MINISTRY OF TOURISM TOURISM DEVELOPMENT AUTHORITY USAID-EEPP

OBJECTIVE 8.2.1 DOCUMENTATION VOLUME II

ENVIRONMENTAL MONITORING UNIT MANUALS AND CHECKLISTS



(RSSTI) Red Sea Sustainable Tourism Initiative



(TDA) Tourism Development Authority



(USAID) United States Agency for International

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Glossary of the Terminology Used in the Manual

Annex One

Glossary of the Scientific Desalination Terminology Used in this Manual English/ Arabic

English Terminology	Arabic	Abbreviated meaning
A		
Additives	إضافات	Chemical elements and compounds are added for specific purposes such as to resist corrosion, remove scale, etc.
Alkalinity	القلوية	Presence of hydroxide ions (OH), carbonates (CO3) or bicarbonates (HCO3) in water
Atmospheric Pressure	الضىغط الجوي	Is the weight of gas columns in the atmosphere, equivalent to 1,0123 bar at sea level, and increases as reduced below sea level
Anions	أيونات سالبة	Such as fluorides, sulfates, carbonates, bicarbonates, and chlorides and are attracted to the anode
Auxiliary Components	المكونــــات المساعدة	Are the auxiliary components supporting the production process such as pumps, filters, and injection systems, etc.
Acidity	حامضي	The increase of the rates of hydrogen ions in water, and consequently there is a reduction in pH below 7
Aeration tank	حوض تهوية	Is used in wastewater treatment plants, where air is used to activate bacteria that feed on sanitary wastes changing them into sediments that can be settled or filtered.
Alternative Energy	طاقة بديلة	Are the alternative energies other than fossil fuel (hydrocarbons such as coal, oil, and natural gas), and may be renewable energy (such as solar or wind) or nonrenewable (such as nuclear energy)
Alkaline	قلوي	pH number I above 7
Anode	قطب سالب	Positive electric poles attracting ions of negative elements
Activated Carbon	کربون نشط	Special treated carbon used to remove excess chlorine, organic substances, and odors
Aqueous	مائي	Aqua is a Latin term meaning water, either in terms of color, taste, or form etc
Anti	مـواد مقاومــة (ضد)	Such as anti corrosion material Anti scale Anti foam
В		
Back wash	غسيل عكسي	Is the reverse water direction of the seal during the operation of filters etc, for the purpose of washing the filter or the component

	1	
Biological Oxygen	احتياجـــــات	Is the amount of oxygen used in the consumption
Demand (BOD)	الأكســــجين	of organic materials required for the biological
	الحيوي	treatment of water
	درجة الغليان	
Boiling Temperature	درجه العليان	The temperature degree where water boils, and
		varies as per pressure, for water it is 100°c at
		atmospheric pressure, and is equivalent to 180°c
		at atmospheric pressure of 10, and equivalent only
		to 46°c at 1/10 of atmospheric pressure
Back wash	غسیل عکسی	The process of washing filters and ionic
Dack wash	عسين عصبي	
		exchangers and others, where pure water is
		pumped in a reverse direction to expel any
		suspended solids that accumulate during
		operation
Boiling	غليان	Is the process of evaporation of water (liquids) and
2011.19	0,	changes water into bubbles from vapors that rises
		•
		and separates from water level.
Brine	محلول ملحي	Saline water whose concentration is higher than
		that of the feed water
Blow Down	ماءصرف	Blown or discharged water effluent from the plant
	(طرد)	to preserve the salinity rate at the plant
Brine water	مســـــــــــــــــــــــــــــــــــــ	Is a heat exchanger using a heating source (such
	المحلــــول	as vapors) to increase the temperature degree of
	الملحي	
		brine to the highest possible degree (T.B.T)
Brackish water	ماء خفيف	A light saline water (from 1000 to 10,000 ppm)
	الملوحة (بئر)	and is found in wells
Boiler(Steam	غلاية	Used to turn water into steam through the boiling
Generator)	(مرجل)	process
	(مولد بخار)	-
С		
Coagulant	الشبه	Is used as a subsidiary agent in the process of
(Aluminum Sulfate)	(كبريتات	clearing, as it helps in assembling the tiny
(/ daminani Ganate)	الألمونيوم)	
	(15.5	suspended solids into bigger particulates that can
		be settled in sedimentation beds
Condensate	م_اء ن_اتج	Drops of water resulting from the steam
	التكثف	condensation
Commercial	طرق تجارية	Desalination technologies that superseded the
Methods		research stages to manufacturing stages, on the
		commercial level.
Clauda	, ti	
Clouds	السحب	Condensed water vapor in the form of very tiny
		airborne drops, bright white in color (vapor is
		colorless), and if it is close from ground level it is
		called fog
Cations	الأيونـــــات	Such as sodium, calcium. And magnesium, etc,
	- ير الموجبة	and is attracted to the cathode
Chemical Additives	إضافة كيماوية	
Chemical Additives	إصافة ديماوية	Additives for specific purposes such as anti sedimentation, resist corrosion, killing fungi
	1	segumentation resist corresion killing tungi

Crucitala	mit i ti	When the liquid drive, it changes into colid ervetale
Crystals	بلورات	When the liquid dries, it changes into solid crystals (saline treatment)
Concentration	تركيز	The rate of presence of (salts and other elements
Concentration	ىركير	content) in water, and is measured by ppm units
Corrosion	تآكل	The collapse of minerals due to its reaction with the
CONUSION		brine (or medium)
Compaction	تضاغط	If pressure increases on membranes as time goes by
Compaction		in attempts to increase production. The membranes
		are compacted, and then its permeability for fresh
		water, which in turn reduces production.
Condensation	تكثف/تكثيف	Rate of salts dissolved in water, and is measured by
Condensation	/	ppm units or by mg/l.
Chemical	إحتياجــــات	Rate of oxygen used to oxidize inorganic materials,
Oxygen	<u>إِلَيْ بِلَيْ بِلَيْ الْمَ</u> الْأَكْسَـــــجِين	and required for treatment of non-biological material in
Demand (COD)	الكيماوية	water.
Cell	خلية	This term is used in power dialyzing units, where the
	~	unit consists of a number of cells, and each cell
		consists of membranes through which the conc. brine
		and salt production channels pass.
Copper Alloys	سبائك	Used for its good conductivity of heat and its high
	النحاس	resistance to corrosion such as copper and nickel
	U	alloys 90/10, 70/30
Capacity	السعة	Such as Thermal capacity and Production capacity
Compressor	ضاغط	A rotating equipment to compress gases and vapors
Coating	طلاء	To coat/paint the metallurgic materials to resist
J		corrosion
Chamber	غرفة	Such as chamber for flashing evaporation
Cathode	قطب موجب	positive elements Negative electric poles that attracts
	(كـاثود/مهبط	ions of
	í (
Corrosion	موانع (مثبط)	Chemical materials added with specific rates to
inhibitors	التآكل	prevent (or minimize) metallurgic corrosion
Condenser	مكثف	Heat exchanger for the purpose of vapor/steam
		condensation
Concentration	نسبة التركيز	The rate between the salinity of water (or brine) to the
Ratio		salinity of feed water
Calibration	معايرة	To confirm the accuracy of equipment used in
		measurements
Cooling Water	ماء التبريد	Used to discharge heat from the unit
Commercial	وحمم وحمد ات	Technologies that reach the competition on the
Units	تجارية	commercial levels
D		
Distillation	التقطير	Is the heating desalination process using condensed
		steam
Diffusion	انتشار	Moving of elements through brines due to differential
		concentrations
Dissolved	الأمـــــلاح	Consists of a number of positive and negative ions
Solids	الذائبة	such as cations
		Calcium (Ca)
		Sodium (Na)
		Magnesium (Mg)
		Potassium (K)

	T	
Desalination	اقتصــاديات	Includes the primary prices per unit and the costs of
Economics	التحلية	equipment, operation, maintenance, and accordingly,
		the production costs of desalinated water per cubic
		meter.
Disinfections	تطھیے۔۔۔۔ر	Adding materials such as chlorine to kill microbes and
	(المتعقيم)	harmful bacteria in water
Desalination	ر <u>ا میں</u> تحلية (إزالة	Separation of salts from water (or vice versa) in brine
(Desalting)	ملوحة/تعذيب	(such as seawater or well water.
(Desaiting)	ملوكة (تعديب	(Such as seawaler of well waler.
Dilution) تخفيف	Increase water rates and reduction of rates of other
Dilution	تحقيف	
Distanta	(elements
Dialysis	ديلزة (فرز)	Is the process of separation or dilution of the brine, by
		separation of salts there from, and attracting these
		salts by means of electric poles
Deposits	رواسب	Soft deposits or sediments such as clay and carbon
		scales, and solid deposits as sulfates and silica scales
Deairator	طـــــارد	An equipment using the processes of atomization and
	(مزیـــل)	heating to discharge the gases dissolved in feed water
	الغازات	
Dissolved	غازات ذائبة	Such as oxygen, carbon dioxide, which must be
gases		disposed prior to entering to unit6s (specially thermal
0		units) to prevent corrosion, and affect the chambers'
		pressure
Demister	فاصل الر ذاذ	Mist is water sprinkles, and is carried partly with steam
Dernieter		and therefore causes its pollution with its carried salts
		and minerals. Therefore the demister is used to
		achieve pure steam.
Duel Purpose	محطة ثنائية	Double purpose stations for power generation and
(Co-generation)	معلك النيا- الغرض	water production, that is to say production of two types
(Co-generation)	الغرص	
Distillate	ماء مقطر	of electric and thermal energies.
Distillate	ماء مفطر	Water produced from the process of distillation
(Distilled water)	7.1 - 71	(evaporation and condensation)
Desalination	محطة تحلية	Consists of one or more desalination units (to produce
Plant	f> -	bigger amounts of water)
Deairation	نــــازح (أو	Is placed before the thermal desalination units as a
	مزيـــل	part of the primary treatment of feed water to remove
	الغازات)	the dissolved gases (which leads to unit corrosion)
Desalination	وحدة تحلية	The set of the components required for the production
Unit		of a specific amount of water
Distillate	ماء مقطر	The water output resulting from any thermal
		desalination plant
E		
Environment	البيئة	The ambient air, water, or ground surrounding human
	- <u></u> ,	
Electro Dialveia	ال درازة	0
-		
(E.D.)	`` /	away nom the prine, which turns it into resh water
Electre Distant	الحهرباني	Omiles to (E.D.) above mentioned but with all all
Electro Dialysis	.	Similar to (E.D.) above mentioned but with changing
Reverse (EDR)	(الفـــرز)	electric poles (positive and negative) to reverse the
	الكهربــــائي المعكوسة	salt separation process in order to minimize the
		potential salt deposits on membranes surfaces.
Electro Dialysis (E.D.)	الـــــديلزة (الفــــرز) الكهربائي الــــديلزة	beings Uses the differential power voltage to attract salts away from the brine, which turns it into fresh water

Electric Conductivity	التوصـــل الکهربائی	Method for measuring water salinity. As water salinity increases, the electric conductivity also increases. The measuring unit of electric conductivity is m S /cm& μ S/ cm and the electric conductivity is about twofold the total solids dissolved in potable water
European Desalination Society (EDS)	الجمعيـــــة الأوروبيـــة لتحلية المياه	A European society based in Italy, specialized in water desalination.
Egyptian Desalination Association (EDA)	الجمعيــــة المصـــرية لتحلية المياه	First registered and newly operating Egyptian association in water desalination based in Cairo, Egypt.
Environment Pollution	تلوث البيئة	Introducing unfavorable elements into the environment that hazardously affect human beings. Pollution may be in air, water or food, etc
Evaporation	تبخير	Similar to evaporating but after setting up a heat source to push forward the process of turning of liquid into steam
Effectiveness	فعالية	The state of benefiting from energy in terms of input energy (to the unit) and similar output energy
Efficiency	كفاءة	The state of benefiting from energy according to design requirements, and is equal to the ratio of output to input energy
Enriched Uranium	يورانيــــوم مخصــــب (خصب)	Uranium containing specific excess of 235, and typically consists of 3.5 activated Uranium 235, 96% and the rest is inactive uranium 238.
F		
Filtration	الترشيح	Separation of suspended solids (and some dissolved solids), and its accuracy varies from normal filtration to micro filtration to Ultra filtration, to nano- filtration.
Fouling (soft scale)	ترســــبات (رواســـب) قشور طرية	Deposits that can be removed by mechanical, chemical methods, or by diluted acids such as the deposits of suspended materials like clay and algae, or dissolved as carbonates
Flashing	نبخيــــر ومضي	Sudden evaporation due to the presence of water (liquid) at a temperature above heating, and then the liquid is set in a pressure below boiling pressure, a part of the liquid shall be changed into steam, and then the liquid temperature is reduced to the boiling degree.
Freezing	تجمـــــد (تجمید)	By reduction of temperature degree the liquid is changed into solid salt-free crystals.
Feed	يغذى	Supplying any equipment, component, or system with the main source thereof such as feeding feed water to the desalination unit or steam boilers
Filtration	ترشيح	clearing water off suspended solids such as sand, clay, etc
Foam	ر غــــاوي (رغوة)	Soils of organic and inorganic material that are formed on the water levels may be carried by steam with water sprinkles

Freezing طرق التجميد methods A thermal method where saline water is cooled leading to frozen fresh water crystals that may be separated and dissolved to achieve water.	
and dissolved to achieve water.	ed
	I.
Input water that enters to feed the unit at an all الماء التغذية	าต
compensate output water	
Fresh water ماء عذب Potable water	
Flow rate معــــدل Measured by quantified units such as cubic meter p	er
day or by masses units such as ton/hr.	
G	
Gases الغازات Presence of gases in water causes corrosion of he	at
units	
Generator مولد Such as Steam Generator, Generator Electric	
Ground water میاہ جوفیة Such as wells and springs	
H	
Heavy water الماء الثقيل The well known type of water is the soft water (H ₂ C)),
(Deuterium and each 7,000 part of it consists of one part of hea	
Oxide-D ₂ O) water (Deuterium Oxide-D ₂ O) and Deuterium (D ₂) is	а
counterpart of hydrogen (H ₂), but its atom contai	ns
neutron in addition to the proton in the Hydrogen ato	n.
This is why its is heavier, and thus called heavy wate	r.
Heat Transfer انتقـــــل Heat is transferred according to different	ial
temperature degrees from highest to lowest degre الحرارة	es
either by conductivity (diffusion), loading, or radiation	
Heat Recovery اسستعادة Recover and reuse of heat to benefit therefrom:	
Negative ions الحرارة	
Chloride (CI)	
Carbonate (CO ₃)	
Bi-Carbonate (HCO ₃)	
Sulfate (SO ₄)	
Hydrological الدورة المائية Source of fresh water for all humanity through th	
Cycle evaporation of seas and oceans waters into cloud	ls,
and then rainfall and returns to seas again.	
Like human head hair manufactured from substanc الشـــعيرات	
Fibers الدقيق الدفية like cellulose acetate and used as semi permeat	le
membranes for the process of reverse osmosis المجوفة	
Heating system بخار تسخين The difference between the vapor and the steam	
(Vapor) that the latter has a higher pressure and temperatu	
degree. Heating steam is typically used as a he	at
source to heat the brine in thermal stations.	
Hard Scale ترسبات Scales that cannot be removed by mechanic	
(رواسب) chemical methods or by acids such as sulfates a	าป
silica scales (قشور)	
صلبة	
Heat حرارة A form of energy that causes heating	
Hollow Fiber خيط مجوف Like human head hair used in making membranes f	or
the process of reverse osmoses	
Heat rejection طرد الحرارة To achieve heat balance in any component or syster	
it is necessary to discharge an amount of ener	
similar to the inlet heat, but with a lower temperatu	re
degree.	
Lloot Evolutions M Equipment for best such as singly between the transfer	
Equipment for heat exchanging between hot and co مبـــــادل Heat Exchanger	100

هدمان و العنائي seals. Shall be called a heater, cooler, condenser, evaporator according to its intended purpose(s), etc. Heat source المحسور العالي المحمولة المحسور المعلمي المحمولة المحسور المحمولة الم		1	
Heat source مسند المعندية A source of external thermal energy required for the thermal desalination plants as a thermal power for the process of distillation, and shall be either steam, hot water, or hot gases, etc. I Ion Exchange للتبادية Uses resins for exchanging ions with ions dissolved in thine, leading to dilution of brine to fresh water. There are positive ion exchangers to absorb cations and there are negative ion exchangers to absorb both anions and cations. International Desalination An association board in USA, having experts, scientists, and international companies as members, in Association IDA Ions للمعني الله field of desalination Ions للتعلي الله field of desalination Ions للتعلي الله field of desalination L Either an added (or withdrawn) heat at the fixation of temperature degree to change the liquid into steam (or vice versa). This heat is latent, that is, it is intangible due to lack of sensing instruments (such as thermostal). Same meaning applies in case of changing the liquid to solid (freezing) or from solid to liquid (melting). And is measured by kg l/kg Membrane الاعني التعلي الله الله والله وال وال وال		حراري	
المعنية المعالية المعنية المعالية In Exchange التبيال العبية Ion Exchange التبيال التبيالة Ion Exchange التبيالة العديالة International التبيالة التحدية Desalination An association board in USA, having experts, scientists, and international cations. International the field of desalination Ions التحدية The molecule of the compounds dissolved in water is divided into particles with either a positive or negative charge, each of which is called ions. L Item an added (or withdrawn) heat at the fixation of temperature degree to change the liquid into steam (or vice versa). This heat is latent, that is, it is intangible due to lack of sensing instruments (such as thermostat). Same meaning applies in case of changing the liquid to solid (freezing) or from solid to liquid (melting). And is measured by kg l/kg M Increase in density of membranes permeability and reduction of production capacity and hence requires pressure increase from the high-pressure pump. Membrane الموني Ross T			
Image: process of distillation, and shall be either steam, hot water, or hot gases, etc. Ion Exchange التبياني International التبييني Desaination Association Association العالي Ions التبييني Iternational الله Ions الله Iternational الله Ions الله Ions الله Iternational الله Ions الله Ions اللله Ions Ions Ions Ioncrease in density of membranes <t< td=""><td>Heat source</td><td>مصــــدر</td><td>A source of external thermal energy required for the</td></t<>	Heat source	مصــــدر	A source of external thermal energy required for the
سنلین العندين العندي العندين العندين العندي العندي العندي العندي العندي العند العادي		حرارة	thermal desalination plants as a thermal power for the
Innertic Exchange التبياد Ion Exchange Ion Exchangers for absorb anions. Also there are negative ion exchangers to absorb anions. Also there are Mixed beds to absorb both anions and cations. International الحمديا An association board in USA, having experts, basication in DA Ions Ions التواني Ions التواني Ithe field of desalination in DA Increase ach of which is called ions. L Ither an added (or withdrawn) heat at the fixation of temperature degree to change the liquid into steam (or vice versa). This heat is latent, that is, it is intangible due to lack of sensing instruments (such as thermostal). Same meaning applies in case of changing the liquid to solid (freezing) or from solid to liquid (melting). And is measured by kg l/kg Membrane الاغفية Compaction العنه اللهدة Mass Transfer Special materials (such as cellulose and polymer compounds) to separate the dissolved substances in the brine. Multi Stage Multi Stage			process of distillation, and shall be either steam, hot
 الألوني الألوني المحمد المحمد			water, or hot gases, etc.
 الألوني الألوني المحمد المحمد	1		
 الألوني الألوني المحمد المحمد	Ion Exchange	التبــــادل	Uses resins for exchanging ions with ions dissolved in
Are positive ion exchangers to absorb cations and there are negative ion exchangers to absorb anions. Also there are Mixed beds to absorb both anions and cations. International Desalination الجعيـــــة Association in Association الجيـــــة International Association الجعــــة An association board in USA, having experts, sentists, and international companies as members, in the field of desalination IDA The molecule of the compounds dissolved in water is divided into particles with either a positive or negative charge, each of which is called ions. L Either an added (or withdrawn) heat at the fixation of temperature degree to change the liquid into steam (or vice versa). This heat is latent, that is, it is intangible due to lack of sensing instruments (such as thermostat). Same meaning applies in case of changing the liquid to solid (freezing) or from solid to liquid (melting). And is measured by kg l/kg M Increase in density of membranes due to increase of pressure and temperature degrees on membranes. This causes tightness in the membrane permeability and reduction of production capacity and hence requires pressure increase from the high-pressure pump. Membrane الحفــــــــــــــــــــــــــــــــــــ	U U	الأيونى	
Also there are Mixed beds to absorb both anions and cations. International Desalination Association Doard in USA, having experts, scientists, and international companies as members, in the field of desalination IDA Ions الحريات Ions الحريات Latent Heat الحريات Etable Either an added (or withdrawn) heat at the fixation of temperature degree to change the liquid into steam (or vice versa). This heat is latent, that is, it is intangible due to lack of sensing instruments (such as thermostat). Same meaning applies in case of changing the liquid to solid (freezing) or from solid to liquid (melting). And is measured by kg Vkg M Increase in density of membranes due to increase of pressure and temperature degrees on membranes. This causes tightness in the membrane permeability and reduction of production capacity and hence requires pressure increase from the high-pressure pump. Membrane الخفية Mass Transfer Special materials (such as cellulose and polymer compounds) to separate the dissolved substances in the brine. Multi Multi Stage Multi (Multiple) Flash (M. S. F.) Increase in density process is used to evaporate the brine. Multi (Multiple) S. F. is used through several stages to maxing benefits from the energy carried by the brine. Multi (Multiple) Inference S. F. is used through several stage is used as a heat soore to produce another type of steam in another stage (at a lower pressure) a		Ŧ	
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membranes, and high pressure pumps in membrane	Components	الأساسية	
			membranes, and high pressure pumps in membrane

		units
Membrane	التقطير	A method using thermal energy for water distillation.
Distillation	الغشائي	And the passage of steam (only) through thermal
		membranes.
Multi stage	تبخر ومضي	Uses flashing evaporation to form steam, which
Flash	متعــــدد	condenses to form fresh water produced. The units
(MSF)	المراحل	consists of several stages, where pressure is lowered
		from one stage to another.
Micro-Filtration	ترشيح دقيق	Process of clearing water off the tiny suspended
	(ميكروبي) صيانة	particulates such as algae within the micron limit.
Maintenance	صيانة	Conserving the equipment by changing the damaged
		and conducting repair works for operation.
Monitoring	مراقبــــــة	Following up and controlling the performance of
	(متابعة)	components and systems through measurement
		devices, either onsite or in the control room.
Make Up water	ماء التعويض	To feed the unit to compensate its effluent either in the
		form of output water or discharged wastewater.
Multi (Multiple)	متعدد التأثير	Type of desalination technology, where benefits are
Effect		drawn from the generated resulting energy to produce
		steam from the next impact stage and under lower
		pressure and so on.
Ν	•	
Nuclear Energy	الطاقـــــة	The energy resulting from the fission of heavy atoms
	النووية	such as Uranium or merging of atoms such as Helium,
		in order to transfer this nuclear energy (between
		nuclei) into a beneficial energy for human beings
		(thermal or electrical).
Nano Filtration	ترشــــــــــــــــــــــــــــــــــــ	Clearing water off the very tiny suspended particulates
	متناهي الدقة	such as the dual ions, colors, and odors (ranging from
	-	10 to 100 angstroms).
Nuclear Energy	طاقة نووية	Benefits from the fission of heavy natural elements
		such as Uranium, heat generation, and the release of
		particulates such as neutrons, alpha, beta, and gamma
		rays for human benefit either in peace or for military
		excellence.
Natural	يورانيــــوم	Uranium produced from its specific mines, and
Uranium	طبيعي	naturally consists of 0.7% of active Uranium (235), and
		the rest 99.3% of inactive uranium (238).
0		
Osmotic	أسموزي	Permeation of diluted solution to conc. Brine through a
		semi permeable membrane to produce a balanced
		concentration.
Osmotic	الضــــغط	The pressure at which the permeation stops of the
Pressure	الأسموزي	diluted solution to the conc. Brine through a semi
		permeable membrane.
Once Through	أحــــادي	Inlet system of feed water, passing through the
Ŭ	المــــرورّ	desalination unit, then fully discharged and replaced by
	(اتجاه واحد)	new quantities of feed water.
Osmosis	تناضح	Permeation of diluted solution to conc. Brine through a
		semi permeable membrane to produce a balanced
		concentration
Operation	تشغيل	Production process along with monitoring equipment
· · · · ·		

		performance.
Orifice	فتحة ضيقة	Used to measure and reduce the flow rate, and also to
	(خانقة)	create a differential pressure before and after the
	· · ·	orifice (relatively).
Ρ		
рН	الرقم (الأس)	Is the number that determines the nature of the
	الأيدو جيني أ	solution (brine), in terms of acidity or alkalinity. It is the
		negative logarithm for the concentration of hydrogen
		ion, below 7 acidity, and more than 7 alkalinity.
Productivity	الإنتاجية	Production rate per hour or per day whether a
5 (quantified rate such as m ³ /day or mass rate (ton/hr).
Performance	أداء	The status of operating the components according to
Dragourg	إناء ضغط	its design requirements.
Pressure Vessel	إناء صنعط	A cylindrical container that tolerates high pressures, and consists of membrane elements in the units of
VESSEI		reverse osmosis.
Power	توليد القدرة	Using multi methods for electric power generation in
Generation	(الكهربية)	power plants (whether thermal, nuclear, or solar, etc.).
Part of Million	ج_زء ف_ی	Unit for measuring salinity (and other elements) in the
(PPM)	المليون	brine.
Per Capita	حصة الفرد	Individual share (in a community) from any material,
		income, product, or natural resource.
Properties	خواص	Anything that has chemical and/or physical
		characteristics, etc, that determines its capability of
-		performing a specific activity.
Permanent	عسر الماء	The hardness of sulfates, chlorides, and calcium
Hardness	الدائم	nitrates and /or magnesium and is removed by
Product Water	ماء منتج	heating. Fresh water produced from the desalination unit.
Potable Water	ماء شر ب	Salinity from 100 to 500 ppm, in addition to its being
		void of any pollutants that hazardous to human beings.
Power Plant	محطة قوى	A single-purpose station only for electric power
		generation.
Pre- Treatment	معالجة أولية	The preparation of feed water before its entering the
		unit (by removal of gases, suspended solids, and
		chemical additives) in order not to negatively affect
		equipment by corrosion and deposits.
Post Treatment	معالجة نهائية	The preparation of water produced from the
		desalination plant using the specifications required for
Product Water	ماء منتج	usage. The output resulting from any desalination plant
Product Water	ماء مللج مضخة	A revolving equipment to push forward liquids and
	مصنت	increase its pressures, and is typically operated by
		electric motor or turbine (gaseous, steamy) or diesel
		engine.
Preformance	معامل الأداء	The ratio between the rate of product water, and the
Ratio (PR)		rate of inlet energy (or heating steam).
Primary Water	مصادر الماء	The quantity of natural water for a group of humans,
Resources	الطبيعية	including rivers, rainwater, natural ground water, and
(PWR)		other sources.
Permeation	نفاذية	The possible passage of an element through
		membranes.
R		

Reverse One of the most commonly applied desalination by using membranes, and uses the high pressure to push (R.O.) Reverse One of the most commonly applied desalination by using membranes, and uses the high pressure to push (R.O.) Recirculation A portion of the brine is recirculated to benefit from its chemical contents, and thereby reduce the rates of the feed water required for the desalination plant. Rain Julia Condensed water drops from clouds Re-Generation Law are required for the desalination plant. Residual Condensed vater drops from clouds Research Law are required to remove the remaining rate before entering the desalination unit, to prevent its negative impact on membranes. Research Law are required to romove the remaining rate before entering the desalination unit, to prevent its negative impact on membranes. Research Law are required to not deplete as long as there is life on earth, such as colar energy, wind-driven energy, organic materials, etc. Rewable Resistance for heat transfer by insulation or resistance for corrosion preventives), etc. Recovery Ratio Law are radie of heer as long as there is used. S S Salinity Law are radie of heat transfer by insulation or resistance for corrosion preventives), etc. Salinity Law are radie of heat radia by energy (Watt) falling over square meter (Wm ²), and varies from z	Resin	ر اتنجات	Resin materials in the form of small balls (ml) placed
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		level, and any increase may cause the deposit of salts.
Stainless steel	حديد صلب	Alloys of corrosion-resistant steel such as Steel 316 L.
Sludge	حديد تحسب حماة	Steel outputs in the process of wastewater treatment.
Surface	سطح	Such as heat transfer surfaces and membrane
Oundee		surfaces.
Semi	شبه نفاذ	Membranes that permit the passage of some elements
Permeable		excluding others.
Steam Rejector	طارد بخاري	Used in withdrawal of gases or to pressurize steam
eteam rejector	Ç, Ç	and gases (to eject into the air). Uses the theory of
		transferring speed difference to vacuum, where gases
		and withdrawn and pressurized.
Solar Energy	طاقة شمسية	Using heat and light radiation to change them to
		energy (heat or electrical) that could be beneficial.
Solar Still	مقطر شمسي	A simulation of the natural water cycle conducted in a
		small device operating by solar energy for evaporation
		(and disinfection).
Section	منطقة	A series of stages having same properties
	(جزء/قطاع) مرحلة	
Stage	مرحلة	Steam chamber, containing evaporated water, and
-		condensed steam.
Sea water	ماء البحر	Saline water, whose salinity is higher than well water,
	<u>tı</u> ı	higher than 30,000 ppm.
Saline (salty)	ماء مالح	When salinity is higher than that is permissible for
water	(ملحي)	potable water (salinity above 1000 ppm) and is called
		well water (or brackish water) if its salinity range from 1000 to 10,000 ppm, and is called seawater in case its
		salinity is above 30,000 ppm.
Surface Water	مياه سطحية	Such as rivers, tributaries, seas, and lakes.
Silt Density	مقياس كثافة	An index that determines the necessity of pretreatment
Index	لعكارة العكارة	and filtration to remove the suspended elements so as
(SDI)		not to affect negatively the desalination unit especially
		membranes.
Specifications	مواصفات	membranes. Is abbreviated as "specs", which are the prerequisites
· · ·	مواصفات	
· · ·	مواصفات ملفوفـــــة	Is abbreviated as "specs", which are the prerequisites
Specifications		Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system.
Specifications	ملفوفــــــة	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane.
Specifications	ملفوفـــــة حلزونيا نسبة مرور	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water
Specifications Spiral Wounded	ملفوفـــــة حلزونيا	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches
Specifications Spiral Wounded Salt passage	ملفوفــــــة حلزونيا نسبة مرور	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water
Specifications Spiral Wounded Salt passage T	ملفوفة حلزونيا نسبة مرور الملح	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10%
Specifications Spiral Wounded Salt passage	ملفوفــــــة حلزونيا نسبة مرور	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which
Specifications Spiral Wounded Salt passage T	ملفوفة حلزونيا نسبة مرور الملح	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of
Specifications Spiral Wounded Salt passage T Turbidity	ملفوفـــــة حلزونيا نسبة مرور الملح العكارة	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light.
Specifications Spiral Wounded Salt passage T Turbidity Top Brine	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجة	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal
Specifications Spiral Wounded Salt passage T Turbidity Top Brine Temperature	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجة حـرارة	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity
Specifications Spiral Wounded Salt passage T Turbidity Top Brine	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجة	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity and efficiency also increases, but is determined with
Specifications Spiral Wounded Salt passage T Turbidity Top Brine Temperature	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجة حـرارة	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity and efficiency also increases, but is determined with solid deposits (such as sulfates, silica) over heat
Specifications Spiral Wounded Salt passage T Turbidity Top Brine Temperature (T.B.T)	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجة للمحلول	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity and efficiency also increases, but is determined with solid deposits (such as sulfates, silica) over heat transfer surfaces.
Specifications Spiral Wounded Salt passage T Turbidity Top Brine Temperature (T.B.T) Thermal	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجـة للمحلول أغشية	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity and efficiency also increases, but is determined with solid deposits (such as sulfates, silica) over heat transfer surfaces. Semi permeable membranes that allows the passage
Specifications Spiral Wounded Salt passage T Turbidity Top Brine Temperature (T.B.T)	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجة للمحلول	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity and efficiency also increases, but is determined with solid deposits (such as sulfates, silica) over heat transfer surfaces.
Specifications Spiral Wounded Salt passage T Turbidity Top Brine Temperature (T.B.T) Thermal Membrane	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجة للمحلول أغش_ية حرارية	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity and efficiency also increases, but is determined with solid deposits (such as sulfates, silica) over heat transfer surfaces. Semi permeable membranes that allows the passage of steam (only).
Specifications Spiral Wounded Salt passage T Turbidity Top Brine Temperature (T.B.T) Thermal	ملفوفة حلزونيا نسبة مرور الملح العكارة أعلى درجـة للمحلول أغشية	Is abbreviated as "specs", which are the prerequisites in an element, component, or an operation system. Spirally wrapped membrane belts to increase the permeable surface area, while reducing the size of membrane. The ratio between the concentration of the fresh water produced to feed water concentration, and reaches 10% Tiny and suspended particulates in water, which causes dirt in water clarity and prevents passage of light. Highest temperature degree of brine in thermal stations, and as it increases, the plants productivity and efficiency also increases, but is determined with solid deposits (such as sulfates, silica) over heat transfer surfaces. Semi permeable membranes that allows the passage

Tomporary	1 11	Hardness of coloium and/or magnesium biserbanets
Temporary	عسر الماء المقت	Hardness of calcium and/or magnesium bicarbonate
Hardness	المؤقت المواد الكلية	Element to determine water colimity, and is measured
Total Dissolved	المواد الكليــه الذائبة	Element to determine water salinity, and is measured
Solids (TDS)	الدانبه	by ppm, and measured by electrical conductivity and
		the total suspended solids are almost equivalent to half
Tatal		of electrical conductivity for potable water.
Total	مجموع	Suspended elements (or solids) in water that are
Suspended	المواد العالقة	removable by filtration
Solids (TDS)		
U	1	
Ultra Filtrate	ترشيح فائق	Clearing water from the tiny particulate matters such
	الدقة	as fungi within the limits from 1 to 0.1 Micron (100-100
		angstrom).
Uranium	اليورانيوم	A heavy unstable material that can be fissured and
		used in generating nuclear energy. There are Uranium
		235 and 238 that can be directly fissured for power
		generation. It has a simple percentage in nature
		(0.7%), while the biggest percentage (99.3%) is in the
		form of inactive uranium (238), which requires neutron
		absorption to change into an inactive element which is
		Plutonium 239 used in nuclear arms and nuclear
		energy.
V		
Volume	الحجم	A unit measured by liter or cubic meter.
Vaporization	بخر (تبخر)	Movement of water vapor from the water surface and
	(3.)3.	at a temperature degree below boiling degree) through
		material movement (airborne) or by diffusion.
Vacuum	تفريـــــغ	Reduce pressure below atmospheric pressure, and
	(تخلخل)	accordingly, reduce the liquid's boiling temperature
	(- /	degree.
Venting	تهويـــــة	Allowing a quantity of gases to flee to the atmosphere
	(تنفيس)	either for disposal or pressure relief.
Vapor pressure	(ضياع)	Is the pressure at which the solution boiling degree is
	البخار)	determined.
Vapor	انضـــــــغاط	A thermal desalination method that uses steam in the
Compression	(ضــــغط	final desalination unit stages as a heat source after
•	البخار)	being pressured (either thermally or mechanically).
W	· · · · ·	
Water Science	جمعية العلوم	An association affiliated to the Gulf Cooperation
and Technology	وتكنولوجيا	Council (GCC) for water technologies and sciences,
Association	رـــرعبيــــــــــــــــــــــــــــــــ	based in Manama, Bahrain.
(WSTA)		
Water Quality	نوعية المياه	Means water is void of specific rates of rejected
	بر :	elements as per application.
	<u>I</u>	
Wind Energy	طاقة الرياح	Using air movement to push forward windmills
		changing it to a moving energy to run components
		such as pumps, power generators, and etc.
Water Hardness	عسر الماء	Presence of compounds such as calcium and
	مسر المدد	magnesium that reduces the soap foam in water, and
		exists at a rate from 1 to more than 180 ppm.
Water	معالجة المياه	A term that expresses the meaning of changing any
Treatment	معانجة المياه	invalid water into valid water for human benefit.
HEALINEIIL	<u> </u>	mvanu walei muo vanu walei 101 muman penem.

Treatment differs according to the water source and
nature of usage required for the produced water.