Draft White Paper on Groundwater Extraction Data

Submitted to:
Buena Vista Water Storage District

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DRAFT WHITE PAPER ON GROUNDWATER EXTRACTION DATA

1.0 Introduction

There are seven components to Groundwater Sustainability Plan (GSP) coordinating agreements. These components will be described in the Department of Water Resources' (DWR) GSP regulations, expected to be released in draft form in November, 2015. The components are:

a. Groundwater elevation data;
b. Groundwater extraction data;
c. Surface water supply;
d. Total water use;
e. Change in groundwater storage;
f. Water budget, and
g. Sustainable yield.

This white paper was prepared by the Buena Vista Water Storage District (BVWSD) and addresses Item b of the preceding list - *Groundwater Extraction Data*. The information presented in this paper provides a methodology for the consistent collection of groundwater extraction data to be applied within the boundaries of the Buena Vista Groundwater Sustainability Agency (BVGSA), boundaries consistent with those of the BVWSD. The information presented in this document is intended to serve three purposes:

- serve as guidance for the BVGSA;
- support coordination with other GSAs, and
- provide a framework for use in developing a GSP that may be prepared cooperatively by the BVGSA and other GSAs in Kern County.

2.0 Groundwater Extraction Data

Establishing clearly defined methods for determination of groundwater extractions is central to both sustainable groundwater management within a GSA and for establishing credibility and commonality for reporting and analysis of data on extractions among neighboring GSAs. For this reason complete, accurate water accounting are key components of coordinating agreements between cooperating GSAs. This section proposes two methods for the determination of groundwater extractions from within the BVGSA.

2.1 Calculated Groundwater Extraction Data

When extraction is calculated, it is estimated through a water budget. A robust water budget must include data that describe groundwater extractions, surface water supplies, total water use, change in groundwater storage and change in commitments to receive or deliver water in the future to or from other entities. Measurement and analysis of groundwater elevation data (Item a. of the list at the beginning of this paper) will be the principal tool for estimating change in storage.

The BVGSA has developed an accounting worksheet for recording data to be included when calculating the GSA's water budget. This worksheet is presented in Appendix A.

2.2 Total Water Use

There are two recommended methods for estimating consumptive water use in the BVSG:

- Use of satellite imagery based estimates, and
- Use of computational tools such as the DWR's Independent Demand Calculator (IDC).

Ideally, these two tools can be applied to complement one and other to provide both accurate, spatially- and temporally-defined data on crop water use, the dominant water use within the BVGSA, and also to estimate deep percolation from irrigated lands within the GSA service area

2.2.1 Satellite Imagery

Landsat satellite imagery processed by the Irrigation Training and Research Center (ITRC) at Cal Poly San Luis Obispo computes actual evapotranspiration (ETa) over large areas. The ITRC develops these estimates using the *Mapping Evapotranspiration at High Resolution with Internal Calibration* (METRIC) methodology originally developed at the University of Idaho. METRIC has been used in scientific research to determine the spatial distribution of ETa at the 30-meter pixel resolution of Landsat thermal mapper imagery. Because the methodology measures actual evaporation, outputs account for factors such as crop management, plant vigor, stand density, and moisture stress that can cause ETa to differ from potential crop water use (Howes, 2014).

The ETa data estimated by METRIC can be verified using field-scale ETa measurements and crop consumptive use estimates developed from the IDC method, described below.

2.2.2 Independent Demand Calculator (IDC)

The IDC Approach applies DWR's CUP-E program to generate daily estimates of irrigation water demand that can be summed to monthly values for use in DWR's Independent Demand Calculator (IDC) program. The IDC is a root zone water balance that generates monthly deep percolation volumes for use as inputs to groundwater models. While the IDC was developed for use with DWR's C2VSim model, values generated by IDC can be applied to estimate deep percolation from irrigated lands in any water accounting structure. The IDC would use climatological data from nearby CIMIS or NOAA stations, cropping data for the BVWSD service area and soils data from the NRCS's SSURGO database to estimate crop water demands and to schedule irrigation applications to satisfy these demands. Because of the nature of the soils and crop data, estimates of ET and of deep percolation can be computed at the spatial resolution needed to meet the requirements of the water accounting or modelling tools that will be adopted by the BVGSA to aid in sustainable management of groundwater.

Monthly estimates of agricultural consumptive use, combined with data on urban water use, will be combined to estimate annual total water use within the BVGSA. Total Water Use estimates for the BVGSA can then be consolidated with similarly derived estimates from other areas within the Kern Subbasin to characterize water use within the Subbasin.

2.3 Surface Water Supply

Water supplies available to the BVWSD include the Kern River, the State Water Project, occasional deliveries from the Central Valley Project and other surface sources and minor volumes of effective precipitation. Published data available from the KCWA's annual Water Supply Reports and other sources will be used to document surface water deliveries into the BVWSD and these estimates of inflows will be confirmed using measurements of surface flows developed by the District.

2.4 Groundwater Extraction

Groundwater extractions within BVGSA will be measured with meters. For metering to be effective, all wells within the BVWSD will be metered regardless of the well's ownership and the volume of water produced. Domestic wells may be exempted from these requirements only in instances where power bills and independently verified pumping depths have been provided. Meters will be installed, certified, and tested following the procedures developed by DWR for metering of wells used in groundwater substitution transfers. This process consists of the following three steps:

- Background Review: Review flow meter documentation; contact flow meter manufacturer for certification documentation.
- Site Visit: Perform site visit to photograph installation, confirm design dimensions, and operate wells to monitor flow meters.
- Certification Letters: The BVGSA will obtain certification letters with information required in DWR's "*Technical Information for Water Transfers in 2015*" or more current DWR guidance regarding certification of flow meters. The letters will be prepared and sealed by a California registered Professional Engineer and will include operational requirements the District may need to follow.

BVGSA has elected to standardize using electromagnetic meters for several reasons: accuracy, durability, ease of data collection and adaptability to existing well discharges. Basic specifications for electromagnetic flow meters are presented in Appendix B. Other GSAs may require different methods of metering which they find to be better suited to their conditions and objectives.

2.5 Reporting of Extraction Data

SGMA requires annual reporting of groundwater elevation data, groundwater extraction, surface water use, total water use, and change in groundwater storage. The BVGSA will compile data on volumes of water extracted by each well within the GSA's boundaries on a quarterly schedule and will maintain data on groundwater extraction within the GSA's GIS system so that extraction data can be combined with water use data to provide timely, spatially- and temporally-defined mapping of water use and groundwater extraction.

2.6 Quality Control and Quality Assurance

Groundwater extraction data can be evaluated for accuracy against values prepared in Agricultural Water Management Plans (AWMPs), Groundwater Management Plans (GMPs) and estimates of changes in stored groundwater determined based on changes observed in groundwater elevations. If volumes of groundwater usage presented in AWMPs and GMPS depart by more than 15% from the measured volumes of extraction, the AWMPs, GMPs and monitored extractions should be reviewed to establish the cause of the discrepancy.

Appendix A – Water Budget Accounting Spreadsheet

BUENA VISTA WATER STORAGE DISTRICT USE OF SUPPLY

	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]	[26]	[27]	[28]	[29]	[30]	[31]	[32]	[33]	[34]
YEAR	WATER DEMANDS																TOTAL WATER DEMANDS (AF)
	CROP USE (AF)	EVAP LOSS (AF)	ISABELLA LOSS (AF)	ISA. LOSS OVERSTORAGE (AF)	DISTRICT WELLS (AF)	LANDOWNER WELLS (AF)	OTHER RECHARGE (AF)	KR CARRYOVER (AF)	SWP CARRYOVER (AF)	BANKING WTR RETURNED (AF)	CARMEL ENTITLEMENT (AF)	WATER SALE (AF)	WATER EXCHANGES (AF)	OTHER DEMANDS (AF)	GW ACCTS BALANCE CO (AF)	3RD PARTY OBLIGATIONS (AF)	
2005	104,800		16,928	-				60,208	3,040	-	11,431	-	71,158	7,861	345,412		620,838
2006	104,196		14,826	-				49,136	5,706	-	10,835	-	45,633	12,591	428,066		670,989
2007	98,519		10,125	-				15,053	4,709	-	932	-	30,215	7,867	355,831		523,251
2008	91,705		11,506	-				24,341	5,341	-	3,792	-	21,142	4,093	318,789		480,709
2009	97,361		11,665	-				24,521	(1,658)	-	3,132	-	21,080	575	295,193		451,869
2010	101,362		13,327	-				64,000	7,166	-	8,686	-	54,595	2,907	291,319		543,362
2011	129,773		9,971	-				35,697	17,110	-	13,831	-	72,656	1,817	415,053		695,908
2012	115,158		7,945	-				19,553	15,591	-	1,609	-	25,333	2,823	379,152		567,164
2013	114,572		5,585	-				6,103	12,206	-	563	10,000	21,374	246	347,276		517,925
2014	100,436		2,809	-				555	258	-	463	27,206	9,195	-	330,045		470,967
2015										-						**207,185**	
	105,788																123,177

[18] Estimated crop water use (transpiration and soil evap) method of reporting to conform to approved list
[19] Water surface evaporation losses (canals, reservoirs and recharge ponds)
[20] Lake Isabella Losses from storage
[21] Lake Isabella Losses from overstorage
[22] Water pumped from district wells
[23] Water pumped from private wells
[24] Water in 3rd party banking programs(net), 10% leave behind to be accounted for in detail backup
[25] Lake Isabella Carryover at end of current year
[26] Aqueduct Carryover at end of current year
[27] Recharge water recovered in same year as recharge
[28] Carmel Entitlement
[29] Water Sales
[30] Water exchanged to other districts
[31] Misc Demands, Loss North of 46
[32] Carryover to next year of all groundwater accounts
[33] Obligations to 3rd Parties (Banking, Agreements, Etc) Shown at current year only
[34] Sum of [17] through [29]

BUENA VISTA WATER STORAGE DISTRICT SOURCE OF SUPPLY

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]
YEAR	KR A-J RUNOFF % OF AVG	WATER SOURCES													SAFE YIELD		TOTAL WATER SUPPLY (AF)
		KR CO WATER (AF)	SWP CO WATER (AF)	KR ENTITLEMENT (AF)	FK SUPPLY (AF)	SWP SUPPLY (AF)	SWP - A21 SUPPLY (AF)	BANKING PROGRAMS (AF)	WATER EXCHANGES (AF)	DISTRICT WELLS (AF)	LANDOWNER WELLS (AF)	3RD PARTY RECOVERY (AF)	GW ACCTS BALANCE CO (AF)	OTHER SUPPLY (AF)	MINOR STREAMS (AF)	PRECIP (AF)	
2005	172	18,928	2,672	288956	1811	22,341	50,210	-	65,548				243,426	-	-	*	693,892
2006	174	60,208	3,040	273897	21035	19,436	32,792	-	39,875				345,412	-	-	*	795,695
2007	27	49,136	5,706	22617	1583	13,840	12,467	-	46,628				428,066	-	-	*	580,043
2008	72	15,053	4,709	92063	0	10,311	-	-	23,449				355,831	-	-	*	501,416
2009	64	24,341	5,341	76028	0	13,907	-	-	23,499				318,789	-	-	*	461,905
2010	127	24,521	(1,658)	207133	0	10,790	-	-	69,149				295,193	-	-	*	605,128
2011	206	64,000	7,166	331207	0	17,236	-	-	59,402				291,319	-	-	*	770,330
2012	39	35,697	17,110	39062	0	14,085	-	-	35,322			7,500	415,053	10,144	-	*	573,973
2013	22	19,553	15,591	13670	0	7,566	-	-	36,920				379,152	-	-	*	472,452
2014	21	6,103	12,206	11716	0	1,074	-	-	7,221			5,253	347,276	-	-	*	390,849
2015	13	555	258		0	0	-	-	5,100				330,045		-	*	335,145
1970-12	102.5	31,754		135,635	2,221	15,243	8,679										134,366

NOTES:

[1] April-July Runoff of the Kern River in % of average (1894-2005 = 464,430 AF)
[2] Carryover from previous year in Lake Isabella (Ex. 1980 Column 24 is entered into 1981 Column 2)
[3] Carryover from previous year in Aqueduct (example same as above)
[4] Current Year Entitlement
[5] FK supplies (NO BANKING FOR 3RD PARTY)
[6] SWP + pool purchases (NO BANKING FOR 3RD PARTY)
[7] Art 21 purchases
[8] Water recovered from district banking programs
[9] Water received from exchanges
[10] Water pumped from district wells
[11] Water pumped from private wells
[12] Water recovered from 3rd party banking programs
[13] Carryover from previous year of all groundwater accounts
[14] Misc Supply - Such as manadority release above entitlement, POOL A&B
[15] Minor Stream supply - to be discussed at a later time
[16] Effective Precipitation - to be discussed at a later time.
[17] Sum of [2] through [15]

SUMMARY OF
BUENA VISTA WATER STORAGE DISTRICT BALANCE

	TOTAL WATER SUPPLY (AF)	TOTAL WATER DEMANDS (AF)	ANNUAL BALANCE (AF)	ACCUM BALANCE (AF)
2005	693,892	620,838	73,054	975,505
2006	795,695	670,989	124,707	1,100,211
2007	580,043	523,251	56,792	1,157,003
2008	501,416	480,709	20,708	1,177,710
2009	461,905	451,869	10,036	1,187,746
2010	605,128	543,362	61,766	1,249,512
2011	770,330	695,908	74,422	1,323,934
2012	573,973	567,164	6,809	1,330,743
2013	472,452	517,925	(45,473)	1,285,270
2014	390,849	470,967	(80,119)	1,205,152
2015	335,145	0	0	0

Net 3rd Party Obligations	997,967

Appendix B – Electromagnetic Flow Meter Specification

SECTION J

ELECTROMAGNETIC FLOW METER, LIQUID, SINGLE-CHANNEL

PART 1 - GENERAL

1.1 SCOPE

A. This section describes the requirements for a flow sensor.

B. Under this item, the contractor shall furnish and deliver the flow measurement equipment and accessories as herein specified.

1.2 QUALITY ASSURANCE

A. Referenced Standards and Guidelines - Complies with applicable portions of ANSI/AWWA Standards and NSF/ANSI Standard 61, Annex G. There are currently no AWWA standards that specifically address electromagnetic metering.

1. Flow measurement function complies with Industry Standards
    a. ANSI B16.5 Class 150 RF
    b. AWWA Class B
    c. NEMA 4X/6P (IP66/IP67)

1.3 SUBMITTALS

A. The following information shall be included in the submittal for this section:

1. Outline dimensions, conduit entry locations and weight
2. Customer connection and power wiring diagrams
3. Data sheets and catalog literature for microprocessor-based transmitter and transducer
4. Interconnection drawings
5. Installation and operations manual
6. List of spare parts
7. Complete technical product description including a complete list of options provided
8. Any portions of this specification not met must be clearly indicated or the supplier and contractor shall be liable to provide all additional components required to meet this specification

1.4 SYSTEM DESCRIPTION

Electromagnetic flow meter is intended for fluid metering in agricultural water. No moving parts are to be in the flow stream. Amplifier may be integrally mounted to the detector or can be remote-mounted. Unit is to be ideally suited for measuring dynamic, non-continuous flow. Field applications include a possibility of tracking and monitoring minimum and/or maximum flow rates, therefore the unit is to provide pulse signals that can be fed to dedicated batch controllers, PLCs and other more specialized instrumentation.

1.5 DEFINITIONS

A. Amplifier – Device used for increasing the power of a signal. It does this by taking energy from a power supply and controlling the output to match the input signal shape but with larger amplitude.

B. ANSI – (American National Standards Institute) A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States. The organization also coordinates U.S. standards with international standards so that American products can be used worldwide.

C. AWWA – (American Water Works Association) An international non-profit professional organization founded to improve water quality and supply.

D. Detector Coils – Also called an "induction loop", an electromagnetic communication or detection system which uses a moving magnet to induce an electrical current in a nearby wire.

E. Electrode – An electrical conductor used to make contact with a nonmetallic part of a circuit (e.g. a semiconductor, an electrolyte or a vacuum).

F. Modbus RTU – a serial communications protocol published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs). This is used in serial communication & makes use of a compact, binary representation of the data for protocol communication.

G. NEMA – (National Electrical Manufacturers Association) Is the 'Association of Electrical Equipment and Medical Imaging Manufacturers' in the United States. Its approximately 450 member companies manufacture products used in the generation, transmission, distribution, control, and end use of electricity. These products are used in utility, industrial, commercial, institutional, and residential applications.

H. NSF – (National Science Foundation) A United States government agency that supports fundamental research and education in all the non-medical fields of science and engineering.

I. PLCs – (Programmable Logic Controller) A digital computer used for automation of electromechanical processes, such as control of machinery on factory assembly lines, amusement rides, or light fixtures. PLCs are used in many industries and machines.

J. Serial Communications – In telecommunication and computer science, serial communication is the process of sending data one bit at a time, sequentially, over a communication channel or computer bus. This is in contrast to parallel communication, where several bits are sent as a whole, on a link with several parallel channels.

PART 2 – PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with specifications, provide flow measurement equipment by one of the following:

1. Seametrics
2. Toshiba
3. Badger Meter
4. Siemens

2.2 OPERATING CONDITIONS

A. System Components

1. Metering Tube (Detector)

a. Consists of stainless steel tube lined with a non-conductive material. Energized detector coils around tube create a magnetic field across the diameter of the pipe. As a conductive fluid flows through the magnetic field, a voltage is induced across two electrodes; this voltage is proportional to the average flow velocity of the fluid.

2. Signal Amplifier

a. Consists of unit which receives, amplifies, and processes the detector's analog signal. Signal is converted to both analog and digital signals that are used to display rate of flow and totalization. Processor controls zero-flow stability, analog and frequency outputs, serial communications and a variety of other parameters. Integrated LCD display indicates rate of flow, forward and reverse totalizers and diagnostic messages. Display guides user through programmable routines.

B. Operational Requirements

1. Electromagnetic Flow Meter

a. The flow meter system shall operate with a pulsed DC excitation frequency, and shall produce a signal output that is directly proportional and linear with the volumetric flow rate of the liquid flowing through the metering tube. The metering system shall include a metering sensor tube (detector), a signal amplifier, and the necessary connecting wiring. The metering system shall have the ability to incorporate a meter mounted or remote mounted amplifier.

b. Engineering Units:

1) The signal amplifier shall be program selectable to display the following units of measure: Totalized Volume: U.S. gallons, million gallons (U.S.), cubic feet or acre feet; Instantaneous Flow: gallons per minute, cubic feet per second.

c. Operating Principle: Electromagnetic Induction

d. Metering Tube (Detector)

1) The metering tube (detector) shall be constructed of 304 or 316 stainless steel, and rated for a maximum allowable non-shock pressure and temperature for steel pipe flanges, according to ANSI B16.5.
2) The metering tube (detector) shall be available in line size from 6" to 12".
3) The metering tube (detector) end connections shall be carbon steel or stainless steel flanged, according to ANSI B16, Class 150 and AWWA Class B standards.
4) The insulating liner material of the metering tube (detector) shall be made of a hard rubber elastomer and NSF-listed for meter sizes 6" and above, in conformance with manufacturer's recommendation for the intended service.
5) The metering tube (detector) shall include two self-cleaning measuring electrodes. The electrode material shall be corrosion resistant and available in Alloy C or 316 stainless steel.
6) The metering tube (detector) shall include a third "empty pipe detection" electrode located in the upper portion of the inside diameter of the flow tube in order to detect an empty pipe condition when the flow tube is running partially empty. Empty pipe detection that is not activated until the pipe is 50% empty is not acceptable.
7) The metering tube (detector) housing shall be constructed of carbon steel, welded at all joints, and rated to meet NEMA 4X/6P (IP66/IP67) ratings.
8) For remote amplifier applications, the metering tube (detector) junction box enclosure shall be constructed of cast aluminum (powder-coated paint) and shall meet NEMA 4X/6P (IP66/IP67) ratings.
9) When installed in non-metallic or internally lined piping, the metering tube (detector) shall be provided with a pair of corrosion resistant grounding rings. The grounding ring material shall be 316 stainless steel.
10) Meter lining material shall be hard rubber, santoprene or polypropylene.
11) Fluid Temperature Range
    i. For remote amplifier applications, the fluid temperature range shall be 32°F to 130°F [0°C to 54°C] at a maximum ambient temperature of 122°F [50°C] for all specified lining materials.
    ii. For meter-mounted amplifier applications, the fluid temperature range shall be 32°F to 130°F [0°C to 54°C] at a maximum ambient temperature of 122°F [50°C] for all specified lining materials.

e. Signal Amplifier

1) The signal amplifier shall be microprocessor based, and shall energize the detector coils with a digitally controlled pulsed DC.
2) Power shall be supplied by internal battery with life of 5 years. Unit shall be external power input convertible.
3) The signal amplifier shall have an ambient temperature rating of -4°F to 140°F [-20°C to 60°C].
4) The signal amplifier shall include non-volatile memory capable of storing all programmable data and accumulated totalizer values in the event of a power interruption.
5) Automatic zero stability, low flow cut-off, empty pipe detection and bi-directional flow measurement shall be inherent capabilities of the signal amplifier.
6) All signal amplifier outputs shall be galvanically isolated to 50 volts.
7) The signal amplifier and/or remote junction enclosures shall be constructed of cast aluminum (powder-coated paint) and shall meet NEMA 4X/6P (IP66/IP67) ratings.
8) Inputs/Outputs:

   The signal amplifier shall provide a total of four digital outputs and one digital input.

   i. Up to four open collector digital outputs, program selectable from the following: Forward pulse, reverse pulse, AMR pulse, high/low flow alarm, empty pipe alarm, flow direction, and error alarm.
   ii. One digital input: ADE
   iii. Advanced protocol support using Modbus/RTU.

f. Control and Programming

1) The signal amplifier shall be programmable via function buttons. The programming functions shall be available in a user-friendly, menu driven software through the LCD interface. The signal amplifier shall accommodate the following languages: English or Spanish.
2) Programmable parameters of the amplifier include, but are not limited to: calibration factors, totalizer resets, unit of measure, pulse output scaling and ADE, flow-alarm functions, language selection, low-flow cutoff, noise dampening factor and sampling frequency selection.
3) The signal amplifier shall have a programming option allowing entry of a selected numeric password value for tamper protection.

g. System Performance

1) The metering system shall operate over a flow range of 0.35 to 27 ft/s.
2) The metering system shall perform to the following accuracy:

   1% for flow range of 10% to 100% maximum flow.

   2% for flow range from cutoff value to 10% of max. flow.

Maximum flow is defined as the flow determined by the high velocity specified in item 1) above.

3) The metering system shall be capable of measuring the volumetric flow rate of liquids having an electrical conductivity as low as 20 micromhos per centimeter.

4) The system measuring repeatability shall be <0.10% of full scale.

h. Indication

1) The signal amplifier shall include a LCD interface with a minimum digits of 5 for flow rate or velocity and 8 for volume to display the following values:

i. Flow rate in selectable rate units
ii. Forward totalizer in selectable volume units
iii. Reverse totalizer in selectable volume units
iv. Net totalizer in selectable volume units
v. Error or alarm messages
vi. Software revision level
vii. Flow velocity
viii. % of full scale flow

PART 3 - EXECUTION

3.1 INSTALLATION

A. The contractor will not install the meters with this project. The following is specified so that the contractor understands the installation requirements. All meters are to be delivered to the District yard.

B. Follow manufacturer's recommendation for installation. Installation will conform to the guidelines provided by the Installation & Operation Manual.

C. Straight pipe requirement shall be an equivalent of three diameters on the inlet (upstream) side, and two diameters on the outlet (downstream) side.

D. For best performance, place meter in a pipe configuration that assures a full pipe.

3.2 CALIBRATION

A. Each meter shall be hydraulically calibrated in an ISO 9000-certified testing facility, which utilizes a computerized gravimetric testing method with a measuring uncertainty of 0.1%.

B. Each meter shall be provided with a calibration certificate indicating the measured error (percent deviation) at three different flows, respectively equivalent to 25%, 50% and 75% of the nominal flow rate for each size.

3.3 MANUFACTURER'S WARRANTY

A. Terms

1. The manufacturer of the above specified equipment warrants the Product to be free from defects in materials and workmanship appearing within the earlier of either: One (1) year after installation; or one (1) year and six (6) months after shipment from manufacturer.

3.4 PAYMENT

Full compensation for furnishing the Electromagnetic Flow Meters shall be paid for at the contract price, as listed in the bidding schedule, per each meter for each size specified. Payment shall include full compensation for materials, fabrication, testing and delivery and for doing all work associated with supplying the meters in conformance with these specifications.

END OF SECTION