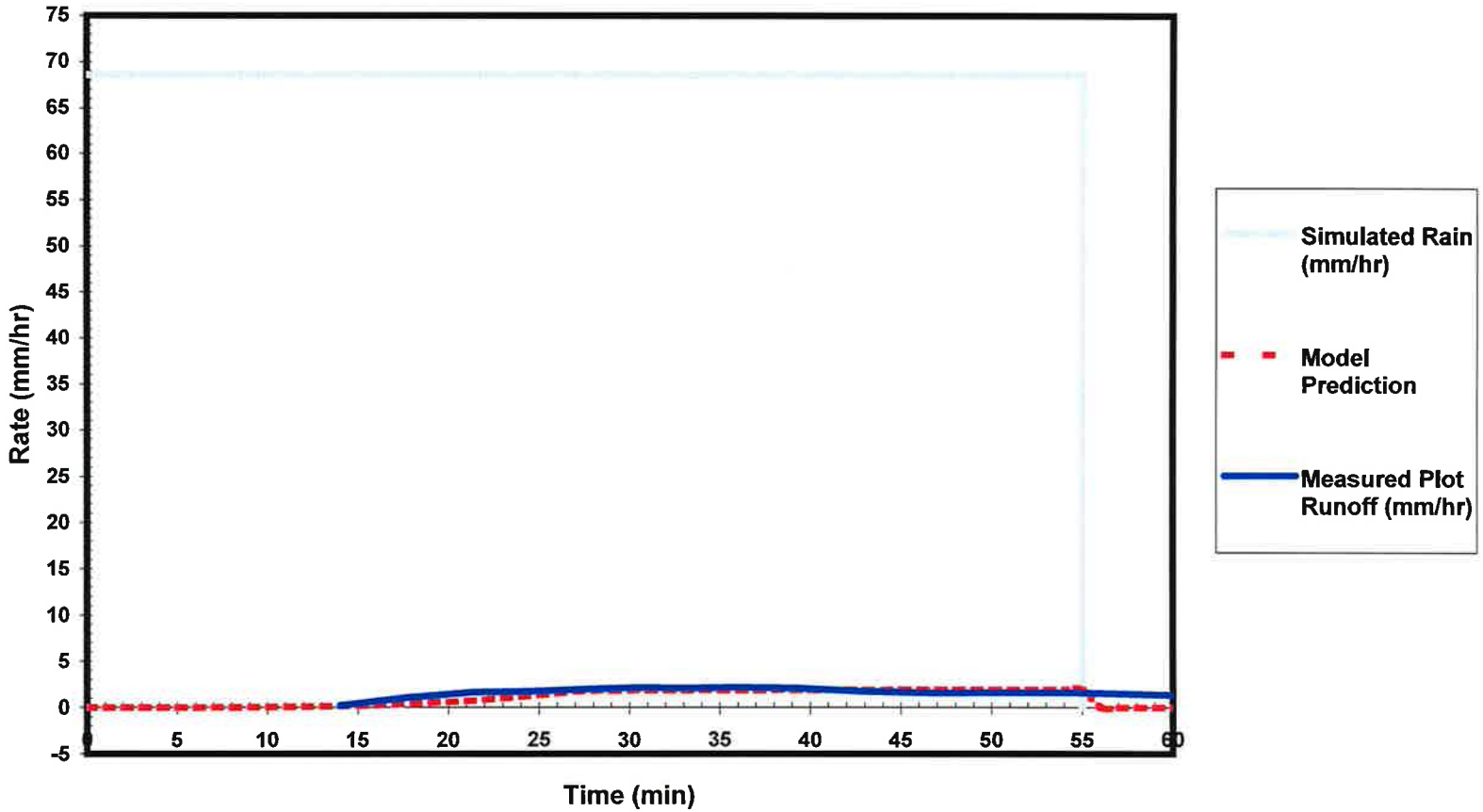
TEST 16

sec	min	END OF PLOT cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
2580	43	0.00005317	1.91			
2640	44	0.00005324	1.92			
2700	45	0.00005329	1.92			
2760	46	0.00005335	1.92			
2820	47	0.0000534	1.92			
2880	48	0.00005345	1.92			
2940	49	0.0000535	1.93			
3000	50	0.00005354	1.93			
3060	51	0.00005359	1.93			
3120	52	0.00005363	1.93			
3180	53	0.00005367	1.93			
3240	54	0.0000537	1.93			
3300	55	0.00005374	1.93			
3360	56	0.00000002	0.00			
3420	57	0.00000002	0.00			
3480	58	0.00000002	0.00			
3540	59	0.00000002	0.00			
3600	60	0.00000002	0.00			
3660	61	0.00000002	0.00			
3720	62	0.00000002	0.00			
3780	63	0.00000002	0.00			
3840	64	0.00000002	0.00			
3900	65	0.00000002	0.00			

TEST 16

FIGURE A-22

Plot Conductivity Test -15



TEST 16

LID 16

phi:	5	*dtheta*	40%	*slope (x:1):*	3
Ks:	5.00E-03	*Ko:*	40000	*LID length (cm):*	200

		EPS		END OF PLOT				
sec	min	cm/sec	mm/hr	cm/sec	mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
0	0	0	0.00	0.000000	0.00	38.4	39.8	-3.6%
60	1	0.00000066	0.02	0.000000	0.00			
120	2	0.00006684	2.41	0.000000	0.00			
180	3	0.00018763	6.75	0.000000	0.00			
240	4	0.00043158	15.54	0.000000	0.00			
300	5	0	29.89	0.000000	0.00			
360	6	0.00142177	51.18	0.000000	0.00			
420	7	0.0020618	74.22	0.000000	0.00			
480	8	0.00228201	82.15	0.000000	0.00			
540	9	0.00232111	83.56	0.000000	0.00			
600	10	0.0023281	83.81	0.000000	0.00			
660	11	0.00232953	83.86	0.000000	0.00			
720	12	0.00232988	83.88	0.000000	0.00			
780	13	0.00232999	83.88	0.000427	15.37			
840	14	0.00233003	83.88	0.000582	20.94			
900	15	0.00233006	83.88	0.000674	24.26			
960	16	0.00233008	83.88	0.000737	26.52			
1020	17	0.0023301	83.88	0.000783	28.20			
1080	18	0.00233012	83.88	0.000820	29.51			
1140	19	0.00233013	83.88	0.000850	30.59			
1200	20	0.00233014	83.89	0.000875	31.49			
1260	21	0.00233016	83.89	0.000896	32.26			
1320	22	0.00233017	83.89	0.000915	32.94			
1380	23	0.00233018	83.89	0.000931	33.53			
1440	24	0.00233019	83.89	0.000946	34.05			
1500	25	0.0023302	83.89	0.000959	34.53			
1560	26	0.00233012	83.88	0.000971	34.95			
1620	27	0.00233009	83.88	0.000982	35.34			
1680	28	0.00233008	83.88	0.000992	35.69			
1740	29	0.00233009	83.88	0.001001	36.02			
1800	30	0.00233012	83.88	0.001009	36.32			
1860	31	0.00233014	83.89	0.001016	36.59			
1920	32	0.00233016	83.89	0.001024	36.85			
1980	33	0.00233019	83.89	0.001030	37.09			
2040	34	0.0023302	83.89	0.001036	37.31			
2100	35	0.00233022	83.89	0.001042	37.52			
2160	36	0.00233023	83.89	0.001048	37.71			
2220	37	0.00233024	83.89	0.001053	37.90			
2280	38	0.00233025	83.89	0.001057	38.07			
2340	39	0.00233026	83.89	0.001062	38.23			
2400	40	0.00233027	83.89	0.001066	38.39			
2460	41	0.00155235	55.88	0.000376	13.53			
2520	42	0.00111077	39.99	0.000103	3.70			
2580	43	0.00083231	29.96	0.000000	0.00			
2640	44	0.00064736	23.30	0.000000	0.00			
2700	45	0.00051886	18.68	0.000000	0.00			
2760	46	0.00042609	15.34	0.000000	0.00			
2820	47	0.00035694	12.85	0.000000	0.00			
2880	48	0.00030396	10.94	0.000000	0.00			
2940	49	0.00026243	9.45	0.000000	0.00			
3000	50	0.00022923	8.25	0.000000	0.00			
3060	51	0.00020223	7.28	0.000000	0.00			
3120	52	0.00017996	6.48	0.000000	0.00			
3180	53	0.00016134	5.81	0.000000	0.00			
3240	54	0.0001456	5.24	0.000000	0.00			

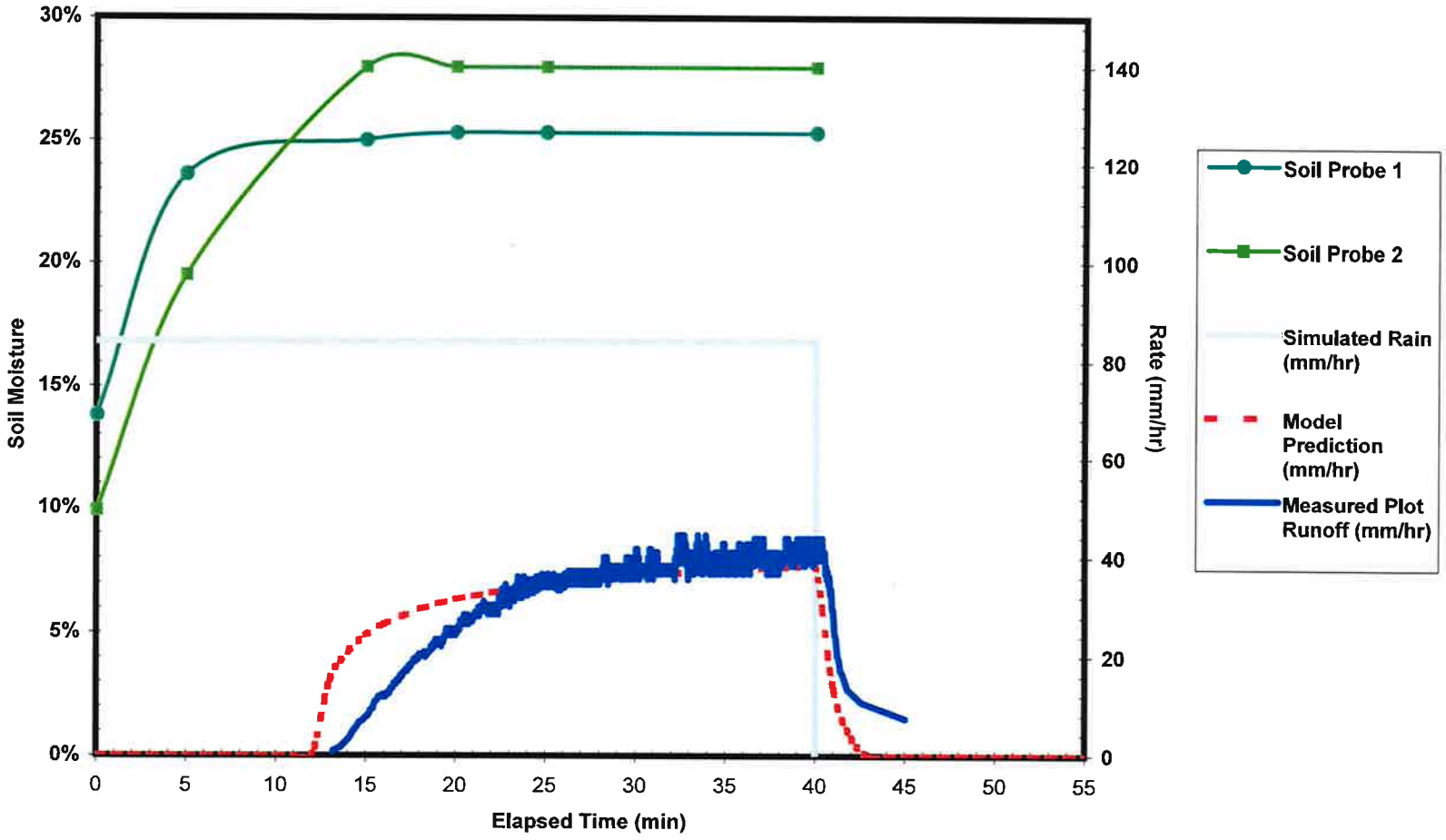
TEST 16

sec	min	EPS cm/sec	EPS mm/hr	END OF PLOT cm/sec	END OF PLOT mm/hr	Max Runoff (mm/hr)	Actual Runoff (mm/hr)	% Difference
3300	55	0.00013216	4.76	0.000000	0.00			
3360	56	0.00012059	4.34	0.000000	0.00			
3420	57	0.00011053	3.98	0.000000	0.00			
3480	58	0.00010173	3.66	0.000000	0.00			
3540	59	0.00009402	3.38	0.000000	0.00			
3600	60	0.00008717	3.14	0.000000	0.00			

TEST 16

FIGURE A-22

Rain/Runoff Hydrograph - 16



TEST 16

APPENDIX B

Spokane
US 2 Hyetograph
&
Hydrograph Data

TABLE B-1

Spokane US 2 Precipitation Event Log						
Date	Duration, Hours	Good Rainfall data?	Total Rainfall, mm	Peak Intensity, mm/hour	Peak 5 Min Intensity, mm/hour	Antecedent Dry Period, hours
9/11/04 5:09	**3.9**	**yes**	**10.16**	**18.85**	**12.19**	**-**
9/12/04 16:38	**0.4**	**yes**	**2.54**	**16.18**	**12.19**	**31.6**
9/13/04 11:05	1.3	yes	1.78	12.53	6.10	18.0
9/13/04 16:16	0.9	yes	3.05	16.04	12.19	3.9
9/15/04 4:34	**6.6**	**yes**	**5.33**	**2.46**	**3.05**	**35.4**
9/15/04 14:48	**2.8**	**yes**	**3.05**	**13.75**	**9.14**	**3.7**
9/17/04 11:24	**4.5**	**yes**	**3.56**	**2.87**	**3.05**	**41.8**
10/6/04 7:38	-	no (windy)	<1.0	-	-	447.7
10/9/04 3:47	**5.2**	**yes**	**5.33**	**2.89**	**3.05**	**55.9**
10/16/04 12:18	**2.1**	**yes**	**3.56**	**9.10**	**9.14**	**171.4**
10/16/04 23:19	**14.2**	**yes**	**9.40**	**10.95**	**9.14**	**8.9**
10/17/04 19:07	**6.5**	**yes**	**8.13**	**11.08**	**6.10**	**5.6**
11/1/04 22:33	**2.0**	**yes**	**1.02**	**1.35**	**3.05**	**44.9**
11/2/04 11:26	**11.0**	**yes**	**11.18**	**6.90**	**3.05**	**10.9**
11/6/04 17:39	0.9	no (insignificant)	<1.0	-	-	-
11/15/04 17:56	**12.0**	**yes**	**10.92**	**2.23**	**3.05**	**307.5**
11/18/04 7:14	**3.2**	**yes**	**6.35**	**6.72**	**6.10**	**49.3**
11/23/04 22:24	**6.9**	**yes**	**11.42**	**3.18**	**3.05**	**131.9**
Bold events have been graphed						

TABLE B-2

Spokane US 2 Runoff Event Log							
Date	0 m Slot Drain			3.2 m Slot Drain		6.1 m Slot Drain	
	Good Runoff data?	Runoff Depth, mm[1]	% Captured (78+/- 6%)[2]	Runoff Depth, mm[1]	% Infiltrated	Runoff Depth, mm[1]	% Infiltrated
9/11/04 5:09	**yes**	**7.94**	**78**				
9/12/04 16:38	**yes**	**1.62**	**64**				
9/13/04 11:05	yes	0.61	34				
9/13/04 16:16	yes	2.49	82				
9/15/04 4:34	**yes**	**4.69**	**88**				
9/15/04 14:48	**yes**	**2.12**	**70**				
9/17/04 11:24	**yes**	**2.40**	**68**				
10/6/04 7:38	yes	0.11	-				
10/9/04 3:47	**yes**	**4.64**	**87**	**0.02**	**99.67%**		
10/16/04 12:18	**yes**	**2.76**	**78**				
10/16/04 23:19	**yes**	**7.60**	**81**				
10/17/04 19:07	**yes**	**7.44**	**92**	**0.16**	**97.86%**	**0.02**	**99.36%**
11/1/04 22:33	**yes**	**0.64**	**63**				
11/2/04 11:26	**yes**	**10.51**	**94**				
11/6/04 17:39	yes	0.07	-				
11/15/04 17:56	**yes**	**9.54**	**87**	**0.01**	**99.92%**		
11/18/04 7:14	**yes**	**6.23**	**98**	**0.03**	**99.51%**		
11/23/04 22:24	**yes**	**10.07**	**88**	**0.02**	**99.77%**		

[1] Runoff Depth = Volume calculated by # of tips/contributing surface area
[2] % Captured=(Runoff Depth)/(Rainfall Depth x Contributing Area), average +/- CI, n = 16, $\alpha = 0.05$
Bold events have been graphed

FIGURE B-1

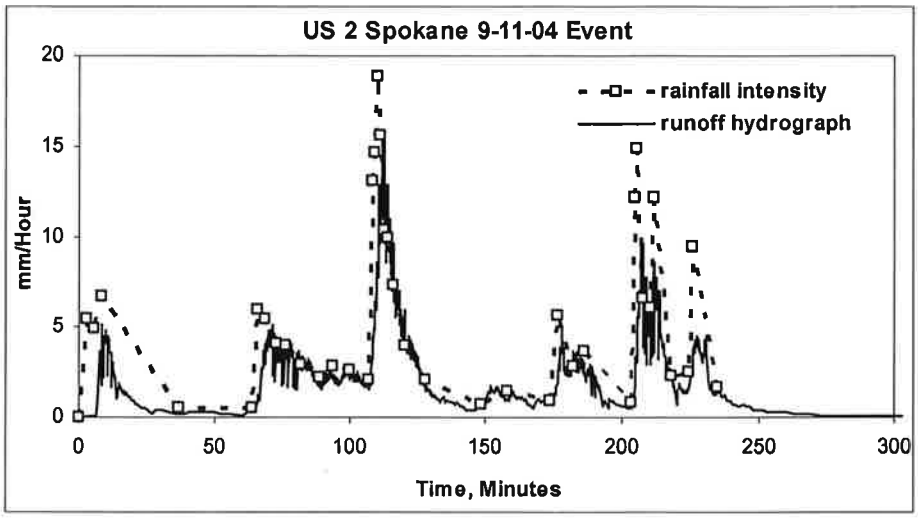


FIGURE B-2

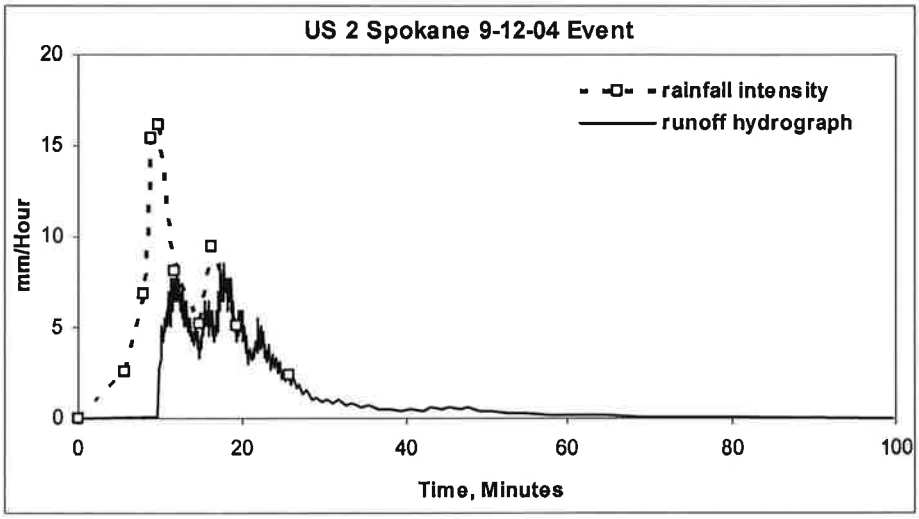


FIGURE B-3

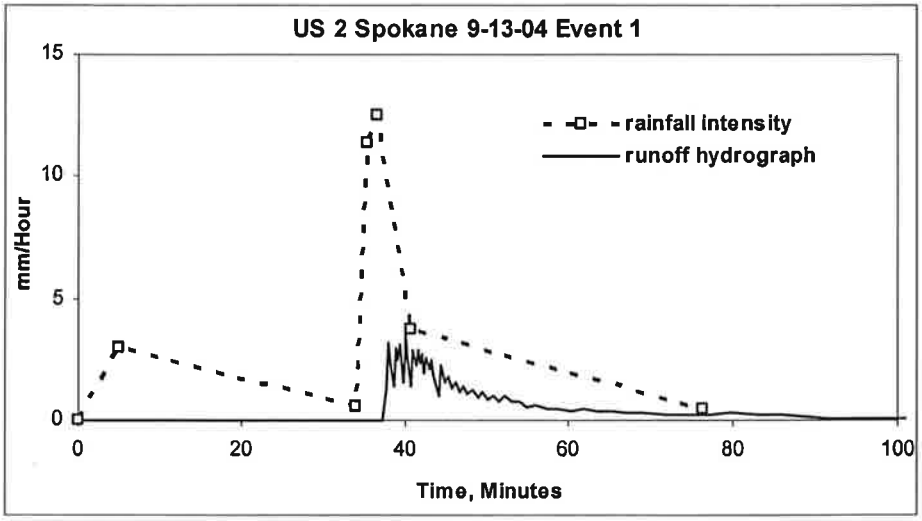


FIGURE B-4

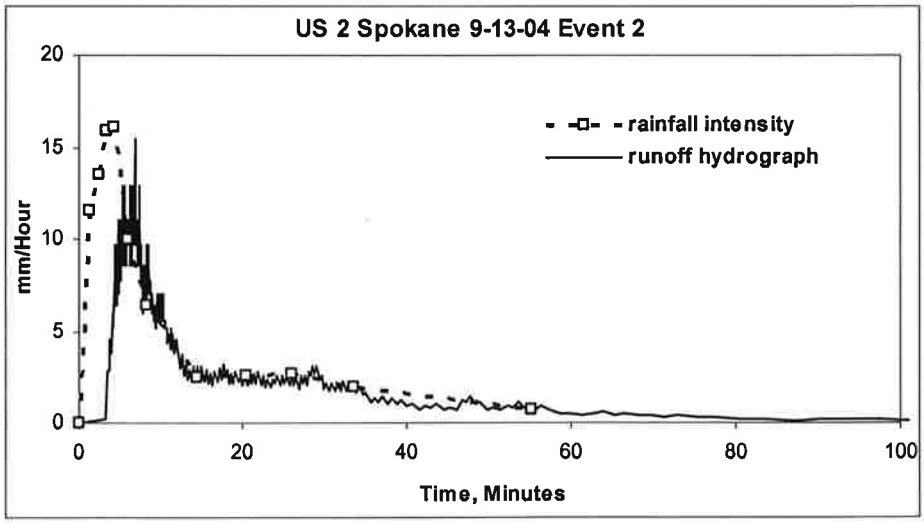


FIGURE B-5

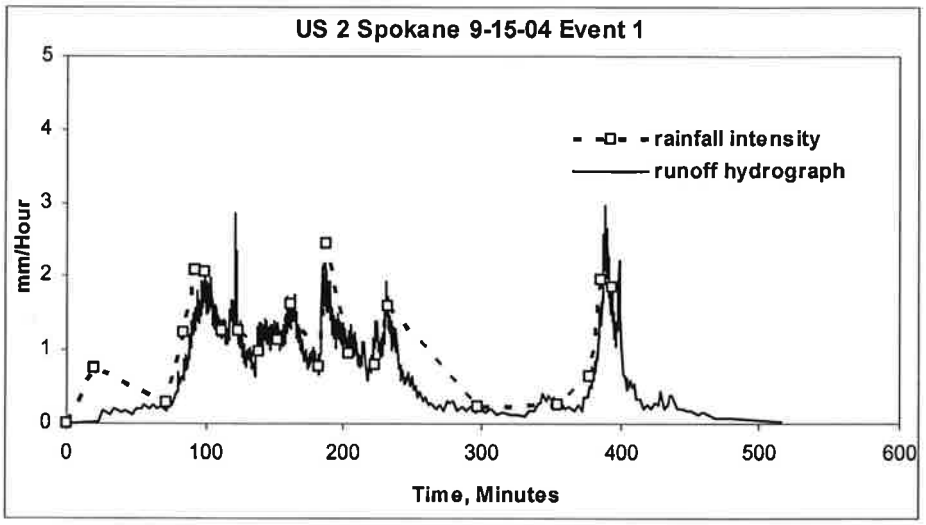


FIGURE B-6

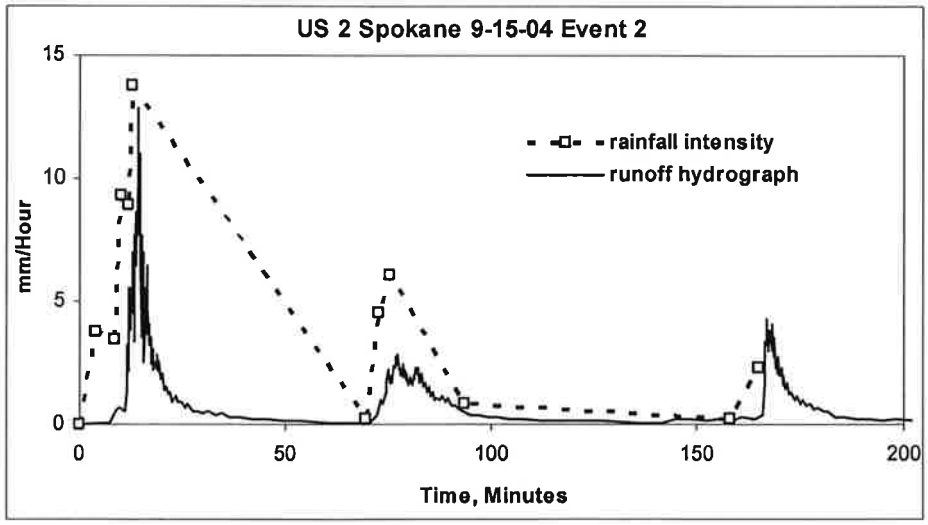


FIGURE B-7

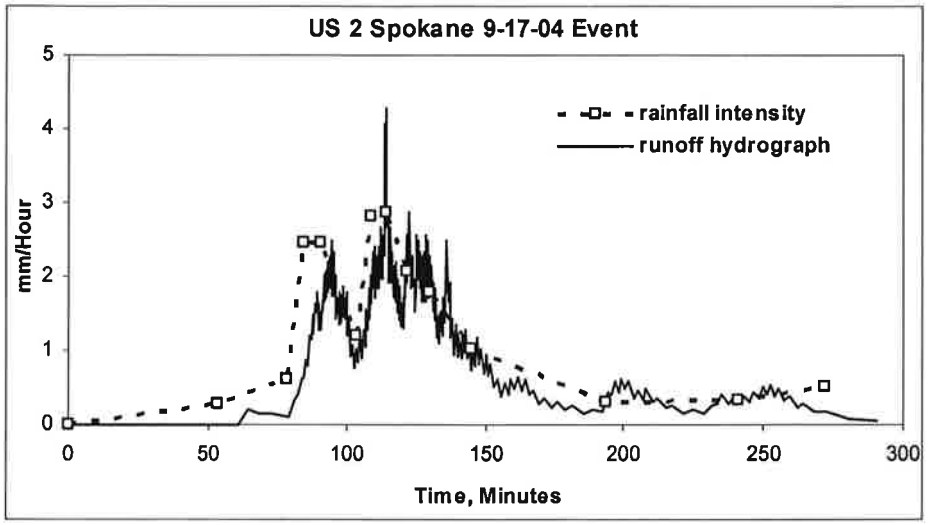


FIGURE B-8

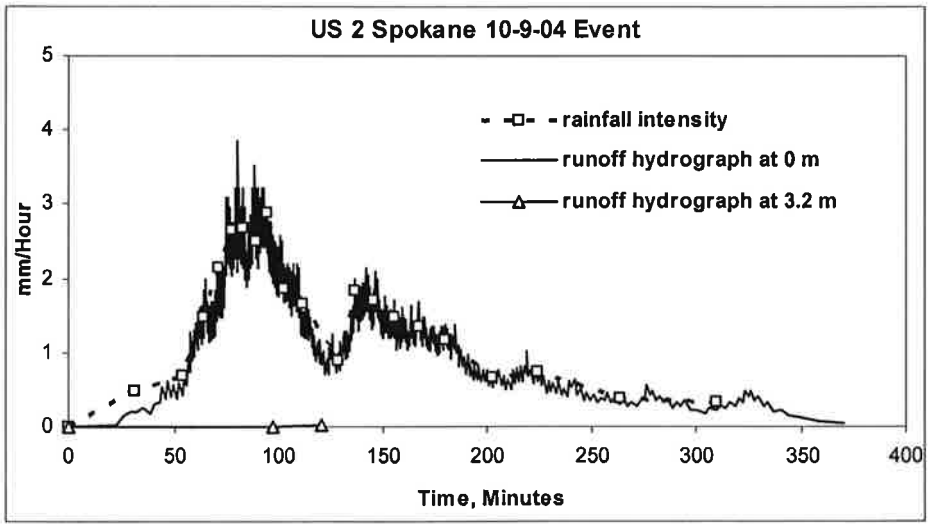


FIGURE B-9

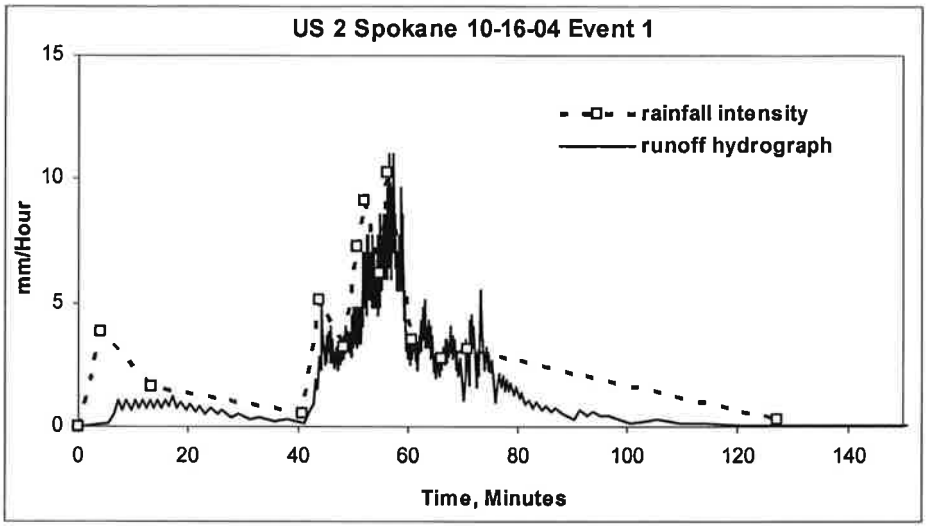


FIGURE B-10

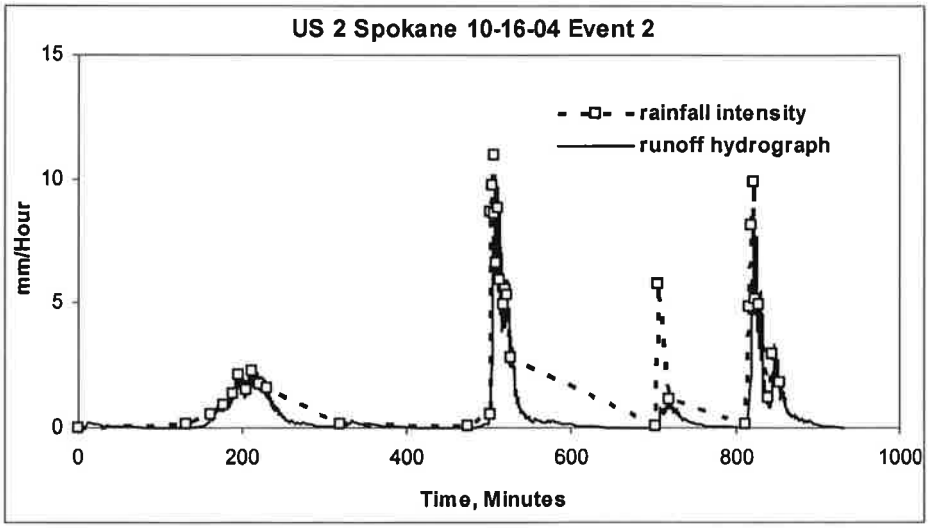


FIGURE B-11

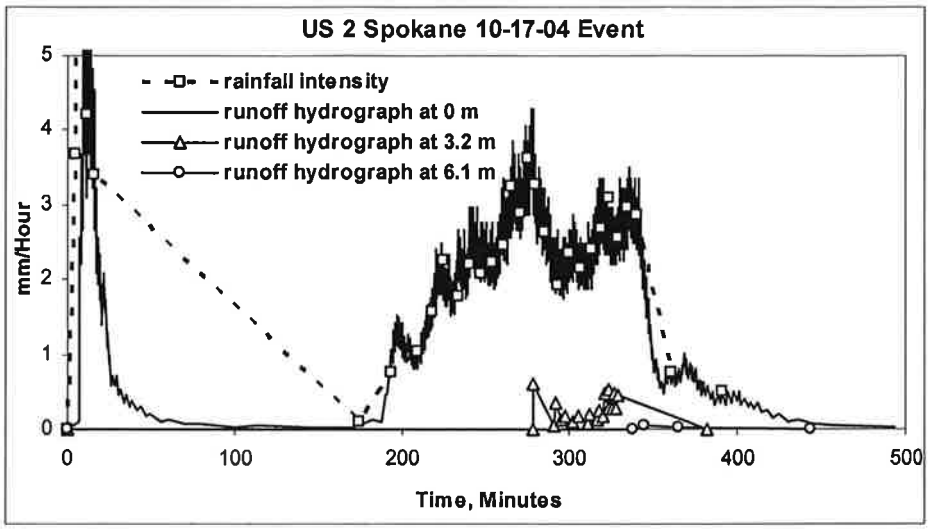


FIGURE B-12

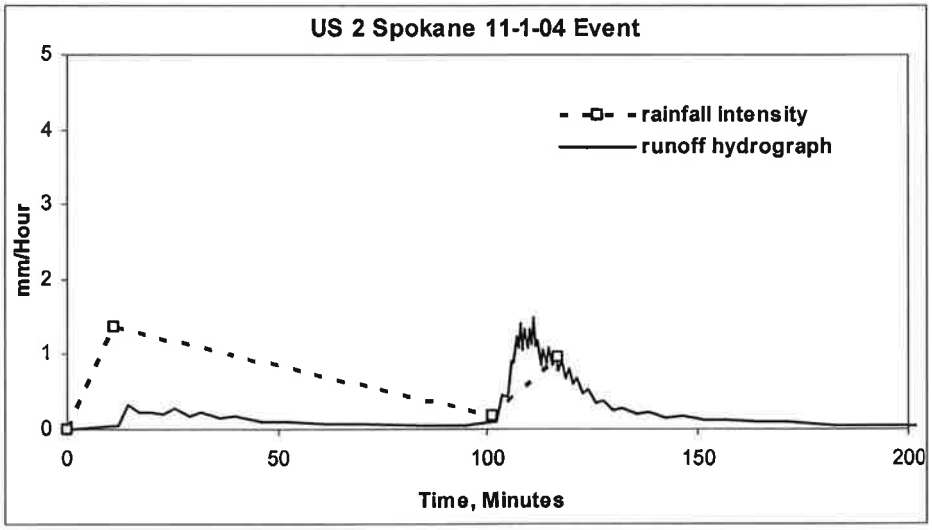


FIGURE B-13

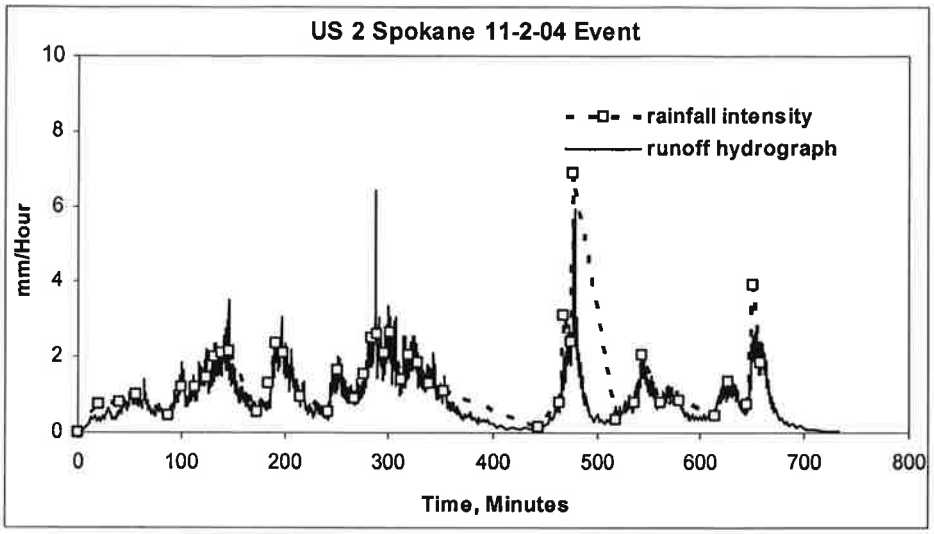


FIGURE B-14

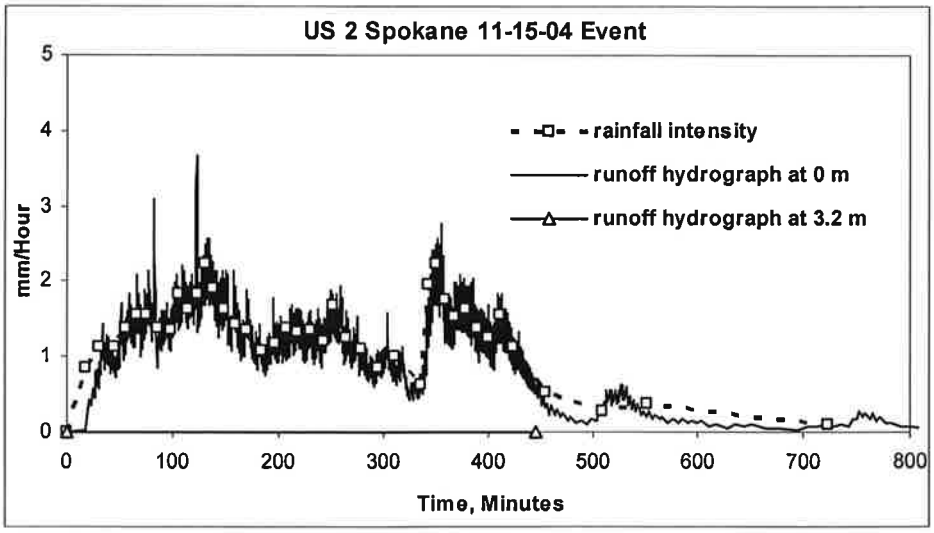


FIGURE B-15

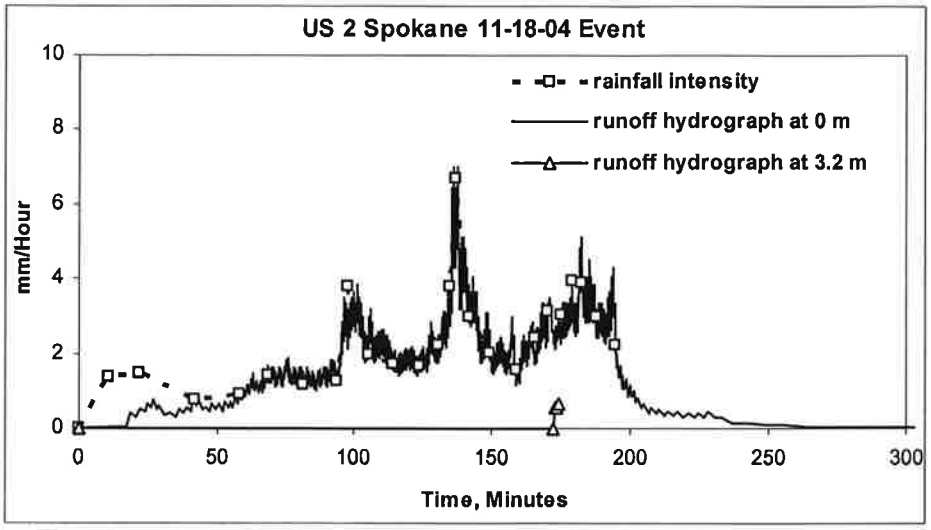
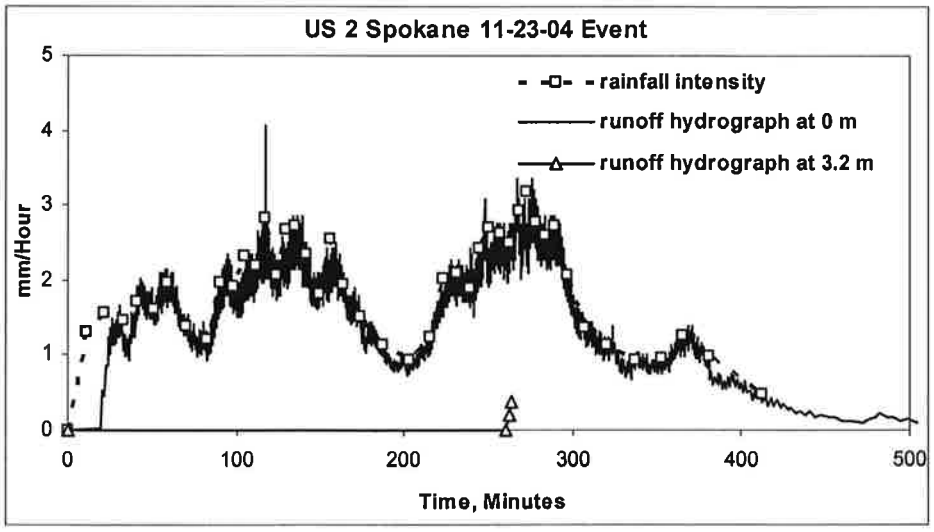


FIGURE B-16



APPENDIX C

Pullman SR 270
Hyetograph
&
Hydrograph Data

TABLE C-1 SR 270 Remote Site Rainfall/Runoff Event Summary

Date	Duration, Hours	Good Rainfall data?	Total Rainfall, mm	Peak Intensity, mm/hour	Peak 5 Min Intensity, mm/hour	Antecedent Dry Period, hours	Good Hydrograph data?	Runoff Depth, mm[1]	Peak Runoff, mm/hr	% Captured (39 +/- 6%)[2]
8/17/2004 16:52	6.13	no	<5.0	-	-	-	yes	0.48	10.8	-
8/6/2004 3:57	1.47	yes	3.3	10	9.1	244.9	bypassed	-	-	-
8/19/2004 15:15	2.22	yes	2.5	32.1	6.1	57.8	bypassed	-	-	-
8/22/2004 0:42	**2.54**	**yes**	**3.3**	**3.6**	**3**	**55.2**	**yes**	**0.57**	**1.2**	**17**
8/22/2004 4:07	**20.57**	**yes**	**11.9**	**20.3**	**18.3**	**3.9**	**yes**	**3.1**	**9.9**	**26**
8/24/2004 0:02	**0.97**	**yes**	**1.5**	**18.5**	**6.1**	**20.3**	**yes**	**0.58**	**7.2**	**38**
8/24/2004 4:00	4.87	no	<0.5	-	-	3	insignificant	-	-	-
8/24/2004 18:12	**1.57**	**yes**	**1.8**	**2.9**	**3**	**9.3**	**yes**	**0.5**	**0.7**	**28**
8/25/2004 4:16	**8.88**	**yes**	**8.1**	**67.7**	**21.3**	**8.5**	**yes**	**3.61**	**36.1**	**44**
8/25/2004 17:19	1.43	no	<1.0	-	-	4.6	yes	1.42	36.1	-
9/13/2004 15:12	**2.67**	**yes**	**7.4**	**13.3**	**6.1**	**428.4**	**yes**	**2.91**	**12.1**	**39**
9/13/2004 21:34	**1.47**	**yes**	**2.5**	**6.5**	**6.1**	**3.7**	**yes**	**0.88**	**3.9**	**35**
9/15/2004 7:48	**3.65**	**yes**	**4.1**	**5.8**	**6.1**	**32.8**	**yes**	**1.62**	**4.5**	**40**
9/18/2004 1:22	**4.85**	**yes**	**8.6**	**31.5**	**21.3**	**61.9**	**yes**	**3.71**	**15.5**	**43**
9/19/2004 15:36	**4.53**	**yes**	**2.5**	**8.7**	**6.1**	**33.4**	**yes**	**0.94**	**2.7**	**37**
9/23/2004 1:09	0.83	no	<1.0	-	-	77	insignificant	-	-	-
10/9/2004 4:57	6.95	yes	11.9	6.6	6.1	386.9	incomlete	-	-	-
10/16/2004 9:54	8.63	yes	6.9	4.5	3	166	malfunction	-	-	-
10/17/2004 7:02	2.32	yes	1.8	1.6	3	12.5	malfunction	-	-	-
10/17/2004 20:45	10.81	yes	10.9	8.1	9.1	11.4	malfunction	-	-	-
10/18/2004 16:58	3.68	yes	2	1.2	3	39.4	malfunction	-	-	-
10/20/2004 12:00	0.56	yes	1	2.2	3	39.3	malfunction	-	-	-
10/20/2004 23:54	6.06	yes	5.1	12.4	9.1	11.3	malfunction	-	-	-
10/21/2004 9:20	1.44	yes	1	3.2	3	3.4	malfunction	-	-	-
10/21/2004 17:33	0.1	yes	0.6	16.9	12.2	6.8	malfunction	-	-	-
10/22/2004 9:43	5.85	yes	6.4	2.3	3	16.1	malfunction	-	-	-
10/30/2004 15:51	**0.26**	**yes**	**1.8**	**9.8**	**6.1**	**192.3**	**yes**	**0.38**	**3.3**	**22**
10/31/2004 8:19	7.57	yes	1.3	1	3	16.2	insignificant	-	-	-
11/1/2004 21:40	1.19	yes	1	0.9	3	29.8	malfunction	-	-	-
11/2/2004 15:18	9.32	yes	6.6	2	3	16.3	malfunction	-	-	-
11/15/2004 22:04	**3.06**	**yes**	**2.8**	**1.7**	**3**	**309.6**	**yes**	**1.53**	**1.3**	**55**
11/18/2004 9:35	**1.14**	**yes**	**3.3**	**3.8**	**6.1**	**56.5**	**yes**	**1.36**	**4.2**	**41**
11/23/2004 23:27	**8.54**	**yes**	**13.7**	**4**	**3**	**132.7**	**yes**	**7.16**	**2**	**52**
11/24/2004 12:54	**6.17**	**yes**	**3.6**	**2.2**	**3**	**4.9**	**yes**	**1.1**	**1.4**	**31**
11/24/2004 23:33	**7.06**	**yes**	**7.4**	**2**	**3**	**4.5**	**yes**	**2.86**	**1.7**	**39**
11/25/2004 15:46	**0.99**	**yes**	**5.3**	**19.9**	**12.2**	**9.1**	**yes**	**3.6**	**8.3**	**67**

[1] Runoff Depth = Volume calculated by # of tips/contributing surface area

[2] average +/- CI, n = 17, α = 0.05

Bold events have been graphed

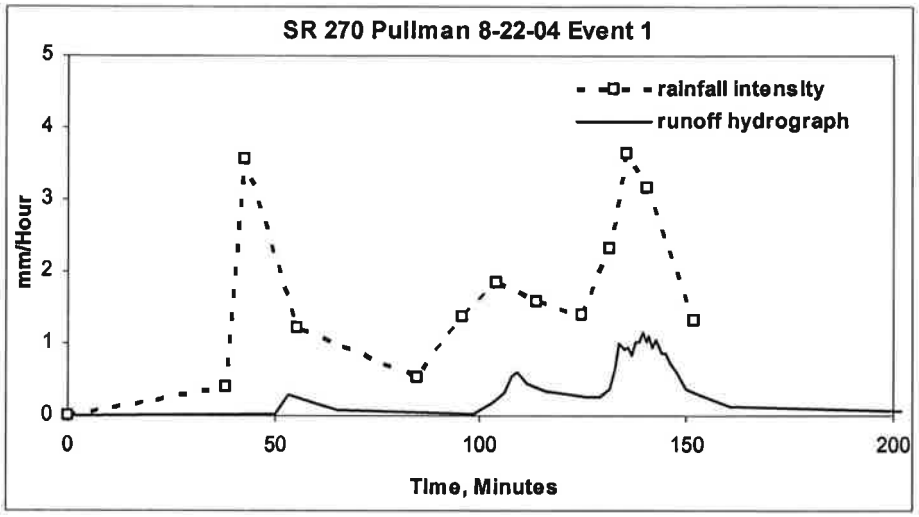


FIGURE C-1

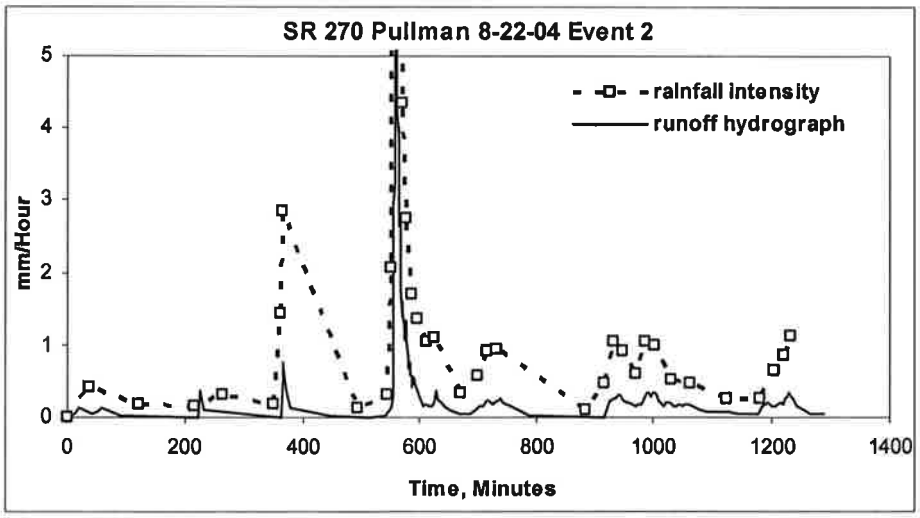


FIGURE C-2

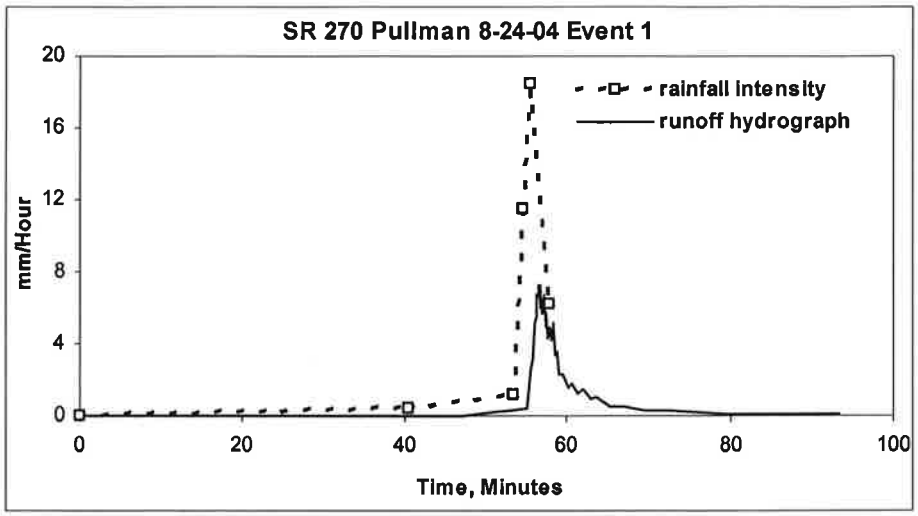


FIGURE C-3

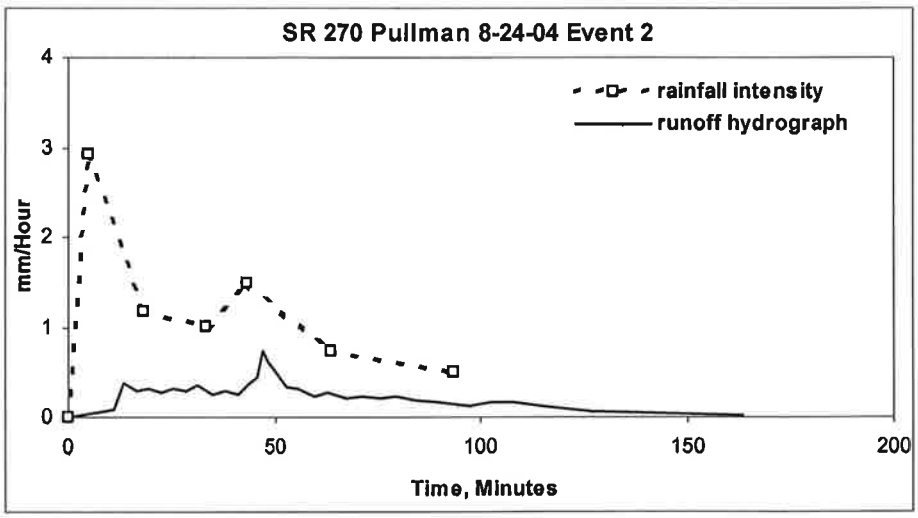


FIGURE C-4

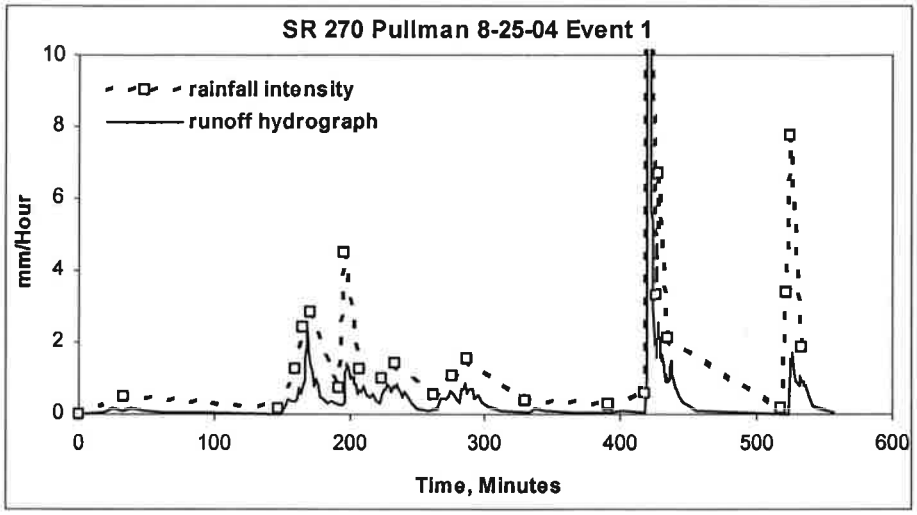


FIGURE C-5

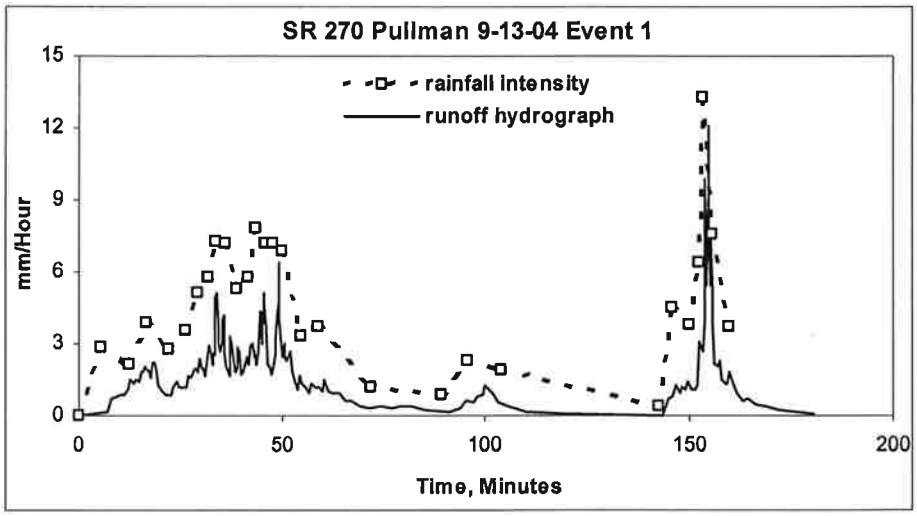


FIGURE C-6

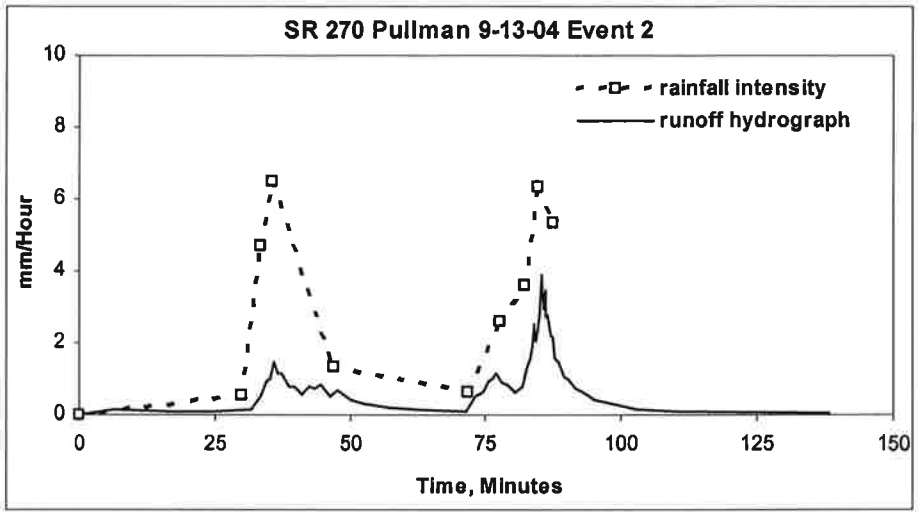


FIGURE C-7

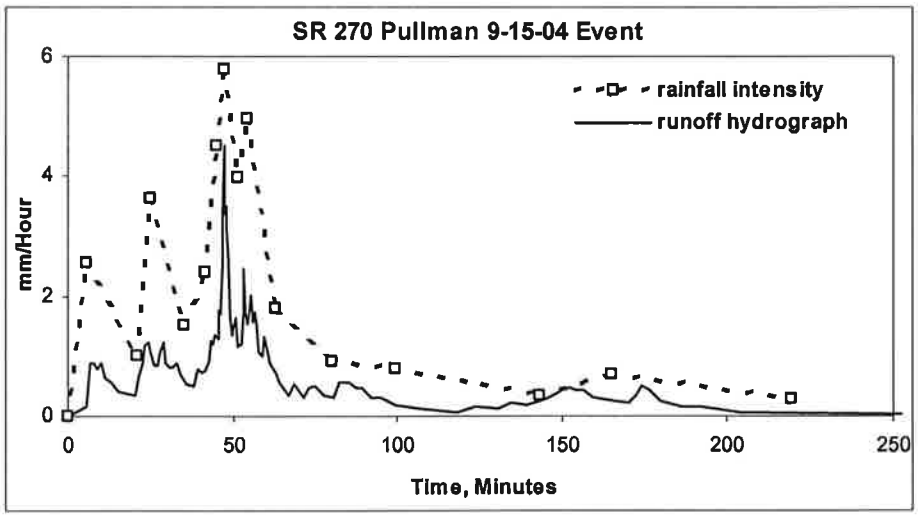


FIGURE C-8

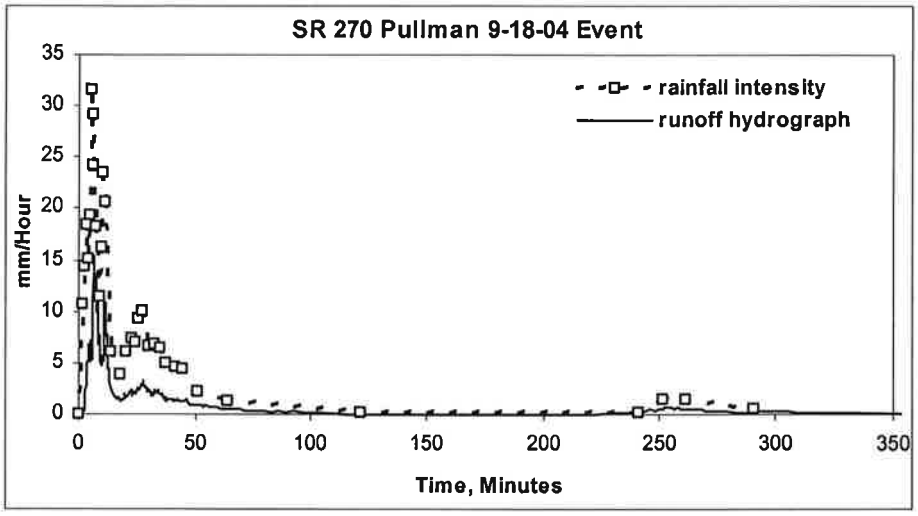


FIGURE C-9

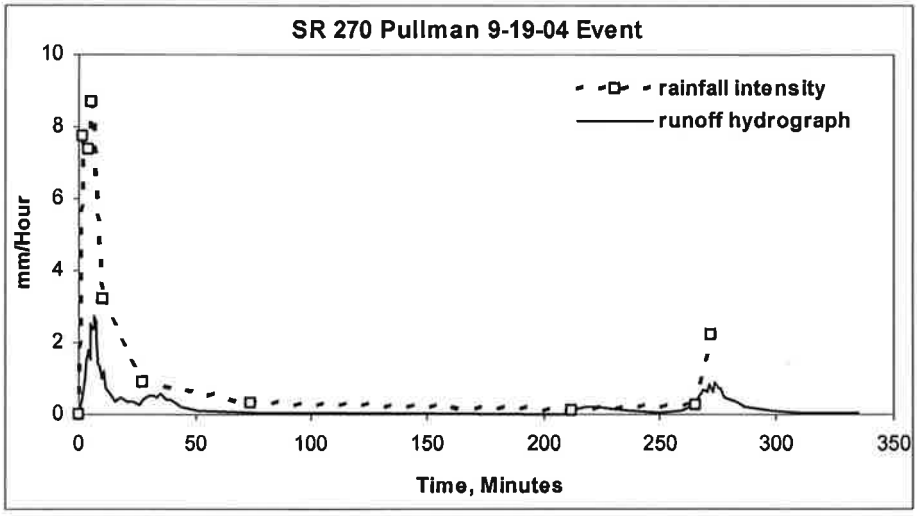


FIGURE C-10

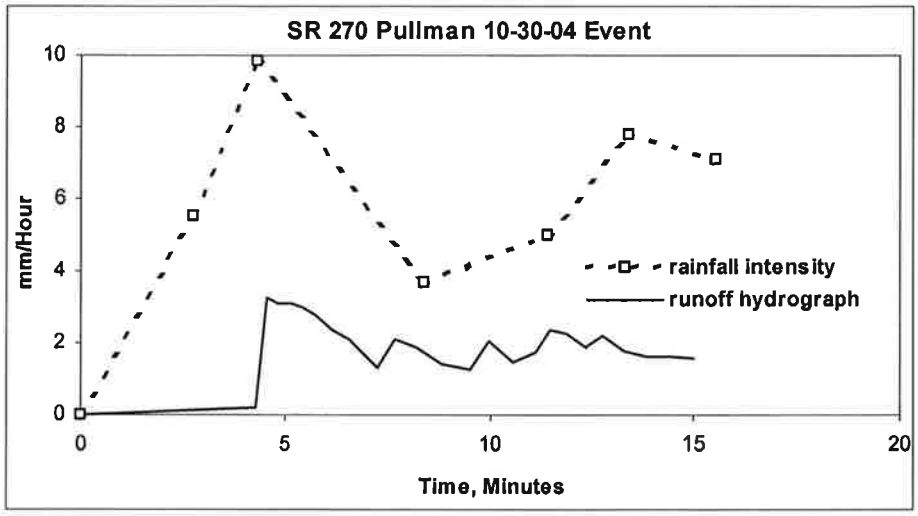


FIGURE C-11

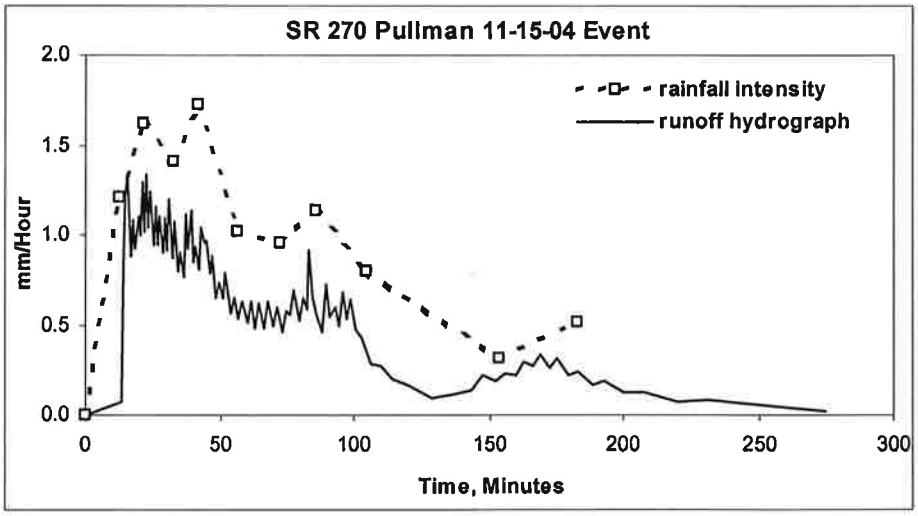


FIGURE C-12

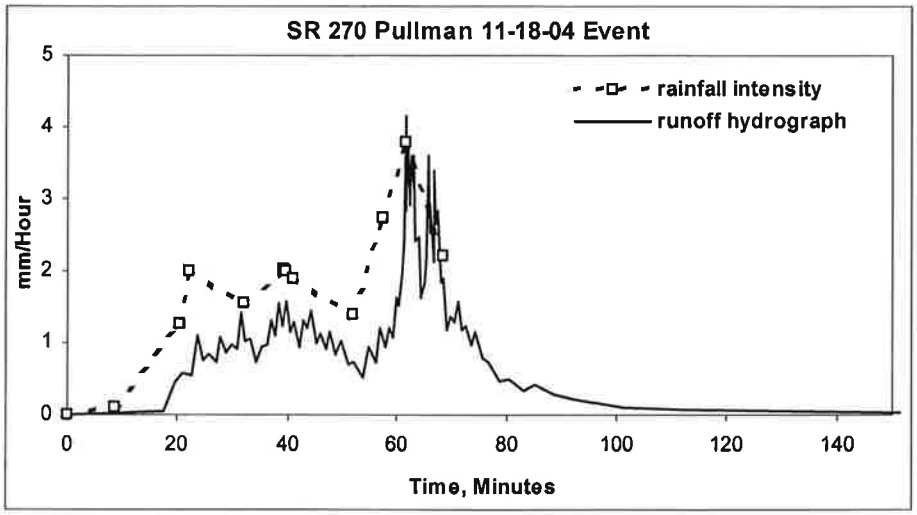


FIGURE C-13

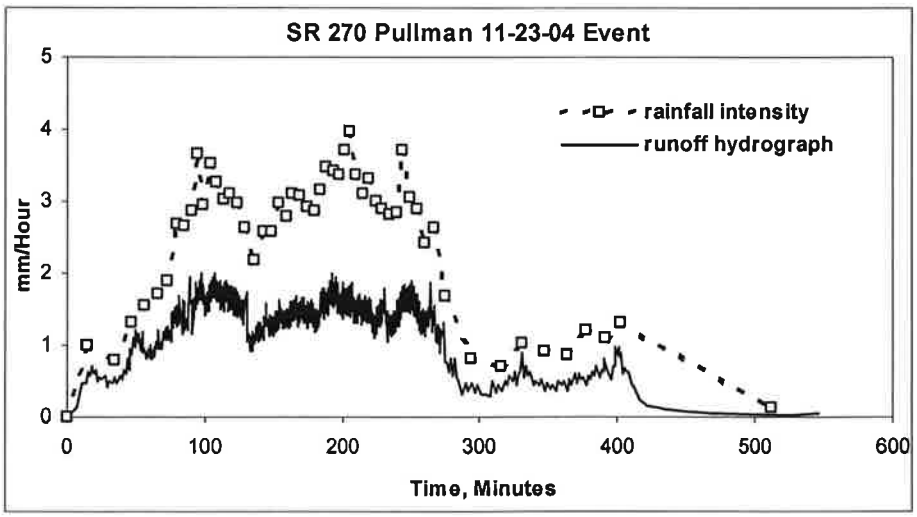


FIGURE C-14

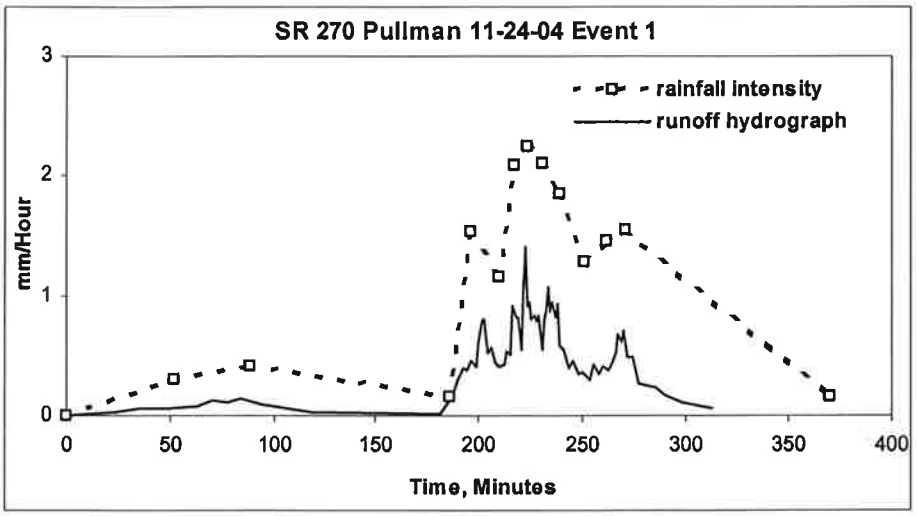


FIGURE C-15

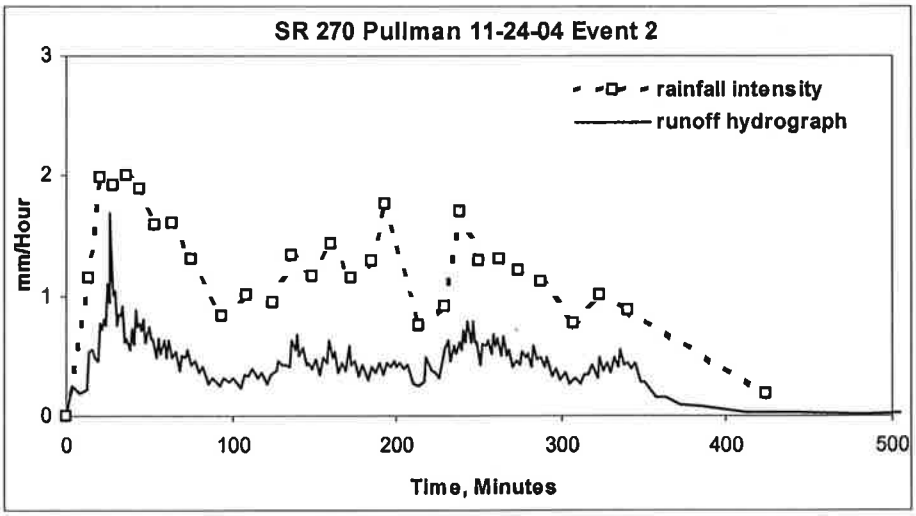


FIGURE C-16

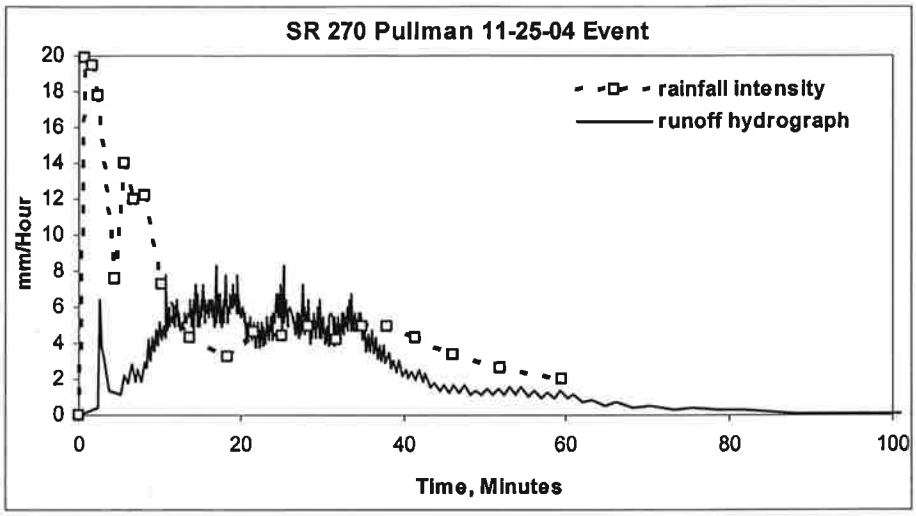

SR 270 Pullman 11-25-04 Event
rainfall intensity
runoff hydrograph
mm/Hour
20
18
16
14
12
10
8
6
4
2
0
0
20
40
60
80
100
Time, Minutes

FIGURE C-17

APPENDIX D

I 90 Hyetograph
&
Hydrograph Data

FIGURE D-1

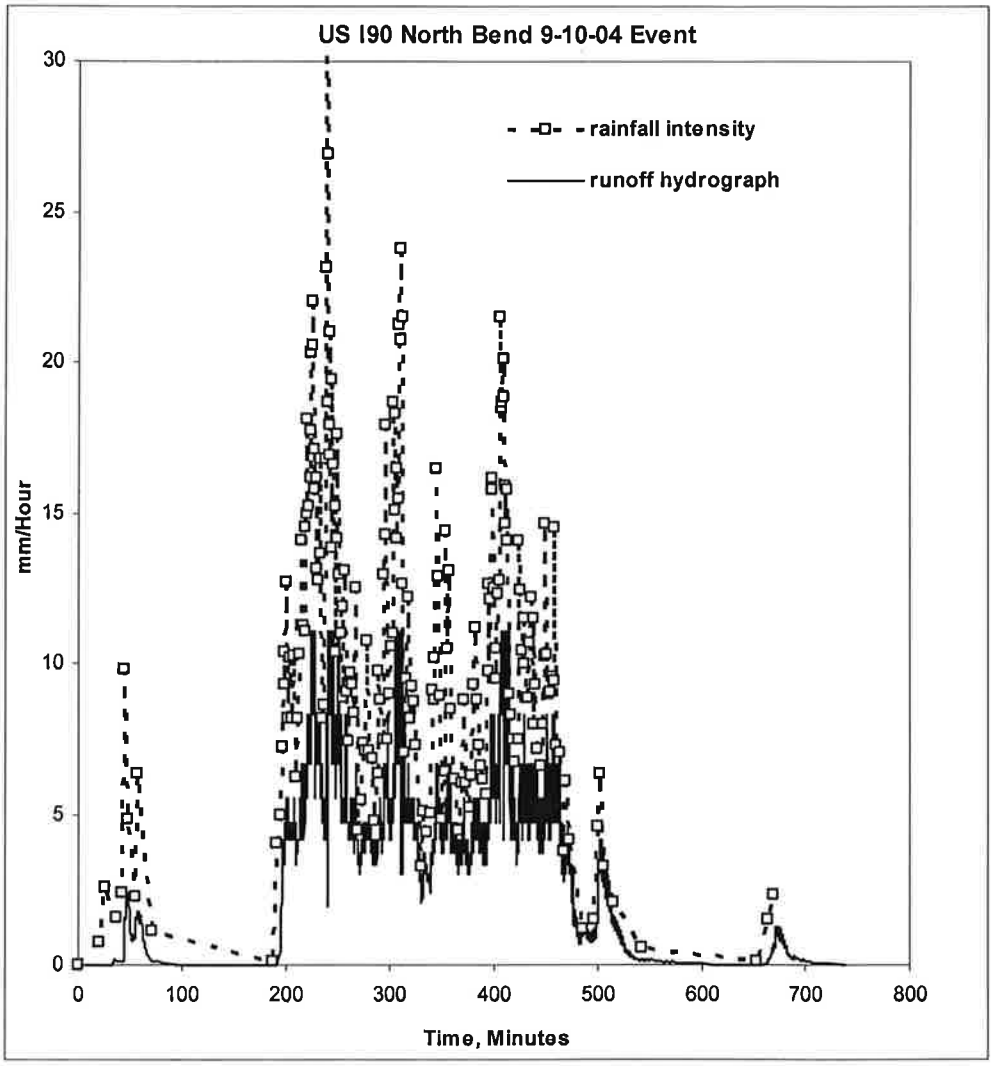

US I90 North Bend 9-10-04 Event
rainfall intensity
runoff hydrograph
mm/Hour
Time, Minutes
0
5
10
15
20
25
30
0
100
200
300
400
500
600
700
800

FIGURE D-2

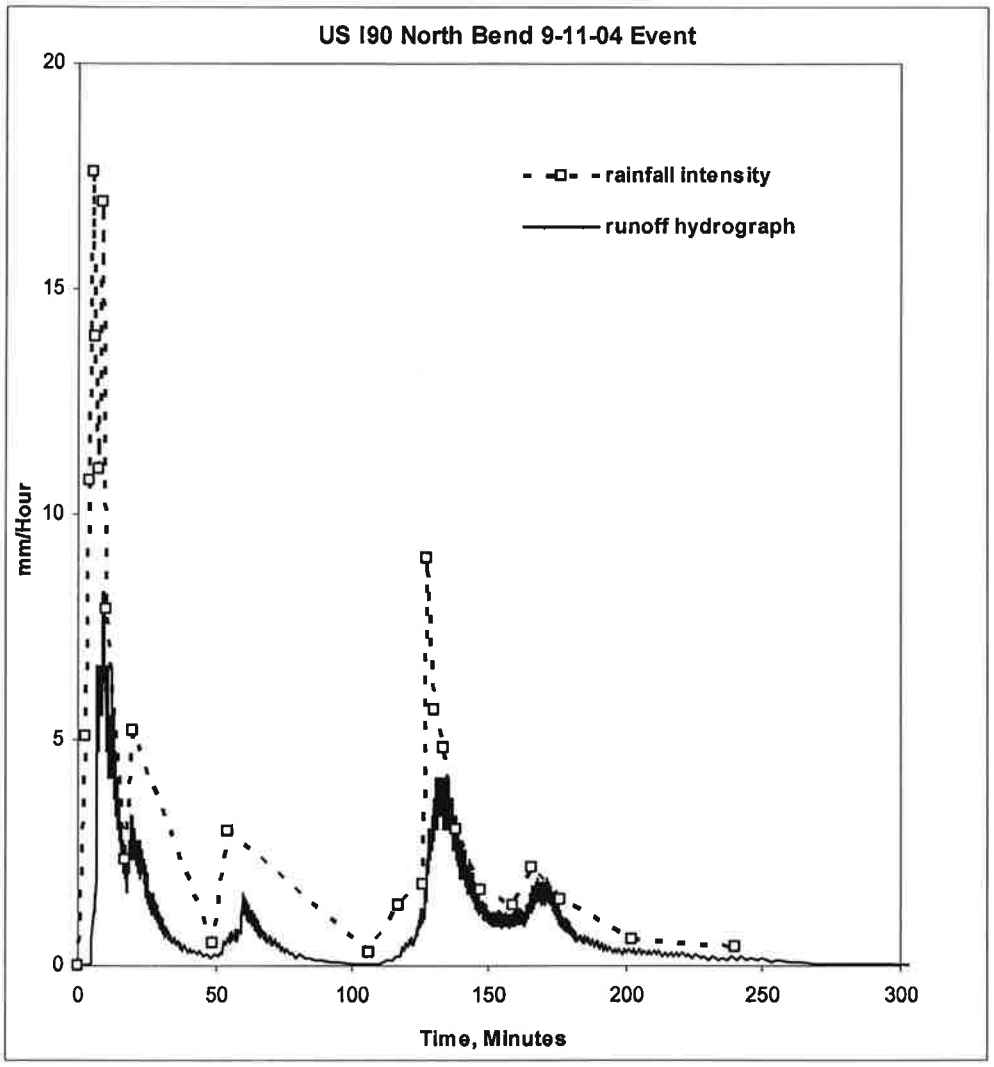

US I90 North Bend 9-11-04 Event
rainfall intensity
runoff hydrograph
mm/Hour
Time, Minutes
0
5
10
15
20
0
50
100
150
200
250
300

TABLE D-1

North Bend I90 Storm Event Log										
Date	Duration, Hours	Good Rainfall data?	Total Rainfall, mm	Peak Intensity, mm/hour	Peak 5 Minute Intensity, mm/hour	Antecedent Dry Period, hours	Good Hydrograph data?	Runoff Depth, mm[1]	Peak Runoff, mm/hour	% Captured (55% Average)
9/10/04 19:44	11.2	yes	51.31	32.08	18.29	3.5	yes	26.24	11.06	51
9/11/04 23:50	4.0	yes	6.35	17.58	12.19	16.9	yes	3.73	8.29	59

[1] Runoff Depth = Volume calculated by # of tips/contributing surface area

Bold events have been graphed

APPENDIX E

Tipping Bucket Flow Meter Calibration Data

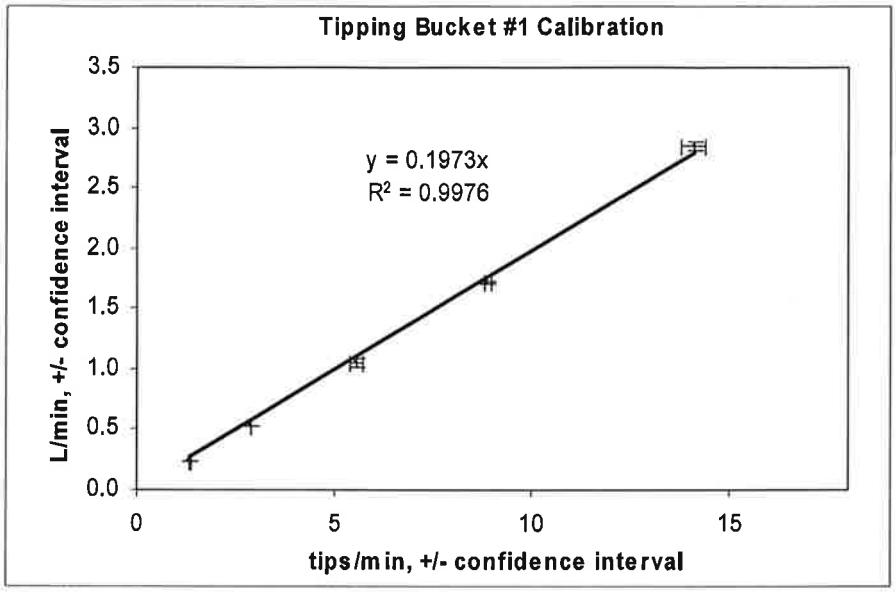


FIGURE E-1 Tipping bucket #1 L/min vs. tips/min. calibration

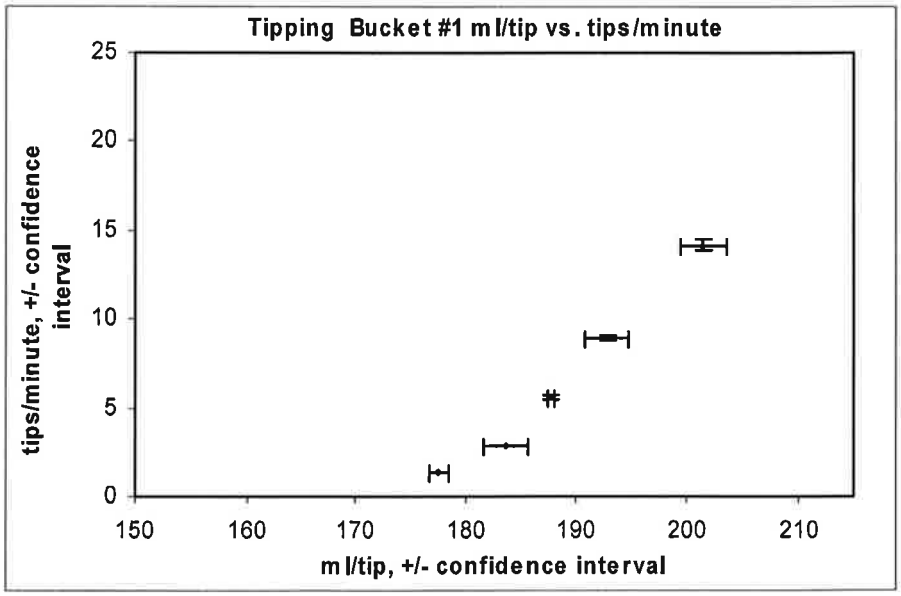


FIGURE E-2 Tipping bucket #1 ml/tip vs. tips/min. calibration

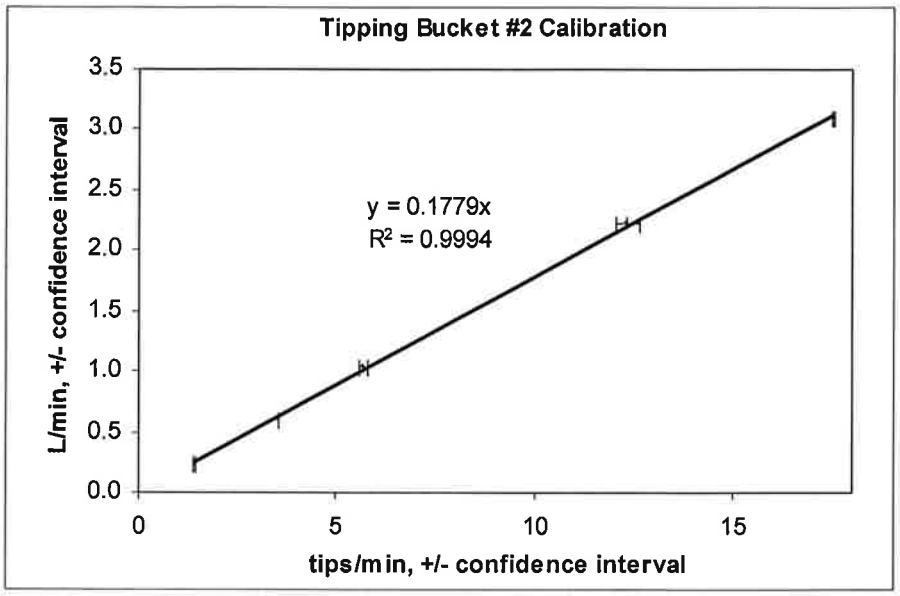


FIGURE E-3 Tipping bucket #2 L/min vs. tips/min. calibration

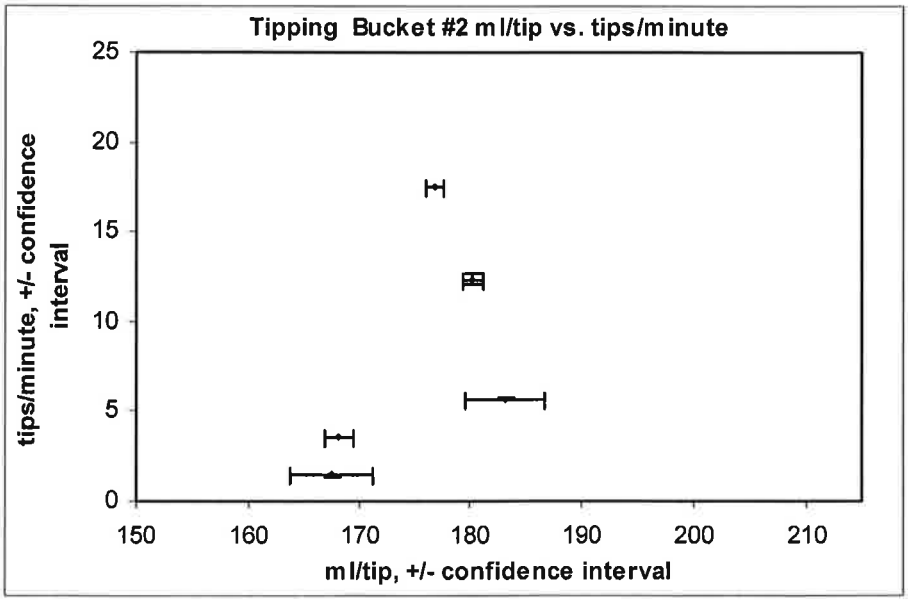


FIGURE E-4 Tipping bucket #2 ml/tip vs. tips/min. calibration

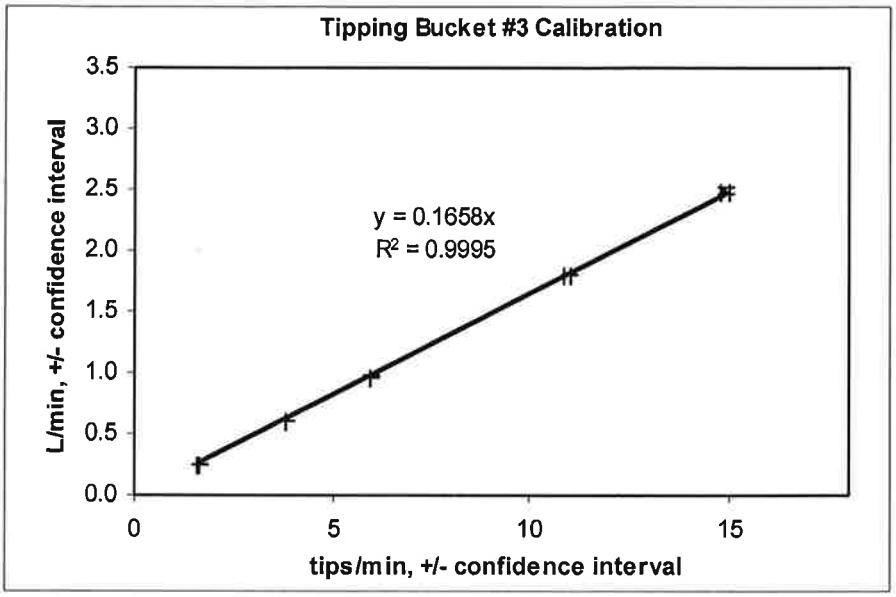


FIGURE E-5 Tipping bucket #3 L/min vs. tips/min. calibration

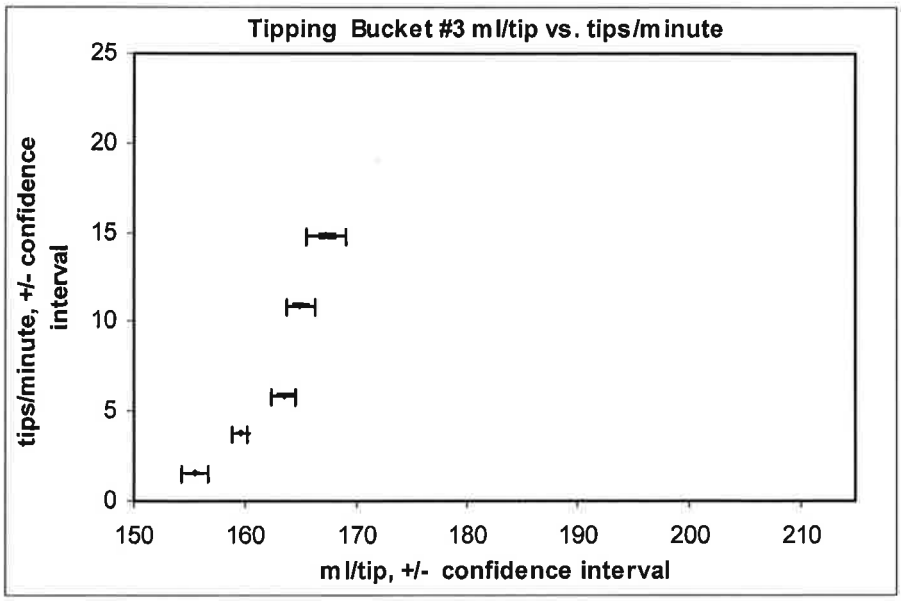


FIGURE E-6 Tipping bucket #3 ml/tip vs. tips/min. calibration

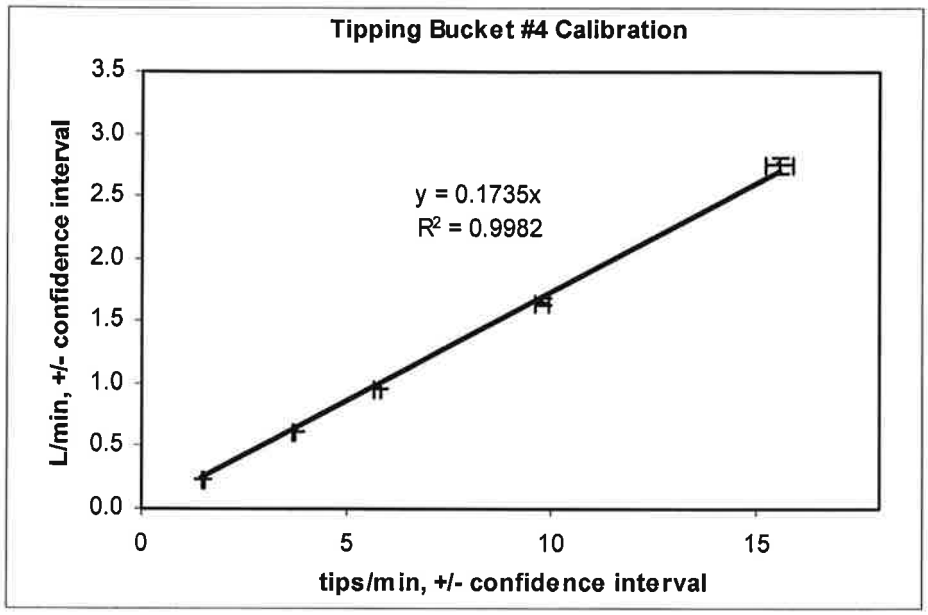


FIGURE E-7 Tipping bucket #4 L/min vs. tips/min. calibration

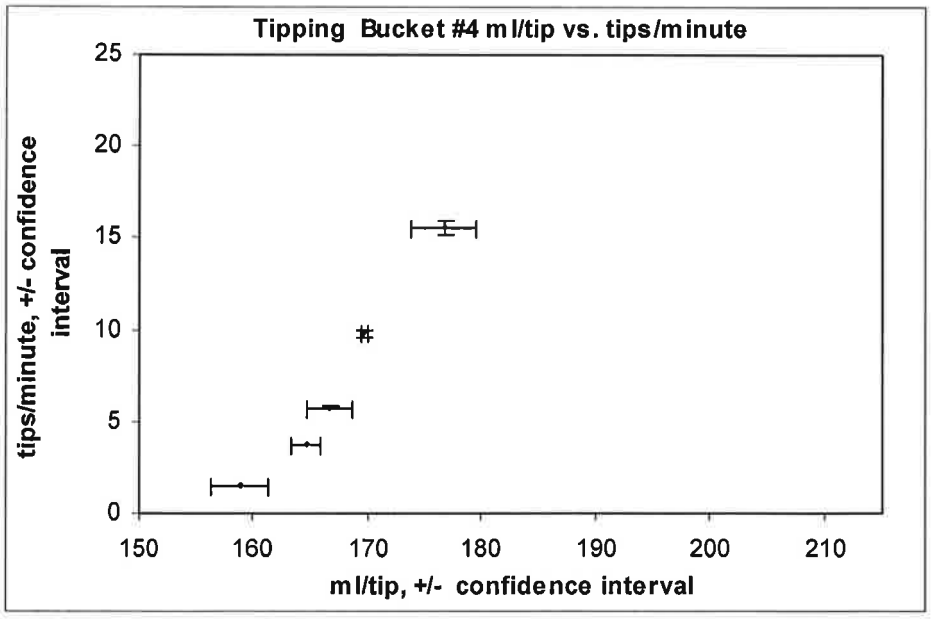


FIGURE E-8 Tipping bucket #4 ml/tip vs. tips/min. calibration

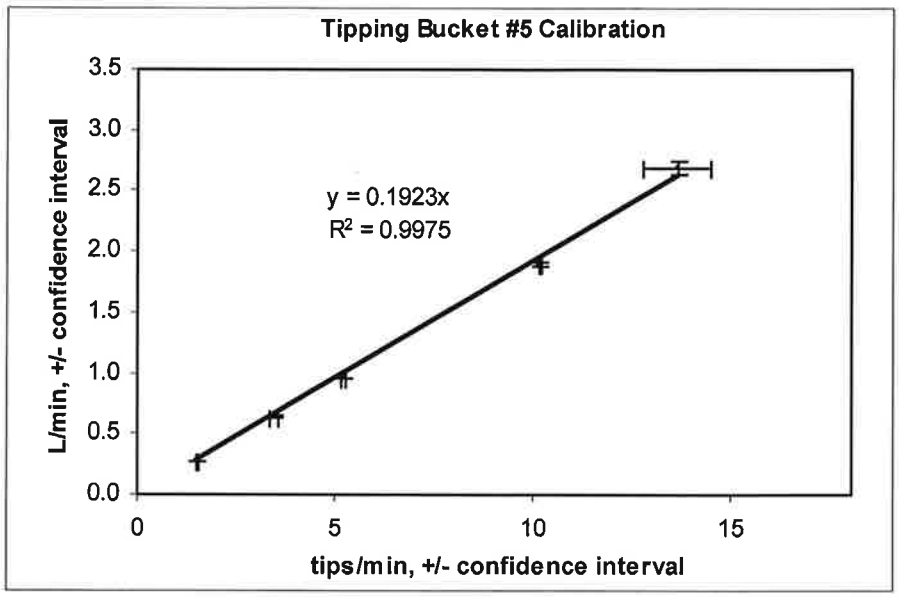


FIGURE E-9 Tipping bucket #5 L/min vs. tips/min. calibration

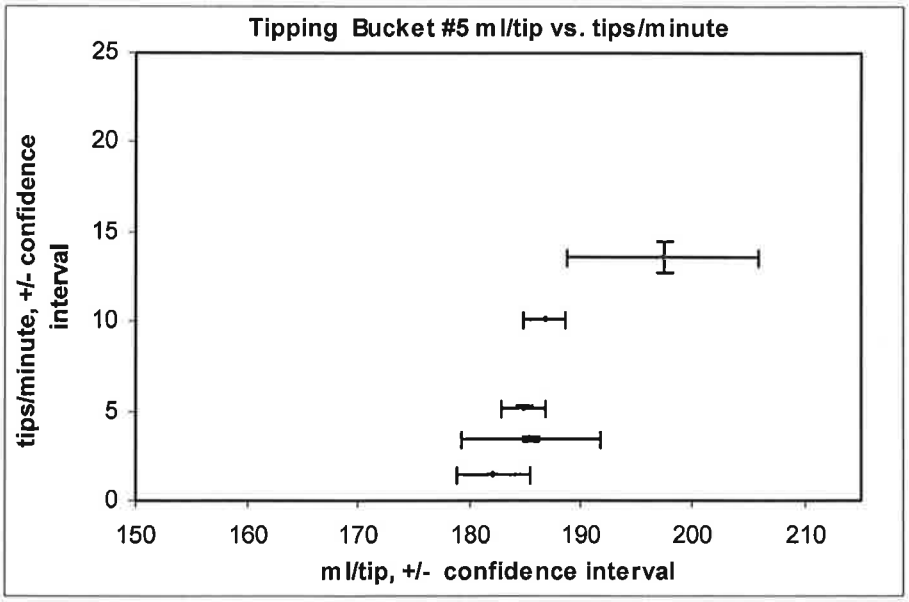


FIGURE E-10 Tipping bucket #5 ml/tip vs. tips/min. calibration

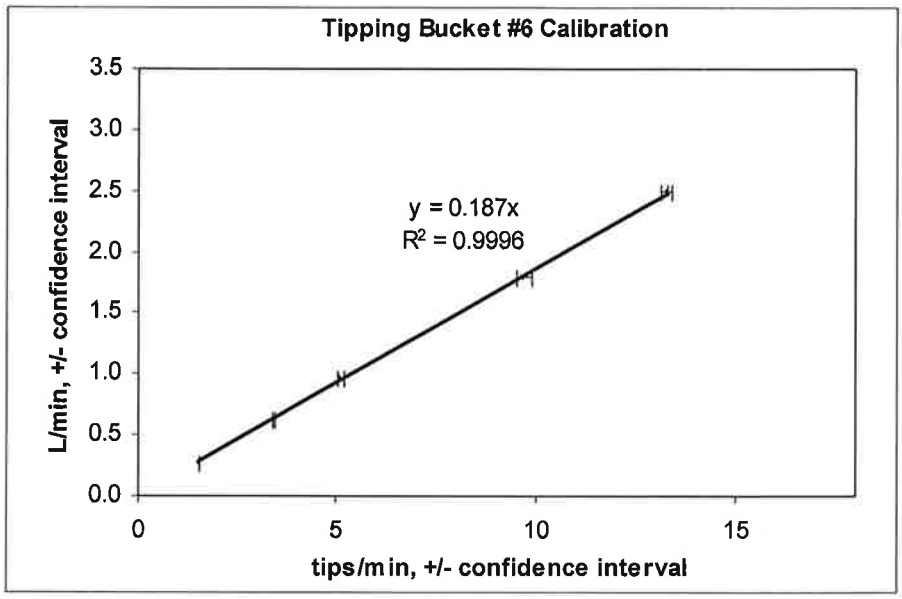


FIGURE E-11 Tipping bucket #6 L/min vs. tips/min. calibration

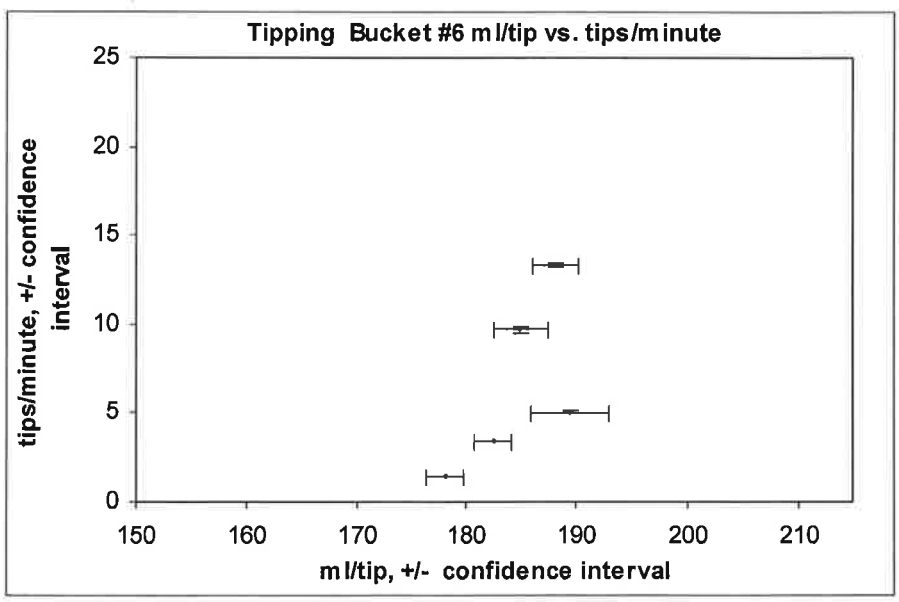


FIGURE E-12 Tipping bucket #6 ml/tip vs. tips/min. calibration

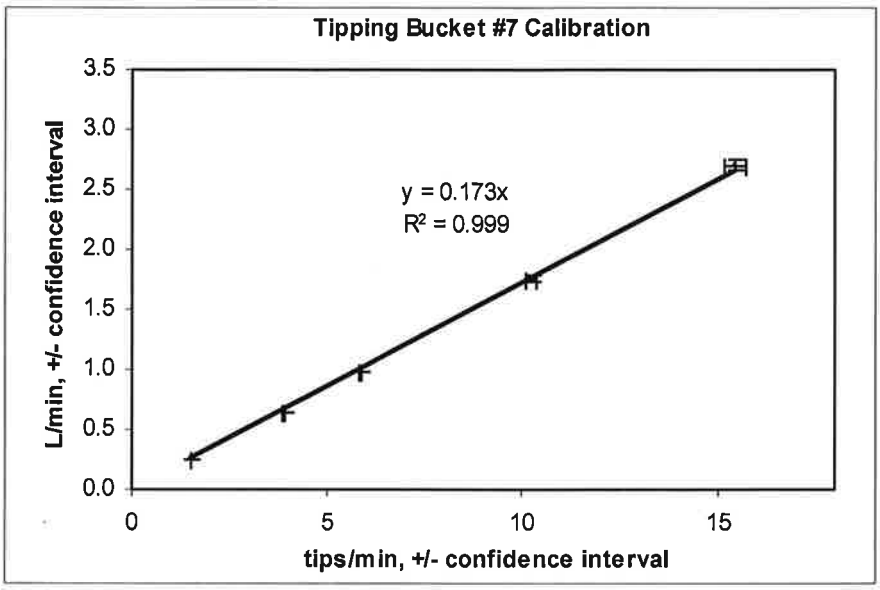


FIGURE E-13 Tipping bucket #7 L/min vs. tips/min. calibration

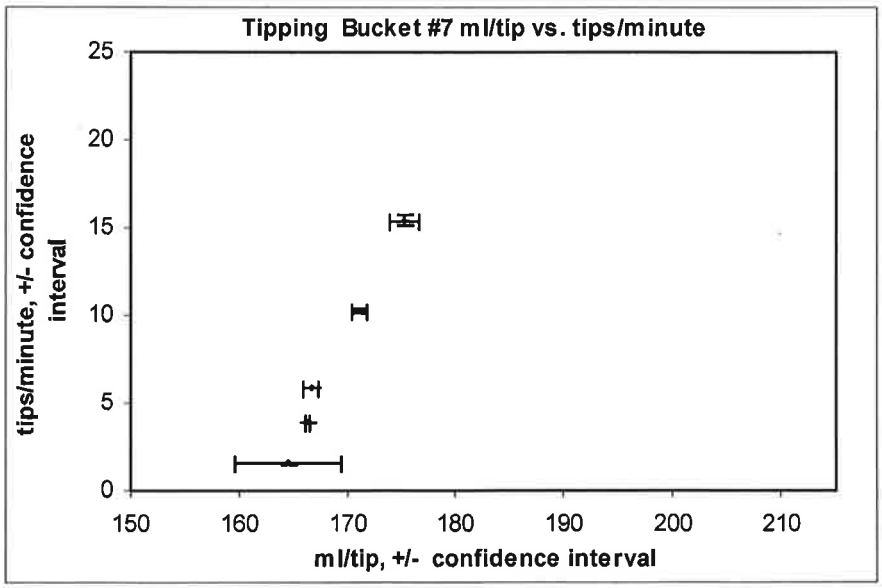


FIGURE E-14 Tipping bucket #7 ml/tip vs. tips/min. calibration

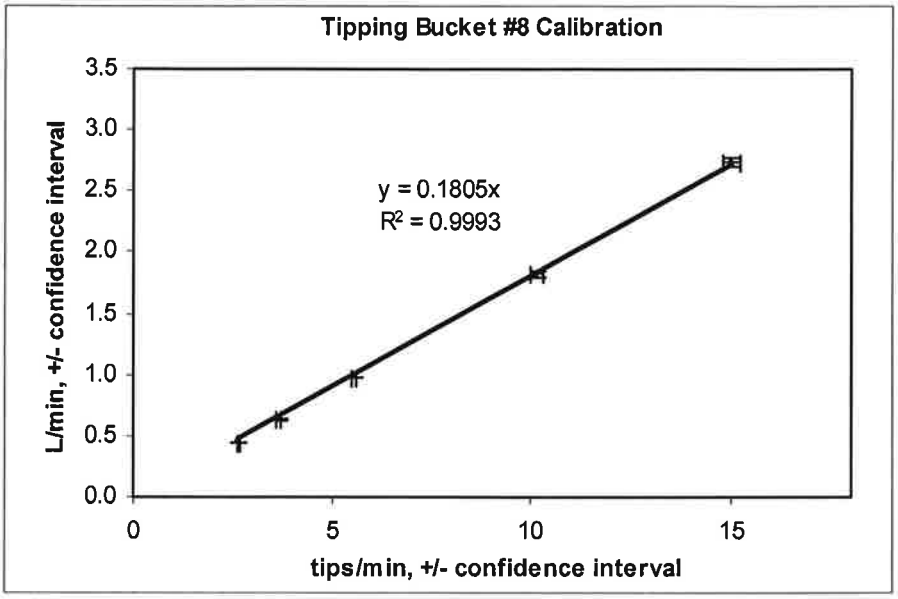


FIGURE E-15 Tipping bucket #8 L/min vs. tips/min. calibration

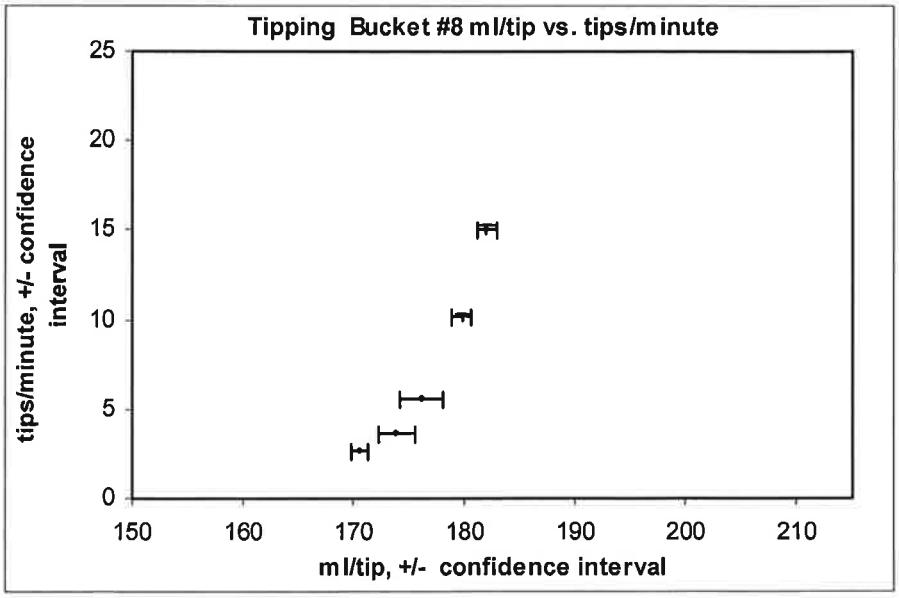


FIGURE E-16 Tipping bucket #8 ml/tip vs. tips/min. calibration

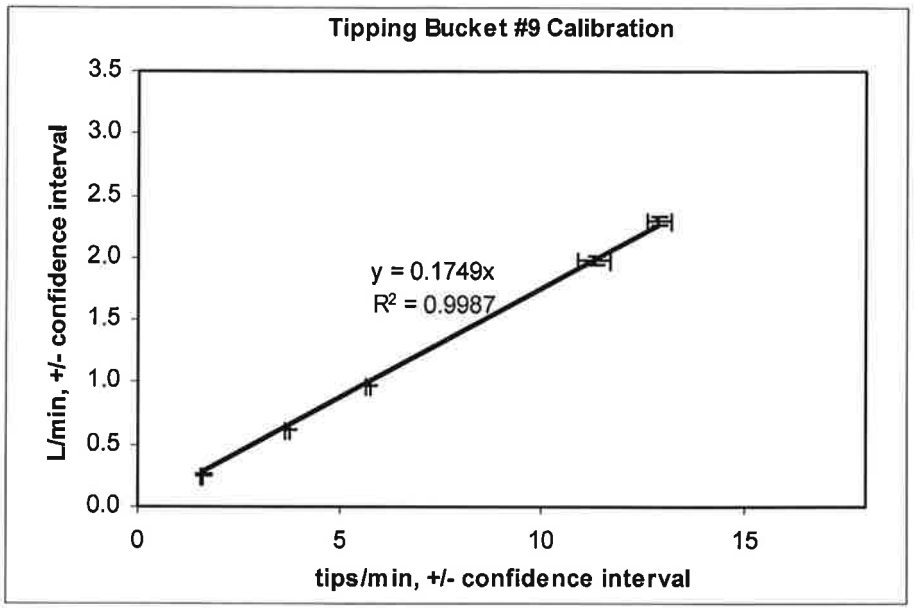


FIGURE E-17 Tipping bucket #9 L/min vs. tips/min. calibration

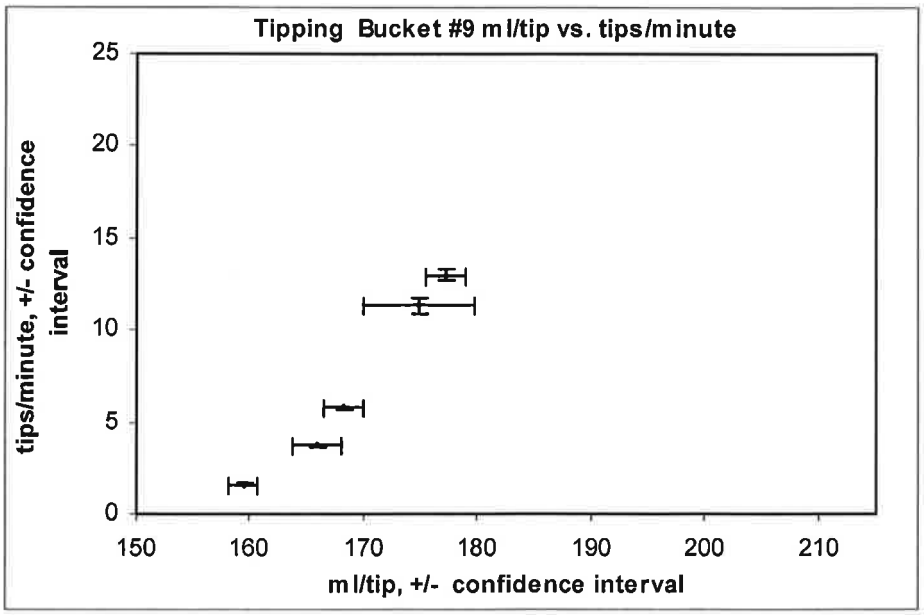


FIGURE E-18 Tipping bucket #9 ml/tip vs. tips/min. calibration

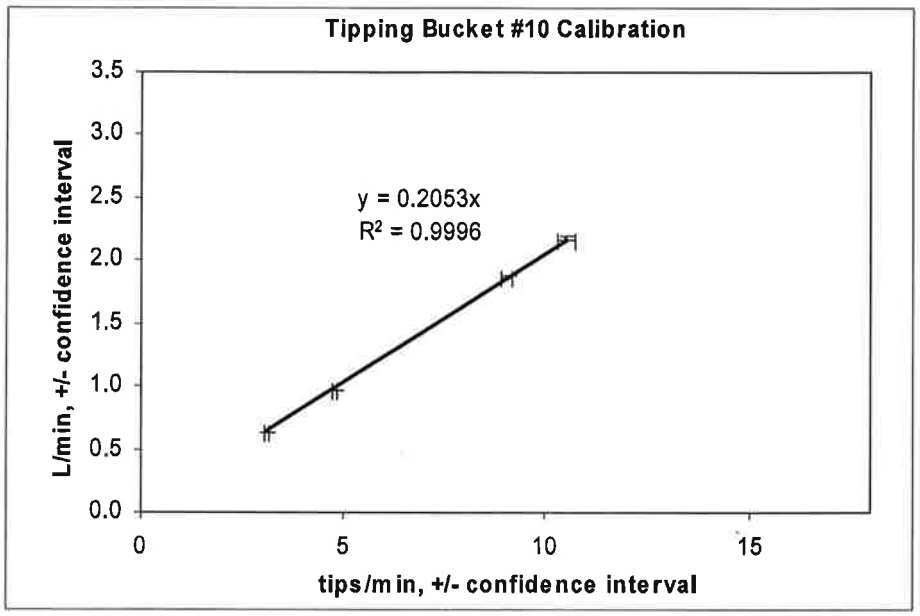


FIGURE E-19 Tipping bucket #10 L/min vs. tips/min. calibration

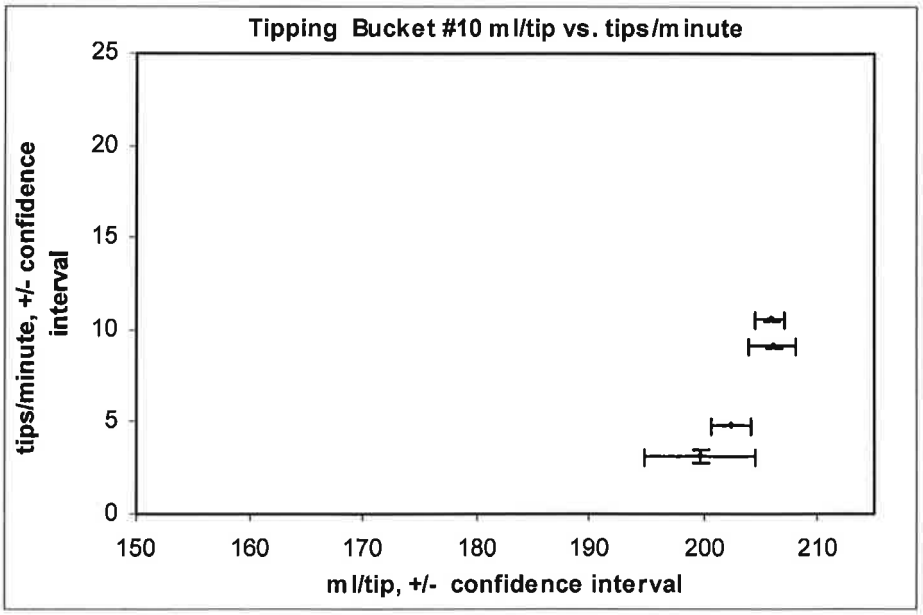


FIGURE E-20 Tipping bucket #10 ml/tip vs. tips/min. calibration

APPENDIX F

Field Hydraulic Conductivity Measurement Data

Fine Grading for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 2 Simulation/Remote Site	B			

Initial Sample Mass (prior to splitting, See AASHTO T2) **Lbs**

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	128.1 g	3. Mass (Wt.) of Moisture (1) - (2) =	2.5 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	125.6 g	4. Percent of Moisture [(3) / (2)] x 100 =	2.0 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1	/	x 100 =	#DIV/0!	SE#2	/	x 100 =	#DIV/0!
Average Sand Equivalent			#DIV/0!	Sand Equivalent Specification from Std. Spec.			

Aggregate Gradation

Initial Dry Mass = 125.6 g **Split Fines - Coarse = 125.0 g**

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		% Passing
3/8"		g	%	
#4	0.6	0.6 g	0 %	
#6		0.6 g	0 %	100 %
# 8		0.6 g	0 %	100 %
#10	8.3	8.9 g	7 %	93 %
#16		8.9 g	7 %	93 %
#20	39.0	47.9 g	38 %	62 %
#40	40.1	88.0 g	70 %	30 %
#50		88.0 g	70 %	30 %
#80		88.0 g	70 %	30 %
#100	15.9	103.9 g	83 %	17 %
# 200	6.6	110.5 g	88.0 %	12.0 %
#270	2.7	113.2 g	90.1 %	9.9 %
*Pan	11.9			
#450	3.0	116.2 g	92.5 %	7.5 %
#635	1.8	118.0 g	93.9 %	6.1 %

*Pan is washed thru the #450 and #635 sieves, use of aerosol ot may be helpful.

Wood Waste

% % Max.

Dust Ratio = 0.075 mm(#200) / 0.425 mm(#40)

12.0 / 29.9 = 0.40

Comments:

Tester's Signature	Date	Checked By	Date
bill richards	12/9/2004		

Combined Gradation for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 2 Simulation/Remote Site				

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	5627.6 g	3. Mass (Wt.) of Moisture (1) - (2) =	9.3 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	5618.3 g	4. Percent of Moisture [(3) / (2)] x 100 =	0.2 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1		/		x 100 =	#DIV/0!	SE#2		/	9.8	x 100 =
Average Sand Equivalent					#DIV/0!	Sand Equivalent Specification from Std. Spec.				

Aggregate Gradation

Initial Dry Mass = (See # 2 Above) 5618.3 g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		Percent Passing
	g	g	%	100 %
1 1/2	176.1 g	176.1 g	3 %	97 %
1 1/4	g	176.1 g	3 %	97 %
1"	g	176.1 g	3 %	97 %
3/4	55.3 g	231.4 g	4 %	96 %
5/8	g	231.4 g	4 %	96 %
1/2	84.7 g	316.1 g	6 %	94 %
3/8	48.3 g	364.4 g	6 %	94 %
1/4	g	364.4 g	6 %	94 %
#4	191.9 g	556.3 g	10 %	90 %
Pan = (M1)	5062.0 g			
M2 = Split from Fine grading	125 g			
Corrected Fine Aggregate Pan M2+(M2 x C / M1) =	125.0 g			
#6	x (f) 40.50 = g	556.3 g	10 %	90 %
#8	x (f) 40.50 = g	556.3 g	10 %	90 %
#10	8.3 x (f) 40.50 = 336.1 g	892.4 g	16 %	84 %
#16	x (f) 40.50 = g	892.4 g	16 %	84 %
#20	39.0 x (f) 40.50 = 1579.3 g	2471.8 g	44 %	56 %
#40	40.1 x (f) 40.50 = 1623.9 g	4095.7 g	73 %	27 %
#50	x (f) 40.50 = g	4095.7 g	73 %	27 %
#80	x (f) 40.50 = g	4095.7 g	73 %	27 %
#100	15.9 x (f) 40.50 = 643.9 g	4739.5 g	84 %	16 %
#200	6.6 x (f) 40.50 = 267.3 g	5006.8 g	89.1 %	10.9 %
#270	2.7 x (f) 40.50 = 109.3 g	5116.1 g	91.1 %	8.9 %
#450	3.0 x (f) 40.50 = 121.5 g	5237.6 g	93.2 %	6.8 %
#635	1.8 x (f) 40.50 = 72.9 g	5310.5 g	94.5 %	5.5 %
		5310.5 g		
Corrected Pan	125.0 x (f) 40.50 = 5062.0 g	5618.3 g		

C = (% passing #635/100)x Initial Dry Mass 307.77 g

Gradation Adjustment Factor (f) = M1 / M2 = 40.496

Wood Waste

% % Max.

Comments:

Tester's Signature:	Date	Checked By	Date
bill richards	12/9/2004		

Particle Size Distribution Analysis (Site US-2)

$$data_s := \begin{pmatrix} 5.5 & .020 \\ 6.8 & .032 \\ 8.9 & .053 \\ 10.9 & .075 \\ 16 & .150 \\ 27 & .425 \\ 56 & .850 \\ 84 & 2.00 \\ 90 & 4.75 \\ 94 & 9.5 \\ 94.01 & 12.5 \\ 96 & 19.0 \\ 97 & 37.5 \\ 100 & 75 \end{pmatrix}$$

First column of data shows cumulative percent finer. Second column of data shows particle sizes, mm.

Percent Finer: $Perc := data_s^{\langle 0 \rangle}$

Particle Sizes, mm: $Diam := data_s^{\langle 1 \rangle}\ mm$

Percent in size class: $N := length(Perc) - 1$ $\quad N = 13$

$i := 1..N$

$pct_i := Perc_i - Perc_{i-1}$

Geometric mean sizes: $dm_i := \sqrt{Diam_i \cdot Diam_{i-1}}$

Calculation of characteristic diameters using curve fitting method

$P := 0, 1..100$ Range of values for plotting

$Curve(P) := linterp(Perc, Diam, P)$ Interpolation function for desired sizes

$d_{10} := Curve(10)$ $\quad d_{30} := Curve(30)$ $\quad d_{60} := Curve(65)$ $\quad d_{50} := Curve(50)$

$d_{84} := Curve(84)$ $\quad d_{90} := Curve(90)$ $\quad d_{16} := Curve(16)$ $\quad fines := data_{s_{3,0}}$

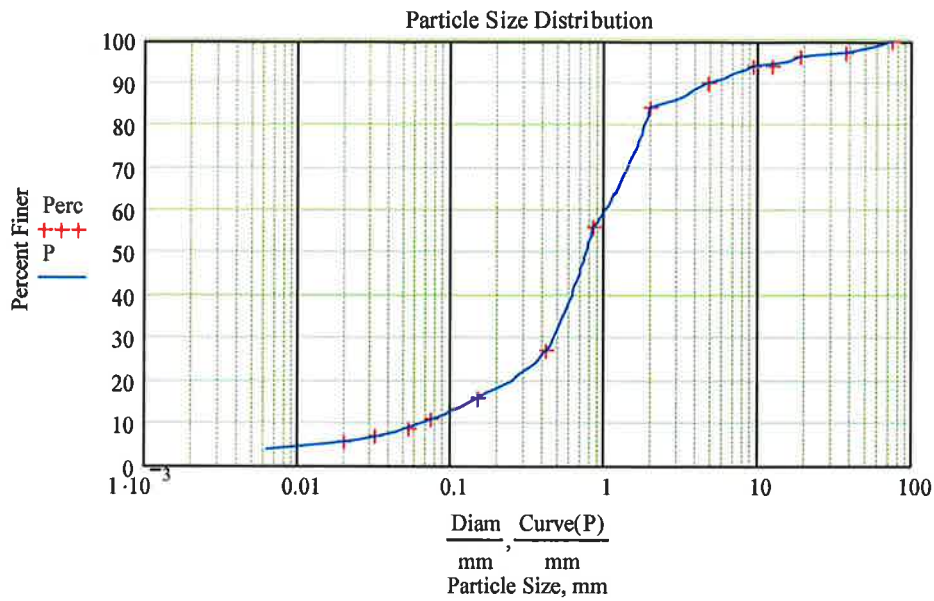
$d_{10} = 0.07mm$ $\quad d_{30} = 0.47mm$ $\quad d_{60} = 1.22mm$ $\quad fines = 10.9$

$d_{84} = 2mm$ $\quad d_{90} = 4.75mm$

Massman Modified D_{10} Infiltration Analysis

$$K_{sat} := 10^{\left(-1.57 + 1.90 \cdot \frac{d_{10}}{mm} + 0.015 \cdot \frac{d_{60}}{mm} - 0.013 \cdot \frac{d_{90}}{mm} - 2.08 \cdot \frac{fines}{100}\right)} \cdot \frac{cm}{sec}$$

$K_{sat} = 0.02 \frac{cm}{sec}$ $\quad K_{sat} = 691.54 \frac{mm}{hr}$ $\quad K_{sat} = 27.23 \frac{in}{hr}$



Percent in size class:

pct =

	0
0	0
1	1.3
2	2.1
3	2
4	5.1
5	11
6	29
7	28
8	6
9	4
10	0.01
11	1.99
12	1
13	3

Geometric mean sizes:

dm =

	0
0	0
1	0.03
2	0.04
3	0.06
4	0.11
5	0.25
6	0.6
7	1.3
8	3.08
9	6.72
10	10.9
11	15.41
12	26.69
13	53.03

mm

Calculation of mean particle size:

$$d_m := \sum_i \frac{dm_i \cdot pct_i}{100}$$

$$d_m = 3.19\text{mm}$$

Geometric standard deviation:

$$\sigma_g := \sqrt{\frac{d_{84}}{d_{16}}} \qquad \sigma_g = 3.65$$

Gradation Coefficient:

$$G := 0.5 \cdot \left(\frac{d_{84}}{d_{50}} + \frac{d_{50}}{d_{16}} \right) \qquad G = 3.85$$

Project	Natural Dispersion Research		
	US 2 Rainfall Simulation/Remote Site		
Project No.			
Boring No.			
Sample No.	B	depth	
Station	US 2	Offset	

US Sieve (in / #)	Metric Sieve (mm)	Percent Passing
6	152.5	
4	101.6	
2	50.8	
1 1/2	38.1	97
1 1/4	31.75	
3/4	19.05	96
3/8	9.5	94
4	4.75	90
10	2	84
20	0.85	56
40	0.425	27
100	0.15	16
200	0.075	10.9
270	0.053	8.9
450	0.032	6.8
635	0.02	5.5

	D10 (mm)	Infiltration Rate (in/hr)	Infiltration Rate (cm/sec)
2001 DOE	0.070	1.2	8.70E-04
Silty Inflow, Lower Bound	0.070	0.3	1.85E-04
Filtered Inflow, Upper Bound	0.070	4.6	3.25E-03
98 WSDOT	0.070	1.7	1.19E-03
Average Value	0.070	2.0	1.44E-03

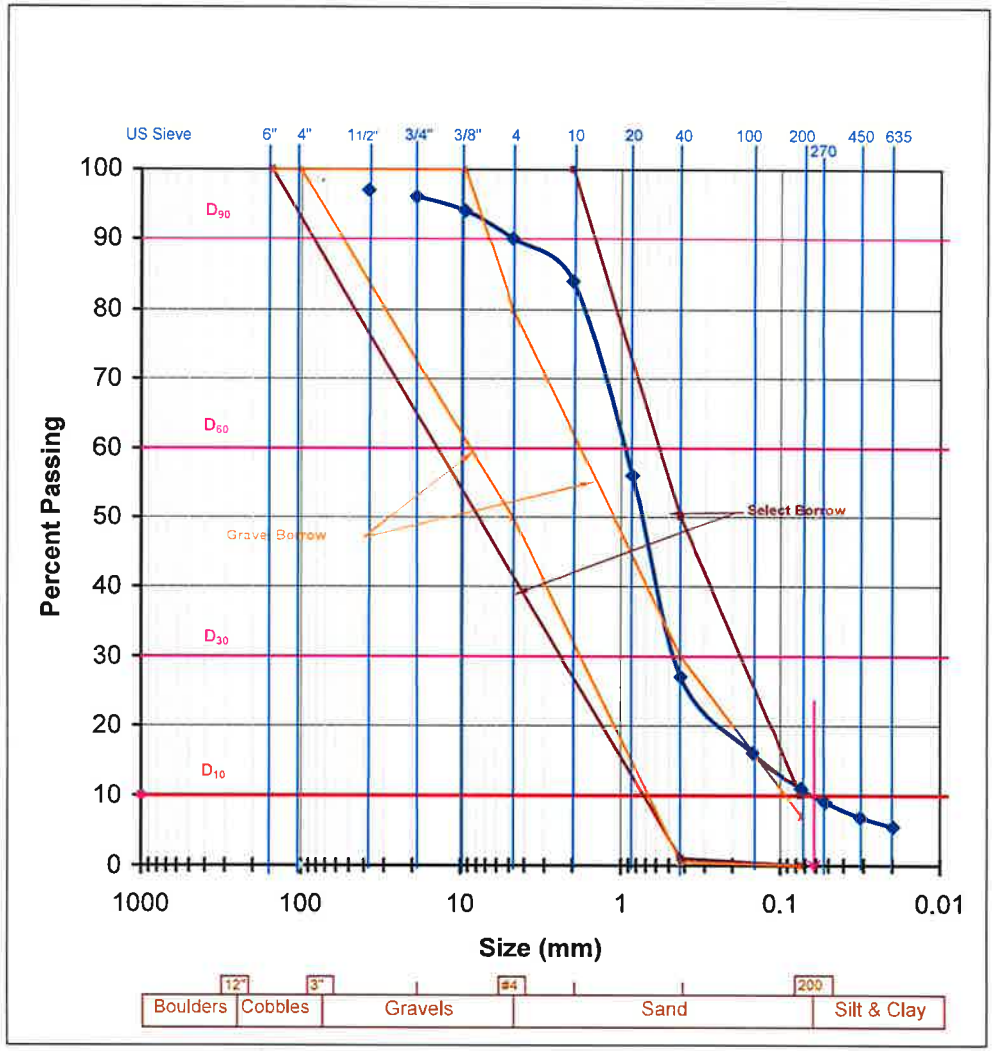
		Hydraulic Conductivity	
		in/hr	cm/sec
2003 WSDOT	K sat=	27.8	1.96E-02

D90 (mm)	4.75
D60 (mm)	1.22
D30 (mm)	0.47
D10 (mm)	0.07

Coefficient of Uniformity	Cu =	17.43
Coefficient of Gradation	Cc =	2.58

Water Content	W =	
Liquid Limit	LL =	
Plastic Limit	PL =	
Plasticity Index	PI =	

Soil Classification	GM



Fine Grading for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 395 Rainfall Simulation "A"	A1			

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	115.2 g	3. Mass (Wt.) of Moisture (1) - (2) =	1.5 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	113.7 g	4. Percent of Moisture [(3) / (2)] x 100 =	1.3 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1	/	x 100 =	#DIV/0!	SE#2	/	x 100 =	#DIV/0!
Average Sand Equivalent			#DIV/0!	Sand Equivalent Specification from Std. Spec.			

Aggregate Gradation

Initial Dry Mass = 113.7 g **Split Fines - Coarse = 102.6 g**

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		% Passing
3/8"		g	%	
#4	11.1	11.1 g	10 %	
#6		11.1 g	10 %	90 %
# 8		11.1 g	10 %	90 %
#10	15.8	26.9 g	24 %	76 %
#16		26.9 g	24 %	76 %
#20	20.7	47.6 g	42 %	58 %
#40	17.6	65.2 g	57 %	43 %
#50		65.2 g	57 %	43 %
#80		65.2 g	57 %	43 %
#100	22.1	87.3 g	77 %	23 %
# 200	8.6	95.9 g	84.3 %	15.7 %
#270	3.6	99.5 g	87.5 %	12.5 %
*Pan	14.2			
#450	5.3	104.8 g	92.2 %	7.8 %
#635	3.2	108.0 g	95.0 %	5.0 %

*Pan is washed thru the #450 and #635 sieves, use of aerosol ot may be helpful.

Wood Waste % % Max.

Dust Ratio = 0.075 mm(#200) / 0.425 mm(#40)

15.7 / 42.7 = 0.37

Comments:

Tester's Signature	Date	Checked By	Date
bill richards	12/7/2004		

Combined Gradation for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 395 Rainfall Simulation "A"	A			

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	5688.2 g	3. Mass (Wt.) of Moisture (1) - (2) =	67.3 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	5620.9 g	4. Percent of Moisture [(3) / (2)] x 100 =	1.2 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1		/		x 100 =	#DIV/0!	SE#2		/	9.8	x 100 =

Average Sand Equivalent #DIV/0! Sand Equivalent Specification from Std. Spec.

Aggregate Gradation

Initial Dry Mass = (See # 2 Above) 5620.9 g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		Percent Passing	
	g	g	%	100	%
1 1/2	g	g	%	100	%
1 1/4	657.0 g	657.0 g	12 %	88	%
1"	g	657.0 g	12 %	88	%
3/4	238.6 g	895.6 g	16 %	84	%
5/8	g	895.6 g	16 %	84	%
1/2	182.6 g	1078.2 g	19 %	81	%
3/8	195.1 g	1273.3 g	23 %	77	%
1/4	g	1273.3 g	23 %	77	%
#4	420.1 g	1693.4 g	30 %	70	%
Pan = (M1)	3927.5 g				
M2 = Split from Fine grading	102.6 g				
Corrected Fine Aggregate Pan M2+(M2 x C / M1) =	102.6 g				

C = (% passing #635/100)x Initial Dry Mass 218.194 g

Gradation Adjustment Factor (f) = M1 / M2 = 38.280

#6	x (f) 38.28 =	g	1693.4 g	30 %	70	%
#8	x (f) 38.28 =	g	1693.4 g	30 %	70	%
#10	15.8 x (f) 38.28 =	604.8 g	2298.2 g	41 %	59	%
#16	x (f) 38.28 =	g	2298.2 g	41 %	59	%
#20	20.7 x (f) 38.28 =	792.4 g	3090.6 g	55 %	45	%
#40	17.6 x (f) 38.28 =	673.7 g	3764.3 g	67 %	33	%
#50	x (f) 38.28 =	g	3764.3 g	67 %	33	%
#80	x (f) 38.28 =	g	3764.3 g	67 %	33	%
#100	22.1 x (f) 38.28 =	846.0 g	4610.3 g	82 %	18	%
#200	8.6 x (f) 38.28 =	329.2 g	4939.5 g	87.9 %	12.1	%
#270	3.6 x (f) 38.28 =	137.8 g	5077.3 g	90.3 %	9.7	%
#450	5.3 x (f) 38.28 =	202.9 g	5280.2 g	93.9 %	6.1	%
#635	3.2 x (f) 38.28 =	122.5 g	5402.7 g	96.1 %	3.9	%
			5402.7 g			
Corrected Pan	102.6 x (f) 38.28 =	3927.5 g	5620.9 g			

Wood Waste

% % Max.

Comments:

Tester's Signature:	Date	Checked By	Date
bill richards	12/7/2004		

Particle Size Distribution Analysis (Site US 395A)

$$data_s := \begin{pmatrix} 3.9 & .020 \\ 6.1 & .032 \\ 9.7 & .053 \\ 12.1 & .075 \\ 18 & .150 \\ 33 & .425 \\ 45 & .850 \\ 59 & 2.00 \\ 70 & 4.75 \\ 77 & 9.5 \\ 81 & 12.5 \\ 84 & 19.0 \\ 88 & 31.5 \\ 100 & 75 \end{pmatrix}$$

First column of data shows cumulative percent finer. Second column of data shows particle sizes, mm.

Percent Finer: $Perc := data_s^{\langle 0 \rangle}$

Particle Sizes, mm: $Diam := data_s^{\langle 1 \rangle}\ mm$

Percent in size class: $N := length(Perc) - 1$ $\quad N = 13$

$i := 1..N$

$pct_i := Perc_i - Perc_{i-1}$

Geometric mean sizes: $dm_i := \sqrt{Diam_i \cdot Diam_{i-1}}$

Calculation of characteristic diameters using curve fitting method

$P := 0, 1..100$ Range of values for plotting

$Curve(P) := linterp(Perc, Diam, P)$ Interpolation function for desired sizes

$d_{10} := Curve(10)$ $\quad d_{30} := Curve(30)$ $\quad d_{60} := Curve(65)$ $\quad d_{50} := Curve(50)$

$d_{84} := Curve(84)$ $\quad d_{90} := Curve(90)$ $\quad d_{16} := Curve(16)$ $\quad fines := data_{s_{3,0}}$

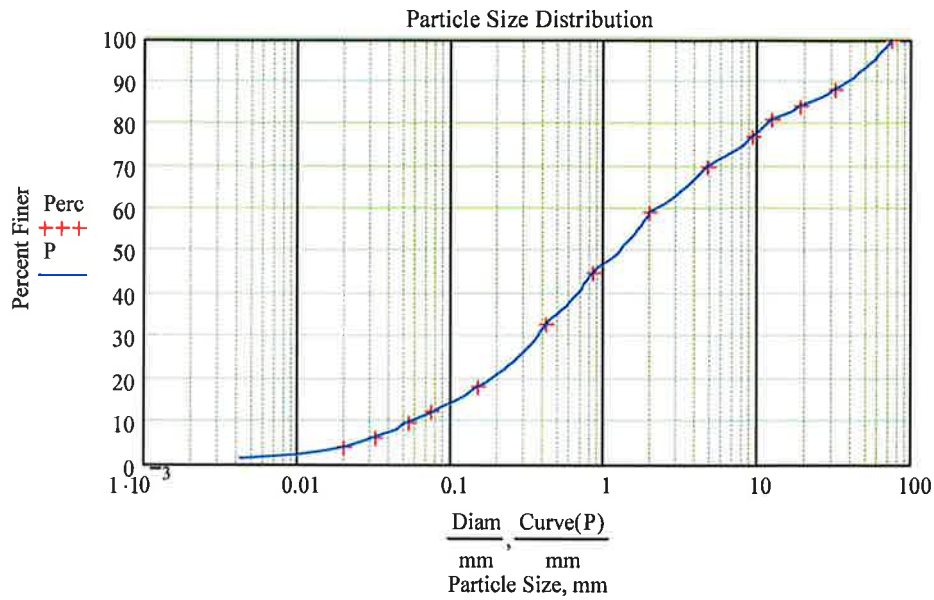
$d_{10} = 0.06mm$ $\quad d_{30} = 0.37mm$ $\quad d_{60} = 3.5mm$ $\quad fines = 12.1$

$d_{84} = 19mm$ $\quad d_{90} = 38.75mm$

Massman Modified D_{10} Infiltration Analysis

$$K_{sat} := 10^{\left[-1.57 + \left(1.90 \cdot \frac{d_{10}}{mm}\right) + \left(0.015 \cdot \frac{d_{60}}{mm}\right) - \left(0.013 \cdot \frac{d_{90}}{mm}\right) - \left(2.08 \cdot \frac{fines}{100}\right)\right]} \cdot \frac{cm}{sec}$$

$K_{sat} = 6.808 \times 10^{-3} \frac{cm}{sec}$ $\quad K_{sat} = 245 \frac{mm}{hr}$ $\quad K_{sat} = 9.65 \frac{in}{hr}$



Percent in size class:

pct =

	0
0	0
1	2.2
2	3.6
3	2.4
4	5.9
5	15
6	12
7	14
8	11
9	7
10	4
11	3
12	4
13	12

Geometric mean sizes:

dm =

	0
0	0
1	0.03
2	0.04
3	0.06
4	0.11
5	0.25
6	0.6
7	1.3
8	3.08
9	6.72
10	10.9
11	15.41
12	24.46
13	48.61

mm

Calculation of mean particle size:

$$d_m := \sum_i \frac{dm_i \cdot pct_i}{100}$$

$$d_m = 8.82\text{mm}$$

Geometric standard deviation:

$$\sigma_g := \sqrt{\frac{d_{84}}{d_{16}}} \qquad \sigma_g = 12.35$$

Gradation Coefficient:

$$G := 0.5 \cdot \left(\frac{d_{84}}{d_{50}} + \frac{d_{50}}{d_{16}} \right) \qquad G = 12.6$$

Project	Natural Dispersion Research		
	US 395 Rainfall Simulation Site "A"		
Project No.			
Boring No.			
Sample No.		depth	1 ft
Station	US 395 A	Offset	

US Sieve (in / #)	Metric Sieve (mm)	Percent Passing
6	152.5	
4	101.6	
2	50.8	
1 1/2	38.1	
1 1/4	31.75	88
3/4	19.05	84
3/8	9.5	77
4	4.75	70
10	2	59
20	0.85	45
40	0.425	33
100	0.15	18
200	0.075	12.1
270	0.053	9.7
450	0.032	6.1
635	0.02	3.9

	D10 (mm)	Infiltration Rate (in/hr)	Infiltration Rate (cm/sec)
2001 DOE	0.060	1.1	7.57E-04
Silty Inflow, Lower Bound	0.060	0.3	1.79E-04
Filtered Inflow, Upper Bound	0.060	4.1	2.86E-03
98 WSDOT	0.060	1.5	1.04E-03
Average Value	0.060	1.8	1.26E-03

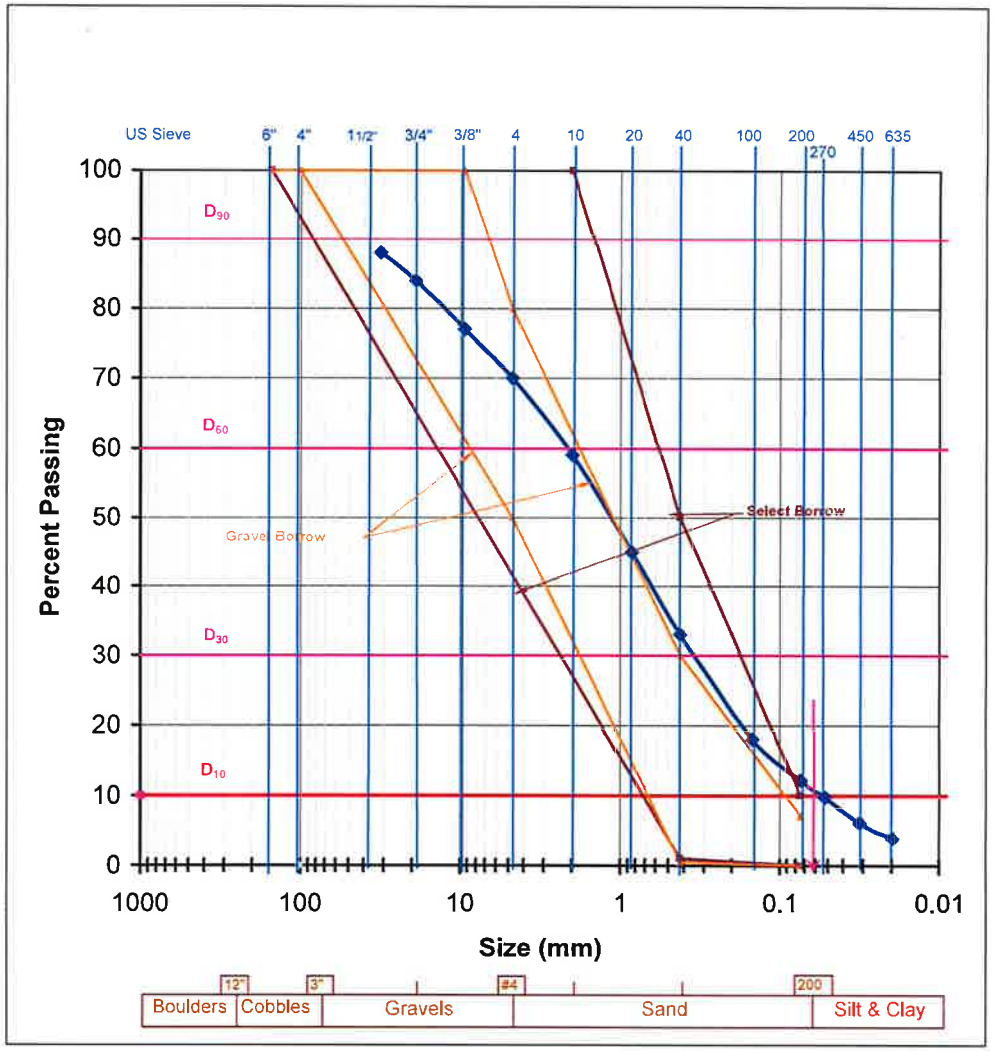
		Hydraulic Conductivity	
		in/hr	cm/sec
2003 WSDOT	K sat=	9.8	6.94E-03

D90 (mm)	38.75
D60 (mm)	3.50
D30 (mm)	0.37
D10 (mm)	0.06

Coefficient of Uniformity	Cu =	58.33
Coefficient of Gradation	Cc =	0.65

Water Content	W =	
Liquid Limit	LL =	
Plastic Limit	PL =	
Plasticity Index	PI =	

Soil Classification	GM



Fine Grading for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 395 Rainfall Simulation "B"	A2			

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	116.1 g	3. Mass (Wt.) of Moisture (1) - (2) =	3.1 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	113 g	4. Percent of Moisture [(3) / (2)] x 100 =	2.7 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1	/	x 100 =	#DIV/0!	SE#2	/	x 100 =	#DIV/0!
Average Sand Equivalent			#DIV/0!	Sand Equivalent Specification from Std. Spec.			

Aggregate Gradation

Initial Dry Mass = 113 g **Split Fines - Coarse = 65.3 g**

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		% Passing
3/8"	29.0	29.0 g	26 %	
#4	18.7	47.7 g	42 %	
#6		47.7 g	42 %	58 %
# 8		47.7 g	42 %	58 %
#10	19.0	66.7 g	59 %	41 %
#16		66.7 g	59 %	41 %
#20	15.8	82.5 g	73 %	27 %
#40	9.7	92.2 g	82 %	18 %
#50		92.2 g	82 %	18 %
#80		92.2 g	82 %	18 %
#100	9.6	101.8 g	90 %	10 %
# 200	3.5	105.3 g	93.2 %	6.8 %
#270	1.4	106.7 g	94.4 %	5.6 %
*Pan	6.3			
#450	2.1	108.8 g	96.3 %	3.7 %
#635	1.3	110.1 g	97.4 %	2.6 %

*Pan is washed thru the #450 and #635 sieves, use of aerosol ot may be helpful.

Wood Waste % % Max.

Dust Ratio = 0.075 mm(#200) / 0.425 mm(#40)

6.8 / 18.4 = 0.37

Comments:

Tester's Signature	Date	Checked By	Date
bill richards	12/8/2004		

Combined Gradation for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 395 Rainfall Simulation "B"	B			

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	6269.5 g	3. Mass (Wt.) of Moisture (1) - (2) =	19.0 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	6250.5 g	4. Percent of Moisture [(3) / (2)] x 100 =	0.3 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1		/		x 100 =	#DIV/0!	SE#2		/	9.8	x 100 =
Average Sand Equivalent					#DIV/0!	Sand Equivalent Specification from Std. Spec.				

Aggregate Gradation

Initial Dry Mass = (See # 2 Above) 6250.5 g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		Percent Passing
2"	668.8 g	668.8 g	11 %	89 %
1 1/2	g	668.8 g	11 %	89 %
1 1/4	295.9 g	964.7 g	15 %	85 %
1"	271.8 g	1236.5 g	20 %	80 %
3/4	209.9 g	1446.4 g	23 %	77 %
5/8	g	1446.4 g	23 %	77 %
1/2	629.0 g	2075.4 g	33 %	67 %
3/8	382.1 g	2457.5 g	39 %	61 %
1/4	g	2457.5 g	39 %	61 %
#4	872.3 g	3329.8 g	53 %	47 %
Pan = (M1)	2920.7 g			
M2 = Split from Fine grading	65.3 g			
Corrected Fine Aggregate Pan M2+(M2 x C / M1) =	65.3 g			
#6	x (f) 44.73 = g	3329.8 g	53 %	47 %
#8	x (f) 44.73 = g	3329.8 g	53 %	47 %
#10	19.0 x (f) 44.73 = 849.8 g	4179.6 g	67 %	33 %
#16	x (f) 44.73 = g	4179.6 g	67 %	33 %
#20	15.8 x (f) 44.73 = 706.7 g	4886.3 g	78 %	22 %
#40	9.7 x (f) 44.73 = 433.9 g	5320.2 g	85 %	15 %
#50	x (f) 44.73 = g	5320.2 g	85 %	15 %
#80	x (f) 44.73 = g	5320.2 g	85 %	15 %
#100	9.6 x (f) 44.73 = 429.4 g	5749.6 g	92 %	8 %
#200	3.5 x (f) 44.73 = 156.5 g	5906.1 g	94.5 %	5.5 %
#270	1.4 x (f) 44.73 = 62.6 g	5968.7 g	95.5 %	4.5 %
#450	2.1 x (f) 44.73 = 93.9 g	6062.6 g	97.0 %	3.0 %
#635	1.3 x (f) 44.73 = 58.1 g	6120.8 g	97.9 %	2.1 %
		6120.8 g		
Corrected Pan	65.3 x (f) 44.73 = 2920.7 g	6250.5 g		

C = (% passing #635/100)x Initial Dry Mass 129.709 g

Gradation Adjustment Factor (f) = M1 / M2 = 44.727

Wood Waste

% % Max.

Comments:

Tester's Signature:	Date	Checked By	Date
bill richards	12/8/2004		

Particle Size Distribution Analysis (Site US 395B)

$$data_s := \begin{pmatrix} 2.1 & .02 \\ 3.0 & .032 \\ 4.5 & .053 \\ 5.5 & .075 \\ 8 & .150 \\ 15 & .425 \\ 22 & .850 \\ 33 & 2.00 \\ 47 & 4.75 \\ 61 & 9.5 \\ 67 & 12.5 \\ 77 & 19.0 \\ 80 & 25.0 \\ 85 & 31.5 \\ 89 & 50.0 \\ 100 & 75.0 \end{pmatrix}$$

First column of data shows cumulative percent finer. Second column of data shows particle sizes, mm.

Percent Finer: $Perc := data_s^{\langle 0 \rangle}$

Particle Sizes, mm: $Diam := data_s^{\langle 1 \rangle}\ mm$

Percent in size class: $N := length(Perc) - 1$ $\quad N = 15$

$i := 1..N$

$pct_i := Perc_i - Perc_{i-1}$

Geometric mean sizes: $dm_i := \sqrt{Diam_i \cdot Diam_{i-1}}$

Calculation of characteristic diameters using curve fitting method

$P := 0, 1..100$ Range of values for plotting

$Curve(P) := linterp(Perc, Diam, P)$ Interpolation function for desired sizes

$d_{10} := Curve(10)$ $\quad d_{30} := Curve(30)$ $\quad d_{60} := Curve(65)$ $\quad d_{50} := Curve(50)$

$d_{84} := Curve(84)$ $\quad d_{90} := Curve(90)$ $\quad d_{16} := Curve(16)$ $\quad fines := data_{s_{3,0}}$

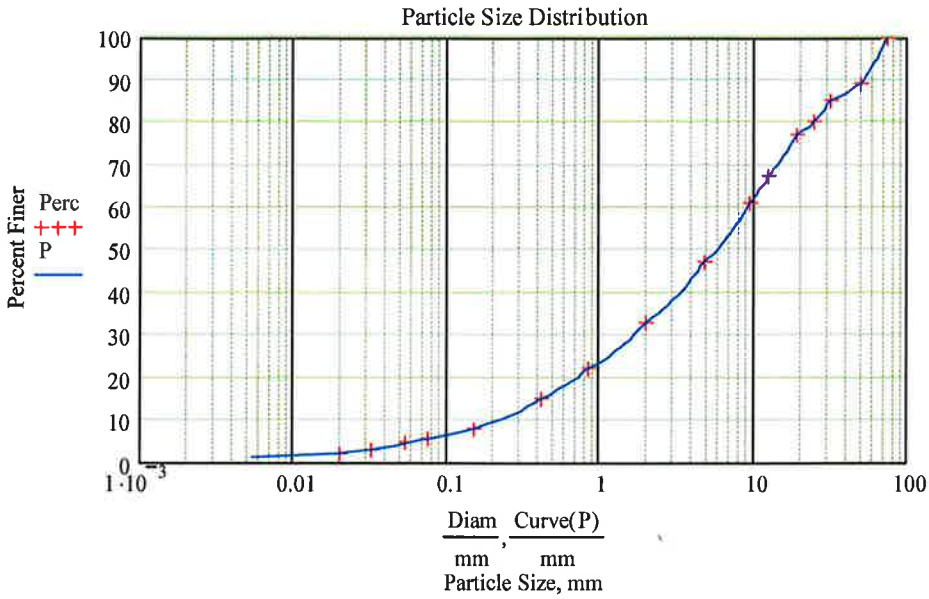
$d_{10} = 0.23mm$ $\quad d_{30} = 1.69mm$ $\quad d_{60} = 11.5mm$ $\quad fines = 5.5$

$d_{84} = 30.2mm$ $\quad d_{90} = 52.27mm$

Massman Modified D_{10} Infiltration Analysis

$$K_{sat} := 10^{\left(-1.57 + 1.90 \cdot \frac{d_{10}}{mm} + 0.015 \cdot \frac{d_{60}}{mm} - 0.013 \cdot \frac{d_{90}}{mm} - 2.08 \cdot \frac{fines}{100}\right)} \cdot \frac{cm}{sec}$$

$K_{sat} = 0.02 \frac{cm}{sec}$ $\quad K_{sat} = 629.71 \frac{mm}{hr}$ $\quad K_{sat} = 24.79 \frac{in}{hr}$



Percent in size class:

pct =

	0
0	0
1	0.9
2	1.5
3	1
4	2.5
5	7
6	7
7	11
8	14
9	14
10	6
11	10
12	3
13	5
14	4
15	11

Geometric mean sizes:

dm =

	0
0	0
1	0.03
2	0.04
3	0.06
4	0.11
5	0.25
6	0.6
7	1.3
8	3.08
9	6.72
10	10.9
11	15.41
12	21.79
13	28.06
14	39.69
15	61.24

mm

Calculation of mean particle size:

$$d_m := \sum_i \frac{dm_i \cdot pct_i}{100}$$

$$d_m = 14.15\text{mm}$$

Geometric standard deviation:

$$\sigma_g := \sqrt{\frac{d_{84}}{d_{16}}} \qquad \sigma_g = 7.89$$

Gradation Coefficient:

$$G := 0.5 \cdot \left(\frac{d_{84}}{d_{50}} + \frac{d_{50}}{d_{16}} \right) \qquad G = 8.56$$

Project	Natural Dispersion Research		
	US 395 Rainfall Simulation/Remote Site B		
Project No.			
Boring No.			
Sample No.	B	depth	1 ft
Station	US 395	Offset	

US Sieve (in / #)	Metric Sieve (mm)	Percent Passing
6	152.5	
4	101.6	
2	50.8	89
1 1/2	38.1	
1 1/4	31.75	85
3/4	19.05	77
3/8	9.5	61
4	4.75	47
10	2	33
20	0.85	22
40	0.425	15
100	0.15	8
200	0.075	5.5
270	0.053	4.5
450	0.032	3
635	0.02	2.1

	D10 (mm)	Infiltration Rate (in/hr)	Infiltration Rate (cm/sec)
2001 DOE	0.230	4.5	3.18E-03
Silty Inflow, Lower Bound	0.230	1.0	7.37E-04
Filtered Inflow, Upper Bound	0.230	12.6	8.86E-03
98 WSDOT	0.230	4.8	3.25E-03
Average Value	0.230	6.0	4.26E-03

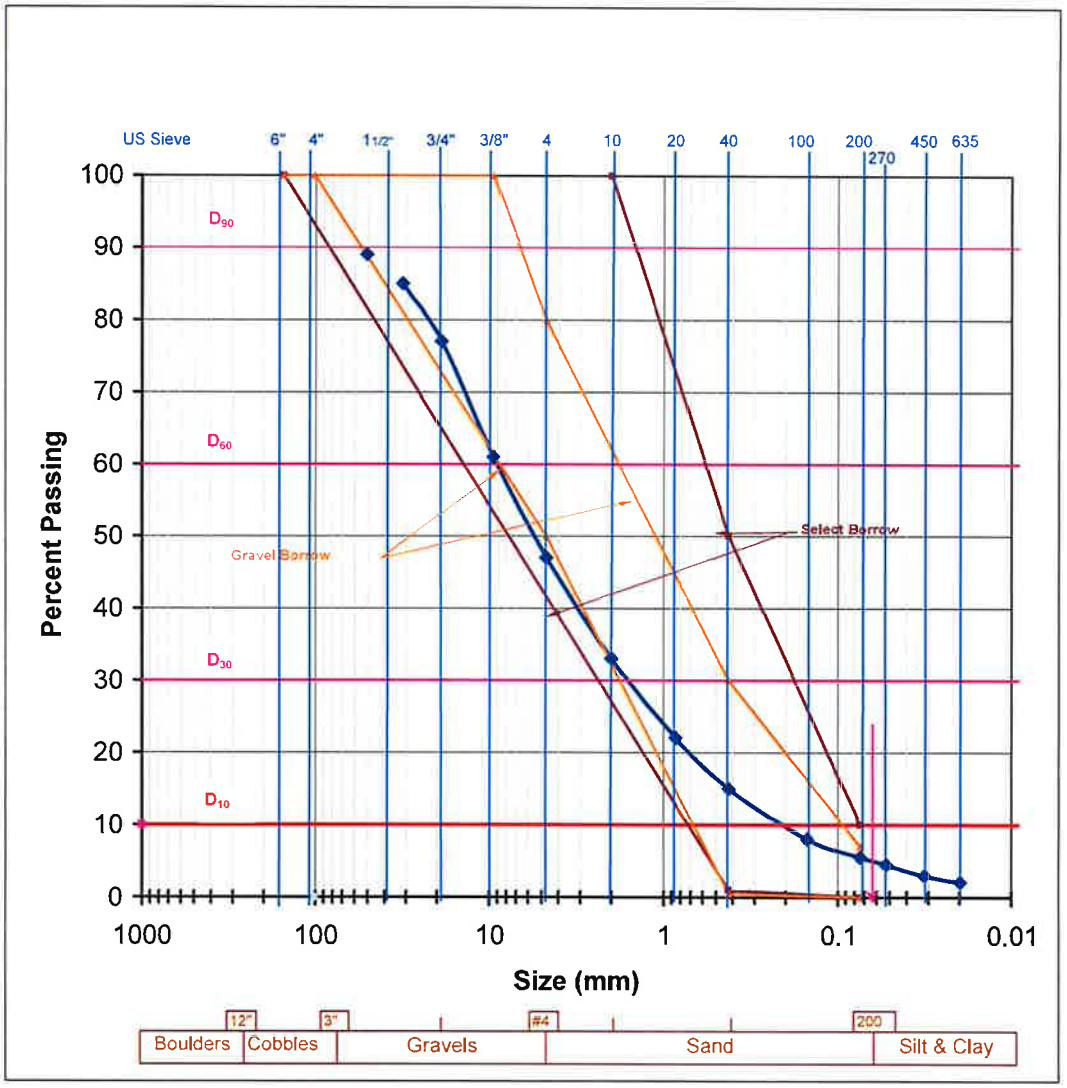
		Hydraulic Conductivity in/hr	Hydraulic Conductivity cm/sec
2003 WSDOT	K sat=	24.9	1.76E-02

D90 (mm)	52.27
D60 (mm)	11.50
D30 (mm)	1.69
D10 (mm)	0.23

Coefficient of Uniformity	Cu =	50.00
Coefficient of Gradation	Cc =	1.08

Water Content	W =	
Liquid Limit	LL =	
Plastic Limit	PL =	
Plasticity Index	PI =	

Soil Classification	GM



Fine Grading for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 195 Rainfall Simulation Site				

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	119.3 g	3. Mass (Wt.) of Moisture (1) - (2) =	2.5 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	116.8 g	4. Percent of Moisture [(3) / (2)] x 100 =	2.1 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1	/	x 100 =	#DIV/0!	SE#2	/	x 100 =	#DIV/0!
Average Sand Equivalent			#DIV/0!	Sand Equivalent Specification from Std. Spec.			

Aggregate Gradation

Initial Dry Mass = 116.8 Split Fines - Coarse = 115.3 g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		% Passing
3/8"		g	%	
#4	1.5	1.5 g	1 %	
#6		1.5 g	1 %	99 %
# 8		1.5 g	1 %	99 %
#10	8.4	9.9 g	8 %	92 %
#16		9.9 g	8 %	92 %
#20	23.7	33.6 g	29 %	71 %
#40	22.8	56.4 g	48 %	52 %
#50		56.4 g	48 %	52 %
#80		56.4 g	48 %	52 %
#100	30.7	87.1 g	75 %	25 %
# 200	12.3	99.4 g	85.1 %	14.9 %
#270	3.9	103.3 g	88.4 %	11.6 %
*Pan	13.2			
#450	4.6	107.9 g	92.4 %	7.6 %
#635	3.0	110.9 g	94.9 %	5.1 %

*Pan is washed thru the #450 and #635 sieves, use of aerosol ot may be helpful.

Wood Waste % % Max.

Dust Ratio = 0.075 mm(#200) / 0.425 mm(#40)

14.9 / 51.7 = 0.29

Comments:

Tester's Signature	Date	Checked By	Date
bill richards	12/14/2004		

Combined Gradation for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
Reister	US 195 Rainfall Simulation Site				

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	6769.3 g	3. Mass (Wt.) of Moisture (1) - (2) =	52.0 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	6717.3 g	4. Percent of Moisture [(3) / (2)] x 100 =	0.8 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1		/		x 100 =	#DIV/0!	SE#2		/	9.8	x 100 =

Average Sand Equivalent	#DIV/0!	Sand Equivalent Specification from Std. Spec.	

Aggregate Gradation

Initial Dry Mass = (See # 2 Above) 6717.3 g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)		Accumulative Mass Retained (g)		Percent Passing	
		g	g	%	100	%
1 1/2		g	g	%	100	%
1 1/4		54.4 ç	54.4 g	1 %	99	%
1"		109.7 ç	164.1 g	2 %	98	%
3/4		29.8 ç	193.9 g	3 %	97	%
5/8		g	193.9 g	3 %	97	%
1/2		37.8 ç	231.7 g	3 %	97	%
3/8		23.3 ç	255.0 g	4 %	96	%
1/4		g	255.0 g	4 %	96	%
#4		108.9 ç	363.9 g	5 %	95	%
Pan = (M1)		6353.4 ç				
M2 = Split from Fine grading		115.3 g				
Corrected Fine Aggregate Pan M2+(M2 x C / M1) =		115.3 g				
#6	x (f) 55.10 =	g	363.9 g	5 %	95	%
#8	x (f) 55.10 =	g	363.9 g	5 %	95	%
#10	8.4 x (f) 55.10 =	462.9 g	826.8 g	12 %	88	%
#16	x (f) 55.10 =	g	826.8 g	12 %	88	%
#20	23.7 x (f) 55.10 =	1305.9 g	2132.7 g	32 %	68	%
#40	22.8 x (f) 55.10 =	1256.4 g	3389.1 g	50 %	50	%
#50	x (f) 55.10 =	g	3389.1 g	50 %	50	%
#80	x (f) 55.10 =	g	3389.1 g	50 %	50	%
#100	30.7 x (f) 55.10 =	1691.7 g	5080.7 g	76 %	24	%
#200	12.3 x (f) 55.10 =	677.8 g	5758.5 g	85.7 %	14.3	%
#270	3.9 x (f) 55.10 =	214.9 g	5973.4 g	88.9 %	11.1	%
#450	4.6 x (f) 55.10 =	253.5 g	6226.9 g	92.7 %	7.3	%
#635	3.0 x (f) 55.10 =	165.3 g	6392.2 g	95.2 %	4.8	%
			6392.2 g			
Corrected Pan	115.3 x (f) 55.10 =	6353.4 g	6717.3 g			

C = (% passing #635/100)x Initial Dry Mass 325.109 g

Gradation Adjustment Factor (f) = M1 / M2 = 55.103

Wood Waste

% % Max.

Comments:

Tester's Signature:	Date	Checked By	Date
bill richards	12/14/2004		

Particle Size Distribution Analysis (Site US 195)

$$data_s := \begin{pmatrix} 4.8 & .020 \\ 7.3 & .032 \\ 11.1 & .053 \\ 14.3 & .075 \\ 24 & .150 \\ 50 & .425 \\ 68 & .850 \\ 88 & 2.00 \\ 95 & 4.75 \\ 96 & 9.5 \\ 97 & 12.5 \\ 97.01 & 19.0 \\ 98 & 25 \\ 99 & 37.5 \end{pmatrix}$$

First column of data shows cumulative percent finer. Second column of data shows particle sizes, mm.

Percent Finer: $Perc := data_s^{\langle 0 \rangle}$

Particle Sizes, mm: $Diam := data_s^{\langle 1 \rangle}\ mm$

Percent in size class: $N := length(Perc) - 1$ $\quad N = 13$

$i := 1..N$

$pct_i := Perc_i - Perc_{i-1}$

Geometric mean sizes: $dm_i := \sqrt{Diam_i \cdot Diam_{i-1}}$

Calculation of characteristic diameters using curve fitting method

$P := 0, 1..100$ Range of values for plotting

$Curve(P) := linterp(Perc, Diam, P)$ Interpolation function for desired sizes

$d_{10} := Curve(10)$ $\quad d_{30} := Curve(30)$ $\quad d_{60} := Curve(65)$ $\quad d_{50} := Curve(50)$

$d_{84} := Curve(84)$ $\quad d_{90} := Curve(90)$ $\quad d_{16} := Curve(16)$ $\quad fines := data_{s_{3,0}}$

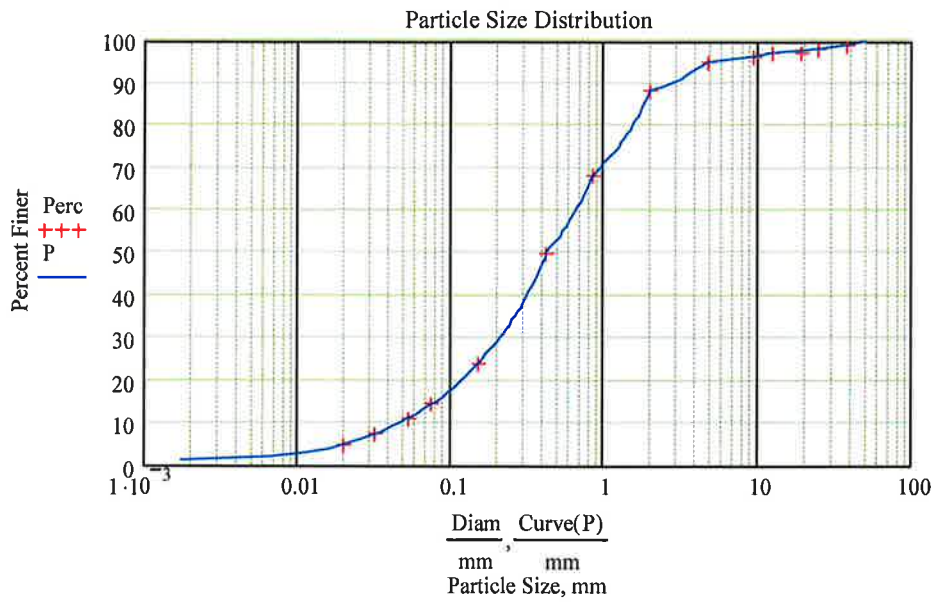
$d_{10} = 0.047mm$ $\quad d_{30} = 0.213mm$ $\quad d_{60} = 0.779mm$ $\quad fines = 14.3$

$d_{84} = 1.77mm$ $\quad d_{90} = 2.786mm$

Massman Modified D_{10} Infiltration Analysis

$$K_{sat} := 10^{\left(-1.57 + 1.90 \cdot \frac{d_{10}}{mm} + 0.015 \cdot \frac{d_{60}}{mm} - 0.013 \cdot \frac{d_{90}}{mm} - 2.08 \cdot \frac{fines}{100}\right)} \cdot \frac{cm}{sec}$$

$K_{sat} = 0.016 \frac{cm}{sec}$



Percent in size class:

pct =

	0
0	0
1	2.5
2	3.8
3	3.2
4	9.7
5	26
6	18
7	20
8	7
9	1
10	1
11	0.01
12	0.99
13	1

Geometric mean sizes:

dm =

	0
0	0
1	0.025
2	0.041
3	0.063
4	0.106
5	0.252
6	0.601
7	1.304
8	3.082
9	6.718
10	10.897
11	15.411
12	21.794
13	30.619

mm

Calculation of mean particle size:

$$d_m := \sum_i \frac{dm_i \cdot pct_i}{100}$$

$$d_m = 1.365\text{mm}$$

Geometric standard deviation:

$$\sigma_g := \sqrt{\frac{d_{84}}{d_{16}}} \qquad \sigma_g = 4.481$$

Gradation Coefficient:

$$G := 0.5 \cdot \left(\frac{d_{84}}{d_{50}} + \frac{d_{50}}{d_{16}} \right) \qquad G = 4.493$$

Project	Natural Dispersion Research		
	US 195 Rainfall Simulation Site		
Project No.			
Boring No.			
Sample No.		depth	1 ft
Station	US 195	Offset	

US Sieve (in / #)	Metric Sieve (mm)	Percent Passing
6	152.5	
4	101.6	
2	50.8	
1 1/2	38.1	
1 1/4	31.75	99
3/4	19.05	97
3/8	9.5	96
4	4.75	95
10	2	88
20	0.85	68
40	0.425	50
100	0.15	24
200	0.075	14.3
270	0.053	11.1
450	0.032	7.3
635	0.02	4.8

	D10 (mm)	Infiltration Rate (in/hr)	Infiltration Rate (cm/sec)
2001 DOE	0.047	0.9	6.18E-04
Silty Inflow, Lower Bound	0.047	0.2	1.69E-04
Filtered Inflow, Upper Bound	0.047	3.3	2.33E-03
98 WSDOT	0.047	1.2	8.23E-04
Average Value	0.047	1.5	1.04E-03

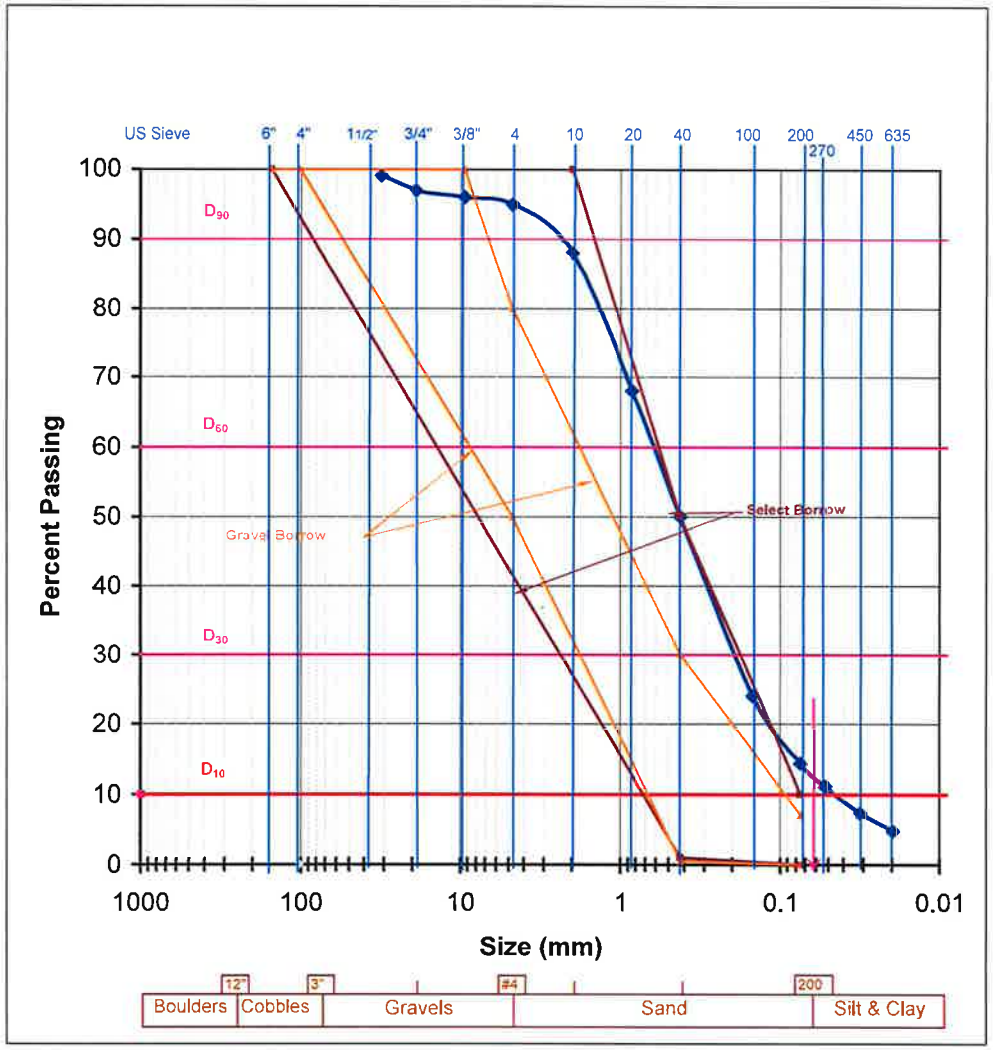
		Hydraulic Conductivity	
		in/hr	cm/sec
2003 WSDOT	K sat=	22.3	1.58E-02

D90 (mm)	2.79
D60 (mm)	0.78
D30 (mm)	0.21
D10 (mm)	0.05

Coefficient of Uniformity	Cu =	16.57
Coefficient of Gradation	Cc =	1.24

Water Content	W =	
Liquid Limit	LL =	
Plastic Limit	PL =	
Plasticity Index	PI =	

Soil Classification	GM



Fine Grading for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
LID	SR 270 Static Site				

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	262.4 g	3. Mass (Wt.) of Moisture (1) - (2) =	g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	262.4 g	4. Percent of Moisture [(3) / (2)] x 100 =	%

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1		/		x 100 =	#DIV/0!	SE#2		/ 9.8	x 100 =

Average Sand Equivalent	#DIV/0!	Sand Equivalent Specification from Std. Spec.	

Aggregate Gradation

Initial Dry Mass = 262.4 g **Split Fines - Coarse = 186.2 g**

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		% Passing
3/8"	20.9	20.9 g	8 %	
#4	55.3	76.2 g	29 %	
#6		76.2 g	29 %	71 %
# 8		76.2 g	29 %	71 %
#10	47.8	124.0 g	47 %	53 %
#16		124.0 g	47 %	53 %
#20	24.8	148.8 g	57 %	43 %
#40	15.5	164.3 g	63 %	37 %
#50		164.3 g	63 %	37 %
#80		164.3 g	63 %	37 %
#100	21.9	186.2 g	71 %	29 %
# 200	15.8	202.0 g	77.0 %	23.0 %
#270	9.5	211.5 g	80.6 %	19.4 %
*Pan	20.2			
#450	12.4	223.9 g	85.3 %	14.7 %
#635	12.5	236.4 g	90.1 %	9.9 %

*Pan is washed thru the #450 and #635 sieves, use of aerosol ot may be helpful.

Wood Waste % % Max.

Dust Ratio = 0.075 mm(#200) / 0.425 mm(#40)

23.0 / 37.4 = 0.62

Comments:

Tester's Signature	Date	Checked By	Date
Bill Richards	4/14/05		

Combined Gradation for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
LID	SR 270 Static Site				

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	g	3. Mass (Wt.) of Moisture (1) - (2) =	g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	g	4. Percent of Moisture [(3) / (2)] x 100 =	#DIV/0! %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1		/		x 100 =	#DIV/0!	SE#2		/	9.8	x 100 =

Average Sand Equivalent	#DIV/0!	Sand Equivalent Specification from Std. Spec.	

Aggregate Gradation

Initial Dry Mass = (See # 2 Above) g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		Percent Passing	
	g	g	#DIV/0!	% #DIV/0!	%
1 1/2	g	g	#DIV/0!	% #DIV/0!	%
1 1/4	g	g	#DIV/0!	% #DIV/0!	%
1"	g	g	#DIV/0!	% #DIV/0!	%
3/4	g	g	#DIV/0!	% #DIV/0!	%
5/8	g	g	#DIV/0!	% #DIV/0!	%
1/2	g	g	#DIV/0!	% #DIV/0!	%
3/8	g	g	#DIV/0!	% #DIV/0!	%
1/4	g	g	#DIV/0!	% #DIV/0!	%
#4	g	g	#DIV/0!	% #DIV/0!	%
Pan = (M1)	g				
M2 = Split from Fine grading	186.2 g 186.2		C = (% passing #635/100)x Initial Dry Mass		#DIV/0! g
			Gradation Adjustment Factor (f) = M1 / M2 =		
#6	x (f) = g	g	#DIV/0!	% #DIV/0!	%
#8	x (f) = g	g	#DIV/0!	% #DIV/0!	%
#10	47.8 x (f) = g	g	#DIV/0!	% #DIV/0!	%
#16	x (f) = g	g	#DIV/0!	% #DIV/0!	%
#20	24.8 x (f) = g	g	#DIV/0!	% #DIV/0!	%
#40	15.5 x (f) = g	g	#DIV/0!	% #DIV/0!	%
#50	x (f) = g	g	#DIV/0!	% #DIV/0!	%
#80	x (f) = g	g	#DIV/0!	% #DIV/0!	%
#100	21.9 x (f) = g	g	#DIV/0!	% #DIV/0!	%
#200	15.8 x (f) = g	g	#DIV/0!	% #DIV/0!	%
#270	9.5 x (f) = g	g	#DIV/0!	% #DIV/0!	%
#450	12.4 x (f) = g	g	#DIV/0!	% #DIV/0!	%
#635	12.5 x (f) = g	g	#DIV/0!	% #DIV/0!	%
		g			
Corrected Pan	186.2 x (f) = g	#DIV/0! g			

Wood Waste

% % Max.

Comments:

Tester's Signature:	Date	Checked By	Date

Particle Size Distribution Analysis (Site I-90)

$$data_s := \begin{pmatrix} 9.9 & .020 \\ 14.7 & .032 \\ 19.4 & .053 \\ 23.0 & .075 \\ 29 & .150 \\ 37 & .425 \\ 43 & .850 \\ 53 & 2.00 \\ 71 & 4.75 \\ 92 & 9.5 \\ 99.97 & 12.5 \\ 99.98 & 19.0 \\ 99.99 & 37.5 \\ 100 & 75 \end{pmatrix}$$

First column of data shows cumulative percent finer. Second column of data shows particle sizes, mm.

Percent Finer: $Perc := data_s^{\langle 0 \rangle}$

Particle Sizes, mm: $Diam := data_s^{\langle 1 \rangle}\ mm$

Percent in size class: $N := length(Perc) - 1$ $\quad N = 13$

$i := 1..N$

$pct_i := Perc_i - Perc_{i-1}$

Geometric mean sizes: $dm_i := \sqrt{Diam_i \cdot Diam_{i-1}}$

Calculation of characteristic diameters using curve fitting method

$P := 0, 1..100$ Range of values for plotting

$Curve(P) := linterp(Perc, Diam, P)$ Interpolation function for desired sizes

$d_{10} := Curve(10)$ $\quad d_{30} := Curve(30)$ $\quad d_{60} := Curve(65)$ $\quad d_{50} := Curve(50)$

$d_{84} := Curve(84)$ $\quad d_{90} := Curve(90)$ $\quad d_{16} := Curve(16)$ $\quad fines := data_{s_{3,0}}$

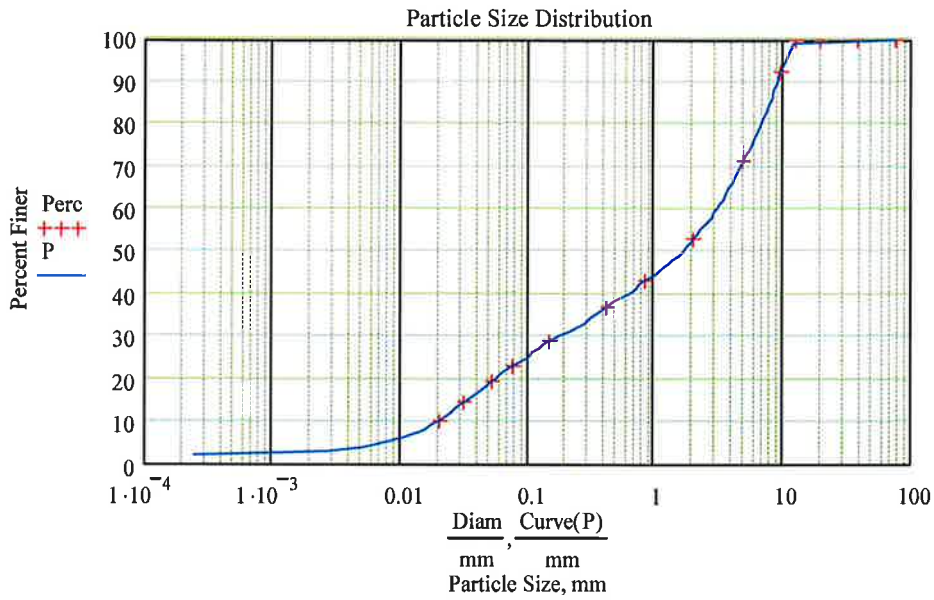
$d_{10} = 0.02mm$ $\quad d_{30} = 0.184mm$ $\quad d_{60} = 3.833mm$ $\quad fines = 23$

$d_{84} = 7.69mm$ $\quad d_{90} = 9.048mm$

Massman Modified D_{10} Infiltration Analysis

$$K_{sat} := 10^{\left(-1.57 + 1.90 \cdot \frac{d_{10}}{mm} + 0.015 \cdot \frac{d_{60}}{mm} - 0.013 \cdot \frac{d_{90}}{mm} - 2.08 \cdot \frac{fines}{100}\right)} \cdot \frac{cm}{sec}$$

$K_{sat} = 8.511 \times 10^{-3} \frac{cm}{sec}$ $\quad K_{sat} = 12.062 \frac{in}{hr}$



Percent in size class:

pct =

	0
0	0
1	4.8
2	4.7
3	3.6
4	6
5	8
6	6
7	10
8	18
9	21
10	7.97
11	0.01
12	$10 \cdot 10^{-3}$
13	0.01

Geometric mean sizes:

dm =

	0
0	0
1	0.025
2	0.041
3	0.063
4	0.106
5	0.252
6	0.601
7	1.304
8	3.082
9	6.718
10	10.897
11	15.411
12	26.693
13	53.033

mm

Calculation of mean particle size:

$$d_m := \sum_i \frac{dm_i \cdot pct_i}{100}$$

$$d_m = 3.042\text{mm}$$

Geometric standard deviation:

$$\sigma_g := \sqrt{\frac{d_{84}}{d_{16}}} \qquad \sigma_g = 14.262$$

Gradation Coefficient:

$$G := 0.5 \cdot \left(\frac{d_{84}}{d_{50}} + \frac{d_{50}}{d_{16}} \right) \qquad G = 24.21$$

Project	Natural Dispersion Research		
	SR 270 Site		
Project No.			
Boring No.			
Sample No.	E	depth	
Station		Offset	

US Sieve (in / #)	Metric Sieve (mm)	Percent Passing
6	152.5	
4	101.6	
2	50.8	
1 1/2	38.1	
1 1/4	31.75	
3/4	19.05	
3/8	9.5	92
4	4.75	71
10	2	53
20	0.85	43
40	0.425	37
100	0.15	29
200	0.075	23
270	0.053	19.4
450	0.032	14.7
635	0.02	9.9

	D10 (mm)	Infiltration Rate (in/hr)	Infiltration Rate (cm/sec)
2001 DOE	0.020	0.5	3.57E-04
Silty Inflow, Lower Bound	0.020	0.2	1.40E-04
Filtered Inflow, Upper Bound	0.020	2.7	1.92E-03
98 WSDOT	0.020	N/A	N/A
Average Value	0.020	1.1	8.05E-04

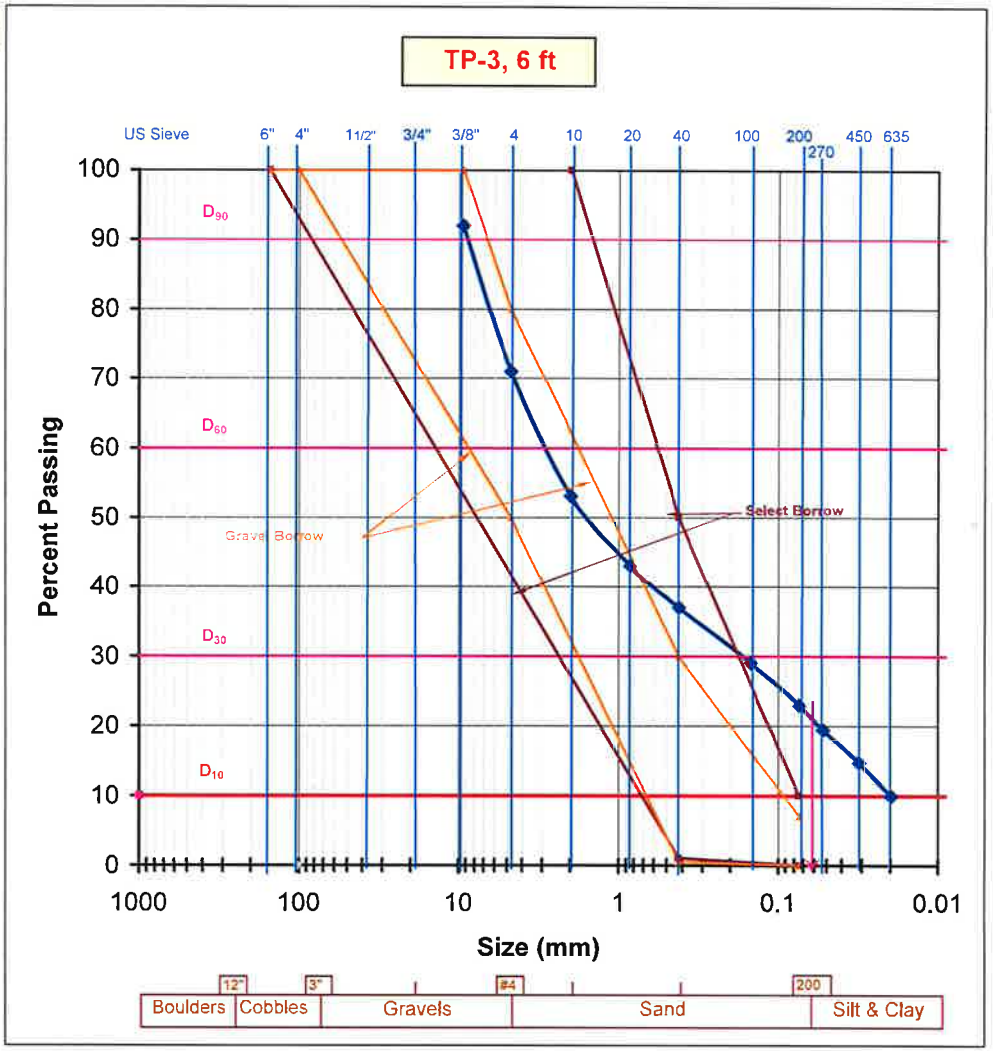
		Hydraulic Conductivity in/hr	Hydraulic Conductivity cm/sec
2003 WSDOT	K sat=	12.0	8.50E-03

D90 (mm)	9.05
D60 (mm)	3.83
D30 (mm)	0.18
D10 (mm)	0.02

Coefficient of Uniformity	Cu =	191.50
Coefficient of Gradation	Cc =	0.44

Water Content	W =	
Liquid Limit	LL =	
Plastic Limit	PL =	
Plasticity Index	PI =	

Soil Classification	GM



Fine Grading for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
LID	I-90 Static Site	D			

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	135.1 g	3. Mass (Wt.) of Moisture (1) - (2) =	4.4 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	130.7 g	4. Percent of Moisture [(3) / (2)] x 100 =	3.4 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1 / x 100 =	#DIV/0!	SE#2 / x 100 =	#DIV/0!
Average Sand Equivalent	#DIV/0!	Sand Equivalent Specification from Std. Spec.	

Aggregate Gradation

Initial Dry Mass =	130.7 g	Split Fines - Coarse =	119.9 g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		% Passing
3/8"	1.3	1.3 g	1 %	
#4	9.5	10.8 g	8 %	
#6		10.8 g	8 %	92 %
# 8		10.8 g	8 %	92 %
#10	24.2	35.0 g	27 %	73 %
#16		35.0 g	27 %	73 %
#20	23.6	58.6 g	45 %	55 %
#40	20.4	79.0 g	60 %	40 %
#50		79.0 g	60 %	40 %
#80		79.0 g	60 %	40 %
#100	27.9	106.9 g	82 %	18 %
# 200	9.8	116.7 g	89.3 %	10.7 %
#270	3.0	119.7 g	91.6 %	8.4 %
*Pan	10.4			
#450	4.4	124.1 g	95.0 %	5.0 %
#635	2.0	126.1 g	96.5 %	3.5 %

*Pan is washed thru the #450 and #635 sieves, use of aerosol ot may be helpful.

Wood Waste % % Max.

Dust Ratio = 0.075 mm(#200) / 0.425 mm(#40)

10.7 / 39.6 = 0.27

Comments:

Tester's Signature	Date	Checked By	Date
bill richards	12/14/2004		

Combined Gradation for Infiltration

Contract No.	Material	Sample No./ Assur. No.	Quantity To Date	Pit No./Agg. Source	Time / Date Sampled
LID	I-90 Static Site	D			

Initial Sample Mass (prior to splitting, See AASHTO T2) Lbs

Moisture Content AASHTO T-255 (when required)

1. Mass (Wt.) Initial Sample (See T-11/27 Table 1 for minimum size)	6880.3 g	3. Mass (Wt.) of Moisture (1) - (2) =	32.4 g
2. Mass (Wt.) Dried Sample (See FOP for Maximum Temperature)	6847.9 g	4. Percent of Moisture [(3) / (2)] x 100 =	0.5 %

Sand Equivalent AASHTO T-176 (Sand Reading/Clay Reading) X 100

SE#1		/		x	100 =	#DIV/0!	SE#2	/	9.8	x	100 =

Average Sand Equivalent #DIV/0! Sand Equivalent Specification from Std. Spec.

Aggregate Gradation

Initial Dry Mass = (See # 2 Above) 6847.9 g

Sieve Size mm (inch)	Mass Retained on Individual Sieve (g)	Accumulative Mass Retained (g)		Percent Passing
	g	g	%	100 %
1 1/2	514.3 g	514.3 g	8 %	92 %
1 1/4	g	514.3 g	8 %	92 %
1"	103.3 g	617.6 g	9 %	91 %
3/4	199.7 g	817.3 g	12 %	88 %
5/8	g	817.3 g	12 %	88 %
1/2	196.2 g	1013.5 g	15 %	85 %
3/8	159.2 g	1172.7 g	17 %	83 %
1/4	g	1172.7 g	17 %	83 %
#4	449.3 g	1622.0 g	24 %	76 %
Pan = (M1)	5225.9 g			
M2 = Split from Fine grading	119.9 g			
Corrected Fine Aggregate Pan M2+(M2 x C / M1) =	119.9 g			

C = (% passing #635/100)x Initial Dry Mass 200.493 g

Gradation Adjustment Factor (f) = M1 / M2 = 43.585

#6	x (f) 43.59 =	g	1622.0 g	24 %	76 %
#8	x (f) 43.59 =	g	1622.0 g	24 %	76 %
#10	24.2 x (f) 43.59 =	1054.8 g	2676.8 g	39 %	61 %
#16	x (f) 43.59 =	g	2676.8 g	39 %	61 %
#20	23.6 x (f) 43.59 =	1028.6 g	3705.4 g	54 %	46 %
#40	20.4 x (f) 43.59 =	889.1 g	4594.5 g	67 %	33 %
#50	x (f) 43.59 =	g	4594.5 g	67 %	33 %
#80	x (f) 43.59 =	g	4594.5 g	67 %	33 %
#100	27.9 x (f) 43.59 =	1216.0 g	5810.6 g	85 %	15 %
#200	9.8 x (f) 43.59 =	427.1 g	6237.7 g	91.1 %	8.9 %
#270	3.0 x (f) 43.59 =	130.8 g	6368.5 g	93.0 %	7.0 %
#450	4.4 x (f) 43.59 =	191.8 g	6560.2 g	95.8 %	4.2 %
#635	2.0 x (f) 43.59 =	87.2 g	6647.4 g	97.1 %	2.9 %
			6647.4 g		
Corrected Pan	119.9 x (f) 43.59 =	5225.9 g	6847.9 g		

Wood Waste

% % Max.

Comments:

Tester's Signature:	Date	Checked By	Date
bill richards	12/14/2004		

Particle Size Distribution Analysis (Site US 395-B)

$$data_s := \begin{pmatrix} 2.9 & .020 \\ 4.2 & .032 \\ 7.0 & .053 \\ 8.9 & .075 \\ 15 & .150 \\ 33 & .425 \\ 46 & .850 \\ 61 & 2.00 \\ 76 & 4.75 \\ 83 & 9.5 \\ 85 & 12.5 \\ 88 & 19.0 \\ 92 & 37.5 \\ 100 & 75 \end{pmatrix}$$

First column of data shows cumulative percent finer. Second column of data shows particle sizes, mm.

Percent Finer: $Perc := data_s^{\langle 0 \rangle}$

Particle Sizes, mm: $Diam := data_s^{\langle 1 \rangle}\ mm$

Percent in size class: $N := length(Perc) - 1$ $\quad N = 13$

$i := 1..N$

$pct_i := Perc_i - Perc_{i-1}$

Geometric mean sizes: $dm_i := \sqrt{Diam_i \cdot Diam_{i-1}}$

Calculation of characteristic diameters using curve fitting method

$C := lspline(Perc, Diam)$ Spline curve fit to size distribution data

$P := 0, 1..100$ Range of values for plotting

$Curve(P) := interp(C, Perc, Diam, P)$ Interpolation function for desired sizes

$d_{10} := Curve(10)$ $\quad d_{30} := Curve(30)$ $\quad d_{60} := Curve(65)$ $\quad d_{50} := Curve(50)$

$d_{84} := Curve(84)$ $\quad d_{90} := Curve(90)$ $\quad d_{16} := Curve(16)$ $\quad fines := data_{s_{3,0}}$

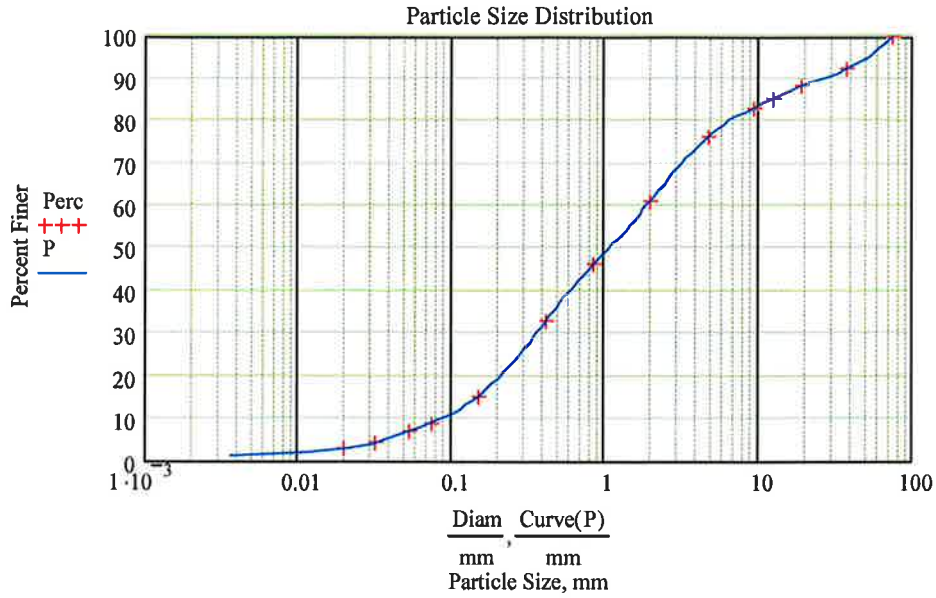
$d_{10} = 0.089mm$ $\quad d_{30} = 0.366mm$ $\quad d_{60} = 2.459mm$ $\quad fines = 8.9$

$d_{84} = 10.93mm$ $\quad d_{90} = 27.32mm$

Massman Modified D_{10} Infiltration Analysis

$$K_{sat} := 10^{\left(-1.57 + 1.90 \cdot \frac{d_{10}}{mm} + 0.015 \cdot \frac{d_{60}}{mm} - 0.013 \cdot \frac{d_{90}}{mm} - 2.08 \cdot \frac{fines}{100}\right)} \cdot \frac{cm}{sec}$$

$K_{sat} = 0.012 \frac{cm}{sec}$ $\quad K_{sat} = 17.646 \frac{in}{hr}$



Percent in size class:

	0
0	0
1	1.3
2	2.8
3	1.9
4	6.1
5	18
6	13
7	15
8	15
9	7
10	2
11	3
12	4
13	8

pct =

Geometric mean sizes:

	0
0	0
1	0.025
2	0.041
3	0.063
4	0.106
5	0.252
6	0.601
7	1.304
8	3.082
9	6.718
10	10.897
11	15.411
12	26.693
13	53.033

dm = mm

Calculation of mean particle size:

$$d_m := \sum_i \frac{dm_i \cdot pct_i}{100}$$

$$d_m = 7.251\,mm$$

Geometric standard deviation:

$$\sigma_g := \sqrt{\frac{d_{84}}{d_{16}}} \qquad \sigma_g = 8.207$$

Gradation Coefficient:

$$G := 0.5 \cdot \left(\frac{d_{84}}{d_{50}} + \frac{d_{50}}{d_{16}} \right) \qquad G = 8.391$$

Project	Natural Dispersion Research		
	I-90 Static Site		
Project No.			
Boring No.			
Sample No.	D	depth	
Station	I-90	Offset	

US Sieve (in / #)	Metric Sieve (mm)	Percent Passing
6	152.5	
4	101.6	
2	50.8	
1 1/2	38.1	92
1 1/4	31.75	
3/4	19.05	88
3/8	9.5	83
4	4.75	76
10	2	61
20	0.85	46
40	0.425	33
100	0.15	15
200	0.075	8.9
270	0.053	7
450	0.032	4.2
635	0.02	2.9

	D10 (mm)	Infiltration Rate (in/hr)	Infiltration Rate (cm/sec)
2001 DOE	0.089	1.6	1.10E-03
Silty Inflow, Lower Bound	0.089	0.3	1.95E-04
Filtered Inflow, Upper Bound	0.089	5.6	3.98E-03
98 WSDOT	0.089	2.1	1.47E-03
Average Value	0.089	2.5	1.76E-03

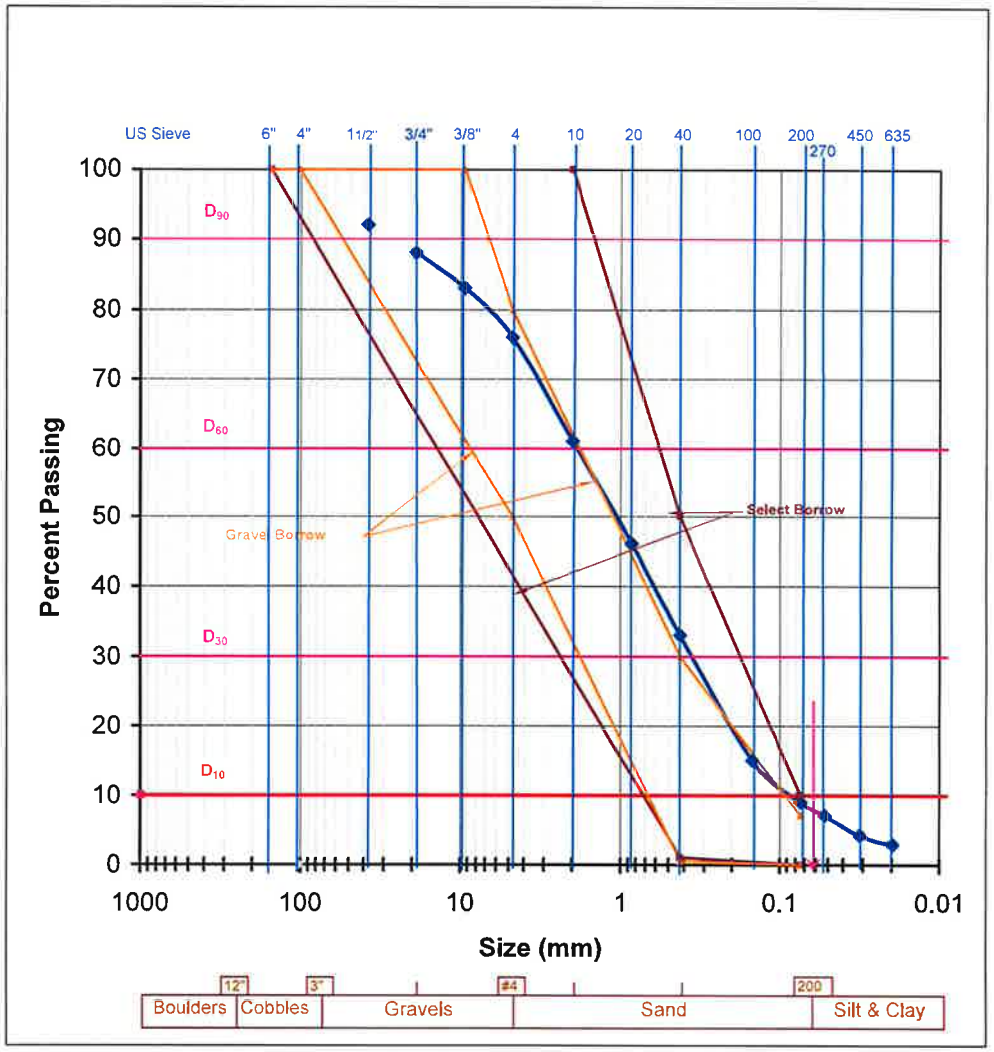
		Hydraulic Conductivity in/hr	Hydraulic Conductivity cm/sec
2003 WSDOT	K sat=	17.7	1.25E-02

D90 (mm)	27.32
D60 (mm)	2.46
D30 (mm)	0.37
D10 (mm)	0.09

Coefficient of Uniformity	Cu =	27.64
Coefficient of Gradation	Cc =	0.61

Water Content	W =	
Liquid Limit	LL =	
Plastic Limit	PL =	
Plasticity Index	PI =	

Soil Classification	GM



GP FIELD DATA SHEET

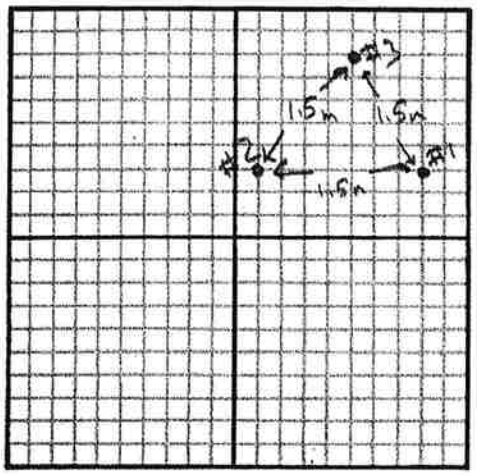
SECTION 1: SITE INFORMATION

Date 3-13-05 Investigator M.S. Rester

Site Location US-2 Mobile Site

Dominant Soil Type(s) Silty Sand / Sandy Loam

Site Map:



Soil Profile Description (horizon depth, texture, structure, color, etc.):

Depth	Description

Presence of special soil conditions (mottling, water table depth, hardpan, induration, compacted layers, etc.):

Mixed clay layer at ≈ 6" - 12"

Comments and Notes (topography, slope, vegetation, etc.):

Presence of gravels and cobbles

Hole #1 US 2 - Mt. Spokane Rd

GP FIELD DATA SHEET

SECTION 2: STANDARDIZED PROCEDURE FOR PERMEAMETER READINGS AND CALCULATIONS

Date 3-13-05 Investigator M.S. Reister

Reservoir Constants: (See label on Permeamter)

Combined Reservoirs X	35.33	cm²
Inner Reservoir Y		cm²

✓ CHECK RESERVOIR USED

GP SN: 10396

Depth of Well Hole 18 cm

Note: In standardized procedure the radius of the well hole is always 3.0 cm

1st Set of Readings with height of water in well (H_1) set at 5 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_1, (CM/MIN)
1	0	0	8.5	—	—
2	2	2	9.1	0.6	0.30
3	4	2	10.0	0.9	0.45
4	6	2	10.6	0.6	0.30
5	8	2	11.3	0.7	0.35
6	10	2	12.1	0.8	0.40
7	12	2	12.8	0.7	0.35
8	14	2	13.5	0.7	0.35
9	16	2	14.3	0.8	0.40
10	18	2	15.1	0.8	0.40
11	20	2	15.9	0.8	0.40
12	22	2			

2nd Set of Readings with height of water in well (H_2) set at 10 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_2, (CM/MIN)
1	0	0	24	—	—
2	1	1	24.6	0.6	0.6
3	2	1	25.2	0.6	0.6
4	3	1	25.8	0.6	0.6
5	4	1	26.4	0.6	0.6
6	5	1			
7	6	1			
8	7	1			
9	8	1			
10	9	1			

CALCULATIONS

$\bar{R}$, the steady state rate of flow, is achieved when R is the same in three consecutive time intervals.

For the 1st Set of Readings $\bar{R}_1$ = (0.40)/60 = 6.67E-3 cm/sec
(R_1)

For the 2nd Set of Readings $\bar{R}_2$ = (0.60)/60 = 0.01 cm/sec
(R_2)

K_{fs} = [(.0041)(35.33)(0.01)] - [(.0054)(35.33)(6.67E-3)] = 1.8E-4 cm/sec → 0.26 in/hr
FIELD SATURATED HYDRAULIC CONDUCTIVITY — RESERVOIR CONSTANT — $\bar{R}_2$-STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_1$-STEADY STATE RATE OF FLOW

ϕ_m = [(.0572)(_____)(_____)] - [(.0237)(_____)(_____)] = _____ cm²/sec
MATRIC FLUX POTENTIAL — RESERVOIR CONSTANT — $\bar{R}_1$ STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_2$ STEADY STATE RATE OF FLOW

α = (_____) / (_____) = _____ cm⁻¹
ALPHA PARAMETER — K_{fs} — ϕ_m

$\Delta\Theta$ = (_____) - (_____) = _____ cm³/cm³
DELTA THETA — Θ_s, FIELD SATURATED WATER CONTENT OF SOIL, IN CM/CM — Θ_i, AMBIENT WATER CONTENT OF SOIL, IN CM/CM

ESTIMATED	
MEASURED	

CHECK ONE

S = $\sqrt{2(\_\_\_\_)(\_\_\_\_)}$ = _____ cm sec$^{-1/2}$
SORPTIVITY — $\Delta\Theta$ — ϕ_m

Test Hole # 2 - US 2 Mt. Spokane Rd

GP FIELD DATA SHEET

SECTION 2: STANDARDIZED PROCEDURE FOR PERMEAMETER READINGS AND CALCULATIONS

Date 3-13-05 Investigator M.S. Reister

Reservoir Constants: (See label on Permeamter)

Combined Reservoirs X	35.33	cm²	✓ CHECK RESERVOIR USED
Inner Reservoir Y		cm²	

Depth of Well Hole 18 cm

Note: In standardized procedure the radius of the well hole is always 3.0 cm

1st Set of Readings with height of water in well (H_1) set at 5 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_1, (CM/MIN)
1	0	0	11.0	—	—
2	2	2	11.4	0.4	0.20
3	4	2	11.6	0.2	0.10
4	6	2	11.8	0.2	0.10
5	8	2	12.0	0.2	0.10
6	10	2			
7	12	2			

2nd Set of Readings with height of water in well (H_2) set at 10 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_2, (CM/MIN)
1	0	0	27.0	—	—
2	1	1	28.5	1.5	1.5
3	2	1	30.2	1.7	1.7
4	3	1	31.8	1.6	1.6
5	4	1	33.4	1.6	1.6
6	5	1	35.5	2.1	2.1
7	6	1	37.7	2.2	2.2
8	7	1	40.8	3.1	3.1
9	8	1	43.7	2.9	2.9
10	9	1	46.4	2.7	2.7
11	10	1	49.0	2.6	2.6
12	11	1	51.0	2.0	2.0
13	12	1	53.0	2.0	2.0
14	13	1	55.0	2.0	2.0
15	14	1			

CALCULATIONS

$\bar{R}$, the steady state rate of flow, is achieved when R is the same in three consecutive time intervals.

For the 1st Set of Readings $\bar{R}_1$ = (0.10) / 60 = 1.67E-3 cm/sec
(R_1)

For the 2nd Set of Readings $\bar{R}_2$ = (2.0) / 60 = 3.33E-2 cm/sec
(R_2)

K_{fs} = [(.0041)(35.33)(3.33E-2)] - [(.0054)(35.33)(1.67E-3)] = 0.0045 cm/sec
FIELD SATURATED HYDRAULIC CONDUCTIVITY — RESERVOIR CONSTANT — $\bar{R}_2$ -STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_1$ -STEADY STATE RATE OF FLOW

6.38 in/hr

ϕ_m = [(.0572)(_____)(_____)] - [(.0237)(_____)(_____)] = _____ cm²/sec
MATRIC FLUX POTENTIAL — RESERVOIR CONSTANT — $\bar{R}_1$ STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_2$ STEADY STATE RATE OF FLOW

α = (_____) / (_____) = _____ cm⁻¹
ALPHA PARAMETER — K_{fs} — ϕ_m

$\Delta\Theta$ = (_____) - (_____) = _____ cm³ / cm³
DELTA THETA — Θ_s, FIELD SATURATED WATER CONTENT OF SOIL, IN CM /CM — Θ_i, AMBIENT WATER CONTENT OF SOIL, IN CM /CM

ESTIMATED	
MEASURED	

CHECK ONE

S = $\sqrt{2(\_\_\_\_)(\_\_\_\_)}$ = _____ cm sec$^{-1/2}$
SORPTIVITY — $\Delta\Theta$ — ϕ_m

Test Hole #3 - US 2 Mt. Spokane Rd

GP FIELD DATA SHEET S.N. 10396

SECTION 2: STANDARDIZED PROCEDURE FOR PERMEAMETER READINGS AND CALCULATIONS

Date 3-13-05 Investigator M.S. Reister

Reservoir Constants: (See label on Permeamter)

Combined Reservoirs X	35.33	cm²
Inner Reservoir Y		cm²

☑ CHECK RESERVOIR USED

Depth of Well Hole _____

Note: In standardized procedure the radius of the well hole is always 3.0 cm

1st Set of Readings with height of water in well (H_1) set at 5 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_1, (CM/MIN)
1	0	0	24.0	—	—
2	2	2	24.6	0.6	0.30
3	4	2	24.9	0.3	0.15
4	6	2	25.6	0.3	0.15
5	8	2	26.0	0.4	0.20
6	10	2	26.7	0.7	0.35
7	12	2	27.1	0.4	0.20
8	14	2	27.6	0.5	0.25
9	16	2	27.9	0.3	0.15
10	18	2	28.3	0.4	0.20
11	20	2	28.5	0.2	0.10
12	22	2	28.7	0.2	0.10
13	24	2	28.9	0.2	0.10
14	26	2			

2nd Set of Readings with height of water in well (H_2) set at 10 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_2, (CM/MIN)
1	0	1	29.0	—	—
2	1	1	30.5	1.5	1.5
3	2	1	32.0	1.5	1.5
4	3	1	33.5	1.5	1.5
5	4	1	35.0	1.5	1.5
6	5	1	36.8	1.8	1.8
7	6	1	38.5	1.7	1.7
8	7	1	40.2	1.7	1.7
9	8	1	42.0	1.8	1.8
10	9	1	43.8	1.8	1.8
11	10	1	45.6	1.8	1.8
12	11	1	47.4	1.8	1.8
13	12	1			
14	13	1			
15	14	1			

CALCULATIONS

$\bar{R}$, the steady state rate of flow, is achieved when R is the same in three consecutive time intervals.

For the 1st Set of Readings $\bar{R}_1$ = (0.10)/60 = 1.67E-3 cm/sec
(R_1)

For the 2nd Set of Readings $\bar{R}_2$ = (1.8)/60 = 0.03 cm/sec
(R_2)

K_{fs} = [(.0041)(35.33)(0.03)] - [(.0054)(35.33)(1.67E-3)] = 0.004 cm/sec
FIELD SATURATED HYDRAULIC CONDUCTIVITY — RESERVOIR CONSTANT — $\bar{R}_2$ -STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_1$ -STEADY STATE RATE OF FLOW

↳ 5.67 in/hr

ϕ_m = [(.0572)(_____)(_____)] - [(.0237)(_____)(_____)] = _____ cm²/sec
MATRIC FLUX POTENTIAL — RESERVOIR CONSTANT — $\bar{R}_1$ STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_2$ STEADY STATE RATE OF FLOW

α = (_____) / (_____) = _____ cm⁻¹
ALPHA PARAMETER — K_{fs} — ϕ_m

$\Delta\Theta$ = (_____) - (_____) = _____ cm³ / cm³
DELTA THETA — Θ_s, FIELD SATURATED WATER CONTENT OF SOIL, IN CM /CM — Θ_i, AMBIENT WATER CONTENT OF SOIL, IN CM /CM

ESTIMATED	☐
MEASURED	☐

CHECK ONE

S = $\sqrt{2(\_\_\_\_)(\_\_\_\_)}$ = _____ cm sec$^{-1/2}$
SORPTIVITY — $\Delta\Theta$ — ϕ_m

GP FIELD DATA SHEET

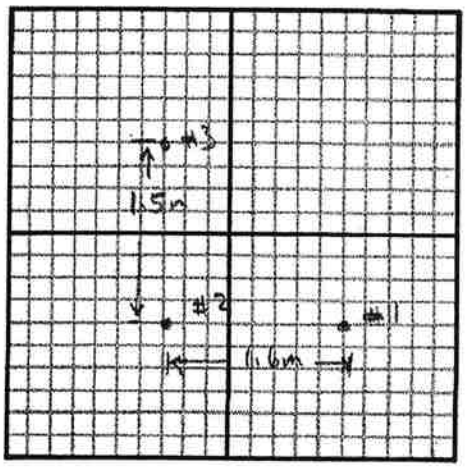
SECTION 1: SITE INFORMATION

Date 3-20-05 Investigator M.S. Roister

Site Location US 195 Mobile Site

Dominant Soil Type(s) Silty Sand w/ gravel

Site Map:



Soil Profile Description (horizon depth, texture, structure, color, etc.):

Depth	Description
	N/A

Presence of special soil conditions (mottling, water table depth, hardpan, induration, compacted layers, etc.):

None

Comments and Notes (topography, slope, vegetation, etc.):

Silty sand w/ gravel and cobbles - uniform soil profile.

US 195 - Test Hole #1

GP FIELD DATA SHEET

SECTION 2: STANDARDIZED PROCEDURE FOR PERMEAMETER READINGS AND CALCULATIONS

Date 3-20-05 Investigator M. S. Reistor

Reservoir Constants: (See label on Permeamter)

Combined Reservoirs X	35.33	cm²
Inner Reservoir Y		cm²

✓ CHECK RESERVOIR USED

Depth of Well Hole 29cm (40cm from surface)

Note: In standardized procedure the radius of the well hole is always 3.0 cm

1st Set of Readings with height of water in well (H_1) set at 5 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_1, (CM/MIN)
1	0	—	22.0	—	—
2	2	2	28.5	6.5	3.25
3	4	2	35.0	6.5	3.25
4	6	2	41.5	6.5	3.25
5	8	2			
6	10	2			
7	12	2			
8	14	2			
9	16	2			
10	18	2			

2nd Set of Readings with height of water in well (H_2) set at 10 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_2, (CM/MIN)
1	0	—	45.0	—	—
2	1	1	52.2	7.2	7.2
3	2	1	59.4	7.2	7.2
4	3	1	66.7	7.3	7.3
5	4	1			
6	5	1			
7	6	1			
8	7	1			
9	8	1			
10	9	1			

CALCULATIONS

R, the steady state rate of flow, is achieved when R is the same in three consecutive time intervals.

For the 1st Set of Readings $\bar{R}_1$ = (3.25)/60 = 5.42E-2 cm/sec
(R_1)

For the 2nd Set of Readings $\bar{R}_2$ = (7.2)/60 = 0.12 cm/sec
(R_2)

K_{fs} = [(.0041)(35.33)(0.12)] - [(.0054)(35.33)(5.4E-2)] = 0.007 cm/sec
FIELD SATURATED HYDRAULIC CONDUCTIVITY — RESERVOIR CONSTANT — $\bar{R}_2$ - STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_1$ - STEADY STATE RATE OF FLOW

↳ 0.03 in/hr

ϕ_m = [(.0572)(_____)(_____)] - [(.0237)(_____)(_____)] = _____ cm²/sec
MATRIC FLUX POTENTIAL — RESERVOIR CONSTANT — $\bar{R}_1$ STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_2$ STEADY STATE RATE OF FLOW

α = (_____) / (_____) = _____ cm⁻¹
ALPHA PARAMETER — K_{fs} — ϕ_m

$\Delta\Theta$ = (_____) - (_____) = _____ cm³/cm³
DELTA THETA — Θ_s, FIELD SATURATED WATER CONTENT OF SOIL, IN CM/CM — Θ_i, AMBIENT WATER CONTENT OF SOIL, IN CM/CM

ESTIMATED	
MEASURED	

CHECK ONE

S = $\sqrt{2(\_\_\_\_)(\_\_\_\_)}$ = _____ cm sec$^{-1/2}$
SORPTIVITY — $\Delta\Theta$ — ϕ_m

US 195 #2

GP FIELD DATA SHEET

SECTION 2: STANDARDIZED PROCEDURE FOR PERMEAMETER READINGS AND CALCULATIONS

Date 3-20-05 Investigator M.S. Reister

Reservoir Constants: (See label on Permeamter)

Combined Reservoirs X 35.33 cm²	✓	CHECK RESERVOIR USED
Inner Reservoir Y cm²		

Depth of Well Hole 29cm (39cm from surface)

Note: In standardized procedure the radius of the well hole is always 3.0 cm

1st Set of Readings with height of water in well (H_1) set at 5 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_1, (CM/MIN)
1	0	—	6.5	—	—
2	2	2	8.0	1.5	0.75
3	4	2	9.2	1.2	0.60
4	6	2	10.4	1.2	0.60
5	8	2	11.7	1.3	0.65
6	10	2	12.8	1.1	0.55
7	12	2	13.9	1.1	0.55
8	14	2	15.0	1.1	0.55
9	16	2			
10	18	2			

2nd Set of Readings with height of water in well (H_2) set at 10 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_2, (CM/MIN)
1	0	—	23.0	—	—
2	1	1	24.4	1.4	1.4
3	2	1	25.6	1.2	1.2
4	3	1	26.8	1.2	1.2
5	4	1	27.9	1.1	1.1
6	5	1	29.0	1.1	1.1
7	6	1	30.1	1.1	1.1
8	7	1			
9	8	1			
10	9	1			

CALCULATIONS

$\bar{R}$, the steady state rate of flow, is achieved when R is the same in three consecutive time intervals.

For the 1st Set of Readings $\bar{R}_1$ = (0.55)/60 = 9.17E-3 cm/sec
(R_1)

For the 2nd Set of Readings $\bar{R}_2$ = (1.1)/60 = 1.83E-2 cm/sec
(R_2)

K_{fs} = [(.0041)(35.33)(1.83E-2)] - [(.0054)(35.33)(9.17E-3)] = 0.0009 cm/sec → 1.28 in/hr
FIELD SATURATED HYDRAULIC CONDUCTIVITY — RESERVOIR CONSTANT — $\bar{R}_2$ - STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_1$ - STEADY STATE RATE OF FLOW

ϕ_m = [(.0572)(_____)(_____)] - [(.0237)(_____)(_____)] = _____ cm²/sec
MATRIC FLUX POTENTIAL — RESERVOIR CONSTANT — $\bar{R}_1$ STEADY STATE RATE OF FLOW — RESERVOIR CONSTANT — $\bar{R}_2$ STEADY STATE RATE OF FLOW

α = (_____) / (_____) = _____ cm⁻¹
ALPHA PARAMETER — K_{fs} — ϕ_m

$\Delta\Theta$ = (_____) - (_____) = _____ cm³ / cm³
DELTA THETA — θ_{fs}, FIELD SATURATED WATER CONTENT OF SOIL, IN CM/CM — θ_i, AMBIENT WATER CONTENT OF SOIL, IN CM/CM

ESTIMATED		CHECK ONE
MEASURED		

S = $\sqrt{2(\_\_\_\_)(\_\_\_\_)}$ = _____ cm sec$^{-1/2}$
SORPTIVITY — $\Delta\Theta$ — ϕ_m

GS 195 #3

GP FIELD DATA SHEET

SECTION 2: STANDARDIZED PROCEDURE FOR PERMEAMETER READINGS AND CALCULATIONS

Date 3-20-05 Investigator M.S. Reister

Reservoir Constants: (See label on Permeamter)

Combined Reservoirs X	35.33	cm²
Inner Reservoir Y		cm²

✓ CHECK RESERVOIR USED

Depth of Well Hole 25cm (35cm from surface)

Note: In standardized procedure the radius of the well hole is always 3.0 cm

1st Set of Readings with height of water in well (H_1) set at 5 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_1, (CM/MIN)
1	0	—	13.0	—	—
2	2	2	15.3	2.3	1.15
3	4	2	17.6	2.3	1.15
4	6	2	19.9	2.3	1.15
5	8	2			
6	10	2			
7	12	2			
8	14	2			
9	16	2			
10	18	2			

2nd Set of Readings with height of water in well (H_2) set at 10 cm

READING NUMBER	TIME	TIME INTERVAL (MIN)	WATER LEVEL IN RESERVOIR, (CM)	WATER LEVEL CHANGE, (CM)	RATE OF WATER LEVEL CHANGE, R_2, (CM/MIN)
1	0	—	28.5	—	—
2	1	1	30.2	1.7	1.7
3	2	1	31.9	1.7	1.7
4	3	1	33.7	1.8	1.8
5	4	1	35.1	1.4	1.4
6	5	1	36.7	1.6	1.6
7	6	1	38.3	1.6	1.6
8	7	1	39.7	1.4	1.4
9	8	1	41.4	1.7	1.7
10	9	1	43.1	1.7	1.7
11	10	1	44.7	1.6	1.6
12	11	1	46.3	1.6	1.6
13	12	1	48.0	1.7	1.7
14	13	1	49.7	1.7	1.7
15	14	1	51.4	1.7	1.7

CALCULATIONS

$\bar{R}$, the steady state rate of flow, is achieved when R is the same in three consecutive time intervals.

For the 1st Set of Readings $\bar{R}_1$ = (1.15 / R_1)/60 = 1.91E-2 cm/sec

For the 2nd Set of Readings $\bar{R}_2$ = (1.7 / R_2)/60 = 2.83E-2 cm/sec

K_{fs} (FIELD SATURATED HYDRAULIC CONDUCTIVITY) = [(.0041)(35.33 / RESERVOIR CONSTANT)(2.83E-2 / $\bar{R}_2$ - STEADY STATE RATE OF FLOW)] - [(.0054)(35.33 / RESERVOIR CONSTANT)(1.91E-2 / $\bar{R}_1$ - STEADY STATE RATE OF FLOW)] = 0.0005 cm/sec → 0.71 in/hr

ϕ_m (MATRIC FLUX POTENTIAL) = [(.0572)(_____ / RESERVOIR CONSTANT)(_____ / $\bar{R}_1$ STEADY STATE RATE OF FLOW)] - [(.0237)(_____ / RESERVOIR CONSTANT)(_____ / $\bar{R}_2$ STEADY STATE RATE OF FLOW)] = _____ cm²/sec

α (ALPHA PARAMETER) = (_____ / K_{fs}) / (_____ / ϕ_m) = _____ cm⁻¹

$\Delta\theta$ (DELTA THETA) = (_____ / θ_s, FIELD SATURATED WATER CONTENT OF SOIL, IN CM/CM) - (_____ / θ_i, AMBIENT WATER CONTENT OF SOIL, IN CM/CM) = _____ cm³/cm³

ESTIMATED	
MEASURED	

CHECK ONE

S (SORPTIVITY) = $\sqrt{2(\_\_\_\_ / \Delta\theta)(\_\_\_\_ / \phi_m)}$ = _____ cm sec$^{-1/2}$

APPENDIX G

LID Equation Comparison Calculations

LID EQUATION CALCULATIONS FOR NATURAL DISPERSION

Eqn. 7: LID = ACP/(Ks/ri-1)

Eastern Washington Flow Control Dispersion

25-year Storm Event	Depth Conversion Factor from 24-hr storm	Peak Incremental Depth:	Timestep (hours):	Isopluvial to Peak Intensity Factor:
Long Duration, Region 1	1.16	0.0507	0.5	0.12
Long Duration, Region 2	1.00	0.0933	0.5	0.19
Long Duration, Region 3	1.06	0.0855	0.5	0.18
Long Duration, Region 4	1.07	0.0796	0.5	0.17
SCS Type 1A (Regions 2 & 3)	1.00	0.024	0.1	0.24

SI UNITS

Highway Location	Roadway Width (m)	Soil Ksat Value (mm/hr)	25-yr Depth (mm)	25-yr Peak Intensity (mm/hr)	LID Length per Equation 7 (m)
Stevens Pass	14	152	254.0	29.9	3.42
Stevens Pass	14	102	254.0	29.9	5.80
Stevens Pass	6.1	102	254.0	29.9	2.53
Wenatchee	14	152	63.5	11.8	1.18
Wenatchee	14	75	63.5	11.8	2.63
Wenatchee	6.1	75	63.5	11.8	1.14
Moses Lake	14	152	35.6	6.6	0.64
Moses Lake	14	102	35.6	6.6	0.97
Moses Lake	6.1	50	35.6	6.6	0.93
Spokane	14	152	55.9	10.1	1.00
Spokane	14	102	55.9	10.1	1.54
Spokane	6.1	102	55.9	10.1	0.67

ENGLISH UNITS

Highway Location	Roadway Width (ft)	Soil Ksat Value (in/hr)	25-yr Depth (in)	25-year Peak Intensity (in/hr)	LID Length per Equation 7 (ft)
Stevens Pass	46	6.0	10.0	1.2	11.2
Stevens Pass	46	4.0	10.0	1.2	19.0
Stevens Pass	20	4.0	10.0	1.2	8.3
Wenatchee	46	6.0	2.5	0.5	3.9
Wenatchee	46	3.0	2.5	0.5	8.6
Wenatchee	20	3.0	2.5	0.5	3.8
Moses Lake	46	6.0	1.4	0.3	2.1
Moses Lake	46	4.0	1.4	0.3	3.2

Moses Lake	20	2.0	1.4	0.3	3.1
Spokane	46	6.0	2.2	0.4	3.3
Spokane	46	4.0	2.2	0.4	5.1
Spokane	20	4.0	2.2	0.4	2.2

Eastern Washington Quality Treatment Dispersion
(with UIC depth to water table satisfied)

Short-Duration Storm Event	Depth Conversion Factor from 2-yr/2-hr to 6-mo/3-hr	Peak Incremental Depth:	Timestep (hours)	Isopluvial to Peak Intensity Factor:
Region 1	0.76	0.2377	0.083	2.18
Region 2	0.68	0.2377	0.083	1.95
Region 3	0.71	0.2377	0.083	2.03
Region 4	0.76	0.2377	0.083	2.18

SI UNITS

Highway Location	Roadway Width (m)	Soil Ksat Value (mm/hr)	2yr-2hour Depth (mm)	6mo-3hour Peak Intensity (mm/hr)	LID Length per Equation 7 (m)
Stevens Pass	14	152	25.4	55.3	8.00
Stevens Pass	14	102	25.4	55.3	16.57
Stevens Pass	6.1	102	25.4	55.3	7.22
Wenatchee	14	152	11.4	22.3	2.40
Wenatchee	14	75	11.4	22.3	5.91
Wenatchee	6.1	75	11.4	22.3	2.57
Moses Lake	14	152	10.2	19.8	2.10
Moses Lake	14	102	10.2	19.8	3.37
Moses Lake	6.1	50	10.2	19.8	3.99
Spokane	14	152	12.7	25.8	2.87
Spokane	14	102	12.7	25.8	4.75
Spokane	6.1	102	12.7	25.8	2.07

ENGLISH UNITS

Highway Location	Roadway Width (ft)	Soil Ksat Value (in/hr)	2yr-2hour Depth (in)	6mo-3hour Peak Intensity (mm/hr)	LID Length per Equation 7 (ft)
Stevens Pass	46	6.0	1.0	2.2	26.2
Stevens Pass	46	4.0	1.0	2.2	54.3
Stevens Pass	20	4.0	1.0	2.2	23.7
Wenatchee	46	6.0	0.5	0.9	7.9

Wenatchee	46	3.0	0.5	0.9	19.4
Wenatchee	20	3.0	0.5	0.9	8.4
Moses Lake	46	6.0	0.4	0.8	6.9
Moses Lake	46	4.0	0.4	0.8	11.1
Moses Lake	20	2.0	0.4	0.8	13.1
Spokane	46	6.0	0.5	1.0	9.4
Spokane	46	4.0	0.5	1.0	15.6
Spokane	20	4.0	0.5	1.0	6.8

APPENDIX H

Project Photos

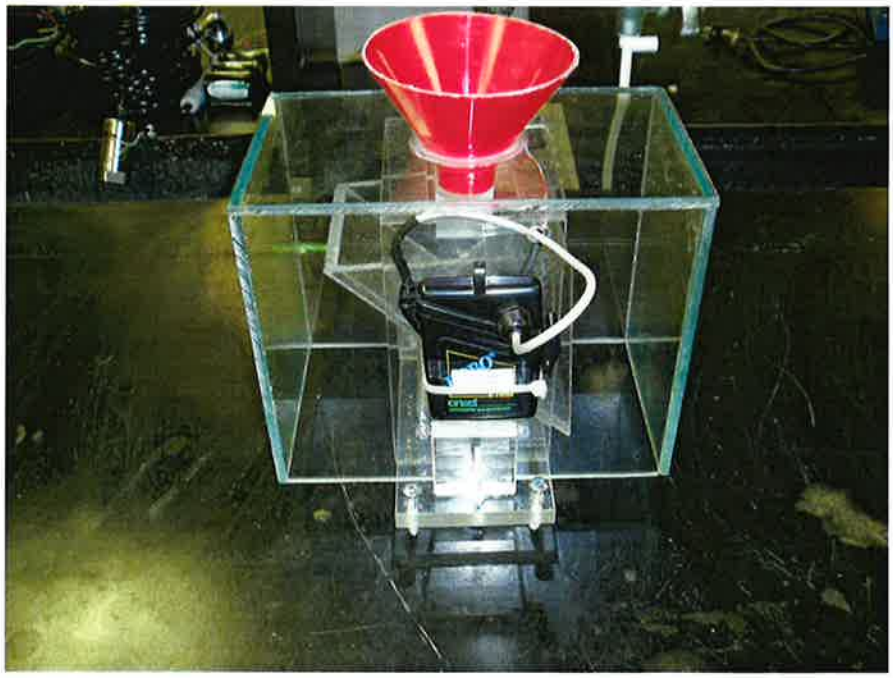


FIGURE F-1 Typical Tipping Bucket Flow Meter w/Onset (HOBO) Data Logger

FIGURE F-2 1st Generation Rainfall Simulator (Front View)

FIGURE F-3 1st Generation Rainfall Simulator (Side View)

FIGURE F-4 2nd Generation Rainfall Simulator (Used for Study)

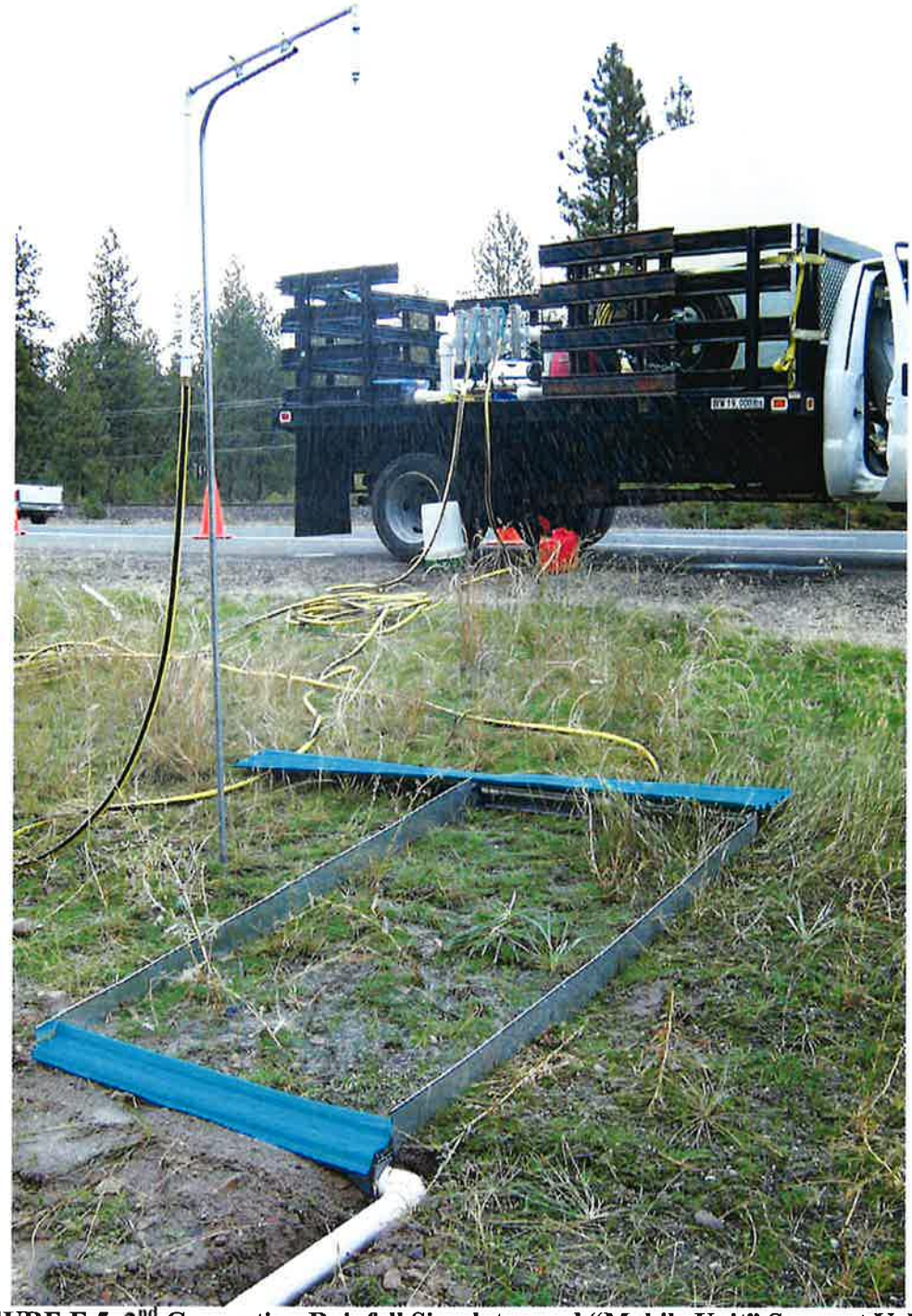


FIGURE F-5 2nd Generation Rainfall Simulator and "Mobile Unit" Support Vehicle

FIGURE F-6 Rainfall Simulation Plot w/Rain Gauges (2m Length – Typical)

FIGURE F-7 "Mobile Unit" Rainfall Simulation Support Vehicle

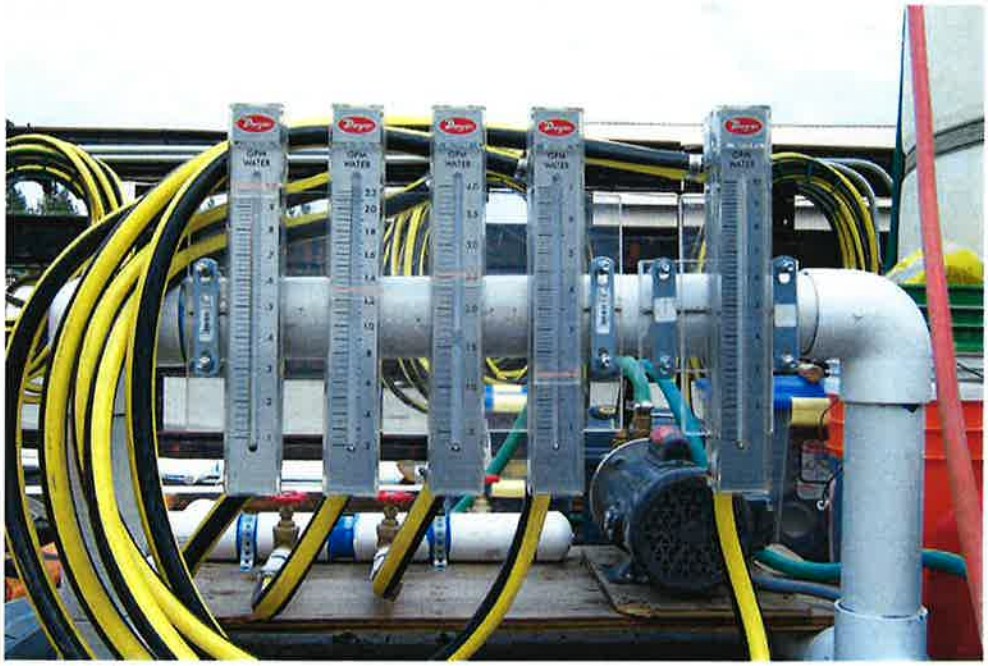


FIGURE F-8 Rainfall Simulator Water Supply Control Manifold

FIGURE F-9 Remote Site Tipping Bucket Flow Meter w/Composite Sample Bucket (Typical)

FIGURE F-10 Remote Site Slot Drain Installation (SR-270 Site Shown)

FIGURE F-11 Tipping Bucket Rain Gauge Installation (SR-2 Remote Site Shown)

FIGURE F-12 Slot Drain Installations at SR-270 Remote Site (Pullman)

FIGURE F-13 I-90 (North Bend) Remote Site Slot Drain/Flow Meter Installation

FIGURE F-14 US-2 (Spokane) Remote Site