SEPA CAS Guidance
Calibration of monitoring and measurement equipment at Sewage Treatment Works

1. Purpose

1.1 This paper presents SEPA guidance for use in the compliance assessment scheme, CAS, when assessing the calibration of monitoring and measurement equipment at sewage treatment works, STW. It applies to Scottish Water and all other operators of sewage treatment works.

1.2 The paper also presents information submitted by Scottish Water outlining its approach to calibration and the methods and techniques that are used

1.3 The principles and approach in this paper have been agreed between SEPA and Scottish Water

1.4 The guidance in this paper is only for use in SEPA's compliance assessment scheme, it does not affect SEPA's enforcement policies/guidance or any enforcement action against any licence.

2. Background

2.1 The calibration of monitoring and measuring equipment is important to ensure that the operator of any STW and SEPA have confidence that the measured data produced is accurate. SEPA is largely concerned with the measurement of inlet flows, storm overflow and flow to full treatment. The operator of a STW may have many other measuring devices detecting sludge blankets and sludge pumps which also require calibration and maintenance.

2.2 There is usually limited ability of an operator to control flows arriving at a STW, as such inlet flow recording is required less for operational control and more for information on the flows and loads being treated at a works to establish whether a works is becoming hydraulically overloaded (by assessment of the dry weather flow (DWF)).

2.3 It is important to ensure that the required flow of sewage is being passed forward for full treatment in order to avoid premature operation of storm overflows. This flow to full treatment (FFT) must be accurately established.

2.4 The importance and sensitivity of such flow information to SEPA and the operator can vary depending on the current hydraulic capabilities and overall performance of the particular STW's and the environmental sensitivity.

2.5 Most SEPA STW licences contain a condition which requires that all monitoring/ measuring equipment shall be calibrated e.g.

All << monitoring/ measuring>> equipment referred to in this licence shall be calibrated regularly and in accordance with the recommendations of the

manufacturer << and/or>> to any relevant current certification standard. Evidence of calibration shall be maintained and available for inspection by a SEPA Officer.

2.4 Conditions such as these are assessed under the Environmental Management Attribute**:** Plant and Infrastructure: Maintenance of plant, infrastructure and monitoring equipment (including calibration) in the Compliance Assessment Scheme, CAS.

2.5 Guidance on assessing this attribute over the whole year is contained within Annex 5 of the CAS guidance manual (an extract of which is reproduced in Table 1 below:

2.6 Supplementary guidance as presented in this paper is required to aid SEPA staff in assessing monitoring and measurement equipment at all sewage treatment works to ensure consistency of approach.

Table 1: Extract of Annex 5 'STW and Trade': CAS guidance manual (2011)

Environmental Management					
EMC attribute	**Licence condition**	**Compliant**	**Minor non-compliance**	**Major non-compliance**	**Comments**
The EMC aspects below should be assessed at a level of detail appropriate to the scale and risk of the licensed activities. *(eg very good knowledge by most staff at higher risk larger sites).*					
Plant and infrastructure					
Maintenance of plant, infrastructure and monitoring equipment (including calibration)		Fully maintained. Maintenance procedures in place and adhered to. **Full calibration of monitoring equipment**.	Evidence of lack of maintenance of effluent treatment works and/or Maintenance procedures incomplete or inadequate; and/or Deviation from maintenance procedures which have not been notified to and/or agreed by SEPA and/or which are liable to cause a minor environmental event. Cat. 3) **Partial calibration of monitoring equipment.**	Significant lack of maintenance of effluent treatment works and/or No maintenance procedures in place; or Significant deviation from maintenance procedures, which are liable to cause a significant or major environmental event (Cat. 1 or 2) and/or **No calibration of monitoring equipment.**	**Is it being maintained? are maintenance procedures being followed?** This attribute is assessed where there is a requirement in a licence for maintenance of plant, infrastructure and monitoring systems (e.g. the plant will be operated and maintained in accordance with **best practice** condition and conditions relating to monitoring equipment). The focus should be on maintenance of critical plant and equipment. For Scottish Water use SEPA/Scottish Water protocol for ensuring compliance during maintenance;

					construction and adverse operating conditions as a guide.

Note: Some minor adjustment of the wording regarding flow calibration in Annex 5 in the CAS manual may take place during 2012 to better reflect this supplementary guidance.

3. Supplementary Guidance

SEPA's High Level Approach

3.1 The assessment of calibration should always be made in a risk proportionate and pragmatic way, ensuring that the calibration aspects are put into perspective with all other aspects of this EMC attribute e.g. the wider maintenance of monitoring equipment and proportionate to the risk of harm to the water environment.

3.2 As a guide any failure to maintain and/or calibrate monitoring equipment at a STW which is performing well, has no significant non compliance issues with flow or premature overflows and whose receiving water is in a good condition and provides good levels of dilution, and hence pose little risk of significant harm, should usually be assessed under CAS as a minor breach.

3.4 On the other hand any failure to maintain and/or calibrate monitoring equipment at a STW which has suspected or known problems with hydraulic overloading, premature operation of storm overflows and/or limited dilution in the receiving waters should be assessed more harshly (tending towards major breaches but not excluding the recording of minor breaches) as the impact of not calibrating such equipment is potentially greater. This is especially important if it has become impossible to measure the flow to full treatment and/or to establish the Dry Weather Flow, DWF.

3.4 The following criteria can be used as a guide to establish the basic sensitivity of a STW for this EMC attribute:

Sensitive STW's:

- Those known or perceived to be at or above hydraulic design;
- Those with known or suspected problems with premature operation of storm overflows;
- STW's with storm overflows in or near designated bathing and ,shellfish waters and/or could adversely affect other designated and protected areas;
- STW's whose discharges receive low dilution.

Less sensitive STW's

- Those that are not considered sensitive above, and
- unlikely to cause a significant environmental impact; and/or
- those that are have no major breaches of plant and equipment and /or no significant breaches of environmental limit conditions (e.g. generally performing and operated well)

Note: this does not represent an exhaustive list of criteria and others may be relevant to a site specific situation, however the SEPA officer must always be able to justify why a site is considered sensitive or less sensitive on the basis on risks to or actual harm to the water environment.

3.5 Note that detailed calibration checks on some flow monitors may be extremely difficult to carry out due to their location within a STW. A pragmatic approach should be taken by SEPA when assessing whether detailed calibration checks need to be carried out, as this may mean the removal of the equipment for some time. A common sense approach should be taken in that if no significant problems with flow are suspected then the need for carrying out detailed checks will be less and any breaches under compliance scheme are considered less serious. If a STW is considered sensitive and there is evidence that a key flow monitor (e.g. one which establishes DWF etc) may be out of calibration (discovered by looking at the long term flow monitoring data to establish trends and/or where storm overflows are operating prematurely) then a discussion of the long term situation regarding flow monitoring should be carried out between SEPA and the operator (e.g. Scottish Water), as it would be unacceptable to retain a monitor which could not be easily maintained and calibrated. This would usually involve SEPA's 'Quality and Standards' staff.

3.6 Note the licence condition for calibration does not stipulate that evidence of calibration is kept on site but that it 'is available for inspection'. SEPA should take a pragmatic and common sense approach to this and where not immediately available provide a reasonable timescale (suggested 7 working days) for this evidence of calibration to be provided.

3.7 SEPA officers should ensure that CAS assessments on the calibration of flow meters can be fully justified, are considered proportionate to the risks of harm and are in line with the general principles above.

3.8 Details of Scottish Water's calibration systems and SEPA's approach to this is detailed below:

<u>Scottish Water's System for Calibration:</u>

3.9 Scottish Water has a system called Maintenance Scheduled Tasks (MST's) for carrying out calibration checks of flow monitors (Magflows and Ultrasonic open channel flow meters). This is presented in Appendix 1.

3.10 Note this system does not produce calibration certificates per se but does generate and record the MST in one of their works management systems

'Ellipse'. The record of calibration checks should be checked by a SEPA officer by asking to see evidence of it being recorded in this system.

3.11 Note any requirement for a calibration certificate in the licence conditions should be considered met if a record of the MST and, where relevant, any more detailed checks can be viewed using 'Ellipse' and the records are satisfactory to the SEPA officer.

3.12 Note the MST checks are carried out by personnel separate from the local operational teams e.g. Electrical and Mechanical craftsmen, other personnel and contractors. Some of this maintenance and calibration is recorded electronically on corporate systems rather than on paper at the site. As such local operations staff may not have any knowledge of the MST checks being done. However the SW wastewater team leader should be able to gain access to the 'Business Objects' reporting system to produce evidence of when the flow meters at the STW were last checked and when they are next due to be checked failing which the records will be made available to SEPA as soon as possible (usually 7 working days).

3.13 An extract from 'Ellipse' is presented below. This extract has been prepared using a data analysis and reporting tool called Business Objects. This shows how often it is checked (in days), when the check was last carried out and when it is next due. A further extract is presented in Appendix 2.

Business Objects

Region: WEST
Function Description: WASTE WATER TREATMENT

Region Description	Equipment Location Description	Ellipse Equipment No	Equipment Description	Tag No	Schedule Description 1	Schedule Frequency 1	Last Scheduled Date	Last Performed Date	Next Scheduled Date
WEST	CRAIGENDORAN PUMPING	005000261753	WET WELL A LEVEL CONTROLLER	LT2101/1	ULTRASONIC MEASUREMENT CALIBRATION	364	10/01/2011	21/12/2010	09/01/2012
WEST	CRAIGENDORAN PUMPING	005000261755	WET WELL B LEVEL CONTROLLER	LT2101/2	ULTRASONIC MEASUREMENT CALIBRATION	364	10/01/2011	21/12/2010	09/01/2012

Example of download of calibration MST's

3.14 Where a problem is identified through the MST then a more detailed examination of the flow meter/ structure is carried out. An example of such an investigation is presented in Appendix 3.

Other STW Operators

3.15 SEPA will expect that all other operators, such as those that operate Public Finance Initiative schemes, PFI, will have a suitable planned and prioritised system in place to carry out calibration checks and more detailed calibration investigations.

3.16 It is not practical to present details of all other systems by all other operators for the calibration of flow monitors in this document. However, Operators should be able to show evidence to SEPA officers when requested that these calibration checks have been carried out as planned.

3.17 SEPA will adopt the same principles of assessment for flow calibration under CAS for all operators which discharge effluents to the water environment and are regulated through the Water Environment (Controlled Activity Regulations) (Scotland)

Key Points:

3.18 The key points for SEPA to bear in mind are that:

- Scottish Water has a system in place for carrying out routine calibration checks of flow meters (MST) - see Appendix 1.

- The MST checking is done on a frequency dependant on its sensitivity in providing operational control for Scottish Water.

- Scottish Water will carry out more detailed calibration checks, but only where a problem is suspected through the MST check or justifiable concerns raised by SEPA. This should be documented as in the example in Appendix 3.

- SEPA would expect other operators (e.g. private operators including those operating PFI schemes) to have a system of calibration checks in place and be able to demonstrate this system and show evidence of carrying out the planned checks to SEPA officers when requested.

- A proportionate and pragmatic approach should be taken in assessing calibration under the compliance assessment scheme.

Appendix 1: Scottish Water's Procedures for the Calibration of Flow Meters:

SW Procedures for Calibration of flow meters

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Scottish Water have a robust system for carrying out routine maintenance called MST's (Maintenance Scheduled Tasks) on Magflows and Ultrasonic Open Channel Flow Measurement Devices.

Magflow devices

Ultrasonic open channel flow measurement

No certificates are generated or recorded on site however the MST's are recorded in Business Objects (one of our corporate data management systems).
This information is available upon request.
The system automatically generates Work Orders which are then actioned by our E&M / ICAT teams through the corporate Click system.

Business Objects

Region: WEST
Function Description: WASTE WATER TREATMENT

Region Description	Equipment Location Description	Ellipse Equipment No	Equipment Description	Tag No	Schedule Description 1	Schedule Frequency 1	Last Scheduled Date	Last Performed Date	Next Scheduled Date
WEST	CRAIGENDORAN PUMPING	005000261753	WET WELL A LEVEL CONTROLLER	LT2101/1	ULTRASONIC MEASUREMENT CALIBRATION	364	10/01/2011	21/12/2010	09/01/2012
WEST	CRAIGENDORAN PUMPING	005000261755	WET WELL B LEVEL CONTROLLER	LT2101/2	ULTRASONIC MEASUREMENT CALIBRATION	364	10/01/2011	21/12/2010	09/01/2012

Example of download of calibration MST's

The MST's are carried out on a frequency determined by their criticality.
Flow meters that control processes are visited once or twice a year, less important meters (not controlling and not providing process or regulatory critical information might be scheduled to be checked once every two years.

The checks required by the MST replicate most of those recommended by the manufacturer but also require that drop tests be carried out if any inaccuracy is suspected.

See Scottish Waters MST's requirement for:
IIFE1C – Electromagflow Calibration
IILU1C – Ultrasonic Calibration

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IILU1C

ULTRASONIC MEASUREMENT CALIBRATION

If this signal is alarmed through telemetry, prior to starting these checks, contact Control/ Call Centre and inform them to ignore any alarms generated relating to this instrument during the MST process.

Visual Inspection

- Check the instrument head, transmitter and cables for any signs of damage, grounding, labelling, alarm status etc.
- Check that the signal path is unobstructed and is not being interfered with by obstacles or surface water disturbances.
- Check connections of Head, Transmitter and Cables Internally etc.

Instrument Checks

- Check the unit for any diagnostic alarms set within the unit in accordance with the Makers instructions.
- Check that all parameter settings are in accordance with the manufacturers recommendations. This is particularly important where the unit is used for flow measurement in conjunction with a standard weir. Ensure that the weir parameters entered match the weir being used.
- Put the unit back on line.
- Check that the values indicated are consistent between the meter, SCADA and telemetry systems.
- Where the signal is used for priority alarming (Out of Hours alarm), the high and low alarm points should be initiated where possible and the alarm checked with Control/ Call Centre/ ICAT section as appropriate. This may require any Telemetry Keyswitch to be in the 'Unmanned' position temporarily.
- Return all signals to their original state and inform Operations that the task is complete. Update Control/ Call Centre where appropriate.
- Complete work order and sign off.
- Where the reading is suspect, a more detailed investigation may be required using set distance checks, drop tests etc. This should be part of a separate repair work order.

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IIFE1C

ELECTROMAGNETIC FLOWMETER CALIBRATION

If this signal is alarmed through telemetry, prior to starting these checks, contact Control/ Call Centre and inform them to ignore any alarms generated relating to this instrument during this MST process.

Visual Inspection

- Check the Flow meter Head, Transmitter and Cables for any signs of damage, grounding, labelling, alarm status etc.
- Check the earth connection to the grounding flanges inserted into the pipe work immediately upstream and/or downstream of the flow meter.
- Check connections of Head, Transmitter and Cables Internally etc.
- Check the unit for any diagnostic alarms set within the unit in accordance with the Makers instructions.
- If used as an events logger check functionality.
- Check that all parameter settings are in accordance with the manufacturer's recommendations.
- Put the unit back on line.
- Check that the values indicated are consistent between the meter, SCADA and telemetry systems.
- Where the signal is used for priority alarming (Out of Hours alarm), the high and low alarm points should be initiated where possible and the alarm checked with Control/ Call Centre/ ICAT section as appropriate. This may require any Telemetry Key switch to be in the 'Unmanned' position temporarily.
- Return all signals to their original state and inform Operations that the task is complete. Update Control/ Call Centre where appropriate.
- Complete work order and sign off.
- Where the flow reading is suspect, a more detailed investigation may be required using additional meters, drop tests etc. This should be part of a separate repair work order.

Appendix 2: Extract of Scottish Water MST checks

Business Objects

Maintenance schedule Tasks (MST) for Calibration of flow meters

[Region: WEST, Region 3 Perth
Function: WASTE WATER TREATMENT

Scottish Water

Region Descriptio n	Equipment Location Description	Eqipment No	Equipment Description	Tag No	Stage	MST No	Standard Job No	Schedule Description 1	Schedule Frequency 1	Last Scheduled Date	Last Performed Date	Next Scheduled Date
WEST	DALDERSE STC	00000000013	THICKENED SLUDGE FLOWMETER NO1	FR304	25	1110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	15/12/2010	23/06/2010	10/12/2011
WEST	DALDERSE STC	00000000027	THICKENED SLUDGE FLOWMETER NO2	FR305	25	1110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	15/12/2010		10/12/2011
WEST	DALDERSE STC	00000000028	REPORT THICKENED SLUDGE INLET FLOWMETER		20	1110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	15/12/2010		10/12/2011
WEST	STIRLING STC	00000010001	DEWATERING FEED PUMPING STATION		25	3001	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	23/07/2007	09/09/2007	19/07/2012
WEST	STIRLING STC	00000010001	DEWATERING FEED PUMPING STATION		20	3001	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	19/01/2010	09/09/2010	15/01/2011
WEST	STIRLING STC	00000000017	THICKENER FEED FLOW	FR3001	20	1210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	23/06/2010	09/09/2010	23/06/2011
WEST	ARDOCH S.T.W. (DA	00000024005	INLET FLOWMETER - FLOW METER		31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000012000	FST 1A SLUDGE PUMPS OUTLET FLOWMETER	FE1303	33	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000001981	FST A SLUDGE OUTLET FLOWMETER	FE1302A	34	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000001980	FST B SLUDGE OUTLET FLOWMETER	FE1302B	34	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000001979	FST C SLUDGE OUTLET FLOWMETER	FE1302C	34	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000010151	FST D SLUDGE OUTLET FLOWMETER	FE1302D	34	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000013070	IMPORTED SLUDGE TO BORRIAN FLOWMETER	FE1700	37	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000013072	IMPORTED SLUDGE PUMPS FLOWMETER	FE1701	37	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000000985	SLUDGE THICKENER B - FEED FLOWMETER		31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000000984	FILTRATE PUMPING STATION - FLOW MONITOR	FR1804	31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000000985	RETURN LIQUOR PUMP STN - FLOW MONITOR	FR1804	31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000015009	GAS FLOWMETER	FE1804	31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000000988	GAS PUMP A - FLOW METER		31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000010018	GAS FLOWMETER	FE1803	31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000010997	GAS PUMP B - FLOW METER	FR1803B	31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000010998	GAS PUMP C - FLOW METER		31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000010999	GAS PUMP D - FLOW METER		31	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000010417	SERVICE WATER TANK INLET FLOWMETER	FE1901	99	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ARDOCH S.T.W. (DA	00000010417	DESIGN CONTROL RECIRCULATION PUMP FLOW NTO	FE1902	99	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	ROTHESAY S.T.W.	00000000985	AERATION TANKS FLOW METER - MAGFLOW		34	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	05/10/2009	23/06/2010	01/10/2012
WEST	ROTHESAY S.T.W.	00000000015	SLUDGE RECEPTION TK OUT METER - MAGFLO		37	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	05/10/2009	23/06/2010	01/10/2012
WEST	ROTHESAY S.T.W.	00000005390	THICKENED SLUDGE OUTLET METER - MAGFLO		37	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	05/10/2009	23/06/2010	01/10/2012
WEST	ROTHESAY S.T.W.	00000005372	FINAL EFFLUENT FLOW METER - MAGFLOW		39	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	05/10/2009	23/06/2010	01/10/2012
WEST	ROTHESAY S.T.W.	00000000481	RAW FLOW METER - MAGFLOW		39	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	05/10/2009	23/06/2010	01/10/2012
WEST	ROTHESAY S.T.W.	00000000482	BAR FLOW METER - MAGFLOW		39	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	1,000	05/10/2009	23/06/2010	01/10/2012
WEST	DALDERSE STW	00000000947	INLET FLOW METER - FLOWMETER		31	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010	23/06/2010	13/10/2011
WEST	DALDERSE STW	00000000587	STORM FLOW CHANNEL FLOWMETER	FE0101	31	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010	23/06/2010	13/10/2011
WEST	DALDERSE STW	00000024554	PRIMARY SLUDGE TO THICKENED TANK FLOWMTR		33	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010	23/06/2010	13/10/2011
WEST	DALDERSE STW	00000000582	FLOW TO FULL TREATMENT FLOWMETER	FE0001	33	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010	23/06/2010	13/10/2011
WEST	DALDERSE STW	00000000136	EMERGENCY OUTFALL FLOWMETER		36	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010		13/10/2011
WEST	DALDERSE STW	00000000137	STORM EXCHARGE FLOWMETER		36	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010		13/10/2011
WEST	DALDERSE STW	00000000572	EFFLUENT OUTLET FLOWMETER		38	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010		13/10/2011
WEST	DALDERSE STW	00000000573	RAW SLUDGE FLOW MONITOR		39	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	11/10/2010	20/08/2010	10/10/2011
WEST	ALLOA STW	00000000612	FOUL INLET CHANNEL FLOW - MONITOR		31	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	20/08/2010	03/07/2010	01/08/2011
WEST	ALLOA STW	00000000613	UNDERGATE INLET FLOW METER - MAGFLOW		31	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	20/08/2010	03/07/2010	01/08/2011
WEST	ALLOA STW	00000000895	RAS RTN MAGFLOW 1		34	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	20/08/2010	12/07/2010	01/08/2011
WEST	ALLOA STW	00000000897	RAS RTN MAGFLOW 2		34	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	20/08/2010	12/07/2010	01/08/2011
WEST	ALLOA STW	00000000714	STORM INLET CHANNEL FLOW - MONITOR		35	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	20/08/2010	13/07/2010	01/08/2011
WEST	ALLOA STW	00000000705	STORM WATER RETURN FLOW METER	F4	35	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	02/08/2010	13/07/2010	01/08/2011
WEST	ALLOA STW	00000000695	SP HUMBY DISCHARGE POINT - MAGS MONITOR		36	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	02/08/2010	13/07/2010	01/08/2011
WEST	ALLOA STW	00000000696	FINAL EFFLUENT FLOW 1	F8	38	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	02/08/2010	02/07/2010	01/08/2011
WEST	ALLOA STW	00000000698	FINAL EFFLUENT FLOW 2	F10	38	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	02/08/2010	02/07/2010	01/08/2011
WEST	BALHEIDON STW	00000015488	INLET FLOW METER - FLOW METER		31	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	23/09/2010	16/08/2010	21/09/2011
WEST	BALHEIDON STW	00000000002	TRICKLING FILTER OUTLET FLOW TRANSMITTER	FE1301	34	H300	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/09/2010	20/08/2010	21/09/2011
WEST	BALHEIDON STW	00000000015	FE HEADER TANK RECIRCULATION TRANSMITTER	FE1302	34	H300	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/09/2010	20/08/2010	21/09/2011
WEST	TYNDRUM STW	00000000163	INLET FLOWMETER		31	H800	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/08/2010	30/08/2010	21/02/2011
WEST	TYNDRUM STW	00000000178	MAIN OUTLET PUMPS FLOW METER		38	H800	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/08/2010	30/08/2010	21/02/2011
WEST	BONNYBRIDGE STW	00000154967	INLET FLOW METER - FLOW METER	F1200	33	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000025209	AERATION TKS IN FW - METER	F1200A	34	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000025430	SAND FILTERS INLET FW - MAGFLOW	FT1201	35	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000025429	SAND FILTERS - OUT FLOW MONITOR	FT1211	35	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000001500	STORM TANK OUT FW - MAGFLOW	81	36	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000001505	SP TANK PUMP STN - OUTLET MAGFLOW	82	36	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000001535	STORM PUMP STN - OUTLET MAGFLOW	83	36	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000001506	SLUDGE FST 1 MAGFLOW - MAGFLOW	FT1201	37	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000001508	SLUDGE FST 2 MAGFLOW - MAGFLOW	FT1208	37	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000001021	SLUDGE DRUM THR - INLET MAGFLOW	FR1212	37	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	22/11/2010	30/10/2009	21/11/2011
WEST	BONNYBRIDGE STW	00000001023	HAUSSER PUMP STN - RAS MAGFLOW	F1212	37	G00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	22/11/2010	30/10/2009	21/11/2011
WEST	STIRLING STW	00000000128	INLET WORKS FLOW METER	F101	31	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	23/06/2010	09/09/2010	23/06/2011
WEST	STIRLING STW	00000014136	ORTT DETENTION 1 - OUTLET FLOW METER		32	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	23/06/2010	09/09/2010	21/03/2011
WEST	STIRLING STW	00000024757	ORTT DETENTION 2 - INLET FLOW METER		32	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	23/06/2010	09/09/2010	21/03/2011
WEST	STIRLING STW	00000012553	FLOW FROM PRIMARY LITBURIES		32	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	23/06/2010	09/09/2010	21/03/2011
WEST	STIRLING STW	00000000111	SBR EXCT CHAMBER INLET FLOW	FR1207	34	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	23/06/2010	09/09/2010	23/06/2011
WEST	STIRLING STW	00000000123	SBR BASIN FW	FR1208	34	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	23/06/2010	09/09/2010	23/06/2011
WEST	STIRLING STW	00000000124	COMBINED GAS FLOWMETER	FR1202	34	G110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	364	23/06/2010	09/09/2010	23/06/2011
WEST	SAUGH PUMPING S	00000000663	INLET CHAMBER - FLOW METER		19	H010	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	23/11/2009		24/05/2010
WEST	GIRVAN STC	00000016217	IMPORTED SLUDGE FLOWMETER	FT008	24	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010	07/10/2009	20/06/2011
WEST	KIRKCALDY S.T.W.	00000000858	STORM RETURN FLOW METER - PROBE	FT002	20	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	21/06/2010	23/06/2010	19/06/2011
WEST	KIRKCALDY S.T.W.	00000000737	SLUDGE REPORT PUMPING SLUDGE FLOWMETER	FT003	37	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	21/06/2010	23/06/2010	19/06/2011
WEST	FAIRLIE S.T.W.	00000014031	FOUL FLOWMETER		31	H200	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/06/2010	09/06/2010	23/06/2011
WEST	FAIRLIE S.T.W.	00000014035	STORM FLOWMETER		35	H200	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/06/2010	09/06/2010	23/06/2011
WEST	FAIRLIE S.T.W.	00000000850	STORM OVERFLOW FLOWMETER	FR0000000 (DATA UNAVAILABLE)	36	H200	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/06/2010	09/06/2010	23/06/2011
WEST	LANGHARK (PAISL	00000001466	INLET FLOW METER 1 - METER		31	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	01/03/2011
WEST	LANGHARK (PAISL	00000001467	INLET FLOW METER 2 - METER		31	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	01/03/2011
WEST	LANGHARK (PAISL	00000001465	AERATION OUTLET CH 1 FLOWMETER		34	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	01/03/2011
WEST	LANGHARK (PAISL	00000001466	AERATION OUTLET CH 2 FLOW 1		34	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	01/03/2011
WEST	LANGHARK (PAISL	00000001467	AERATION OUTLET CH 2 FLOW 2		34	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	01/03/2011
WEST	LANGHARK (PAISL	00000001454	FINAL EFFLUENT FLOW METER - METER		35	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	01/03/2011
WEST	LANGHARK (PAISL	00000001521	SLUDGE TO SIMAL FLOWMETER		36	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	01/03/2011
WEST	LOCHWINNOCH S.T.	00000021418	FLOWMETER 1		38	H00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/03/2010	29/03/2010	21/03/2011
WEST	LOCHWINNOCH S.	00000021419	FLOWMETER 2		38	H00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/03/2010	11/03/2009	21/03/2011
WEST	LOCHWINNOCH S.	00000021420	FLOWMETER 3		38	H00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	23/03/2010	24/08/2010	21/03/2011
WEST	MENNOCK S.T.W.	00000016474	SLUDGE FLOWMETER 1		33	H00	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	05/08/2010	27/10/2009	06/08/2011
WEST	DALMARNOCK SLU	00000004305	FINAL OUTLET SLUDGE FL MONITOR - MAGFLOW		19	G001	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	27/08/2010	03/12/2008	26/08/2011
WEST	DALMARNOCK SLU	00000004315	SLUDGE TRANSFER WET WELL - INLET MAGFLOW		19	G001	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	26/04/2008	26/04/2008	27/04/2009
WEST	DALMARNOCK SLU	00000004315	SLUDGE TRANSFER WET WELL - INLET MAGFLOW		19	G001	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION	364	18/06/2010	25/06/2009	16/06/2011
WEST	DALMARNOCK S.T.V	00000010008	SLUDGE TO DALDOWIE - FLOWMETER		32	H400	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	20/12/2010		20/06/2011
WEST	SHIELDHALL S.T.W.	00000012148	FST 1 - MAGFLOW FLOWMETER	FT301	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012149	FST 2 - MAGFLOW FLOWMETER	FT302	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012132	FST 3 - MAGFLOW FLOWMETER	FT303	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012133	FST 4 - MAGFLOW FLOWMETER	FT304	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012134	FST 5 - MAGFLOW FLOWMETER	FT305	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012135	FST 6 - MAGFLOW FLOWMETER	FT306	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012136	FST 7 - MAGFLOW FLOWMETER	FT307	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012137	FST 8 - MAGFLOW FLOWMETER	FT308	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012138	FST 9 - MAGFLOW FLOWMETER	FT309	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012139	FST 10 - MAGFLOW FLOWMETER	FT310	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012140	FST 11 - MAGFLOW FLOWMETER	FT311	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012141	FST 12 - MAGFLOW FLOWMETER	FT312	33	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012142	RAS TO AERATION TANK 1 FLOWMETER	3A512	34	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012143	RAS TO AERATION TANK 2 FLOWMETER	3A513	34	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012144	RAS TO AERATION TANK 3 FLOWMETER	3A514	34	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012145	RAS TO AERATION TANK 4 FLOWMETER	4A512	34	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012146	RAS TO AERATION TANK 5 FLOWMETER	5A513	34	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000012147	RAS TO AERATION TANK 6 FLOWMETER	6A512	34	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000010022	OUTLET FROM STORM WORK FLOWMETER - METER		36	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	SHIELDHALL S.T.W.	00000010073	FINAL EFFLUENT - ULTRASONIC FLOW METER		39	H210	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	14/12/2009		14/06/2010
WEST	DALDOWIE S.T.W.	00000001180	INLET FLOW METER		31	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	21/06/2010	01/03/2011
WEST	DALDOWIE S.T.W.	00000001181	RAS PUMPS (PHASE 1) FLOW METER		33	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	21/06/2010	01/03/2011
WEST	DALDOWIE S.T.W.	00000001182	RAS PUMPS (PHASE 2) FLOW METER		33	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	21/06/2010	01/03/2011
WEST	DALDOWIE S.T.W.	00000001183	WILLTRONG UK TRIBOVOL Mk TANK 1		35	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	21/06/2010	01/03/2011
WEST	DALDOWIE S.T.W.	00000007204	WILLTRONG UK TRIBOVOL METER 2		35	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	21/06/2010	01/03/2011
WEST	DUNNYWOOD S.T.V	00000007925	RAS FLOW METER - METER		34	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	11/10/2009		10/04/2010
WEST	DUNNYWOOD S.T.V	00000008334	STORM FLOW METER		36	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	11/10/2009	23/06/2010	11/04/2011
WEST	DUNNYWOOD S.T.V	00000012417	DISCHARGE FLOW METER - FLOW		38	H110	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	11/10/2009	23/06/2010	11/04/2011
WEST	KINNEIL KERSE STW	00000000703	LIQUID SLUDGE SUMP OUTLET FLOW METER		24	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	07/03/2011
WEST	KINNEIL KERSE STW	00000000588	MIXED SLUDGE PUMP 1 FLOW METER	FE2101A1	28	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	07/03/2011
WEST	KINNEIL KERSE STW	00000000589	MIXED SLUDGE PUMP 2 FLOW METER	FE2101B1	28	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	07/03/2011
WEST	KINNEIL KERSE STW	00000000590	MIXED SLUDGE PUMP 3 FLOW METER	FE2101C1	28	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	07/03/2011
WEST	KINNEIL KERSE STW	00000000591	MIXED SLUDGE PUMP 4 FLOW METER	FE2101D1	28	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	07/03/2011
WEST	KINNEIL KERSE STW	00000000593	RPT FLOW MONITOR	FR1000	31	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	07/03/2011
WEST	KINNEIL KERSE STW	00000007861	WORKS INLET FLOW METER	FR1040	31	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09/06/2010	16/06/2010	07/03/2011
WEST	KINNEIL KERSE STW	00000007869	SBR3 SBR FLOW METER	FR1000	38	H410	BFE10	ELECTROMAGNETIC FLOWMETER CALIBRATION MI	182	09

Appendix 3 Example of a detailed calibration check by SW Process Science Team

FLOW METER CALIBRATION

(only done where a problem identified at MST check etc).

SITE: NeilstonWwTW MODEL: OCM 111

MEASURING DEVICE: Rectangular Flume LOCATION: FE

MAIN INSTRUMENT PARAMETER CHECKS

Parameter	Definition	Entered Values	Measured Values	Comments
P3	Measurement Device	1	-	Rectangular flume
P46	Range at zero head	131.9cm	131.5cm	Changed to 131.5cm
P7	Height max head	40cm	-	
P6	Flow at max head	184l/s		Auto changed to 185l/s after PMD changes
U0	Approach Width	70cm	69cm	
U1	Throat Width	40cm	40cm	
U2	Hump height	0cm	0cm	
U3	Throat Length	63.0cm	63.0cm	

SEWAGE DEPTH CHECK

OCM111 Sewage Depth	Measured Sewage Depth	Comments
15.2cm	15.4cm	Flow meter and measured depths correspond

FLOW CALCULATION CHECK

OCM111 Head	OCM111 Flow	Flow Calculation Check (BS 3680 calc)	Comments
15.1cm	41.3l/s	42.4l/s	Flow meter and calculated flows correspond

COMMENTS

Ancillary OCM 111 parameters related to correct operation of the flow meter were verified.
Free discharge through flume and "standing wave" after flume observed.
The OCM 111 temp sensor reading at 14°C corresponded closely with thermometer temp check of 16°C.

Date Calibration: 23/9/2010 Calibrated by: Stuart Runciman
Process Support

Next Calibration due: Sept 2011 – March 2012

Scottish Water
Process Science Team
Leading with Science
Delivering trough Collaboration
Protecting the Environment