Audit Report

ALLIANCE FOR WATER STEWARDSHIP CERTIFICATION

Format v1.0

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY LIMITED, 8, LI-HSIN RD. 6, HSINCHU SCIENCE PARK,HSINCHU 300-78, TAIWAN, R.O.C.

PREPARED BY: DNV GL BUSINESS ASSURANCE TAIWAN | DATED: 25 JANUARY 2021 | VERSION: 01

INTRODUCTION

Client Name	Taiwan Semiconductor Manufacturing Company Limited (TSMC)
AWS Reference Number	AWS-010-INT-CAB-0008-000240~000241
Project No.	PRJN-188360-2020-SCM-TWN
Address	Site 1 - Fab 15A : 1, Keya 6th Rd., Daya Dist., Central Taiwan Science Park, Taichung 428-82, Taiwan Site 2 - Fab 15B : 1, Xinke Rd., Situn Dist., Central Taiwan Science Park, Taichung 407-63, Taiwan
Contact details of the person responsible for AWS	Mr. LO, Minglien, Technical Manager of TSMC Corporate ESH Division, MLLOA@TSMC.COM
DNV GL Team	HsianTin Tim Kuo (TK) (Lead Auditor) Jerry Huang (JH) (Auditor) Johnny Yung Chun Wu (JW)(2020-10-26~27) (Auditor) Hung, Chih Hsiung(CH, Hydrology Expert)
Audit Dates	26~30 October 2020
Technical Reviewer	Radhakrishnan Kiran
Scope of the assessment including all locations and facilities that were visited	AWS standard version 2.0 is applied, and the operation type is multi-site certification including two TSMC Fabs located within the same science park in Taichung city of Taiwan, for details please see below: Site 1 - Fab 15A : 1, Keya 6th Rd., Daya Dist., Central Taiwan Science Park, Taichung 428-82, Taiwan Site 2 - Fab 15B : 1, Xinke Rd., Situn Dist., Central Taiwan Science Park, Taichung 407-63, Taiwan All above two sites were visited during the on-site audit during 26~30 October 2020.
Nature of Site	All two sites were located in Central Taiwan Science Park (CTSP) in Taichung City, and 100% owned by TSMC. Both Sites (Fab 15A and Fab 15B) are 12-inch wafer manufacturing fab.
Certification/Audit Type	Initial Certification/Initial Audit
Level of Certification Recommended	In summary, it is DNV GL's opinion that all two sites, namely Site 1 (Fab 15A) and Site 2 (Fab 15B) meet all relevant requirements and criteria for multi-site Platinum level certification. Hence DNV GL thus recommends the **Platinum** Level of AWS certificate with an annual surveillance on-site audit at each site.
Dated	8 December 2020

About the Site

Overview of Unit and Location	TSMC is a world leading company in semiconductor manufacturing sector, with global market share of 52% achieved in 2019. According to its Environmental Policy, TSMC intended to continue enhancing water resource management through adaptation of the International AWS Standard. Within this certification, two sites were 100% owned by TSMC and located in CTSP in Taichung City of Taiwan, planning to apply the multi-site certification under AWS version 2. Fab 15A and Fab 15B are 12-inch wafer manufacturing fab. Fab 15A operated in 2011 and Fab 15B operated in 2012. For each site one unique code was allocated by audit team, and their locations are listed in below: Site 1 - Fab 15A : 1, Keya 6th Rd., Daya Dist., Central Taiwan Science Park, Taichung 428-82, Taiwan Site 2 - Fab 15B : 1, Xinke Rd., Situn Dist., Central Taiwan Science Park, Taichung 407-63, Taiwan
Internal Governance	The organization of water management in TSMC were conducted at two levels: 1, At corporate level, Corporate ESH Division will take the role as the Group Representative for AWS management, and is responsible for corporate level water related management review, regulatory identification and communication, internal audit and Stakeholder communication for water-related topics; 2, All two sites follow the same management system set by corporate. At each site, the Fab Director serves as the management representative for EHS, and responsible for fab water related management review. Furthermore, the Facility Department is responsible for operation and maintenance of water system; and Fab Industrial Safety and Environmental Protection Department (ISEP) is responsible for water-related quality measurement and internal audit.
Description of the catchment in which the client operates	All two sites are located in the CTSP, Central Taiwan Science Park, in Taichung City. All sites were located in the Daan and Dajia River Catchment. In Daan catchment there is one reservoir, Li-Yu-Tan, and in Dajia catchment there are Techi Reservoir and Shigang Barrage, together which contributed as the major water resources in Taichung area. Hence the up catchment is included in the physical scope. For above-mentioned two reservoirs and one barrage, there were respectively two water treatment plants directly drawing water from the reservoirs, namely Fongyuan water treatment plant and Li-Yu-Tan Water Treatment Plant. After treated by the joined wastewater treatment plant, the effluent from CTSP, together with it from the sites, flew into the downstream of Wu River by a long distance dedicated effluent pipeline. After that the Wu River joined with Taiwan Straits. The physical boundary of these two sites were mapped in Figure 1.

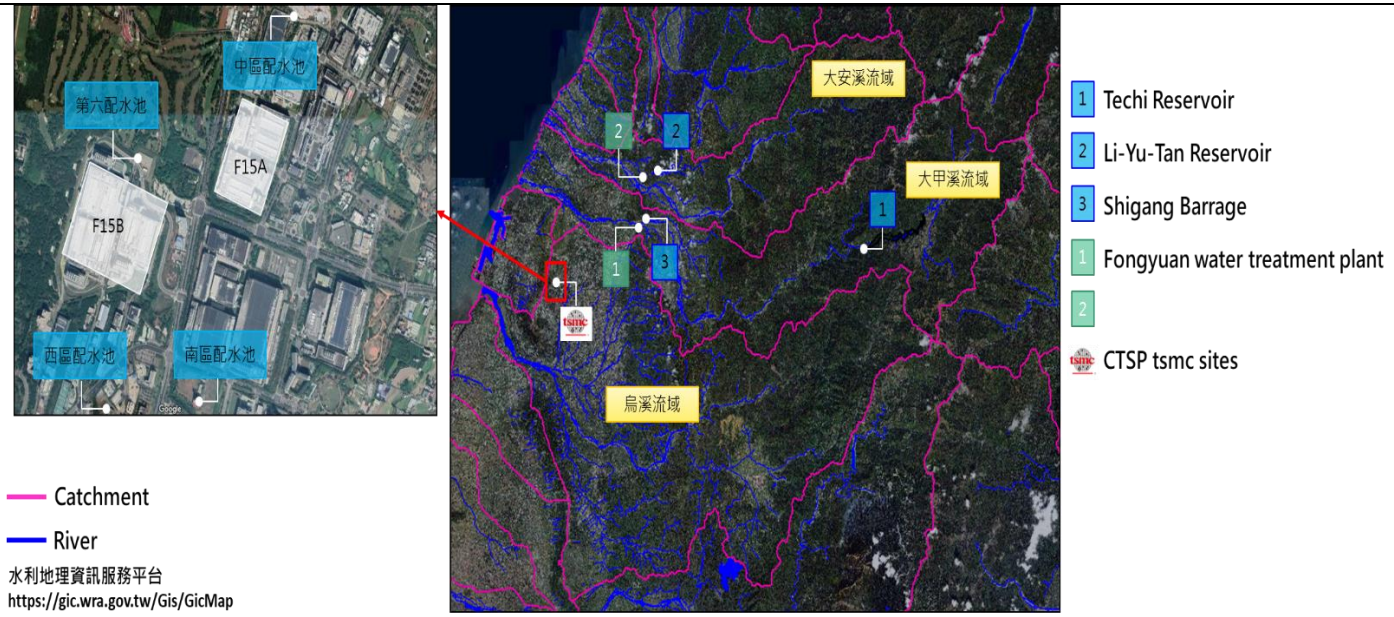


Figure 1, Physical Boundary's Sketch Map

Summary of shared water challenges and Programmes to counter challenges	Although the water-supply to CTSP during normal season could meet the basic requirement, however during dry season or in long-term prospect, together with other water user within the Daan and Dajia River Catchment, all two sites were faced with major shared water challenge as below: Based on the analysis of supply and demand, the Li-Yu-Tan Reservoir and Shigang Barrage can supply approximately 1.37 million tons of water per day. Together with groundwater and regional water sources, the total daily water supply is approximately 1.47 million tons of water per day. However, the daily demand for whole Taichung area is 1.56 million tons (including 70,000 tons to supply Miaoli and 80,000 tons to support Changhua). Therefore, in the event of drought, it is necessary to respond through reduced pressure water supply, groundwater and short-term regional water supply. The four major programmes/strategies currently adopted include: 1. Open source: Set up Futian, Shuinan and Fengyuan water resource recycling plants, which can supplement about 80,000 tons of water per day and is expected to be completed in 2024. At the same time, the Daan and Dajia River water source joint utilization plan will be adopted, which can add about 260,000 tons. 2. Throttling: reduce the leakage rate of tap water. The leakage rate was about 19.67% in 2017 and is expected to decrease to 10% in 2031. 3. Dispatch: Li-Yu-Tan Water Treatment Plant's North Miaoli clean water pipeline project is currently under construction. At the same time, the Daan and Dajia River water source joint utilization plan will be adopted. 4. Redundancy: The installation of disaster prevention and backup wells is expected to be completed in 2021.

	Currently two sites have met the wastewater discharge standard as regulated by CTSP Bureau. To decrease the impact on CTSP WWT Plant and improve the water quality of Wu River, TSMC proposed a long-term target to continuously improve the discharge water quality to meet effluent water quality standards for WWT Plant discharge till 2025. As per the consideration of early-responding mechanism, the effluent water quality standards, including biological acute toxicity, for WWT Plant is more stringent than the effluent standard set by CTSP Bureau.
Visit to Source Water Location	As stated in above, there were two water supply plants which all provided the tap water to CTSP. Audit team chosen to visit the VI water dispatch pool located in CTSP which was used to deliver tap water to two sites. The operation and the maintenance of the water dispatch pool was found in good condition.
Visit to Water Discharge Location	On 28 Oct. 2020, Audit team visited the CTSP WWT and initiated a stakeholder meeting with the top management of WWT. For details please see below section. Year 2020 checked the document of wastewater discharge approval letter and CTSP WWT sampling tsmc F15A & F15B inspection records to confirm that the wastewater is still discharge to WWT.
Stakeholder Interview Observations	The stakeholder announcement was published respectively on websites of AWS, TSMC and DNV GL 30 days before the on-site audit (starting from 26 Oct. 2020) as per the AWS standard. There was no any comment received during this period. Stakeholder interaction was undertaken on 28 Oct. 2020. Summary of discussions from the interactions: 1, At morning on 28, Oct. 2020, audit team visited the CTSP WWT Plant and met with the top management of WWT Plant. During the interview with Chief Engineer Mr. KH Huang 黃國輝, the main topics were focused on: • WWT Plant operation and future phases planning; • the routine regulatory mechanism conducted by WWT Plant to all two TSMC Fabs such as regular sampling and analysis of site's effluent water quality; • the shared catchment water quality challenge and the joint action plan taken by WWT Plant and TSMC; 2, At morning on 28, Oct. 2020, after the meeting with CTSP WWT, audit team then visited the CTSP Bureau and met with the relevant water resource officials. During the interview with Section Chief of Construction Management Division, Mr. Jyun-Kuan Lyu 呂俊寬 and technical specialist Mr. Wang, Kuo-Chung 王國忠, the main topics included: • Water resources distribution in Daan and Dajia River catchment; • Water resource shortage analysis, and the long-term water saving initiatives made by Water Resource Agency (WRA) and local government; • Water management and water recycle best practice among the companies located in CTSP; 3, At afternoon on 28, Oct. 2020, audit team met with the stakeholders in meeting room 701 of the Commercial & Business Service Building in CTSP Bureau: • Mr. Jyun-Kuan Lyu 呂俊寬 and Mr. Wang, Kuo-Chung 王國忠 from CTSP;

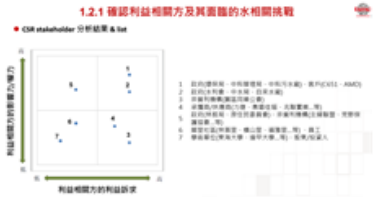
	• Mr. Yang, Chieh-Li 楊傑理, associate Technical Specialist, also from CTSP and responsible for the approval of water utilization plan raised by tsmc. • Mr. Mr. KH Huang 黃國輝 from WWTP outsourced by CTSP. • Mr. Aaron Lu 呂宗倫 from Li Jie Industrial Co., Ltd. Water treatment equipment manufacturer • Resident of Fulin: Li Yafang 李亞芳 • Pure water equipment manufacturer: Olugano, Cai Jiaxue,蔡佳學 engineer • Wastewater treatment agent operator: Zhaolian Engineer Zhuang Binghan 莊秉翰 the main discussions covered: • Since the water consumption of TSMC is relatively huge, there is concern that the tap water supply would be affected during dry season. So that the dispatch pool near tsmc Fab 15 B was built and operated.; • The water quality in Wu River is not in good condition as it is the major receiving water body to intake the wastewater from upstream agriculture & industry. Whether if TSMC is able to control the effluent water quality to decrease the impact on Wu River, especially on these indicators incl. heavy metal, biological acute toxicity etc; • The tap water pipe leaking rate is one of water supply topic since a big earthquake happened in 1999, so-called the 921 earthquakes. This issue should be pay more attention and regard as shared water challenge. • From supplier's perspective, how TSMC impact them on water use and collected the water usage data for wafer WFP quantification; • How TSMC cooperated with the supply chain to promote the water/environmental protection education to interested parties; • TSMC supported the local Water Resource Bureau to improve the WASH facilities of primary schools in remoted areas in recent years; Above concerns raised on water resource shortage and water quality, have been sufficiently discussed between the TSMC teams and the participants. As per the interview with the stakeholder representatives, it's DNV GL's opinion these questions have been responded by TSMC team in appropriated manner, and the stakeholder interview process have provided DNV GL with sufficient information to assess the corresponding indicators as indicated in AWS Standard ver 2.0. There were no outstanding issues identified during the stakeholder interview process.

AUDIT COMMENTS

	Detail	*Score*	*Detail of Evidence Verified*	*Type of Finding Major/Minor/Observation*	*Corrective actions / Response from TSMC*
STEP 1: GATHER DATA TO UNDERSTAND SHARED WATER CHALLENGES AND WATER RISKS, IMPACTS AND OPPORTUNITIES *Intent: To ensure that the site gathers data on its water use and its catchment context and that the site uses these data to understand its shared water challenges as well as its contributions (both positive and negative) to these challenges, water risks, impacts, and opportunities. This information also informs the development of the site's water stewardship strategy and plan (Step 2) and guides the actions (Step 3) necessary to fulfil the site's commitments*					
1.1	**Gather information to define the site's physical scope for water stewardship purposes, including: its operational boundaries; the water sources from which the site draws; the locations to which the site returns its discharges; and the catchment(s) that the site affect(s) and upon which it is reliant**				
1.1.1	The physical scope of the site shall be mapped, considering the regulatory landscape and zone of stakeholder interests, including: - Site boundaries; - Water-related infrastructure, including piping network, owned or managed by the site or its parent organization; - Any water sources providing water to the site that are owned or managed by the site or its parent organization; - Water service provider (if applicable) and its	Conformed	The physical scope of two sites were mapped, including: 1, site boundary of each site located in the Central Taiwan Science Park (CTSP), in which it indicated the layout of the tap water inlet point, discharge point, the WWT facilities, the Central Utility Plant; 2, The Catchment where the sites located was identified refer to the official platform (https://gic.wra.gov.tw/gis/gicmap) provided by Taiwan Water Resource Agency (WRA). All sites were located in the Daan and Dajia River Catchment. In Daan catchment there is one reservoir, Li-Yu-Tan, and in Dajia catchment there are Techi Reservoir and Shigang Barrage, together which contributed		

	ultimate water source; - Discharge points and waste water service provider (if applicable) and ultimate receiving water body or bodies; - Catchment(s) that the site affect(s) and is reliant upon for water.		as the major water resources in Taichung area. Hence the up catchment is included in the physical scope. 3. For above-mentioned two reservoirs and one barrage, there were respectively two water treatment plants directly drawing water from the reservoirs, namely Fongyuan water treatment plant and Li-Yu-Tan Water Treatment Plant. 3, After treated by the joined wastewater treatment plant, the effluent from CTSP, together with it from the sites, flew into the downstream of Wu River by a long distance dedicated effluent pipeline. After that the Wu River joined with Taiwan Straits. 4. At present, CTSP's water consumption permit is 120,000 tons/day, the actual water consumption is 105,000 tons/day, and the water consumption at the tsmc sites accounts for 58,000 tons/day.  		

			   		
1.2	**Understand relevant stakeholders, their water related challenges, and the site's ability to influence beyond its boundaries.**				
1.2.1	Stakeholders and their water-related challenges shall be identified. The process used for stakeholder identification shall be identified. This process shall: - Inclusively cover all relevant stakeholder groups	Conformed	1. In the list of stakeholders in the CSR report, a total of 8 categories of stakeholders are identified. 2. Stakeholder coverage -Government (Environmental Protection Bureau, CTSP, CTSP WWTP, Water Conservancy Association, Taichung Water Conservancy		

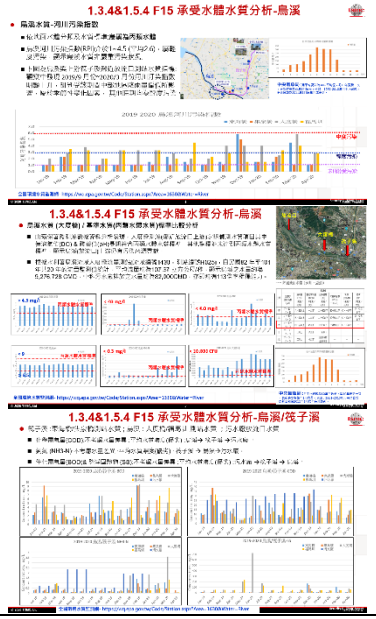
	including vulnerable, women, minority, and Indigenous people; - Consider the physical scope identified, including stakeholders, representative of the site's ultimate water source and ultimate receiving water body or bodies; - Provide evidence of stakeholder consultation on water-related interests and challenges; - Note that the ability and/or willingness of stakeholders to participate may vary across the relevant stakeholder groups; - Identify the degree of stakeholder engagement based on their level of interest and influence		Bureau, Water treatment plants located in the catchment), -Customers, -Non-profit organization (Park Association), -Contractor (Lijie, Olugano), -Aboriginal Committee, Wilderness Conservation Association, -Neighborhood communities (Lincuo county, Hengshan countyLi, Fu Ya county), -Academic institutions (Tunghai University, Feng Chia University), -Shareholders and investors, etc.; 3. According to A-RMS-01-02-007 rev12 6.3 stakeholder management procedures, the focus of the stakeholder's attention has been identified, and the stakeholder's influence and interest appeals have been evaluated 		
1.2.2	Current and potential degree of influence between site and stakeholder shall be identified,	Conformed	1, Stakeholder list for AWS dated on Oct. 2020; 2, Stakeholders' communication approach and the focus area matrix;	-	-

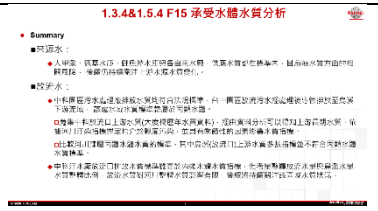
	within the catchment and considering the site's ultimate water source and ultimate receiving water body for wastewater		3. Through the discussion on 2020/5/16 and 2020/10/19, the significant influence and appeals come from the Environmental Protection Agency, CTSP, CTSP WWTP, customers, the Water Resources Association, Water Conservancy Association, Taichung Water Conservancy Bureau, and the fourth district tap water Management Office 4. In the environmental impact assessment meeting record, sample the 2019-12-13 Taichung Park Environmental Protection Supervision Group meeting, Mr.Lin Bohan (Fulin county), Mr.Zhang Qinghe (Fu'an county) and Mr.Wang Mingxing (Fuya county chief) all spoke and express opinions and compare the list of stakeholders, who are listed on the list.		
1.3	**Gather water-related data for the site, including: water balance; water quality, Important Water-Related Areas, water governance, WASH; water-related costs, revenues, and shared value creation.**				
1.3.1	Existing water-related incident response plans shall be identified	Conformed	1. Compare the F-CQC-01-03-001 effluent quality treatment process, A-RMS-08-03-283 water shortage response measures. Currently identify three types of risks and emergencies, including water pollution, water shortage, heavy rain and typhoon caused water pollution, so F-CQC-01-03-001 effluent treatment	**Minor** During the audit, it was found that in the current emergency response plan based on the identified water-related incident response plans, during the dry season, A-RMS-08-03-283 TSMC's raw water supply shortage crisis management internal control	**Root cause:** The contract of Y2019 water truck and water source meets the needs of the Taichung plant. Mass production of Y2020 F15P7 will begin this year. The purchasing department is currently active in looking for other water sources to contract. **Corrective Action:** Action 1: Adopt the "Hsinchu Science Park and Central Taiwan

			process, mainly focus on F-, NH3, TMAH, Cu2+ and pH, A-RMS-08-03-283 water shortage response measures , A-RMS-08-02-037 notification time limit for environmental protection incidents, A-RMS-08-03-210 environmental protection incident notification process, F-JWT-04-03-001 rainwater shutoff valve self-inspection management were setup and implemented. The implementation situation meets the requirements of the procedure. 2. The current water supply situation in central Taiwan is due to drought, indicating that the water status light is yellow. Fab 15A and Fab 15B have started saving water usage up to 5%. Compared with the average in August as the baseline, the water saving situation meets the requirements. If the water status light turns to orange, the factory affairs-new constructions convene the relevant departments to decide on the reduction measures, and implement autonomous water saving of 5%, 7.5% and 10% respectively. When the light became orange, water saving target will set as 10% or the red light, it will be set as 20%, and the	operation procedure 2020-09-15 V5 should be implemented to make contingency, however the current plan does not specify the timing required to finalize the different proportions of the contracted water rights under the different water shortage conditions at each stage. When the water shortage limit set by the process as 20%, which means the target will be 15% in terms of the amount of water rights that need to be contracted after deducting 5% of self-saving, the number of contracts currently confirmed is not enough.	Science Park joint defense" and "Central Taiwan Science Park and Southern Taiwan Science Park joint defense" modes to deal with the insufficiency of the water truck. Action 2: Continue to cooperate with Zhuo Han, the purchasing department, to increase the number of water trucks in the contract.   **Correction action was reviewed and closed by DNV GL.**

			emergency water tanker will be activated to transport the water from pre-decided contracted emergency water-supply site. 3. The water shortage response part is managed in accordance with A-RMS-08-03-283 TSMC's internal control operation process for crisis management of insufficient raw water supply, 2020-09-15 V5. If the pressure of the tap water supply drops, water tankers will be carried out. In early 2020, Has carried out water-tanker drills, sampled Fab 15A and Fab 15B drills at Huan Street, Fenyuan Township on April 15, 2020. The water quality inspection TOC was 738 PPB and 383 PPB, respectively, which was still within the tolerance of water quality indicators 4. Conduct survey of emergency water supply sites in accordance with regulations, sample Jishan water supply sites, contract volume 1000CMD, water quality pH 6.65, conductivity 409.3, TOC 250.3ppm, all within the qualified range 5. Sampling of chemical leakage drills during heavy rain, according to F-JWT-04-03-001 FAB15 plumbing system oi 2020-06-30 V15, conduct chemical filling		

			zone gate switching drills, and compare F15B P6~P7 system switching valves with The rainwater shutoff valve drill record is executed normally. However, the management of the system switching valve is currently not in the emergency response process clearly and can be considered for improvement.		
1.3.2	Site water balance, including inflows, losses, storage, and outflows shall be identified and mapped.	Conformed	1. Draw a water balance chart every month, due to seasonal factors affecting evaporation and condensation, which in turn affects the amount of tap water supplement 2. Sampling comparison 2020-09 F-15A: F15 P1/2 water balance diagram and F-15B P3/4 water balance diagram, the input part includes tap water, rainwater, OAC (air conditioning condensate); the output includes: sewage discharge ; Water reuse, process water treatment recycling, evaporation (cooling tower and scrubber), and irrigation consumption.	-	-
1.3.3	Site water balance, inflows, losses, storage, and outflows, including indication of annual variance in water usage rates, shall be quantified. Where there is a	Conformed	1. as ditto. 2. The tsmc sites currently uses the overall tap water consumption and the unit consumption of F15 wafer production for tracking. 3. there is no significant water-related challenge that would be a threat to		

	water-related challenge that would be a threat to good water balance for people or environment, an indication of annual high and low variances shall be quantified.		good water balance for people or environment was identified during the audit.		
1.3.4	Water quality of the site's water source(s), provided waters, effluent and receiving water bodies shall be quantified. Where there is a water-related challenge that would be a threat to good water quality status for people or environment, an indication of annual, and where appropriate, seasonal, high and low variances shall be quantified.	Conformed	1. The water quality for tsmc to entering the production is comparably high, including TOC 2ppm, turbidity 2NTU, and conductivity 500um. The water quality of the reservoir and water purification plant is tracked monthly according to the website provided by the upstream water purification plant. After the plant receives the water supply from the water purification plant, further water purification projects will be carried out to meet water quality requirements. 2. The water quality inspection of the discharged water is outsourced twice a month. The joint waste water treatment plant requires that the inlet water quality including pH 5~10, F- <15ppm, SS <300ppm, NH3-N< 50 ppm, TMAH< 20 ppm, COD <500ppm. During the audit, both sites can meet the requirements and no circumstances	**Minor** During the audit, it was found that the water body classification and water quality standards of Wu River, the receiving water body of the discharged water from the sites, were not fully integrated in the compilation data. During the audit process, Wu River's water body classification and water quality standards have been collected with the annual quantified results. Follow-up should be based on strategies generated according to the analyzed to the results to respond to water-related challenges, and the high and low level of water body variances annual or seasonal, when applicable.	**Root cause:** The process of data collection did not clearly assess the receiving water of the effluent (the Wu River), including the classification and the standards of water quality. **Corrective Action:** The classification and the standards of water quality of the receiving water of the effluent (the Wu River) have been confirmed. The annual water quality analysis of Wu River will be carried out in the follow-up and other factors likes seasonal changes will be considered. 

			exceeding the water quality standards were found. 3. During the audit, it was found that the water quality requirements of Wu River were not correctly identified, and the non-conformities have been raised, and then tsmc has replied effectively, detailed please refer to the non-conformities. 4. According to the monitoring results of Wu River Monitoring Station, there are currently 4 monitoring stations to monitor the discharge water of the wastewater treatment plant. The average RPI is slightly polluted and the water quality is poor during the dry season, but there is no clear evidence that it is directly related to the discharge water of the CTSP.		 1.3.4&1.5.4 F15 承受水體水質分析 Summary **Correction action was reviewed and closed by DNV GL.**
1.3.5	Potential sources of pollution shall be identified and if applicable, mapped, including chemicals used or stored on site.	Conformed	1. At present, the tsmc plant has established a map of site use and storage of chemicals (potential pollution sources). The potential sources of pollution are the pollution of rainwater discharge outlets caused by chemical and oil leakage, rainwater discharge outlets, chemical unloading areas, discharge water outlets and diesel storage tank. These locations have been	-	-

			identified and marked on the map. 2. In the groundwater monitoring and management, in accordance with A-RMS-02-02-004, three groundwater wells had been set up in accordance with 6.6.3.1, located at the intersection of Dongda Road and Keya 6th Road (MW01) at the upstream of groundwater, and in the downstream of groundwater, at the intersection of Keya West Road and Keya Sixth Road (MW03) and the neighboring Zhongke Road (MW02), two groundwater monitoring wells had been set up. 3. During the audit, the audit team visited the above-mentioned potential pollution sources. Related managements were implemented in accordance with regulations. The groundwater quality monitoring results were also sampled and compared, and there was no specific abnormal water quality change.		
1.3.6	On-site Important Water-Related Areas shall be identified and mapped, including a description of their status	Conformed	Site IWRA mapping and its revision; 1.During the audit, it was found that although the identification of important water-related areas is currently carried out, the	-	-

	including Indigenous cultural values.		identification results are inconsistent with the requirements for important water-related areas in various criteria of the standard, including 1.3.6/1.8.4/3.5.1/3.9.4. Detailed please refer to the non-conformities. 2.During the audit process, the identification of important water-related areas has been re-examined. 3.At the AWS meeting, the Important Water-related Areas were determined and the contents of each chapter were revised to reach consensus: Important Water-related Areas contain: 1. Liyutan Reservoir 2. Techi Reservoir 3. Central Taiwan Science Park 4. Dadu River(Wu River).		
1.3.7	Annual water-related costs, revenues, and a description or quantification of the social, cultural, environmental, or economic water-related value generated by the site shall be identified and used to inform the evaluation of the plan in 4.1.2.	Conformed	tsmc has established a water production cost analysis table. According to the analysis results, the manufacturing cost of Fab-15A F15P12 ultrapure water is 33 NT$/ton; the cost of wastewater treatment is 58 NT$/ton; the manufacturing cost of Fab-15B F15P34 ultrapure water is 40 NT$/ton; The cost of wastewater treatment is NT$75/ton, while the cost of recycling water is NT$ 27/33/ton for	-	-

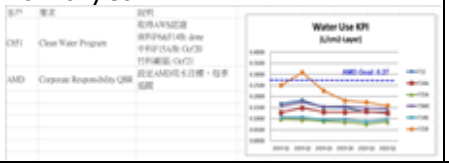
			Fab-15A and Fab-15B, respectively. The cost of analyzing the cost includes chemicals, equipment maintenance, tap water fees, wastewater treatment fees of the joint wastewater treatment plant, labor costs, and operating electricity costs.		
1.3.8	Levels of access and adequacy of WASH at the site shall be identified.	Conformed	In regarding to levels of access and adequacy of WASH at the site, only drinking water quality level identified, however, the level of WASH provision and applicable level for the provision of water and toilet facilities are not defined in the document provided. However during the audit, tsmc had provided the visual evidence to demonstrate that sufficent instructions have been provided for the provision of water and the setting rules of washing facilities, and attention should be paid to the completeness of the description of WASH compliance. Provide warm water washing in winter, and to prevent COVID-19, provide non-contact facilities. The quality of drinking water is inspected once every two months, and 1/8 of the total number of drinking fountains is randomly checked each	**OBS** In regarding to levels of access and adequacy of WASH at the site, only drinking water quality level identified, however , the level of WASH provision and applicable level for the provision of water and toilet facilities are not defined.	**Corrective Action:** 1. Provide employees with adequate and safe drinking water, clean toilets (in accordance with WBCSD standards and the Regulations for the Occupational Safety and Health Equipment and Measures), warm water for washing in winter, health protection and contactless hand washing equipment for COVID-19. 2. Set up the toilet for the Disabled that are better than the regulations.  **The action plan was deemed appropriated by DNV GL.**

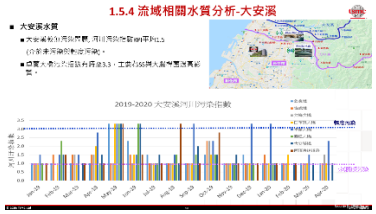
			time. The sampling results show no discrepancies. Observation items have been raised to indicate that tsmc should clarify their truly effort in regarding to this criteria, and tsmc had effectively deal with it, as detailed in the observation items description.		

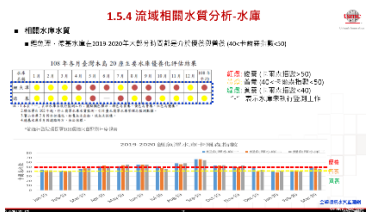
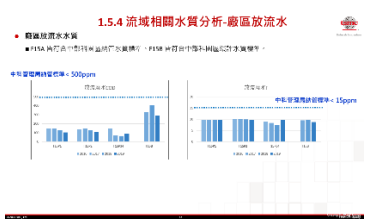
1.4	**Gather data on the site's indirect water use, including: its primary inputs; the water use embedded in the production of those primary inputs the status of the waters at the origin of the inputs (where they can be identified); and water used in out-sourced water-related services**				
	Detail	***Score***	***Detail of Evidence Verified***	***Type of Finding Major/Minor/Observation***	***Corrective actions / Response from TSMC***
1.4.1	The embedded water use of primary inputs, including quantity, quality and level of water risk within the site's catchment, shall be identified.	Conformed	At present, tsmc conducts product water footprint verification every 2 to 3 years. The sites Fab-15A/B was most recently conducted in 2019 (00014-2019-WFP-TWN and 00015-2019-WFP-TWN), and the inventory covers direct supplier and other suppliers data. The verification was implemented in according to LCR database for the inventory and data, and the verified results are F15A 5.0904 M^3/functional unit; F15B 31.2974 M^3/functional unit . Specified the location of the supplier in the AQUEDUCT database to determine its risk. At present, the main suppliers, which located in Taiwan, Korea, Japan and USA, are all in low-risk areas. As indicated in the AQUDUCT database.	-	
1.4.2	The embedded water use of outsourced services shall be identified, and where those services originate within the site's catchment, quantified.	Conformed	The identification of water used by outsourced manufacturers currently includes cleanroom cloth cleaning, parts cleaning and wafer reclaim. Currently, such manufacturers are not located in the same catchment as the tsmc sites. The transportation service outsourcing supplier's vehicle washing water data in the	-	-

			catchment has been collected during the verification.		
1.4.3 ADV	The embedded water use of primary inputs in catchment(s) of origin shall be quantified	7	as ditto as 1.4.1 During the WFP analysis, tsmc developed the inventory results which covers direct supplier and other supplier's data. The raw data included the location of these supplier and hence the embedded water use of primary inputs in catchments of origin had been quantified.	-	-
1.5	**Gather water-related data for the catchment, including: water governance, water balance, water quality, Important Water-Related Areas, infrastructure, and WASH**				
1.5.1	Water governance initiatives shall be identified, including catchment plan(s), water-related public policies, major publicly-led initiatives under way, and relevant goals to help inform site of possible opportunities for water stewardship collective action.	Conformed	In 2020, the Water Resources Department completed the installation of backup water source wells, which are expected to provide 110,000 tons of backup water per day. In addition, it is promoting the construction of Futian, Shuinan and Fengyuan reclaimed water plants, supplying 250,000 tons per day, as the Taichung area responds to the dry season for water source scheduling. When tsmc collected the data, it obtained the analysis report of the Water Conservancy Department on the Dajia Daan River Joint Utilization and Construction Project in 2014, but the data has been many years away from the current time, and it is appropriate to determine whether there is an updated analysis report data. CTSP provides guidance to tsmc to promote water conservation and carry out water conservation consultation in the process.	-	-

1.5.2	Applicable water-related legal and regulatory requirements shall be identified, including legally-defined and/or stakeholder-verified customary water rights.	Conformed	The list of water-related laws and regulations is currently identified by tsmc group based on national regulations and customer requirement. The legal source of the requirements for the production water recovery rate and the whole plant water recovery rate has been identified as the Technology Science Park Hydropower Guidance Management Measures, Ministry of Science and Technology, 2018-12-05. Certain customers require the establishment of a clean water program and AWS at the plant site, and another customer requires water management in accordance with the regulations of the American Semiconductor Association. The water use target is 0.27 L/cm2-layer and is tracked quarterly. Currently, it is performed in accordance with the requirements. During the process tuning-in phase of Fab-15B in 2019Q2, there was a situation that exceeded the standard, and the subsequent requirements were met (<0.2L/cm2-layer, 15A monthly water consumption is about 0.1L/cm2-layer). The environmental impact assessment requirements when setting up the factory are currently listed as other requirements and are in progress in accordance with the requirements. Attend the EIA tracking meeting in the	-	-

			role of park representative and labor union convener. The main task is to participate in various responses to the issues of the environmental supervision group. In the future release water standards, the ammonia nitrogen will be revised down to 20ppm, the copper will be revised down to 0.8ppm, and the biological acute toxicity data will be included in the test. The relevant inlet water quality standards of CSTP WWTP have been properly identified and tested in accordance with regulations for half a year. 		
1.5.3	The catchment water-balance, and where applicable, scarcity, shall be quantified, including indication of annual, and where appropriate, seasonal, variance.	Conformed	The real-time water level maps of Techi Reservoir and Liyutan Reservoir are all available information on the public webpage. tsmc routinely conducts monthly water level and water storage understanding. With regard to historical water use trends, the risk of water restriction due to dry season of central Taiwan is comparably low to southern Taiwan. This year's yellow light water status signal is the most serious situation in the past. From 2020-10-14 step into the yellow light, it has begun to save 5% of water usage. It can be seen from the record of the	-	-

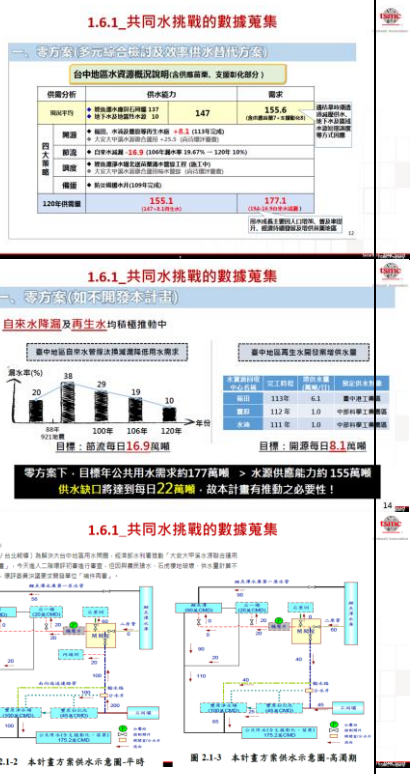
			10-09-Self Water Conservation Checklist that the water saving rate has reached 8.04% (daily water consumption), and using the KPI as the water consumption per unit capacity is communicated to the CTSP, taking August as the baseline period.		
1.5.4	Water quality, including physical, chemical, and biological status, of the catchment shall be identified, and where possible, quantified. Where there is a water-related challenge that would be a threat to good water quality status for people or environment, an indication of annual, and where appropriate, seasonal, high and low variances shall be identified.	Conformed	The water quality information of Techi Reservoir and Liyutan Reservoir is available on the public webpage. tsmc routinely conducts monthly water quality understanding. Liyutan Reservoir and Deji Reservoir are now in slightly Eutrophication status. The main maintenance work of the reservoir is dredging the silt, and the water quality is maintained in a stable state, with an average water conductivity (500us/cm), NTU (2 NTU), TOC (2ppm). At present, no specific area in the catchment is facing challenges due to changes in water quality and quantity.  	-	-

			    		
1.5.5	Important Water-Related Areas shall be identified, and where appropriate, mapped, and their status assessed including any threats	Conformed	During the audit, it was found that although the identification of important water-related areas is currently carried out, the identification results are inconsistent with the requirements for important	**Minor** During the audit, it was found that although the identification of important water-related areas is currently carried out, the identification results are	**Root cause:** The process of identifying Important Water-related Areas did not consider the continuity of each chapter. **Corrective Action:**

	to people or the natural environment, using scientific information and through stakeholder engagement.		water-related areas in various criteria of the standard, including 1.3.6/1.8.4/3.5.1/3.9.4. Detailed please refer to the non-conformities. During the audit process, the identification of important water-related areas has been re-examined.	inconsistent with the requirements for important water-related areas in various criteria of the standard, including 1.3.6/1.8.4/3.5.1/3.9.4. During the audit process, the identification of important water-related areas has been re-examined, and the requirements of each criteria should be compared horizontally to ensure the consistency of the results.	At the AWS meeting, the Important Water-related Areas were determined and the contents of each chapter were revised to reach consensus: Important Water-related Areas contain: 1. Liyutan Reservoir 2. Deji Reservoir 3. Central Taiwan Science Park 4. Dadu River , and are consistent with chapters 1.3.6/1.8.4/3.5.1/3.9.4  1.5.5 F15 重要水相關區域的鑑別 **Correction action was reviewed and closed by DNV GL.**
1.5.6	Existing and planned water-related infrastructure shall be identified, including condition and potential exposure to extreme events.	Conformed	1, The latest Environmental Impact Assessment of CTSP was done in Jan. 2020 which addressed the infrastructure issue in the park; 2, At present, based on the information of the CTSP Drought Relief and Response Zone (Information Sharing System), the relevant infrastructure is activated to respond to related extreme water conditions. https://web2.ctsp.gov.tw/drought/index.html	-	-

					
1.5.7	The adequacy of available WASH services within the catchment shall be identified	Conformed	1, Statistic on Tap water supply penetration rate and WWP Plant distribution rate published by authority; 2, Statistic on Human health facility Popularization rate;	-	-
1.5.8 ADV	Efforts by the site to support and undertake catchment level water-related data collection shall be identified.	7	Although the issue of water shortage in the dry season occasionally exists, it is not serious in central Taiwan as a whole. At the same time, the overall water consumption of the catchment is not affected by the current water consumption of tsmc, nor it will affect the water rights of other users within the same catchment. Therefore, tsmc's effort to water issues in the catchment is mainly in the water quality part. Fab-15A and Fab-15B set up underground water monitoring wells in the upstream and downstream respectively (autonomous, non-environmental assessment requirements). In 2019, it was detected that the upstream manganese content of F15B was too high, so it was returned to the authority for reference. Wu River's discharge port requires biological toxicity testing, which was tested at	**OBS** During the audit, although it was found that the efforts by the site to support and undertake catchment level water-related data collection, including the examination of instant toxicity data in the receiving water, effluent from Central Taiwan Science Park at the Wu River side, had been implemented, however currently the frequency of examination was not specified, which may affect the update and real-time data collection. During the audit process, it has been confirmed that the implementation project of establishing the F15B238 tracking number on the TSM platform is expected to be completed before the end of each year (with a weekly notice 90 days before) as a way to assist in the undertake	**Root cause:** **Corrective Action:** 1. The spontaneous Inspection of upper and confluence of Wu River was completed in 109/11/02. 2. Establish the F15B238 tracking number on the TSM platform and complete the spontaneous inspection before the end of each year.  **The action plan was deemed appropriated by DNV GL.**

			107-12-25, and the conclusions were also provided to CTSP and local authorities as a report on the impact on the environment.	catchment level water-related data. The results of the implementation will be confirmed in subsequent verification.	
1.5.9 ADV	The adequacy of WASH provision within the catchments of origin of primary inputs shall be identified.	4	WASH provision analysis result present by TSMC; In 2019, the water footprint verification was carried out to compare the water footprint contribution of Japanese and Korean raw material suppliers, and the risk of water consumption from the aguadust website is lower than that of the region. The current analysis is based on the average WASH adequacy of the country/area (Taiwan, Japan, South Korea, and the United States). Comparing the water risk analysis of Gumi City 龜尾市 in South Korea, Saitama City 琦玉市 in Japan and Illinois in the United States, the relative water risk is still low. Currently, water footprint analysis is used, but in the future, it might be consider direct inquiry or cooperation with suppliers to find more direct data in the future.	-	-
1.6	**Understand current and future shared water challenges in the catchment, by linking the water challenges identified by stakeholders with the site's water challenges.**				
1.6.1	Shared water challenges shall be identified and prioritized from the information gathered.	Conformed	1, Shared water challenges analyzed by TSMC; 2, Water resource planning and water pollution control measures published by authorities; 3, Although the water-supply to CTSP during normal season could meet the basic	**OBS** During the audit, it was found that although data on the shared water challenge is currently being collected, some of the data (including the Dajia River and Daan	**Root cause:** **Corrective Action:** The report of government in 108 has been updated, the support project of raw water of the Dajia and Daanxi River Basin is currently still in the stage of

			requirement, however during dry season or in long-term prospect, together with other water user within the Daan and Dajia River Catchment, all two sites were faced with major shared water challenge as in the event of drought, it is necessary to respond through reduced pressure water supply, groundwater and short-term regional water supply. In addition to the issue of water shortage in the dry season, the issues of common water challenges also include the leakage of the water pipeline system and whether the surface water and groundwater quality of the upstream and downstream are contaminated.	River Basin Raw Water Support Program) might be too old, in 2014, to be relevant to the shared water challenge represented by the plan. During the audit process, it has been confirmed to update the government report in 2018. The project's estimated completion time has been updated, and the significance of the project's raw water dispatch during the period of water supply and high and low water has been explained. The necessary response plan for subsequent deployment of the site should be considered.	environmental impact assessment, and the project scheduling requirements will be supplemented.  **The action plan was deemed appropriated by DNV GL.**
1.6.2	Initiatives to address shared water challenges shall be identified.	Conformed	1, Action plan on reclaimed water plant cooperated by TSMC and local government; 2, Green Energy Smart Water Control Gate Programme for agriculture irrigation initiated by TSMC supporting local government;	-	-
1.6.3 ADV	Future water issues shall be identified,	3	In the tsmc 2019 CSR report, there is a complete analysis of the trend of short-term	-	-

	including anticipated impacts and trends		droughts in the future. The content includes that the use of water in the future may be affected by risks such as typhoons, floods, and droughts. Therefore, the efficiency of water resources should be actively improved.		
1.6.4 ADV	Potential water-related social impacts from the site shall be identified, resulting in a social impact assessment with a particular focus on water	4	Research Report for TSMC done by Industrial Technology Research Institute on 30 Aug. 2019;	-	-
1.7	**Understand the site's water risks and opportunities: Assess and prioritize the water risks and opportunities affecting the site based upon the status of the site, existing risk management plans and/or the issues and future risk trends identified in 1.6.**				
1.7.1	Water risks faced by the site shall be identified, and prioritized, including likelihood and severity of impact within a given timeframe, potential costs and business impact.	Conformed	1, Management procedure (A-RMS-01-02-007 TSMC ISO 14001/ISO 45001/ TOSHMS MANAGEMENT PROCEDURE); 2, A-RMS-99-02-016 TSMC ENTERPRISE RISK MANAGEMENT PROCEDURE 1A 3, Risk Identification and Assessment Sheet which covered 21 risk topics; 4, According to the Corporate Risk Quantification (2016 version) to assess the risk, the top five water-related risks identified include insufficient water supply, water pollution, sewage treatment facility failure, leakage pollution, and abnormal water quality 5, The impact on operations and costs is explained in the risk assessment table.	**OBS** The risks have been assessed based on the Corporate Risk Quantification (2016 version), and the top five water-related risks have been identified, including insufficient water supply, water pollution, sewage treatment facility failure, leakage pollution, and abnormal water quality. However, the risk assessment data does not clearly indicate the operation Impact and costs impact.	**Root cause:** **Corrective Action:** To re-inspect the risk assessment and incorporate the impact factors on operations and costs.  1.7.1 廠址面臨的水風險 • 廠址面臨的水風險 ■ 與公司各廠區有關的水風險有5項，經評估與 F15 廠址面臨的水風險有直接相關項目共計兩項。 **The action plan was deemed appropriated by DNV GL.**
1.7.2	Water-related opportunities shall be identified, including	Conformed	Water Resources Improvement Identification Sheet, which		

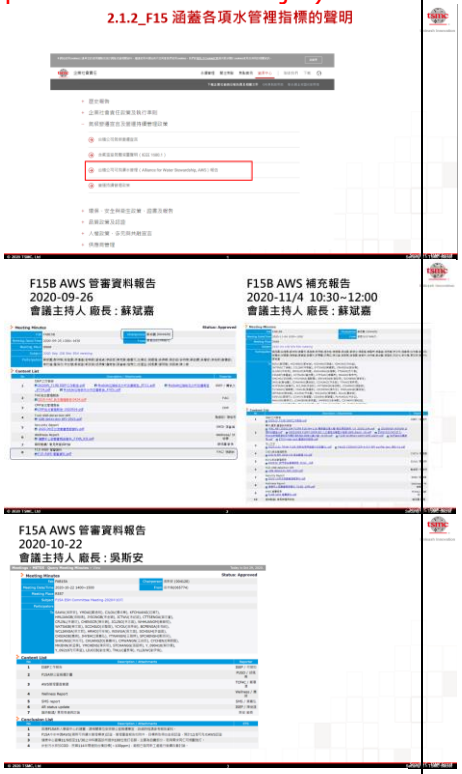
	how the site may participate, assessment and prioritization of potential savings, and business opportunities.		covered 2 main opportunities and 2 major risks; In the Fab-15A/Fab-15B water resources improvement opportunity identification table, 2 opportunities to improve water efficiency are listed as the first priority, and the second is to reduce pollutant discharge.		
1.8	**Understand best practice towards achieving AWS outcomes: Determining sectoral best practices having a local/catchment, regional, or national relevance.**				
1.8.1	Relevant catchment best practice for water governance shall be identified	Conformed	Collect and compare the water management best practice standards of Micron, AUO, Winbond, Silicon (same catchment), GLOBALFOUNDRIES, intel (same industry), including water resource risk management, expansion of diversified water resources, and industry water saving guidance, etc.	-	-
1.8.2	Relevant sector and/or catchment best practice for water balance (either through water efficiency or less total water use) shall be identified .	Conformed	Best Practices Comparison within other leading companies in semiconductor sector. Compare the water management best practice standards of tsmc and Micron, AUO, Winbond, and Silicon Products, and compare and analyze the process recovery rate and unit product water consumption	-	-
1.8.3	Relevant sector and/or catchment best practice for water quality shall be identified, including rationale for data source.	Conformed	Continuous pollution prevention and cutdown; Effluent online measurement and monitoring; Compare the water management best practice standards of tsmc and Winbond, and compare and analyze the water quality.	-	-

1.8.4	Relevant catchment best practice for site maintenance of Important Water-Related Areas shall be identified	Conformed	1, Regular monitoring on IWRA's biodiversity and water quality; 2, Sites' community engagement on IWRA related activities; 3, The current preparation direction is to compare the environmental performance of CSR reports by TSMC, Micron, Winbond, AUO and other companies, and compare the best practice including river water quality monitoring, flood detention basin construction areas, IWRA hydrological maintenance and monitoring, and water-saving volunteers' hydrological and water quality experience sharing, Dajia River Daan River and Wu River water quality monitoring and the maintenance of the aboriginal cultural preservation area. 	-	-
1.8.5	Relevant sector and/or catchment best practice for site provision of equitable and adequate WASH services shall be identified	Conformed	1, Applied WBCSD WASH self assessment tool which was performed at fixed interval; 2, WASH self assessment result;	-	-

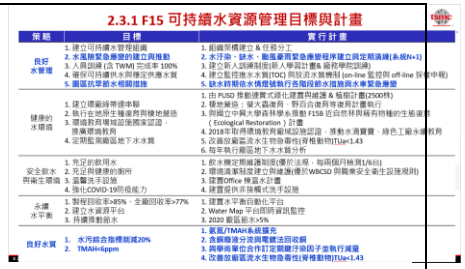
STEP 2: COMMIT TO BE A RESPONSIBLE WATER STEWARD AND DEVELOP A WATER STEWARDSHIP PLAN

Intent: *To ensure there is sufficient leadership support, site authority, and allocated resources for the site to implement the AWS Standard. It focuses on how a site will act on shared water challenges and improve its performance and the status of its catchment in terms of the*

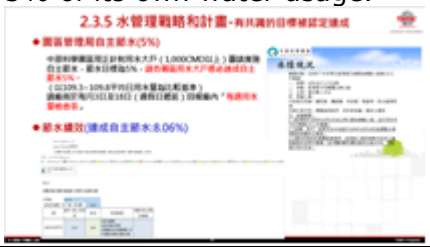
AWS water stewardship outcomes. Step 2 links the information gathered in Step 1 to the actions implemented in Step 3, by describing who will do what and when.					
2.1	**Commit to water stewardship by having the senior-most manager in charge of water at the site, or if necessary, a suitable individual within the organization head office, sign and publicly disclose a commitment to water stewardship, the implementation of the AWS Standard and achieving its five outcomes, and the allocation of required resources**				
2.1.1	A signed and publicly disclosed site statement OR organizational document shall be identified. The statement or document shall include the following commitments: - That the site will implement and disclose progress on water stewardship program(s) to achieve improvements in AWS water stewardship outcomes - That the site implementation will be aligned to and in support of existing catchment sustainability plans - That the site's stakeholders will be engaged in an open and transparent way - That the site will allocate resources to implement the Standard.	Conformed	1, TSMC's Environment Policy signed by CEO, Mr.Lieu, in April 2019 and published in TSMC's website; 2, Water Management section in TSMC's website; 3, The AWS Report signed by Corporate EHS Director, Mr. Fan, and published in TSMC's website;	-	-
2.1.2 ADV	A statement that explicitly covers all requirements set out	1	1, TSMC's Environment Policy signed by CEO in April 2019	**OBS**	**Root cause:** **Corrective Action:**

	in Indicator 2.1.1 and is signed by the organization's senior-most executive or governance body and publicly disclosed shall be identified.		and published in TSMC's website; 2, Water Management section in TSMC's website; 3, The AWS Report signed by Corporate EHS Director and published in TSMC's website; 4, TSMC CSR Report 2019 published in its website; 5, "Sustainable Water Resources Management Goals and Plans-F15" issued in plant level.	During the audit, it was found that although "Sustainable Water Resources Management Goals and Plans-F15" have been sorted out as a statement document describing various goals and objectives covering water management issues, the document has a description of the contents of the implementation plan. During the inspection process, it was found that there may be an opportunity to update, which will be able to more fully present the current implementation direction drawing. also, the document has not been formally signed and issued by the top executive responsible person or department of the site, which may affect its validity as a basis for implementation.	The revised items in the review process will be supplemented by the plant-level safety committee on November 4 (Moderator: plant director Su Binjia).  **The action plan was deemed appropriated by DNV GL.**
2.2	**Implement plan to achieve site water balance targets.**				
2.2.1	The system to maintain compliance obligations for water and wastewater management shall be identified, including: - Identification of responsible persons/positions	Conformed	1, A-RMS-01-02-012 TSMC ESH ORGANIZATION AND RESPONSIBILITIES PROCEDURE, mention about the responsibilities, and corporate management; 2, A-RMS-01-02-007 14001/45001 TOSHMS management procedure;		

	within facility organizational structure - Process for submissions to regulatory agencies.		3, Compare A-RMS-02-02-004 V16 TSMC Environmental Protection Management Procedure 7.2 In the organizational structure, the CSV customer service department responsible for communicating with customers and the MM/MSCM purchasing department for communicating with suppliers have all been Incorporate into the framework. 4, A-RMS-01-03-0029 tsmc ISO 14001/ISO 45001/TOSHMS ESH management system CI7.9 Annex 8 Table 2  		
2.3	**Create a water stewardship strategy and plan including addressing risks (to and from the site), shared catchment water challenges, and opportunities**				
2.3.1	A water stewardship strategy shall be identified that defines the overarching mission, vision, and goals of the organization towards good water stewardship in line with this AWS Standard.	Conformed	1, Water Stewardship Plan and the target setting; 2, Three main strategies incl. water resource risk management; develop diverse water resources; develop preventive measures; 3, TSMC's Environmental Policy; 4, The announced water stewardship strategy had been developed in accordance with AWS's five main outcomes, but the strategic direction is still insufficient in linking with the response measures of 1.7.1	**Minor** During the audit, it was found that the water stewardship strategy had been developed in accordance with AWS's five main outcomes, but the strategic direction is still insufficient in linking with the response measures of 1.7.1 risks and 1.7.2 opportunities, such as insufficient water supply, facility failure, and water supply quality.	**Root cause:** The considerations for the development of the water management strategy are not complete and have been re-inspect. **Corrective Action:** The compilation has been completed according to the comprehensive review of the 5 major goals of AWS.

			risks and 1.7.2 opportunities, such as insufficient water supply, facility failure, and water supply quality. Detailed please refer to the non-conformities.   	During the audit process, the content of AWS "Sustainable Water Stewardship Strategy Management Goal and Plan F-15" has been reviewed and consolidated based on the five main outcomes of AWS.	 **Correction action was reviewed and closed by DNV GL.**
2.3.2	A water stewardship plan shall be identified, including for each target: - How it will be measured and monitored - Actions to achieve and maintain (or exceed) it - Planned timeframes to achieve it - Financial budgets allocated for actions - Positions of persons responsible for actions and achieving targets - Where available, note the link between each target	Conformed	1, CSR Management Platform; 2, Total 3 Water Stewardship Plans set, incl. 2 for water balance, 1 for water quality; 3, Regular CSR board meeting and its annual review process; 4, The previous plan focus is on recovery rates, water consumption and maintenance of public landscapes, the updated one, please refer to 2.3.1, has been found cover AWS 5 major goals.		

	and the achievement of best practice to help address shared water challenges and the AWS outcomes				
2.3.3 ADV	The site's partnership/water stewardship activities with other sites within the same catchment (which may or may not be under the same organisational ownership) shall be identified and described.	4	1, Total 4 activities on sustainable water management cooperated with other stakeholders in same catchment since 2019 were disclosed by TSMC; 2, Participate in the discussion of related issues by the Water and Electricity Committee and Environmental Protection Committee of the member associations of the park.	-	-
2.3.4 ADV	The site's partnership/water stewardship activities with other sites in another catchment(s) (either under same corporate structure or with another corporate site) shall be identified.	4	1, Total 7 activities on sustainable water management cooperated with other stakeholders from other catchments since 2019 were disclosed by TSMC; 2, Served as the chairman of the TSIA Environmental Safety Committee of the Semiconductor Association, leading the wastewater quality issues.	-	-
2.3.5 ADV	Stakeholder consensus shall be sought on the site's water stewardship plan. Consensus should be achieved on at least one target. A list of targets that have consensus and in which stakeholders are involved shall be identified.	7	1, Those currently have reached consensus with stakeholders are: Customer: Through AWS, the target unit production capacity of water is 0.27 liters/cm2-layer Reached continuous cooperation with the CTSP, Water Resources Department, and Taichung City Government to develop and use recycled water.	-	-

			Commit to the CTSP to save 5% of its own water usage. 		
2.4	**Demonstrate the site's responsiveness and resilience to respond to water risks**				
2.4.1	A plan to mitigate or adapt to identified water risks developed in co-ordination with relevant public-sector and infrastructure agencies shall be identified.	Conformed	1, Emergency Plan to handle the water supply shutdown and WWT Plant's capacity downtime; 2, Emergency plan, incl. water tank vehicles, WW buffer tank; 3, In conjunction with the public works of CTSP and Water Resources Bureau, after considering the possibility of insufficient water supply, the sixth distribution pool project was set up.		
2.4.2 ADV	A plan to mitigate or adapt to water risks associated with climate change projections developed in co-ordination with relevant public-sector and infrastructure agencies shall be identified.	6	1, TSMC commissioned the external consultant to do feasibility study on 500-year flood; 2, Respective actions have been taken to address the 500-year flood in all two sites; 3, In response to the Water Conservancy Bureau's announcement of yellow, orange, and red lights, corresponding water consumption reduction and response plans. The current water conditions are yellow, in conjunction with the voluntary reduction of 5% of water consumption in the Science Park.	-	-

			4, Identified external risks including water supply interruption (reduction) emergency plan A-RMS-08-03-238 TSMC's raw water supply shortage crisis management internal control operation process 5, The emergency plan for the abnormality of the sewage treatment facilities in the park has been identified and described in the water treatment plan updated on 2019-07-18.		
STEP 3: IMPLEMENT THE SITE'S STEWARDSHIP PLAN AND IMPROVE IMPACTS Intent: *To ensure that the site is implementing the plan outlined in Step 2, mitigating risks and driving actual improvements in performance*					
3.1	**Implement plan to participate positively in catchment governance.**				
3.1.1	Evidence that the site has supported good catchment governance shall be identified.	Conformed	During the assessment, the following documents/records had been reviewed by the audit team. 1. According to the requirements of CTSP, establish and continuously update the water use plan and water pollution prevention and control measures plan 2. Participate in the legal briefing related to government agency meeting minutes and declaration 3. Draw a water balance diagram (water recovery rate: process recovery rate>85%, actual>90%, water volume: target water consumption per wafer reduced by 10% Actual: 13%, TSIA target water consumption per wafer:	-	-

			7.06/unit F15A 1.8~2.45/unit 15B: 3.3~4.71/unit) 4. Selected as an excellent unit in the water saving performance review meeting 6. Conduct on-site survey guidance for suppliers who need assistance 7. Promote the process of copper recovery, ammonium sulfate drying, cobalt recovery, waste sulfuric acid recovery, etc. 8. Ammonia nitrogen treatment system (compared to the base year target reduction by 20%, actual achievement: 34% for Fab-15A, 40% for Fab-15B), TMAH treatment system (target: <6ppm, actual: 3.61mg for Fab-15A /L, Fab-15B is 2.13mg/L, the reduction rate is 69%, 45%, respectively), copper ion (target <20%, actual 40%, 35%, respectively, control <0.1ppm, environmental assessment requirements 15B<0.8 ppm), COD (20% reduction target, 15B MBR control measures), Acute biological toxicity: <1.43TUa Established improvement project to achieve, (key substances: copper <0.1, residual chlorine <0.15, hydrogen peroxide <4.0, TMAH<4) 9. In the water saving part, it is achieved through waste water recycling to increase the water production rate and reduce the system water loss.		

			10. Current water situation and contingency (green light on 9-16, yellow light on 10-14, to cooperate with autonomous water saving) 11. During the low water period, the waterwheel will reserve 15%, and the water intake points: Yunlinkou Lake, Yunlin Water Forest, Changhua Fenyuan, Taichung Shengang, all configuration and testing are completed.		
3.1.2	Measures identified to respect the water rights of others including Indigenous peoples, that are not part of 3.2 shall be implemented.	Conformed	No issues identified: 1, The water source of all two sites are 100% tap water from water supply plants; 2, The tap water usage ratio in Taichung city achieved 99.1% in 2019;	-	-
3.1.3 ADV	Evidence of improvements in water governance capacity from a site-selected baseline date shall be identified.	2	1, On-line Water Map system used by TSMC; 2, On-line E-learning system; 3, icourse system; 4, TSMC's Training Center in Taichung City; 5, List of the Ddedicated WWT Personnel qualified by authority; 6, F15A uses 2016 as the baseline year, F15B uses 2018 as the baseline year	-	-
3.1.4 ADV	Evidence from a representative range of stakeholders showing consensus that the site is seen as positively contributing to the good water governance of the catchment shall be identified	2	1, The awards by authorities for Water Saving, Green Factory etc; 2, Green Building Certifications incl. LEED, Taiwan Green Building; 3, F15A water-saving performance excellent manufacturer in 2013 given by Water Resources Agency, Ministry of Economic Affairs, ROC.;	-	-

			2015 F15A excellent wastewater treatment specialist given by CTSP; 2020 F15B Water-saving Outstanding Manufacturer given by Ministry of Science and Technology, ROC.		
3.2	**Implement system to comply with water-related legal and regulatory requirements and respect water rights.**				
3.2.1	A process to verify full legal and regulatory compliance shall be implemented	Conformed	1, Annual Supplier Audit conducted by Corporate EHS; 2, Internal audit performed by ISEP; 3, Audit findings review at regular Technical Board meeting; 4, External audit by TSP authorities;	-	-
3.2.2	Where water rights are part of legal and regulatory requirements, measures identified to respect the water rights of others including Indigenous peoples, shall be implemented	Conformed	CTSP EIA reports; 	-	-
3.3	**Implement plan to achieve site water balance targets.**				
3.3.1	Status of progress towards meeting water balance targets set in the water stewardship plan shall be identified	Conformed	1, Sites' Water Stewardship Plan; 2, Water Management section in TSMC's website; 3, The AWS Report signed by Corporate EHS Director and published in TSMC's website; 4, TSMC CSR Report 2019 published in its website; 5, as described in 3.1.1	-	-
3.3.2	Where water scarcity is a shared water challenge, annual targets to improve the site's water use	Conformed	1, Sites' Water Stewardship Plan; 2, Water Management section in TSMC's website;	-	-

	efficiency, or if practical and applicable, reduce volumetric total use shall be implemented		3, The AWS Report signed by Corporate EHS Director and published in TSMC's website; 4, The water scarcity is not a significant issue in central Taiwan comparably, however Taichung City and CTSP and tsmc still need to do the necessary prevention project for this.		
3.3.3	Legally-binding documentation, if applicable, for the re-allocation of water to social, cultural or environmental needs shall be identified.	Conformed	1, Sites' Water Use Permits and its revision history which reflected the decrease of the water usage permit initiated by site; 2, Allocation of 300CMD water permit to Yadong Gas 2. Allocation of 535.4CMD water license to Lianfeng Precision Technology 3. F15A voluntarily restricts shrinking water permits from 33000CMD to 30000CMD; 3, Through media search it was found TSMC provided water for free to society during disaster cases and water shortage period in 2018;	-	-
3.3.4 ADV	The total volume of water voluntarily re-allocated (from site water savings) for social, cultural and environmental needs shall be quantified	0	1, Sites' Water Use Permits and its revision history which reflected the decrease of the water usage permit initiated by site; 2, as described in 3.3.3; 3, Although TSMC actively used water tanks to support the Hualien earthquake and achieved good results, the relationship with the quantitative results of the Site's water saving still needs to be clarified.	-	-
3.4	**Implement plan to achieve site water quality targets.**				

3.4.1	Status of progress towards meeting water quality targets set in the water stewardship plan shall be identified.	Conformed	1, Sites' Water Stewardship Plan; 2, Annual WWT discharge targets set by each site; 3, Ammonia nitrogen treatment system (20% reduction compared to the base year, actual: Fab-15A: 34%, Fab-15B: 40%), TMAH treatment system (target: <6ppm, actual: Fab-15A: 3.61mg/L, Fab -15B: 2.13mg/L, reduction rate Fab-15A: 69%, Fab-15B: 45%), copper ion (target <20%, actual Fab-15A: 40%, Fab-15B: 35%, control< 0.1ppm EIA requires 15B<0.8ppm), COD (20% reduction target, MBR treatment equipment built in Fab-15B), Acute biological toxicity: <1.43TUa improvement project, (key substances: copper <0.1, residual chlorine <0.15, Hydrogen peroxide<4.0, TMAH<4)	-	-
3.4.2	Where water quality is a shared water challenge, continual improvement to achieve best practice for the site's effluent shall be identified and where applicable, quantified	Conformed	1, Sites' Water Stewardship Plan; 2, Annual WWT discharge targets set by each site; 3, TSMC CSR Report 2019; 4, CTSP newly added control items in 2021, all of them meet the requirement. 5, 2020-06-15 Test report (EA-109B5255, EA-109B5256) Added: • NMP 0.0005<1, • Free residual chlorine = 0.26<2,	-	-

			• Dimethylacetamide=0.01<0.1 • Tightening: Copper<1.5  		
3.5	**Implement plan to maintain or improve the site's and/or catchment's Important Water-Related Area**				
	Detail	***Score***	***Detail of Evidence Verified***	***Type of Finding Major/Minor/Observation***	***Corrective actions / Response from TSMC***
3.5.1	Practices set in the water stewardship plan to maintain and/or enhance the site's Important Water-Related Areas shall be implemented	Conformed	1, Site's IWRA Maintenance Procedure; The CTSP is identified as a Site's IWRA. The main maintenance procedure is to maintain the quantity and quality water inlet, and the sewage discharge should meet the discharge standards of the science park. For this purpose, the Site established the INDUSTRIAL CITY WATER Inlet Flow Level SOP to monitor the water quality and quantity of the inflow and outflow water in real time, and set the communication/reporting standards and mechanisms for abnormalities. 2, Sites' Ecological Survey Reports conducted by external consultant at regular intervals; 3, Reproduction of native plants; 4, The green belt of the ring factory is connected in series; 5, Habitat creation; 6, Ecological education places;	-	-

			7, Planting trees into forest plan; Coordinating with CTSP sewage pipe standards (2020-06-04) CTSP Drought Emergency Response Measures Conference (2020-10-12), coordinated with sister-factories to save water by 5%		
3.5.2 ADV	Evidence of completed restoration of non-functioning or severely degraded Important Water-Related Areas including where appropriate cultural values from a site-selected baseline date shall be identified. Restored areas may be outside of the site, but within the catchment.	0	1, Site's IWRA Maintenance Procedure; 2, Biodiversity, incubating animals and plants in the factory area; 3, Planting Trees and Forests Project 4, Cooperate with raw material suppliers to replace PFOA in 2016~2020 to avoid accumulation of wastewater flowing into water bodies. Although the aforementioned four tasks have been effective, the relationship with the restoration of the IWRA identified by the site still needs to be clarified.	-	-
3.5.3 ADV	Evidence from a representative range of stakeholders showing consensus that the site is seen as positively contributing to the healthy status of Important Water-Related Areas in the catchment shall be identified	2	1, Interview with the Site officer from Environmental Education Sites; 2, the visit record from government authority, neighbour communities, schools, etc; 3, Participate in the seminar to share the company's water-saving water quality improvement experience; 4. Promote external education (environmental protection volunteers and water conservation volunteers);	-	-

			5. Certification of environmental education sites 6. Assisted Asia University's MBR water recovery system to increase the water recovery rate from 36% to 47% (shared in the Wu River catchment) 		
3.6	**Implement plan to provide access to safe drinking water, effective sanitation, and protective hygiene (wash) for all workers at all premises under the site's control.**				
3.6.1	Evidence of the site's provision of adequate access to safe drinking water, effective sanitation, and protective hygiene (WASH) for all workers onsite shall be identified and where applicable, quantified	Conformed	1. The penetration rate of tap water is 95.15%, August 2018; 2. The water supply company regularly monitors the water quality of the park's livelihood water; 3. The filter element of the drinking fountains in the sites is maintained monthly, and the E. coli is monitored every two months, and the number of inspection units per inspection is 1/6 of the total number, which is better than the regulations (inspection once every three months, and each inspection is 1/8 of the total number) ; 4. e-learning platform; the correct way of washing hands; 5. Hygiene: PUSD, Public Utility Service Department will maintain the green belt 6. Ratio of toilet users: WBCS standard is 22 men/unit and	-	-

			16 women/unit, F15A is 13 men/unit and 8 women/unit, F15B is 19 men/unit and 11 women/unit 7. Incorporate the number of toilets/person ratio specified in the labor safety and sanitation facility rules into the WASH standard		
3.6.2	Evidence that the site is not impinging on the human right to safe water and sanitation of communities through their operations, and that traditional access rights for Indigenous and local communities are being respected, and that remedial actions are in place where this is not the case, and that these are effective.	Conformed	CTSP's EIA reports of Phase I and Phase II; Before the construction of industrial park, the environmental impact, including the safe water and sanitation of communities through CTSP's operations, had been consider and tracked periodically by the authority.	-	-
3.6.3 ADV	A list of actions taken to support the provision to stakeholders in the catchment of access to safe drinking water, adequate sanitation and hygiene awareness shall be identified	5	Media search on TSMC's Volunteer Society helping the primary schools in remote area, i.e. improving the WASH facilities during 2019-2020; Volunteer Society Caring for Elderly People Living Alone Dongguang Elementary School Water Conservation Volunteer Advocacy, Training, Promotion, Visit	-	-
3.6.4 ADV	In catchments where WASH has been identified as a shared water challenge, evidence of efforts taken with relevant public-sector	4	Media search on TSMC's Volunteer Society helping the primary schools in remote area, i.e. improving the WASH facilities during 2019-2020; In the COVID-19 prevention measures section, promote	-	-

	agencies to share information and to advocate for change to address access to safe drinking water and sanitation shall be identified		personal hygiene and provide clean water According to the official document No. 1070031753 of Zhongying Zi, work with CTSP to improve the water leakage problem of the water supply pipeline.		
3.7	**Implement plan to maintain or improve indirect water use within the catchment**				
3.7.1	Evidence that indirect water use targets set in the water stewardship plan, as applicable, have been met shall be quantified.	Conformed	1, Product's (Wafer produced in 2019) Water Footprint (WFP) Certificates issued by third party; 2, As per SOP, the product's WFP certificate will renew every three years; 		
3.7.2	Evidence of engagement with suppliers and service providers, as well as, when applicable, actions they have taken in the catchment as a result of the site's engagement related to indirect water use, shall be identified	Conformed	Through Product's WFP certification, collecting the water usage and effluent data from main suppliers;	-	-
3.7.3 ADV	Actions taken to address water related risks and challenges related to indirect water use outside the catchment shall be documented and evaluated	5	1.According to A-RMS-10-02-012, carry out supplier audit, hierarchical management system, measure index and target management, and score suppliers;	**OBS** The organization had defined suppliers' water KPI and evaluate their achievement annually. However, for the suppliers who didn't achieve the KPI,	**Root cause:** **Corrective Action:** Set a goal to reduce high resource consumption vendors ■ Short-term goal for reduction (2021): Cumulative water

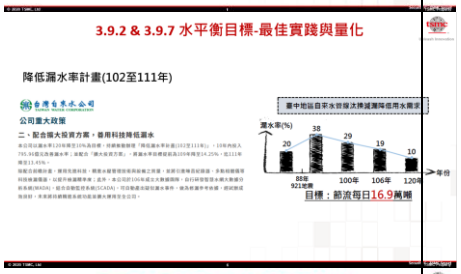
			2.Collecting main raw material's water usage data to calculate the product's WFP; 3.The supplier's environmental safety, health and loss prevention management procedures A-RMS-10-02-012, ver8, will be considered for disqualification if the score is less than 60; the best performers will reduce the frequency of audits; 4.Conduct supplier water saving counseling (2020-06) to assist Taiwan Fuji Materials Electronics in evaluating RO water recycling 5.On 2019-01-30 tsmc put forward the requirements and results of energy-saving, carbon-reduction and water-saving in the supply chain, with a water-saving goal of >1% 6.In 2019, the average water consumption of suppliers' water-saving performance will be reduced by 20%, 2020 new sustainable development indicators Supplier Outline 360	the corrective process is not clear.	saving reach 4 million tons (base year: 2018) ■ Long-term goal for reduction (2030): Cumulative water saving reach 2400 million tons (base year: 2018) The reduction performance of relevant vendors will be collected before Q2 of each year, and the continuous guidance for vendors who are unable to reach the set standards.  3.7.3_F15 Indirect water_Green Supply Chain節能/節水 **The action plan was deemed appropriated by DNV GL.**
3.8	**Implement plan to engage with and notify the owners of any shared water related infrastructure of any concerns the site may have.**				
3.8.1	Evidence of engagement, and the key messages relayed with confirmation of receipt, shall be identified	Conformed	Official letter system, documents exchanged between each site's ISEP and water authority, official records of sending and receiving documents and internal and external communication records are available. All the proposed water plans have been approved. (Fab-15A, 2019 Semiconductor	-	-

			Manufacturing 15A No. 0017) (Fab-15B, 2020-02-07 Zhongying No. 1090002739) Participated in the drought relief meeting (Zhongying Zi No. 1090009647) on 2020-05-08. The results of various drought relief are in close contact with CTSP and the Water Resources Department.		
3.9	**Implement actions to achieve best practice towards AWS outcomes, continually improve towards achieving sectoral best practice having a local/catchment, regional, or national relevance**				
3.9.1	Actions towards achieving best practice, related to water governance, as applicable, shall be implemented	Conformed	1. Regularly review and update a comprehensive sustainable water management plan; 2. Set up a monitoring platform to monitor water regime, water quality, and water balance diagrams daily; 3. Set up the FAM platform to control the equipment maintenance cycle; 4. Sharing water resources management and recycling economy reuse	-	-
3.9.2	Actions towards achieving best practice, related to targets in terms of water balance shall be implemented	Conformed	1. Water resources and water consumption per wafer target and achievement, CSR target and achievement; 2. Production-usage water recycling, whole plant water recycling, reclaimed water usage planning; 3. 22 water saving programs planning and achievements 4. The AWS Report signed by Corporate EHS Director and published in TSMC's website; 5. TSMC CSR Report 2019;		
3.9.3	Actions towards achieving best practice, related to targets in terms of	Conformed	1. The concentration of ammonia nitrogen/Cu/TMAH in discharged wastewater is	-	-

	water quality shall be implemented		currently better than the legal requirements; 2. Cu, system operation is improved, coagulation and sedimentation efficiency is improved, copper sulfate recovery system (WCR) SOP and sulfuric acid recovery (hypochlorous acid water recovery system) are established. In 2019, the concentration of Cu2+ contained in the treated effluent is around 4~7% to the standard. 3. TMAH, comprehensively collect and optimize the treatment system, operate the waste liquid recovery system with SCADA procedures, and establish a filter replacement checklist. In 2019, the concentration of TMAH contained in the treated effluent is around 20% to the standard. 4. Ammonia nitrogen, low-concentration ammonia nitrogen is introduced into the ammonia nitrogen wastewater resource system, filter replacement SOP is established, and Fab-15B ammonia nitrogen treatment equipment is built to meet the stricter standards of environmental assessment. In 2019, the concentration of Ammonia Nitrogen contained in the treated effluent is around 30~40% to the standard.		
3.9.4	Actions towards achieving best	Conformed	Site's IWRA Maintenance Procedure and Planning;	-	-

	practice, related to targets in terms of the site's maintenance of Important Water-Related Areas shall be implemented		1. Green belt maintenance; 2. Afforestation plan, restoration and maintenance of the original ecology;		
3.9.5	Actions towards achieving best practice related to targets in terms of WASH shall be implemented	Conformed	1. The penetration rate of tap water is 95.15%, August 2018; 2. The water supply company regularly monitors the water quality of the park's livelihood water; 3. The filter element of the drinking fountains in the sites is maintained monthly, and the E. coli is monitored every two months, and the number of inspection units per inspection is 1/6 of the total number, which is better than the regulations (inspection once every three months, and each inspection is 1/8 of the total number) ; 4. e-learning platform; the correct way of washing hands; 5. Hygiene: PUSD, Public Utility Service Department will maintain the green belt 6. Ratio of toilet users: WBCSD standard is 22 men/unit and 16 women/unit, F15A is 13 men/unit and 8 women/unit, F15B is 19 men/unit and 11 women/unit 7. Incorporate the number of toilets/person ratio specified in the labor safety and sanitation facility rules into the WASH standard	-	-
3.9.6 ADV	Achievement of identified best	8	1, Statistics on water-related training accepted by technical	-	-

	practice related to targets in terms of good water governance shall be quantified		persons from site's Facility Department; 2, Number of the Dedicated WWT Personnel qualified by authority is higher than the regulatory requirement; 3, Coordinate the water use plan with the Science and Technology Management Bureau to balance the park's water use 4, Construction of Taichung Futian and Shuinan tap water recycling plants to meet water demand 5, The pipeline leakage rate was 38% in 1999, 19% in 2017, and the target of 10% in 2031 (Water Resources Department Central District Water Resources Bureau Daan River and Dajia River Water Source Joint Utilization Environmental Assessment Public Hearing), how to assist the competent authority to reduce The leakage rate is currently listed as one of the best practices.		
3.9.7 ADV	Achievement of identified best practice related to targets in terms of sustainable water balance shall be quantified	0	1, The AWS Report signed by Corporate EHS Director and published in TSMC's website; 2, TSMC CSR Report 2019; 3, as ditto in 3.9.6 4, the CAPA raised due to the OBS can be follow up during succeeding assessment.	**OBS** While Interviewing with stakeholders, it was found that city water pipe leaking rate is one of water supply topic since 921 earthquakes. This topic could be defined as shared water challenge.	**Root cause:** **Corrective Action:** In light of the fact that the leakage rate of the water supply network belongs to the business of the Taiwan Water Corporation, we would cooperate with the Central Taiwan Science Park Bureau to conduct regular comparisons of the water volume and leakage detection of the tap water supply pipes in the expansion area of Central Taiwan Science Park. We have also established a TSM regular reminder system to facilitate the follow-up and continuous tracking and updating the information of

					water leakage rate in the water pipe network.     **The action plan was deemed appropriated by DNV GL.**
3.9.8 ADV	Achievement of identified best practices related to targets in terms of water quality shall be quantified	8	1, The AWS Report signed by Corporate EHS Director and published in TSMC's website; 2, TSMC CSR Report 2019; 3, Technology development on WWT;	-	-

3.9.9 ADV	Achievement of identified best practices related to targets in terms of the site's maintenance of Important Water-Related Areas have been implemented	8	1, Statistics on sites' Ecological restoration in its IWRA; 2,Park Green Belt maintenance 3, Municipal government tree planting activities, planting 1,200 trees; 4, Regenerate animals and plants, lilies, and fireflies in situ; 5, More than 40 ecological education camp activities	-	-
3.9.10 ADV	Achievement of identified best practice related to targets in terms of WASH shall be quantified	4	1.The filter element of the water dispenser in the factory is maintained monthly, and the E. coli is monitored every two months. The number of inspection units per inspection is 1/6 of the total number, which is better than the regulations (inspection once every three months, and each inspection is 1/8 of the total number of units.); 2.e-learning platform; the correct way of washing hands; 3.Sanitation: PUSD, Public Utility Service Department will maintain the green belt 4.Ratio of toilet users: WBCS standard is 22 men and 16 women, F15A is 13 men and 8 women, and F15B is 19 men and 11 women. 5.Each floor of the office building is equipped with a special toilet for the disabled; 6.Clean each toilet every hour and keep records; 7.Incorporate the number of toilets/person ratio specified in the labor safety and sanitation	-	-

			facility rules into the WASH standard		
3.9.11 ADV	A list of efforts to spread best practices shall be identified.	3	1, List for activities to spread best practices during 2019-2020; visits by the Director of the Environmental Protection Agency and the entire Taiwan Environmental Protection Bureau; 2. Promotion and visits actions, and the number of participants is increasing year by year; 3. The activity personnel are all over North, Central and South of Taiwan;	-	-
3.9.12 ADV	A list of collective action efforts, including the organizations involved, positions of responsible persons of other entities involved, and a description of the role played by the site shall be identified.	9	1, List for activities to spread best practices during 2019-2020; visits by the Director of the Environmental Protection Agency and the entire Taiwan Environmental Protection Bureau; 2. Promotion and visits actions, and the number of participants is increasing year by year; 3. The activity personnel are all over North, Central and South of Taiwan; 4. As ditto as in 3.9.11.	-	-
3.9.13 ADV	Evidence of the quantified improvement that has resulted from the collective action relative to a site-selected baseline date shall be identified and evidence from an appropriate range of stakeholders linked to the collective action (including both	6	1, List for activities to spread best practices during 2019-2020; visits by the Director of the Environmental Protection Agency and the entire Taiwan Environmental Protection Bureau; 2. Promotion and visits actions, and the number of participants is increasing year by year; 3. The activity personnel are all over North, Central and South of Taiwan;	-	-

	those implementing the action and those affected by the action) that the site is materially and positively contributing to the achievement of the collective action shall be identified		4.F15A uses 2016 as the baseline year, F15B uses 2018 as the baseline year 5.Cooperate with raw material suppliers to replace PFOA in 2016~2020 to avoid accumulation of wastewater flowing into water bodies 6. As ditto as in 3.9.11.		

STEP 4: EVAUATE THE SITE'S PERFORMANCE

Intent: *To review a site's performance against the actions taken in Step 3, learn from the results – both intended and unintended – and inform the next iteration of the site's water stewardship plan. This evaluation shall occur at least annually, but sites should consider more frequent evaluations.*

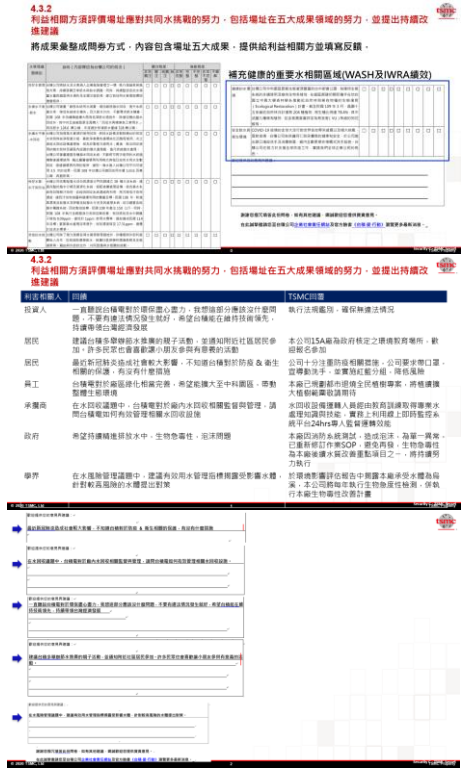
4.1	**Evaluate the site's performance in light of its actions and targets from its water stewardship plan and demonstrate its contribution to achieving water stewardship outcomes.**				
4.1.1	Performance against targets in the site's water stewardship plan and the contribution to achieving water stewardship outcomes shall be evaluated	Conformed	1. The ammonia nitrogen treatment system is expected to be reduced by 20% compared to the base year in 2030, and the actual reduction rate so far has reached 34%. 2. The TMAH treatment system is expected to reach the target <6ppm, and the actual achieved situation is <2mg/L, and the achieved reduction rate is 38%. 3. The copper ion treatment is expected to achieve the target <20%, and 69% has actually been achieved, the discharge water control target is <0.1ppm, and the environmental impact assessment is tightened to require Fab-15B<0.8ppm), 4. COD discharge water target <300ppm, actually achieved <150mg/L, actual discharge value is about 30% of the target value 5. The biological acute toxicity target is <1 TUa. In order to achieve the Wuxi discharge water monitoring plan, an improvement project was established to improve the key substances: copper <0.1, residual chlorine <0.15, hydrogen peroxide <4.0, TMAH<4. 6. The amount of water released: the target is reduced by 30%,		

			and it has reached 13% at present, and the improvement plan is continuously established in the future. 7. The Semiconductor Association has set a water saving target of 5% in the first phase of 2020, and the actual achievement rate of Fab-15A and Fab-15B is 8.06%. 8. Cooperate with the Environmental Protection Bureau of the Municipal Government to rehabilitate and plant 2,500 native trees 9. With the coordination and cooperation of the Science and Technology Management Bureau, the plant's permitted water consumption of 535.4 CMD and 300 CMD was allocated to the supplier. At the same time, the voluntary reduction of water consumption was reduced from the original permitted amount from 33,000 CMD to 30,000 CMD. 10. A specific customer requires a water consumption target of 0.27L/cm2-layer, and the actual achieved status is 0.1271 L/cm2-layer. 12. The part of ammonium sulphate recovered for external sales has reached the target of 60~70 ton/day. 13. For the part of copper recycling, the current target situation is 2.6ton/month. 14. For the cobalt recovery part, the current target situation is 765kg/year.		

			15. For the recycling of waste sulfuric acid, the current target situation is 16,096 ton/2019. With regard to the acquisition of information on water quality and quantity, the annual goal is set in Q4 every year, daily monitoring and logging in to the TSM system, and obtaining water regime information from the water quality and quantity platform. Currently, Baoshan, Liyutan, Techi, Nanhua and Wushantou reservoirs are continuously monitored. On the tsmc One FAC platform, establish on-line monitoring of real-time monitoring data of tap water and wastewater quality to grasp water conditions. 1. The filter element of the water dispenser in the factory is maintained monthly, and the E. coli is monitored every two months. The number of inspection units per inspection is 1/6 of the total, which is better than the regulations (inspection once every three months, and 1/8 of the total number of inspections per inspection.) Wu River (the entrance of the park's special management manifold) annual water quality inspection (acute biological toxicity) 2. The environmental assessment and supervision team of the Central Science Park tracks the water quality of the sewage treatment plant quarterly		
4.1.2	Value creation resulting from the water stewardship	Conformed	1, The AWS Report signed by Corporate EHS Director and published in TSMC's website; 2, TSMC CSR Report 2019;	-	-

	plan shall be evaluated		3, The value creation resulting from the water stewardship plan had been evaluated in AWS meeting conducted periodically in Sites.		
4.1.3	The shared value benefits in the catchment shall be identified and where applicable, quantified	Conformed	1, Research Report for TSMC done by Industrial Technology Research Institute in 2019; 2, Self analysis on social value; 3, Ammonia nitrogen emission reduction 34,800kg. Copper ion emission reduction 545kg, TMAH emission reduction 9979kg 4, Water usage saving 5%  	-	-
4.1.4 ADV	A governance or executive-level review, including discussion of shared water challenges, water risks, and opportunities, and any water-related cost savings or benefits realized, and any relevant	3	1. The factory-level safety committee, the factory director convenes monthly; 2. Fab-15A will be held on October 22, 2020; 3. Major topics include: water risk (water regime), water management goals and results, water use planning, combined use of recycled water, water quality, water performance	-	-

	incidents shall be identified		issues, events, and stakeholder cooperation		
4.2	**Evaluate the impacts of water-related emergency incidents (including extreme events), if any occurred, and determine the effectiveness of corrective and preventative measures.**				
4.2.1	A written annual review and (where appropriate) root-cause analysis of the year's emergency incident(s) shall be prepared and the site's response to the incident(s) shall be evaluated and proposed preventative and corrective actions and mitigations against future incidents shall be identified .	Conformed	1. Compare the emergency response information center system (ERIC system), there is no specific emergency in 2020, there is a water quality abnormal notification (record abnormal handling measures); 2. The content and tracking of emergency incidents reported by the factory-level safety committee every month; 3. Currently, in response to different water supply status during the dry season, according to the emergency response procedures, the contract of water tanker and water consume rights will be started in advance, and various preparations such as visits and contacts of water supply sites will be carried out as planned.	-	-
4.3	**Evaluate stakeholders' consultation feedback regarding the site's water stewardship performance, including the effectiveness of the site's engagement process**				
4.3.1	Consultation efforts with stakeholders on the site's water stewardship performance shall be identified	Conformed	1. 2020-09-07 The AWS stakeholder questionnaire was used for opinion inquiries and feedback, 7 copies were returned, and 5 copies of the electronic questionnaire were returned; 2. Continuously conduct stakeholder questionnaires for opinion inquiries and feedback in the form of questionnaires every year; 3. The content of the questionnaire includes water risk management, water saving, water recycling, water pollution	-	-

			prevention, and river basin water challenges. At present, there is a feedback on the countermeasures for the affected water body (Wuxi). tsmc is currently conducting biological acute toxicity testing. Way to respond.		
4.3.2 ADV	The site's efforts to address shared water challenges shall be evaluated by stakeholders. This shall include stakeholder reviewing of the site's efforts across all five outcome areas, and their suggestions for continual improvement.	0	1. 2020-09-07 The AWS stakeholder questionnaire was used for opinion inquiries and feedback, 7 copies were returned, and 5 copies of the electronic questionnaire were returned; 2. Continuously conduct stakeholder questionnaires for opinion inquiries and feedback in the form of questionnaires every year; 3. The content of the questionnaire includes water risk management, water saving, water recycling, water pollution prevention, and river basin water challenges. At present, there is a feedback on the countermeasures for the affected water body (Wuxi). tsmc is currently conducting biological acute toxicity testing. Way to respond. 4. As ditto as in 4.3.1. 5. The CAPA raised by the Sites should be follow up during succeeding assessment.	**OBS** The organization provides questionnaire to stakeholders to evaluate AWS five main outcome performance, the questionnaire include only 4 of the AWS target index. Information of "IMPORTANT WATER-RELATED AREAS"is not included.	**Root cause:** The writing process lacks the consideration of the Important Water-related Areas. **Corrective Action:** The questionnaire is added to include healthy important water-related areas (WASH and IWRA performance), inform stakeholders and obtain feedback. 

					The action plan was deemed appropriated by DNV GL.
4.4	**Evaluate and update the site's water stewardship plan, incorporating the information obtained from the evaluation process in the context of continual improvement**				
4.4.1	The site's water stewardship plan shall be modified and adapted to incorporate any relevant information and lessons learned from the evaluations in this step and these changes shall be identified.	Conformed	1, Documentations on site's annual top management review meeting, respectively conducted in 7 May 2019 and 27 June 2019; 2, The AWS Report signed by Corporate EHS Director; 3, TSMC CSR Report 2019; 4, AWS team meeting, meeting once a month to track various issues. 5, Make statistics on water-related management plans in the CSR report and update them every year; 6, The identification of central regulations is identified by Corp. ESH; local and regional regulations are exchanged in official documents (sample 2020-07-16 Zhongke Park sewage treatment plant management standards, etc.) 7, AWS meeting: Sampling of meeting minutes on 2020-09-29 (Fab-15A) and 2020-08-18 (Fab-15B), meeting water management goals, water saving goals, stakeholder information collection, river basin water information Both are discussed. And consider planning the future AWS meeting agenda and meeting frequency In the AWS report, the cost of water production is analyzed. Pure water is 30NT$/Ton, wastewater is 75NT$/Ton, and recycled water is 30NT$/Ton.	-	-

			AWS final version report finalizes on 2020-12-24 in the AWS group meeting		

STEP 5: COMMUNICATE ABOUT WATER STEWARDSHIP AND DISCLOSE THE SITE'S STEWARDSHIP EFFORTS

Intent: *To encourage transparency and accountability through communication of performance relative to commitments, policies, and plans. The disclosure of relevant information allows others to make informed opinions on a site's operations and tailor their involvement to suit*

5.1	**Disclose water-related internal governance of the site's management, including the positions of those accountable for legal compliance with water-related local laws and regulations.**				
5.1.1	The site's water-related internal governance, including positions of those accountable for compliance with water-related laws and regulations shall be disclosed	Conformed	1, CSR section on TSMC's website; 2, Water management section on TSMC's website; 3, TSMC's AWS Report published in its website;	-	-
5.2	**Communicate the water stewardship plan with relevant stakeholders.**				
5.2.1	The water stewardship plan, including how the water stewardship plan contributes to AWS Standard outcomes, shall be communicated to relevant stakeholders	Conformed	tsmc conduct the identification of stakeholder and communication topic according to the SOP for publishing CSR report. In TSMC CSR Report 2019 indicated there are 6 categories of stakeholder and 16 issue for sustainable development management; Focus on sustainable water management, tsmc issue Sustainable Water Management (Alliance for Water Stewardship,AWS) Report for communication purpose. The report will be used to communicate with specific stakeholder. Also, tsmc will send the questionnaire related to water management to specific stakeholder to collect further opinion for reference.	-	-

5.3	**Disclose efforts to collectively address shared water challenges, including: associated efforts to address the challenges; engagement with stakeholders; and co-ordination with public-sector agencies.**				
5.3.1	A summary of the site's water stewardship performance, including quantified performance against targets, shall be disclosed annually at a minimum.	Conformed	1, TSMC's AWS Report will be published annually in its website; 2, In published annual CSR report, there is a specific Water related section for details; Through the annual "Water Management Report" published on the company's website, generally 5-6 mid-year disclosure of the previous year's performance report Issues of concern to stakeholders include: wastewater biological acute toxicity, wastewater water quality foam, water intake, water body impact		
5.3.2 ADV	The site's efforts to implement the AWS Standard shall be disclosed in the organization's annual report.	1	TSMC's AWS 2019 Report was prepared and published in its website;	-	-
5.3.3 ADV	Benefits to the site and stakeholders from implementation of the AWS Standard shall be quantified in the organization's annual report.	0	In TSMC's AWS 2018 Report, it disclosed the water-related KPIs achieved but the benefits to stakeholders was not available; 		
5.4	**Disclose efforts to collectively address shared water challenges, including: associated efforts to address the challenges; engagement with stakeholders; and co-ordination with public-sector agencies.**				
5.4.1	The site's shared water-related challenges and efforts made to	Conformed	AWS pilot sites and their stakeholders;	-	-

	address these challenges shall be disclosed.				
5.4.2	Efforts made by the site to engage stakeholders and coordinate and support public-sector agencies shall be identified	Conformed	1, TSMC CSR Report 2019; 2, Reviewing the integrated management system incl. ISO 14001 & 50001; 3, Regular seminar exchanging information within sectors; 4, Because of the effective dispatch of water resources, the public project of the VI water dispatch pools has been established, and working with CTSP together to carry out other public constructions.	-	-
5.5	**Communicate transparency in water-related compliance: make any site water-related compliance violations available upon request as well as any corrective actions the site has taken to prevent future occurrences.**				
5.5.1	Any site water-related compliance violations and associated corrections shall be disclosed	Conformed	TSMC's AWS Report; Together with the compliance identification with the EMS management system, the results are disclosed in the sustainable water management report, there is currently no record of violations of relevant laws and regulations.	-	-
5.5.2	Necessary corrective actions taken by the site to prevent future occurrences shall be disclosed if applicable	Conformed	Internal procedure A-RMS-01-03-029 to manage the water related preventive action;	-	-
5.5.3	Any site water-related violation that may pose significant risk and threat to human or ecosystem health shall be immediately communicated to	Conformed	Internal procedure A-RMS-08-03-210 to respond the water related emergency case;	-	-

	relevant public agencies and disclosed.				

SUMMARY SCORE

STEP	CORE POINTS	ADVANCED POINTS
STEP 1	CONFORMED	25
STEP 2	CONFORMED	22
STEP 3	CONFORMED	66
STEP 4	CONFORMED	3
STEP 5	CONFORMED	1
TOTAL	CONFORMED	117
EVALUATION RESULT	CONFORMED	117
Certification/Audit Type	Initial Audit	
Level of Certification Recommended	AWS PLATINUM LEVEL	

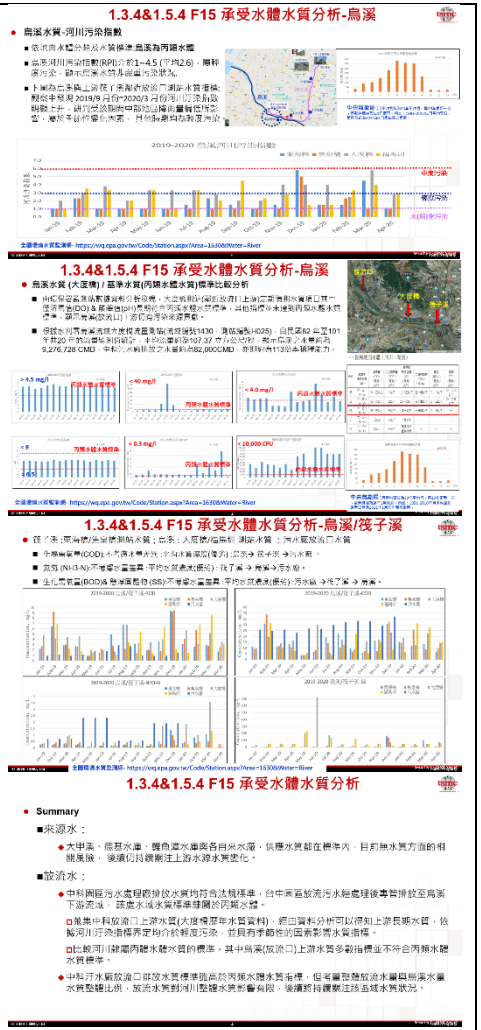
MAJOR NCS

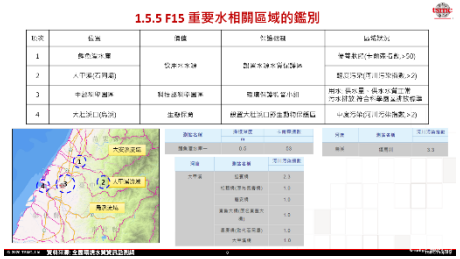
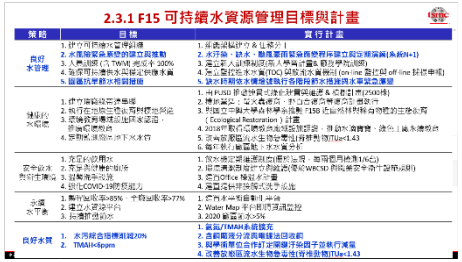
Detail of Finding	CAP	
-	Root Cause	Specific CA
No major NC identified.	-	-

MINOR NCS

Detail of Finding	CAP	
-	Root Cause	Specific CA
稽核時發現，目前依據所鑑別的水相關異常事件緊急應變計畫中，在旱季缺水部分，依據 A-RMS-08-03-283 台積電原水供應不足危機管理內控作業流程 2020-09-15 V5 進行應變，惟目前計畫中並未明訂各階段限水條件下所需完成簽約水權不同比例的時間，若依該流程所訂之限水上限 20%，扣除自行節水 5%之後的 15%需簽約水權量來看，目前完成的簽約量並不足夠所需。 During the audit, it was found that in the current emergency response plan based on the identified water-related incident response plans, during the dry season, A-RMS-08-03-283 TSMC's raw water supply shortage crisis management internal control operation procedure 2020-09-15 V5 should be implemented to make	Y2019 水車水源合約滿足台中廠區需求，今年 Y2020 F15P7 開始量產，採購目前積極尋找其他水源以進行簽約動作。 The contract of Y2019 water truck and water source meets the needs of the Taichung plant. Mass production of Y2020 F15P7 will begin this	Action 1: 水車缺口不足部分，採取【竹/中科聯防】及【中/南科聯防】模式進行應變。 Action 2: 持續與採購卓翰配合，進行水車數量合約追加。 Action 1: Adopt the "Hsinchu Science Park and Central Taiwan Science Park joint defense" and "Central Taiwan Science Park and Southern

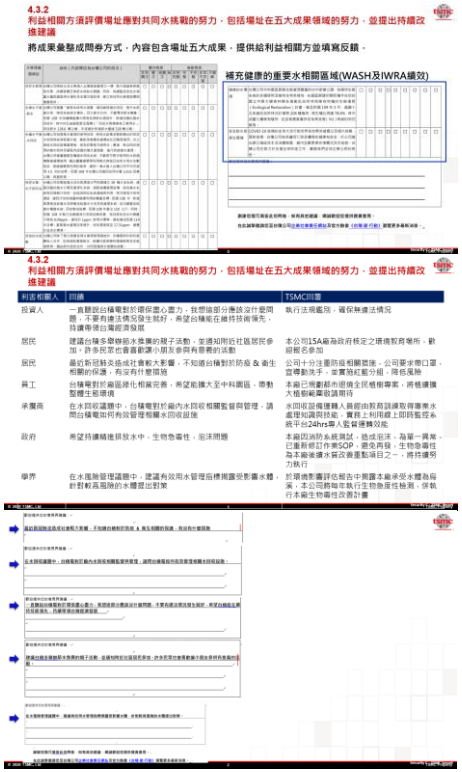
contingency, however the current plan does not specify the timing required to finalize the different proportions of the contracted water rights under the different water shortage conditions at each stage. When the water shortage limit set by the process as 20%, which means the target will be 15% in terms of the amount of water rights that need to be contracted after deducting 5% of self-saving, the number of contracts currently confirmed is not enough.	year. The purchasing department is currently active in looking for other water sources to contract.	Taiwan Science Park joint defense" modes to deal with the insufficiency of the water truck. Action 2: Continue to cooperate with Zhuo Han, the purchasing department, to increase the number of water trucks in the contract.  **Correction action was reviewed and closed by DNV GL.**
稽核時發現，在彙整資料中尚未完整涵蓋放流水承受水體-烏溪的水體分類與水質標準。 稽核過程中，已將烏溪的水體分類與水質標準與各年度量化結果進行收集，後續應依據因應水相關挑戰的策略擬定，對該水體在年度或季節(適用時)中相對各標準之高低變化進行量化與分析。 During the audit, it was found that the water body classification and water quality standards of Wu River, the receiving water body of the discharged water from the sites, were not fully integrated in the compilation data. During the audit process, Wu River's water body classification and water quality standards have been collected with the annual quantified results. Follow-up should be based on strategies generated according to the analyzed to the results to respond to water-related challenges, and the high and low level of water body variances annual or seasonal, when applicable.	資料蒐集過程未明確評估放流水承受水體-烏溪水質分類與水質標準 The process of data collection did not clearly assess the receiving water of the effluent (the Wu River), including the classification and the standards of water quality.	已將承受水體-烏溪水體分類與水質標準進行確認，後續對烏溪水體進行年度水質量化分析並參考季節變化等因素. The classification and the standards of water quality of the receiving water of the effluent (the Wu River) have been confirmed. The annual water quality analysis of Wu River will be carried out in the follow-up and other factors likes seasonal changes will be considered.

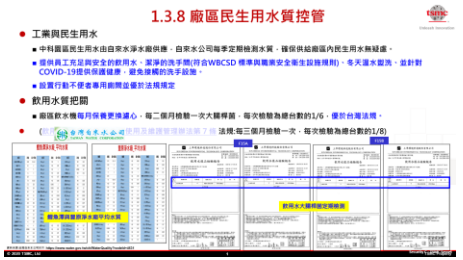
		 **Correction action was reviewed and closed by DNV GL.**
稽核時發現，目前雖進行重要水相關區域的鑑別，但鑑別結果與標準中各章節對重要水相關區域的要求，包括 1.3.6/1.8.4/3.5.1/3.9.4 並不一致。 稽核過程中已將重要水相關區域的鑑別重行審視，宜橫向比對各章節要求內容，確保結果的一致性。 During the audit, it was found that although the identification of important water-related areas is currently carried out, the identification results are inconsistent with the requirements for important water-related areas in various criteria of the standard, including 1.3.6/1.8.4/3.5.1/3.9.4.	鑑別重要水相關區域過程未留意各章節之連貫性 The process of identifying Important Water-related Areas did not consider the continuity of each chapter.	於 AWS 工作小組會議決議重要水相關區域並修正各章節內容達成一致結果: 重要水相關區域 1.鯉魚潭水庫 2. 德基水庫 3. 中部科學園區 4. 大肚溪口(烏溪), 並與 1.3.6/1.8.4/3.5.1/3.9.4 章節一致. At the AWS meeting, the Important Water-related Areas were determined and the contents of each chapter were revised to reach consensus:

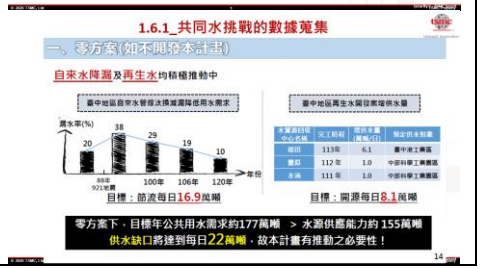
During the audit process, the identification of important water-related areas has been re-examined, and the requirements of each criteria should be compared horizontally to ensure the consistency of the results.		Important Water-related Areas contain: 1. Liyutan Reservoir 2. Deji Reservoir 3. Central Taiwan Science Park 4. Dadu River , and are consistent with chapters 1.3.6/1.8.4/3.5.1/3.9.4  1.5.5 F15 重要水相關區域的鑑別 **Correction action was reviewed and closed by DNV GL.**
永續水資源管理目標：依照 AWS 5 大目標發展出來的水管理策略，但策略方向與 1.7.1 風險、1.7.2 機會的因應措施連結仍有不足， 例如供水不足、設施故障、供水水質。 稽核過程中對 AWS"永續水資源管理目標和計畫 F-15"的內容已再行檢視，依據 AWS 五大主軸進行彙整。 During the audit, it was found that the water stewardship strategy had been developed in accordance with AWS's five main outcomes, but the strategic direction is still insufficient in linking with the response measures of 1.7.1 risks and 1.7.2 opportunities, such as insufficient water supply, facility failure, and water supply quality. During the audit process, the content of AWS "Sustainable Water Stewardship Strategy Management Goal and Plan F-15" has been reviewed, and consolidated based on the five main outcomes of AWS.	水管理策略擬定考量不夠完整，已重新檢視。 The considerations for the development of the water management strategy are not complete and have been re-inspect.	已依據 AWS 5 大目標主軸全盤檢討完成彙整。 The compilation has been completed according to the comprehensive review of the 5 major goals of AWS.  2.3.1 F15 可持續水資源管理目標與計畫 **Correction action was reviewed and closed by DNV GL.**

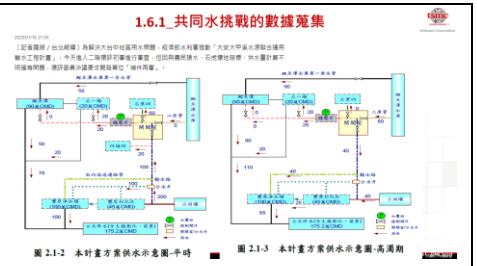
OBSERVATIONS

Detail of Finding	CAP	
-	Root Cause	Specific CA
提供利害關係人評價 AWS 績效的問卷, 內容缺少 AWS 五大目標中的” 健康的重要水相關區域” 相關評價		設計問卷時未考量健康重要水相關區域，問卷增加包含健康的重要水相關

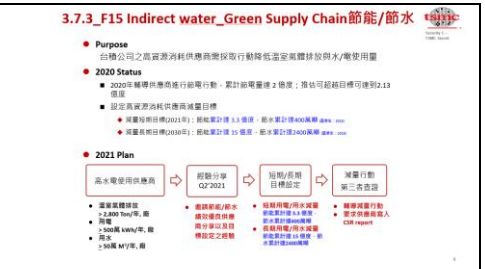
The organization provides questionnaire to stakeholders to evaluate AWS five main outcome performance, the questionnaire include only 4 of the AWS target index. Information of “IMPORTANT WATER-RELATED AREAS”is not included.		區域(WASH 及 IWRA 績效), 告知利害關係人並取得反饋. The writing process lacks the consideration of the Important Water-related Areas.The questionnaire is added to include healthy important water-related areas (WASH and IWRA performance), inform stakeholders and obtain feedback.  4.3.2 利益相關方須評價場址應對共同水挑戰的努力，包括場址在五大成果領域的努力，並提出持續改進建議 將成果彙整成問卷方式，內容包含場址五大成果，提供給利益相關方並填寫反饋， 補充健康的重要水相關區域(WASH及IWRA績效) 4.3.2 利益相關方須評價場址應對共同水挑戰的努力，包括場址在五大成果領域的努力，並提出持續改進建議 利益相關人 / 回饋 / TSMC回覆 投資人 一直關注台積電對於環保盡心盡力，我想這部分應該沒什麼問題，不要有違法情況發生就好，希望台積能在維持技術領先，持續帶領台灣經濟發展 執行法規鑑別，確保無違法情況 居民 建議台積多舉辦親水推廣的親子活動，並通知附近社區居民參加，許多民眾也會喜歡讓小朋友參與有意義的活動 本公司15A廠為政府核定之環境教育場所，歡迎報名參加 居民 最近新冠肺炎造成社會較大影響，不知道台積對於防疫 & 衛生相關的保護，有沒有什麼措施 公司十分注重防疫相關措施，公司要求戴口罩，宣導勤洗手，並實施紅藍分組，降低風險 員工 台積電對於廠區綠化相當完善，希望能擴大至中科園區，增對整體生態環境 本廠已規劃都市退燒全民植樹專案，將植續擴大植樹範圍邀請周待 承攬商 在水回收議題中，台積電對於廠內水回收相關監督與管理，請問台積電如何有效管理相關水回收設施 水回收設備操機人員經由前有訓練取得專業水處理相關時數，實務上利用線上即時監控系統平台24hrs專人監督運轉效能 政府 希望持續精進排放水中，生物急毒性，泥沫問題 本廠因消防系統測試，造成泥沫，為單一偶發，已重新修訂作業SOP，避免再發，生物急毒性為本廠後續水質改善重點項目之一，將持續努力執行 學界 在水風險管理議題中，建議有說明水管理指標與圍受影響水體，針對較高階的水體提出對策 於環境影響評估報告中開露本廠承受水體為長潭，本公司將每年執行生物急毒性檢測，依執行本廠生物毒性改善計畫 **The action plan was deemed appropriated by DNV GL.**
WASH 提供水準與適用的水準只提到了飲用水水質的維護，對於其他項目如用水的提供與盥洗設施的設置則沒說明。 稽核過程中已針對用水的提供和盥洗設施的設置規則提出說明，應注意描述 WASH 符合性時的完整度。 In regarding to levels of access and adequacy of WASH at the site, only drinking water quality level identified, however , the level of WASH provision and applicable level for the provision of water and toilet facilities are not defined.		1. 提供員工充足與安全的飲用水、潔淨的洗手間(符合 WBCSD 標準與職業安全衛生設施規則)、冬天溫水盥洗、並針對 COVID-19 提供保護健康，避免接觸的洗手設施。 2. 設置行動不便者專用廁間並優於法規規定

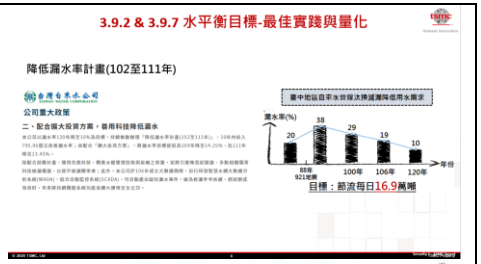
		1. Provide employees with adequate and safe drinking water, clean toilets (in accordance with WBCSD standards and the Regulations for the Occupational Safety and Health Equipment and Measures), warm water for washing in winter, health protection and contactless hand washing equipment for COVID-19. 2. Set up the toilet for the Disabled that are better than the regulations.  1.3.8 廠區民生用水質控管 • 工業與民生用水 • 飲用水質把關 **The action plan was deemed appropriated by DNV GL.**
稽核時發現，於流域內水相關資料收集的努力，包括對放流水流域(烏溪中科放流口)水質急毒性數據的檢測，並未明確持續執行的機制，可能影響數據蒐集的更新與即時性。 稽核過程中已確認在 TSM 平台建立 F15B238 單號的執行項目，預計在每年底前完成(於 90 天前每週通知)檢測，作為協助流域數據蒐集的方式。將於後續查證確認執行結果。 During the audit, although it was found that the efforts by the site to support and undertake catchment level water-related data collection, including the examination of instant toxicity data in the receiving water, effluent from Central Taiwan Science Park at the Wu River side, had been implemented, however currently the frequency of examination was not specified, which may affect the update and real-time data collection. During the audit process, it has been confirmed that the implementation project of establishing the F15B238 tracking number on the TSM platform is expected to be completed before the end of each year (with a weekly notice 90 days before) as a way to assist in the undertake catchment level water-related data. The results of the implementation will be confirmed in subsequent verification.		1. 109/11/02 烏溪上游與烏溪匯流口二處自主檢測完成。 2. TSM 平台建立 F15B238 單號，每年底前完成自主檢測。 1. The spontaneous Inspection of upper and confluence of Wu River was completed in 109/11/02. 2. Establish the F15B238 tracking number on the TSM platform and complete the spontaneous inspection before the end of each year.

		 **The action plan was deemed appropriated by DNV GL.**
稽核時發現，目前雖對共同水挑戰的數據進行蒐集，但其中部分數據(包括大甲大安溪流域原水支援計畫)的時間年代較久(103 年)，可能對於該方案所代表的共同水挑戰風險分析結果的代表性不足。 稽核過程中已確認更新在 107 年政府單位報告。該工程預計完工時間已更新，並說明該工程於供應水量與豐枯水期間的原水調度意義。可考慮後續展開廠址必要的因應方案。 During the audit, it was found that although data on the shared water challenge is currently being collected, some of the data (including the Dajia River and Daan River Basin Raw Water Support Program) might be too old, in 2014, to be relevant to the shared water challenge represented by the plan. During the audit process, it has been confirmed to update the government report in 2018. The project's estimated completion time has been updated, and the significance of the project's raw water dispatch during the period of water supply and high and low water has been explained. The necessary response plan for subsequent deployment of the site should be considered.		已更新 108 年政府單位報告，大甲大安溪流域原水支援計畫目前尚在環評審核階段，並補上此工程調度需求。 The report of government in 108 has been updated, the support project of raw water of the Dajia and Daanxi River Basin is currently still in the stage of environmental impact assessment, and the project scheduling requirements will be supplemented.  

		 **The action plan was deemed appropriated by DNV GL.**
已經依據 Corporate Risk Quantification (2016 version)評估風險，識別出水有關的風險前五項包含供水不足、水質污染、污水處理設施故障、洩漏污染、供水水質異常，但該風險評估資料未能明確說明對營運的衝擊及對成本的影響。 稽核過程中，已重行檢視風險評估的過程，將對營運的衝擊與成本的影響因子完整納入，宜注意將風險評估的結果與 AWS"永續水資源管理目標和計畫"的內容相互比對連結。 The risks have been assessed based on the Corporate Risk Quantification (2016 version), and the top five water-related risks have been identified, including insufficient water supply, water pollution, sewage treatment facility failure, leakage pollution, and abnormal water quality. However, the risk assessment data does not clearly indicate the operation Impact and costs impact.		已重新檢視風險評估，並將對營運的衝擊與成本的影響因子納入。 To re-inspect the risk assessment and incorporate the impact factors on operations and costs. 
稽核時發現，目前雖已整理"可持續水資源管理目標與計畫-F15"，作為描述各項涵蓋水管理議題目標的聲明文件，但該文件在查驗過程中，有部分執行計畫內容描述可能有更新的機會，將能更完整呈現目前的執行方向。同時，該文件尚未由場址最高執行負責人員或部門正式簽署發出，可能影響其作為執行依據的妥善性。 During the audit, it was found that although "Sustainable Water Resources Management Goals and Plans-F15" have been sorted out as a statement document describing various goals and objectives covering water management issues, the document has a description of the contents of the implementation plan. During the inspection process, it was found that there may be an opportunity to update, which will be able to more fully present the current implementation direction drawing. also, the document has not been formally signed and issued by the top executive responsible person or department of the site, which may affect its validity as a basis for implementation.		於本次審查過程中修改項目, 於 11 月 4 日廠級安委會完成補充說明(會議主持人: 蘇斌嘉 廠長. The revised items in the review process will be supplemented by the plant-level safety committee on November 4 (Moderator: plant director Su Binjia). 

		  **The action plan was deemed appropriated by DNV GL.**
對供應商訂有用水量管理指標, 並每年評估乙次供應商績效, 如供應商未達成績效, 未來的管理做法持續追蹤 The organization had defined suppliers' water KPI and evaluate their achievement annually. However, for the suppliers who didn't achieve the KPI, the corrective process is not clear.		■設定高資源消耗供應商減量目標 ◆ 減量短期目標(2021 年)：節水累計達 400 萬噸 (基準年：2018) ◆ 減量長期目標(2030 年)：節水累計達 2400 萬噸 (基準年：2018) 每年 Q2 前收集相關廠商減量績效，對無法達標的供應商將持續輔導。 ■ Set a goal to reduce high resource consumption vendors ◆ Short-term goal for reduction (2021): Cumulative water saving reach 4 million tons (base year: 2018) ◆ Long-term goal for reduction (2030): Cumulative water saving reach 2400 million tons (base year: 2018) The reduction performance of relevant vendors will be collected before Q2 of each year, and the continuous guidance for vendors who are unable to reach the set standards.

		 **The action plan was deemed appropriated by DNV GL.**
與利害關係人訪談過程中得知, 自 921 地震後改善自來水管網漏水率為自來水公司的要務, 宜將此議題鑑別為共同水挑戰. While Interviewing with stakeholders, it was found that city water pipe leaking rate is one of water supply topic since 921 earthquakes. This topic could be defined as shared water challenge.		有鑑於自水來管網漏水率為自來水公司業務，我們與中科管理局合作進行台中園區擴建區的自來水供水管路進行定期比對水量、查漏。我們也建立 TSM 定期提醒機制以利後續持續追蹤並更新自來水管網漏水率資訊。 In light of the fact that the leakage rate of the water supply network belongs to the business of the Taiwan Water Corporation, we would cooperate with the Central Taiwan Science Park Bureau to conduct regular comparisons of the water volume and leakage detection of the tap water supply pipes in the expansion area of Central Taiwan Science Park. We have also established a TSM regular reminder system to facilitate the follow-up and continuous tracking and updating the information of water leakage rate in the water pipe network. 



The action plan was deemed appropriated by DNV GL.

LIST OF PERSONS INTERVIEWED

Name	Designation
Mr. LO, M. L. 羅明廉	Technical Manager, TSMC Corporate ESH Division
Mr. Cheng, H. C. 鄭惠澤	Section Manager, TC Facility Department-2-01
Mr. Chang, C. C. 張朝鈞	Section Manager, TC Facility Department-5-06
Ms. Hu, P. C. 胡佩青	Section Manager, PUSD-0E
Mr. Chang, Y. H.張以函	Engineer, F15A-ISEP
Mr. Li, Y.C.李祐承	Engineer, F15A-ISEP
Mr. Lin, Z. L.林宗龍	Engineer, F15B-ISEP
Mr. Tsui, H. J.崔紘瑞	Engineer, TCFAC-2
Mr. Wu, M.C.吳旻學	Engineer, TCFAC-2-02
Mr. Lin, C. H.林家鴻	Engineer, TCFAC-5-01
Mr. Wang, C. M.王俊明	Engineer, TCFAC-5-02
Mr. Chen, Z. J.陳俊吉	Engineer, TCFAC-5-06