AWWA Free Water Audit Software v6.0
Interactive Data Grading (IDG) Matrix

Volume from Own Sources (VOS) vos.0: Did the water utility supply any water from its own sources during the audit year? (if no, both VOS and VOSEA data validity grades are assigned 'n/a' and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
vos.1	Percent of Flow Metered	What percent of own supply volume is metered?	<25%	25-50%	>50-75%	>75% - 90%		>90% - 95%		>95 - 99%		>99%
vos.2	Meter Electronic Calibration Frequency	What is the frequency of electronic calibration?			None, or Not within last 5 years		Less than annual but within last 5 years *{and vos.5 = Less than annual frequency}*		At least annually *{and vos.5 = Less than annual frequency}*		At least annually *{and vos.5 = Annual frequency or greater}*	At least semi-annually; OR Not applicable due to no electronic signal output (i.e. to SCADA)
vos.3	Scope of Electronic Calibration	What level of data transfer errors are checked as part of the electronic calibration process?				Data transfer errors are not checked, or not sure			Data transfer errors are checked at secondary device(s), but not to tertiary device(s)			Data transfer errors are checked at secondary device(s) AND tertiary device(s); OR Data transfer errors are checked at secondary device(s), but no tertiary device(s) exist
vos.4	Electronic Calibration documentation	Is the most recent electronic calibration documentation available for review?					No *{and vos.6 = No}*		No *{and vos.6 = Yes}*			Yes
vos.5	Meter Flow Accuracy Test Frequency	What is the frequency of in-situ flow accuracy testing?			None, or Not within last 5 years		Less than annual but within last 5 years *{and vos.2 = Less than annual frequency}*		At least annually *{and vos.2 = Less than annual frequency}*		At least annually *{and vos.2 = Annual frequency or greater}*	At least semi-annually
vos.6	Meter Flow Accuracy Test Documentation	Is the most recent in-situ flow accuracy testing documentation available for review?					No *{and vos.4 = No}*		No *{and vos.4 = Yes}*			Yes
vos.7	Meter Fow Accuracy Test Results	What are the total volume-weighted average results of in-situ flow accuracy testing (during or closest to audit year)?	Not sure						At ±6% or greater		Between ±3% to ±6%	At or within ±3%
vos.8	Rigor of Testing & Calibration Procedures	Have testing and calibration procedures been closely scrutinized for compliance with procedures described in the AWWA M36 and/or M33 Manual(s)?									No	Yes
vos.9	Frequency of Data Collection	Which best describes the frequency of finished water meter readings?				Less frequently than monthly		Once per month		More frequently than monthly, but not every day	Daily	Continuous
vos.10	Frequency of Data Review	Which best describes the frequency of data review for anomalies/errors? These can include numbers that are outside of typical patterns, and zero or 'null' values that may reflect a gap in data recording.	Regular review not conducted / Not sure			Less frequently than monthly		Once per month		More frequently than monthly, but not every day		Daily

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Volume from Own Sources Error Adjustment (VOSEA)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
vosea.1	Storage Monitoring	Are tank levels monitored automically & recorded daily?				No						Yes; OR n/a given no distribution storage
vosea.2	Flow Balancing	Are daily changes of stored water volumes in distribution system tanks included in the tabulation of the daily "Volume from Own Sources" quantity?								No; OR Not sure		Yes; OR n/a given no distribution storage
vosea.3	Net Storage Adjustment	Is the annual net distribution storage change included in either the VOS input or the VOSEA input?									No	Yes; OR n/a given no distribution storage
vosea.4	Tie Between Meter Maintenance Practices and EA Input Derivation	Are the flow accuracy test and/or electronic calibration results included in the VOSEA input in the water audit?				Results are available but not analyzed						Yes, results are analyzed and incorporated; OR Yes, results are analyzed and a 'no-adjustment' was determined; OR No error adjustment made due to absence of testing or calibration results

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Water Imported (WI) wi.0: Did the water utility import any water during the audit year? (if no, both WI and WIEA data validity grades are assigned 'n/a' and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
wi.1	Percent of Flow Metered	What percent of water imported is metered?	<25%	25-50%	>50-75%	>75% - 90%		>90% - 95%		>95 - 99%		>99%
wi.2	Meter Electronic Calibration Frequency	What is the frequency of electronic calibration?			None, or Not within last 5 years		Less than annual but within last 5 years *{and wi.5 = Less than annual frequency}*		At least annually *{and wi.5 = Less than annual frequency}*		At least annually *{and wi.5 = Annual frequency or greater}*	At least semi-annually; OR Not applicable due to no electronic signal output (i.e. to SCADA)
wi.3	Scope of Electronic Calibration	What level of data transfer errors are checked as part of the electronic calibration process?				Data transfer errors are not checked, or not sure			Data transfer errors are checked at secondary device(s), but not to tertiary device(s)			Data transfer errors are checked at secondary device(s) AND tertiary device(s); OR Data transfer errors are checked at secondary device(s), but no tertiary device(s) exist
wi.4	Electronic Calibration documentation	Is the most recent electronic calibration documentation available?					No *{and wi.6 = No}*		No *{and wi.6 = Yes}*			Yes
wi.5	Meter Flow Accuracy Test Frequency	What is the frequency of in-situ flow accuracy testing?			None, or Not within last 5 years		Less than annual but within last 5 years *{and wi.2 = Less than annual frequency}*		At least annually *{and wi.2 = Less than annual frequency}*		At least annually *{and wi.2 = Annual frequency or greater}*	At least semi-annually
wi.6	Meter Flow Accuracy Test Documentation	Is the most recent in-situ flow accuracy testing documentation available?					No *{and wi.4 = No}*		No *{and wi.4 = Yes}*			Yes
wi.7	Meter Fow Accuracy Test Results	What are the total volume-weighted average results of in-situ flow accuracy testing (during or closest to audit year)?	Not sure						At ±6% or greater		Between ±3% to ±6%	At or within ±3%
wi.8	Rigor of Testing & Calibration Procedures	Have testing and calibration procedures been closely scrutinized for compliance with procedures described in the AWWA M36 and/or M33 Manual(s)?									No	Yes
wi.9	Frequency of Data Collection	Which best describes the frequency of meter readings (data collection frequency as opposed to billing frequency)?				Less frequently than monthly		Once per month		More frequently than monthly, but not every day	Daily	Continuous
wi.10	Frequency of Data Review	What is the frequency of data review & correction by Exporting or Importing Utility for data gaps and/or anomalies? These can include numbers that are outside of typical patterns, and zero or 'null' values that may reflect a gap in data recording.	Regular review not conducted / Not sure			Less frequently than monthly		Once per month		More frequently than monthly, but not every day		Daily

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Water Imported Error Adjustment (WIEA)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
wiea.1	Agreement in Place	Is an agreement in place between Exporting and Importing Utility for the purchase of water?			No				Yes, but not written			Yes, written
wiea.2	Meter Accuracy Testing or Electronic Calibration Requirements	Are meter accuracy testing or electronic calibration requirements stipulated in the water purchase agreement?			No		No, but meter accuracy testing and/or electronic calibration is conducted upon request of the importing utility	Yes, and stipulated as less frequent than annual			Yes, and stipulated frequency as annual	Yes, and stipulated as more frequent than annual
wiea.3	Tie Between Meter Maintenance Practices and EA Input Derivation	Are flow accuracy test and/or electronic calibration results used to inform the error adjustment input in the water audit?				No						Yes, results are analyzed and incorporated; OR Yes, results are analyzed and a 'no-adjustment' was determined
wiea.4	Data Trail Accessibility	Who has access to the import meter readings including current and archived data?							Exporting Utility only			Exporting and Importing Utility

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Water Exported (WE) we.0: Did the water utility export any water during the audit year? (if no, both WE and WEEA data validity grades are assigned 'n/a' and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
we.1	Percent of Flow Metered	What percent of water exported is metered?	<25%	25-50%	>50-75%	>75% - 90%		>90% - 95%		>95 - 99%		>99%
we.2	Meter Electronic Calibration Frequency	What is the frequency of electronic calibration?			None, or Not within last 5 years		Less than annual but within last 5 years *{and we.5 = Less than annual frequency}*		At least annually *{and we.5 = Less than annual frequency}*		At least annually *{and we.5 = Annual frequency or greater}*	At least semi-annually; OR Not applicable due to no electronic signal output (i.e. to SCADA)
we.3	Scope of Electronic Calibration	What level of data transfer errors are checked as part of the electronic calibration process?				Data transfer errors are not checked, or not sure			Data transfer errors are checked at secondary device(s), but not to tertiary device(s)			Data transfer errors are checked at secondary device(s) AND tertiary device(s); OR Data transfer errors are checked at secondary device(s), but no tertiary device(s) exist
we.4	Electronic Calibration documentation	Is the most recent electronic calibration documentation available?					No *{and we.6 = No}*		No *{and we.6 = Yes}*			Yes
we.5	Meter Flow Accuracy Test Frequency	What is the frequency of in-situ flow accuracy testing?			None, or Not within last 5 years		Less than annual but within last 5 years *{and we.2 = Less than annual frequency}*		At least annually *{and we.2 = Less than annual frequency}*		At least annually *{and we.2 = Annual frequency or greater}*	At least semi-annually
we.6	Meter Flow Accuracy Test Documentation	Is the most recent in-situ flow accuracy testing documentation available?					No *{and we.4 = No}*		No *{and we.4 = Yes}*			Yes
we.7	Meter Fow Accuracy Test Results	What are the total volume-weighted average results of in-situ flow accuracy testing (during or closest to audit year)?	Not sure						At ±6% or greater		Between ±3% to ±6%	At or within ±3%
we.8	Rigor of Testing & Calibration Procedures	Have testing and calibration procedures been closely scrutinized for compliance with procedures described in the AWWA M36 and/or M33 Manual(s)?									No	Yes
we.9	Frequency of Data Collection	Which best describes the frequency of meter readings (data collection frequency as opposed to billing frequency)?				Less frequently than monthly		Once per month		More frequently than monthly, but not every day	Daily	Continuous
we.10	Frequency of Data Review	What is the frequency of data review & correction by Exporting or Importing Utility for data gaps and/or anomalies? These can include numbers that are outside of typical patterns, and zero or 'null' values that may reflect a gap in data recording.	Regular review not conducted / Not sure			Less frequently than monthly		Once per month		More frequently than monthly, but not every day		Daily

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Water Exported Error Adjustment (WEEA)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
weea.1	Agreement in Place	Is an agreement in place between Exporting and Importing Utility for the purchase of water?			No				Yes, but not written			Yes, written
weea.2	Meter Accuracy Testing or Electronic Calibration Requirements	Are meter accuracy testing or electronic calibration requirements stipulated in the water purchase agreement?			No		No, but meter accuracy testing and/or electronic calibration is conducted upon request of the importing utility	Yes, and stipulated as less frequent than annual			Yes, and stipulated frequency as annual	Yes, and stipulated as more frequent than annual
weea.3	Tie Between Meter Maintenance Practices and EA Input Derivation	Are flow accuracy test and/or electronic calibration results used to inform the error adjustment input in the water audit?				No						Yes, results are analyzed and incorporated; OR Yes, results are analyzed and a 'no-adjustment' was determined
weea.4	Data Trail Accessibility	Who has access to the import meter readings including current and archived data?							Exporting Utility only			Exporting and Importing Utility

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Billed Metered Authorized Consumption (BMAC) — bmac.0: Were any customers metered in the audit year? (if no, BMAC data validity grade of 'n/a' is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
bmac.1	Read Success Rate	For billed metered accounts, what % of bills are estimated in a typical billing cycle?	>50%		>20% up to 50%		>10% up to 20%		>5% up to 10%			5% or less
bmac.2	Read Frequency	How often does the utility read its customer meters? For systems with multiple read frequencies, select the reading frequency that describes the majority of your customers.						Less frequenty than quarterly	Quarterly	Bi-Monthly	Monthly	More frequently than monthly
bmac.3	Pro-Rating	Is the BMAC volume pro-rated to represent consumption occuring exactly during the audit period?								No		Yes
bmac.4	Internal Review	How frequently does internal review by utility staff of the BMAC volumes occur?	No review				Less frequently than annually			Annually	More frequently than annually but less than every billing cycle	Every billing cycle
bmac.5		What level of detail is examined in the internal review of BMAC volumes?	No review						Sum total only		Totals grouped by use type or customer class	Totals grouped by use type or customer class and specific accounts flagged for anomalous consumption
bmac.6	Third-Party Review	When was the most recent billing data review by someone who is independent of the utility billing process?								More than 5 years ago, or not sure	Between 3 and 5 years ago	Within last 3 years
bmac.7		What level of detail was examined in the review by someone who is independent of the utility billing process?					Not sure				Third party review includes a check on a sample of accounts	Full billing database query and analysis of raw data to verify the summary consumption volumes

Billed Unmetered Authorized Consumption (BUAC) — buac.0: Was there any billed consumption on unmetered accounts in the audit year? (if no, BUAC data validity grade of 'n/a' is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
buac.1	% Billings Unmetered	What portion of billed accounts are unmetered (% by number of accounts)?					>50%	>20% up to 50%		>10% up to 20%	>5% up to 10%	5% or less
buac.2	Derivation	Methodology to quantify consumption for unmetered accounts?	Guess-timated	Estimated based on assumptions of consumption by customer characteristics (i.e. customer type or meter size)			Extrapolated from similar customer groups in the utility's metered population, but limited is sample sizes					Estimated for each unmetered customer OR derived from representative statistical samples of the system
buac.3	Billing Frequency	How frequently is unmetered customer consumption estimated?		Annually		Semi-Annually		Quarterly		Bi-monthly		Monthly

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Unbilled Metered Authorized Consumption (UMAC) umac.0: Did the water utility have any unbilled-metered consumption in the audit year? (if no, UMAC data validity grade of 'n/a' is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
umac.1	Unbilled Metered Account Policy	Does the water utility policy articulate which accounts are exempt from billing?		No		Policy broadly addresses and there exists a collective understanding						Policy includes specific exemptions
umac.2	Count of Unbilled Meters	How many unbilled metered accounts exist?		Unknown				Estimated total available				Monitored, count available
umac.3	Read Frequency	How often is each unbilled customer meter read? For systems with multiple read frequencies, select the reading frequency that describes the majority of your customers.					Less than annually		Annually	Quarterly	Bi-Monthly	Monthly or more frequently
umac.4	Review Frequency	How often are unbilled metered volumes reviewed for error?		No review conducted			Less than annually		Annually	More than annually, but less than every billing cycle		Each billing cycle

Unbilled Unmetered Authorized Consumption (UUAC) uuac.0: *{automatic check}* Was the default volume used for this input? (if yes, UUAC data validity grade of 3 is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
uuac.1	Inventory	How well-understood is the extent of unbilled unmetered use?	Unknown			Examples known, but no complete inventory				Majority identified and tracked		Complete inventory exists
uuac.2	Documentation	Which best describes the records that are kept for events of unbilled unmetered use?	No document-ation					Documentation exists, but not specific to each event				Each event is documented
uuac.3	Derivation	How is the majority of unbilled unmetered use estimated?	Guess-timation				By a mix of some guesstimation and some event-specific estimates			By number of events multiplied by typical use estimates		Entirely from event-specific estimates

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Systematic Data Handling Errors (SDHE) sdhe.0: *{automatic check}* Was the default volume used for this input? (if yes, SDHE data validity grade of 3 is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
sdhe.1	Input Derivation	Which best describes how the input was derived?		Guesstimated				Extrapolated from discovered instances of erroneous unbilled consumption (that were not back-billed)				Estimation derived from a specific analysis at the account level to identify erroneous unbilled consumption
sdhe.2	Validation of Unit Conversions	Which best describes validation performed in the billing software for multipliers (conversions between unit of meter reading and unit of billing)?	None						A sample of meter multipliers have been analyzed to confirm multiplier conversion in the billing system is correct			All meter multipliers have been analyzed to confirm multiplier conversion in the billing system is correct
sdhe.3	New Account Integration	Which best describes the policy for new service accounts to ensure there is no lapse between start of customer water usage and start of measurement/billing?	Policy doesn't exist	Policy exists, but is unclear			Policy is clear, but adherance in practice is inconsistent					Policy is clear, and adherance in practice is consistent
sdhe.4	Billing Process Auditing	Which best describes auditing that takes place on the billing process?	None					Billing data evaluated annually for general errors, but a specific analysis for systematic data handling errors has not been conducted		Detailed analysis conducted within 5 years of the audit period on stuck meters, extended estimations, & miscoded multipliers		Detailed analysis conducted within 3 years of the audit period on stuck meters, extended estimations, & miscoded multipliers

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Customer Metering Inaccuracies (CMI) cmi.0: Was there any metered customer usage during the audit period? (if no, CMI data validity grade of 'n/a' is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
cmi.1	Reactive Testing Frequency	Do you test meters reactively (when triggered by customer complaint or billing/consumption flag)?	No reactive testing conducted									Reactive testing conducted
cmi.2	Small Meter Testing Frequency	For small size customer meters, which best describes the frequency of proactive testing (effort beyond when triggered by customer complaint or billing/consumption flags)?			No proactive small meter testing activity to date	Not recurring, last effort conducted more than 5 years prior to audit period		Not recurring, but conducted within 5 years prior to audit period		Recurring, within 5 years prior to audit period	Recurring, within two years of the audit period; OR No testing conducted, but at least 10% of meter stock has been replaced within two years of the audit period	Ongoing, conducted annually
cmi.3	Small Meter Testing Sample	Which best describes what meters are included in the proactive small size customer meter testing activities?							Testing targeted to subsets of meters ie oldest meters			Proactive - representative sample (for small meters)
cmi.4	Large Meter Testing Frequency	For mid and large size customer meters, which best describes the frequency of the proactive testing program?			No proactive large meter testing activity to date	Not recurring, last testing effort occurred more than 5 years prior to audit period		Not recurring, but conducted within 5 years prior to audit period		Recurring, within 5 years prior to audit period, but less frequently than annually		Ongoing, conducted annually
cmi.5	Large Meters Tested	Which best describes what meters are included in the proactive mid- and large customer meter testing activities?							Testing targeted to subsets of meters (ie most revenue generating or customer types)			Proactive - all large meters are on a testing schedule
cmi.6	Input Derivation & Data Source	Which best describes how the input was derived?		Guesstimated without any customer meter testing data as a reference				Meter accuracy test results or manufacturer specs are referenced but not analyzed and used directly in calculation		Calculated based on most recent meter accuracy tests, but not comprehensive of all meter performance	No test results were used, but at least 50% of meter stock has been replaced within two years of the audit period	Calculated based on most recent meter accuracy tests, comprehensive of all meter performance
cmi.7	Input Derivation Review	Has the input derivation been reviewed by someone with expert knowledge in the M36 methodology?									No	Yes
cmi.8	Meter Replacement Practices	To what extent does meter replacement occur and for which meters?	Reference question only. Answer selected does not impact data validity grade for the CMI audit input.									
cmi.9	Meter Stock Inventory	Which best describes the reliability of meter installation records?	Reference question only. Answer selected does not impact data validity grade for the CMI audit input.									

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Unauthorized Consumption (UC) uc.0: *{automatic check}* Was the default volume used for this input? (if yes, UC data validity grade of 3 is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
uc.1	Input Derivation	Which best describes how the input was derived?	Guess-timated					Estimation for custom volume extrapolated from observed instances of unauthorized consumption (that were not back-billed)		Estimation for custom volume extrapolated from study, sampling a portion of the system		Estimation for custom volume derived from system-wide study
uc.2	Tracking & Oversight	Which best describes the extent of unauthorized consumption tracking and oversight?		Not tracked		Some discovered events recorded, others are not		All discovered events are recorded		Limited investigation performed and documented for unauthorized consumption, beyond reactively discovered events		System-wide investigation performed and documented for unauthorized consumption, beyond reactively discovered events

Length of Mains (Lm)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
Lm.1	Input Derivation	How was the input derived?	Guess-timated									Derived directly from Mains inventory (GIS, ledger, etc)
Lm.2	Hydrant Laterals	Are hydrant laterals included in the input derivation?								No		Yes
Lm.3	Inventory Updates	Which best describes how the Mains inventory (GIS, ledger, etc) is kept up to date?			Mains inventory (GIS, ledger, etc) is not maintained or updated			Additions or subtractions are updated in the mains inventory (GIS, ledger, etc), but less than annually				Additions or subtractions are updated in the mains inventory (GIS, ledger, etc), at least annually
Lm.4	Inventory Validation	Which best describes how the Mains inventory (GIS, ledger, etc) is field validated to confirm field conditions match the inventory?							No field validation is conducted			Field validation is accomplished (i.e. in daily operations or specific validation projects)

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Number of Service Connections (Nc)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
Nc.1	Input Derivation	How was the input derived?		Guesstimated								Extracted from Services inventory (GIS, billing system, etc)
Nc.2	Input Basis	What is the count of services based on?				Unsure				Non-premise based, i.e. meter count, customer count		Premise based, i.e. service connection count, location ID count
Nc.3	Input Basis	Are inactive (but still pressurized) service lines included in the input? These may be metered or unmetered.					No					Yes
Nc.4	Inventory Updates	Which best describes how the inventory of service connections (GIS, billing system, etc) is kept up to date?	Service line inventory (GIS, billing system, etc) is not main-tained or updated					Additions or subtractions are updated in the service line inventory (GIS, billing system, etc), but less than annually				Additions or subtractions are updated in the service line inventory (GIS, billing system, etc), at least annually
Nc.5	Inventory Validation	Which best describes how the inventory of service connections (GIS, billing system, etc) is field validated to confirm field conditions match the inventory?					No field validation is conducted			Field validation is accomplished for a portion of the system (i.e. in daily operations or specific validation projects)		Field validation is accomplished for the entire system (i.e. in daily operations or specific validation projects)

Average Length of (Private) Customer Service Line (Lp)

Lp.0: *{automatic check}* Are customer meters typically located at the curbstop/property line? (if yes, Lp data validity grade of 10 is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
Lp.1	Input Derivation	How was the input derived?	Guesstimated						Input extrapolated from study sampling a portion of the system			Derived from full mapping and customer inventory
Lp.2	Inventory Completeness	Which best describes how the Customer Service Line and Meter Locations mapping is kept up to date?	Customer Service Line and Meter Locations inventory is not main-tained or updated					Additions or subtractions are updated in the service line and meter locations inventory, but less than annually				Additions or subtractions are updated in the service line and meter locations inventory, at least annually
Lp.3	Inventory Validation	Which best describes how the Customer Service Line mapping is validated to what is in the field?								No field validation is conducted		Field validation is accomplished (i.e. through normal work order processes or specific validation projects)
Lp.4	Policy for Service Line Ownership Delineation	Which best describes the policy to define where the utility's ownership of the service line ends, and the customer's ownership of the service line begins?	Policy doesn't exist	Policy exists, but is unclear				Policy is clear, but adherence in practice is uncertain				Policy is clear, and adherance in practice is consistent

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Average Operating Pressure (AOP)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
aop.1	Pressure Zone Integrity	Which best describes checks on the boundary integrity for the system's pressure zone(s)?						Normally-closed boundary valves between zones have never been confirmed to be fully closed		Normally-closed boundary valves between zones have been confirmed to be fully closed more than 3 years ago		Normally-closed boundary valves between zones have been confirmed within the past 3 years to be fully closed; OR Not applicable, the system operates as a single pressure zone
aop.2	Extent of Static Pressure Data Collected	Which best describes how one-time pressure readings (i.e. from hydrants) are collected?								Collected only if there are low pressure complaints, or new development requests		Collected annually during routine system flushing and/or hydrant testing {or aop.3 = grade of 10, aop.2 will be set to 10}
aop.3	Location of Real-Time Pressure Data Collected	Which best describes where continuous pressure data (via temporary data loggers or permanent telemetry) is collected?						Continuous pressure data is not collected		At zone boundary conditions only (i.e. supply entry points, PRVs, booster stations)	At zone boundary conditions, plus some locations inside the zone(s) but not representing the full pressure profile	At zone boundary conditions, plus locations inside the zone(s) representing the full pressure profile
aop.4	Capture of Seasonal Variation for Real-Time Pressure Data	Which best describes how continuous pressure data is collected?							Temporary data logger(s) deployed, but limited and not capturing seasonal variation during the year		Temporary data logger(s) deployed, adequately capturing seasonal variation during the year	Year-round data collection via permanent monitoring
aop.5	Input Derivation	How was the input derived?			Guesstimated		Loose estimate inferred from field measurements, but no analysis nor calculations performed		Calculated from field data as a simple average		Calculated from field data as a weighted average, compliant with methods described in the M36 Manual; OR Derived from hydraulic model, where model has not been field calibrated in the last 5 years	Derived from hydraulic model, where model has been field calibrated in the last 5 years

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Customer Retail Unit Charge (CRUC) cruc.0: Was any metered consumption billed on a volumetric basis in the audit period? (if no, CRUC data validity grade of 'n/a' is assigned and subsequent questions are hidden)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
cruc.1	Rate Structure in Force	Which best describes the use and reliability of the current rate structure?	Customer bill calcu-lations have not been checked to confirm the rate structure is correctly imple-mented									Customer bill calculations have been checked to confirm the rate structure is correctly implemented
cruc.2	Input Derivation	Choose the option that best describes how the input was derived	Guess-timated				Rate structure has multiple volumetric rates, but only one rate was selected for this input; OR A non-weighted average of multiple rates was calculated					Rate structure has only a single volumetric rate, and this was used as the input; OR A volume-weighted average of all rates was calculated
cruc.3	Dependent Revenue Inclusion	Is there any additional volumetric revenue the utility receives that depends on water meter readings, such as sewer?							Yes, but this has not been incorporated into the volume-weighted average calculation			No; OR Yes, and this has been incorporated into the volume-weighted average calculation
cruc.4	Input Derivation Review	Has the input derivation been reviewed by someone with expert knowledge in the M36 methodology?									No	Yes

AWWA Free Water Audit Software v6.0
Interactive Data Grading (IDG) Matrix

Variable Production Cost (VPC)

Criteria ID	Criteria Theme	Criteria Question	1	2	3	4	5	6	7	8	9	10
vpc.1	Input Derivation	Choose the option that best describes how the input was derived *{if user selects "The VPC was entered using the CRUC value, based on the utility's discretion", then the CRUC data validity grade is automatically assigned to the VPC input}*	Guess-timated			A non-weighted average of multiple sources was calculated						Only one source of water exists, which was the basis for the input derivation; OR Multiple sources of water exist, and a volume-weighted average was calculated for all sources: OR Unit costs for the most expensive source utilized based on utility's discretion
vpc.2	Short-Run Marginal Cost Inclusion	Choose the option that best describes which short-run marginal costs have been included in the input, using the definitions below for reference. Short-run marginal costs can include the following: - chemicals + power for treatment, typically applicable if the utility is producing/treating water - power for distribution, typically applicable if pumps exist in the distribution network - water acquisition costs, typically applicable if the utility is purchasing water or incurs any extraction costs for withdrawing from a source Some short-run marginal costs may not be applicable. The auditor should analyze the system characteristics to determine which costs are applicable for inclusion in the VPC input derivation. See also the latest AWWA M36 Manual for further guidance.			Some but not all applicable short-run marginal costs are included							All applicable short-run marginal costs are included
vpc.3	Long-Run Marginal Cost Inclusion	Choose the option that best describes which long-run marginal costs have been included in the input, using the definitions below for reference. Long-run marginal costs can include the following: - water treatment residuals management, typically applicable if solids are produced from water treatment process - accelerated wear & tear on dynamic equipment, typically applicable if pumps exist for treatment and/or distribution, or any other equipment exists that wears out as a function of use instead of time (i.e. filter media, chemical dosing pumps, uv disinfection bulbs, etc) - payouts for damage claims from main and service line breaks, typically applicable if damage claims are paid by the utility - accelerated expansion of supply capacity, typically applicable if the utility is at or nearing supply capacity, or scarecity costs in water scarce areas - full cost pricing that includes all lifecycle costs and externalities (internalized or not) Some long-run marginal costs may not be applicable. The auditor should analyze the system characteristics to determine which costs are applicable for inclusion in the VPC input derivation. See also the latest AWWA M36 Manual for further guidance.								Long-run marginal costs have not been evaluated for applicability, and are not included	Long-run marginal costs have been evaluated for applicability, and some but not all applicable costs are included	Long-run marginal costs have been evaluated for applicability, and all applicable costs are included
vpc.4	Input Derivation Review	Has the input derivation been reviewed by someone with expert knowledge in the M36 methodology?									No	Yes