Appendix N1 Water Supply Assessment

Appendices

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Moulton Niguel Water District
Town Center Water Supply Assessment

Prepared for:

Moulton Niguel Water District

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Acronyms and Abbreviations

AF	acre-feet
AFY	acre-feet per year
AWMA	Aliso Water Management Agency
BDCP	Bay Delta Conservation Plan
AMP	Allen-McColloch Pipeline
cfs	cubic feet per second
CDR	Center for Demographic Research
CRA	Colorado River Aqueduct
CIP	Central Intertie Pipeline
DU	dwelling unit
EOCF#2	East Orange County Feeder Number 2
EIR	Environmental Impact Report
ET_0	Evapotranspiration
ETWD	El Toro Water District
GPCD	gallons per capita per day
HBDP	Huntington Beach Desalination Project
gpd	gallons per day
JTM	Joint Transmission Main
JRWSS	Joint Regional Water Supply System
ksf	thousand square feet
MNWD	Moulton Niguel Water District
MWDOC	Municipal Water District of Orange County
Project	Town Center Project
QSA	Quantification Settlement Agreement
SB	Senate Bill
SCP	South County Pipeline
SCWD	South Coast Water District
SMWD	Santa Margarita Water District
sq. ft.	square feet
SWP	State Water Project
TM	Technical Memorandum
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment
WTP	water treatment plant

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Executive Summary

In 2019, the City of Laguna Niguel (Lead Agency), determined that the Town Center Project (Project) proposed by Laguna Niguel Town Center Partners (project applicant) qualified as a "project" as defined by the California Water Code section 10912 and requested Moulton Niguel Water District (MNWD) to prepare a Water Supply Assessment (WSA) to satisfy the requirements of Water Code sections 10910, et seq., commonly referred to as Senate Bill (SB) 610. Generally, the WSA must address whether the total projected water supplies available to MNWD over the next 20 years during normal, single-dry, and multiple-dry years will be sufficient to meet the demand projected for the proposed Project in addition to MNWD's existing and planned future uses.

The Project proposes to develop the old Orange County courthouse site (Site) adjacent to the Laguna Niguel City Hall into a mixed use commercial, office, library and residential development. The Project is expected to be completed by the end of 2023. The Project will result in a net increase in water demand from MNWD's residential, commercial, and landscape irrigation customer sectors. The Project will also result in a net increase of 8 AFY of potable water demand when compared with the Agora Arts District Downtown project formerly proposed for the Site (ARCADIS' Agora Arts District Downtown WSA, April 2016). The Agora Art District Downtown project demand was incorporated into the 2015 MNWD Urban Water Management Plan (UWMP). The Project is proposing to add 275 multi-family residential apartments. These residential units will generate approximately 55 acre-feet per year (AFY) of potable water demand. Commercial (non-residential) buildings will generate approximately 91 AFY of potable water demand, mainly as a result of adding restaurants. The Project will have approximately 194,644 sq. ft. (4.46 acres) of landscape areas, with an associated recycled water irrigation demand of approximately 12 AFY.

In accordance with the foregoing and the standards set forth by SB 610, this WSA concludes that the total projected water supplies available to MNWD during normal, single-dry, and multiple-dry water years over the next 20 years will be sufficient to meet the projected water demands for the proposed Project, in addition to MNWD's existing and planned future uses.

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1 Introduction

This section provides background information on the proposed Town Center Project (Project) and the requirements of Water Code section 10910, et seq., commonly referred to as Senate Bill (SB) 610, for developing a Water Supply Assessment (WSA) by the public water supplier. This section also provides a brief overview of the Moulton Niguel Water District (MNWD), the public water supplier that will be supplying water to the proposed Project.

1.1 Town Center Project

The Project proposes to develop the old Orange County courthouse site adjacent to the Laguna Niguel City Hall into a mixed use commercial and residential development. Approximately 206,500 sq. ft. is planned for the commercial space, including space for restaurants, retail, offices, and a library. The residential use will consist of 275 multi-family residential apartments. The Project conceptual site plan is shown on Figure 1-1.

Figure 1-1: Town Center Downtown Concept Site Plan (MNWD, October 2019)

1.2 Water Supply Assessment Requirement

Effective January 1, 2002, SB 610 was signed into law, requiring the preparation of a WSA for certain types of development projects subject to CEQA review. Section 10912(a) of the Water Code defines a "project" for which a WSA must be prepared as any of the following:

1. A proposed residential development of more than 500 dwelling units.
2. A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
3. A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
4. A proposed hotel or motel, or both, having more than 500 rooms.
5. A proposed industrial, manufacturing, or processing plant or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor space.
6. A mixed-use project that includes one or more of the projects specified above.
7. A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.[1]

The City of Laguna Niguel (Lead Agency) has determined that a WSA is required for this Project because it constitutes the type of development defined as a "project" under Water Code section 10912 (above). As the Project is within MNWD's service area, the City contacted MNWD and requested the preparation of a WSA. As noted above, the WSA must address whether the total projected water supplies available to MNWD for the next 20 years during normal, single-dry, and multiple-dry years will be sufficient to meet the demand projected for the proposed Project in addition to MNWD's existing and planned future uses.

A review of MNWD's most recently adopted Urban Water Management Plan of 2015 revealed that projected demands associated with the Project were not accounted for, though, a similar development project (i.e. the Agora Arts District Downtown project) had been accounted for at this project location. The Agora Arts District Downtown project was expected to generate 27 AFY of residential potable water demand, 112 AFY of non-residential potable water demand, and 2.2 AFY of recycled water demand (ARCADIS' Agora Arts District Downtown WSA, April 2016). Therefore, the differences between the Project's water demands and the Agora Arts District Downtown project's water demands will result in a net increase of 8 AFY of potable water and 10 AFY of recycled water. This net increase in water demand is in Table 3-8 and Section 4 of this report.

[1] Certain other "projects" require the preparation of a WSA if the public water system has fewer than 5,000 service connections. (See Water Code § 10910(b).)

1.3 Moulton Niguel Water District

MNWD was formed on November 16, 1960, under the provisions of the California Water District Law, Division 13, section 34000, et seq., of the California Water Code. Prior to the formation of the water district, the lands within the service area were primarily utilized for livestock grazing, with a small area devoted to citrus and field crop production limited by the lack of adequate local water supplies. MNWD was initially formed by local ranchers in order to secure a reliable water supply for their herds.

MNWD now provides water, recycled water, and wastewater service to more than 170,000 people within a service area covering portions of six cities in southern Orange County: Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, and San Juan Capistrano.

All potable water served by MNWD is imported from the Metropolitan Water District of Southern California (Metropolitan) through its member agency, the Municipal Water District of Orange County (MWDOC).

MNWD's recycled water supply is locally sourced and has steadily increased to account for 18 percent of the overall water supply in the service area. MNWD's water supplies and demands are described in more detail in Sections 2 and 3, respectively.

2 Water Supplies

This section describes existing water supply sources and quantifies supplies available to meet MNWD's water demands. Additionally, this section provides an overview of MNWD's potential future supply sources currently under development and quantifies the water supplies projected to be available to MNWD in the next 20 years.

2.1 Existing Water Supplies

All of MNWD's potable water supply is imported water from Metropolitan through MWDOC. Treated imported potable water comes from the Robert B. Diemer (Diemer) Filtration Plant located north of Yorba Linda of the Baker WTP.

Through the 2017/18 fiscal year, treated, imported water represented about 82 percent of MNWD's total water supply. The other 18 percent is (non-potable) recycled water used for landscape irrigation. MNWD is a member of the San Juan Basin Authority (SJBA); however, none of MNWD's supplies are produced from the San Juan Basin. Table 2-1 shows MNWD's historical water supply and use from 1990 to 2015 (according to fiscal years July 1 to June 30).

Table 2-1: Historic Water Supplies

Water Supply Sources	Fiscal Year Ending Supply (AFY)					
	1990	*1995*	*2000*	*2005*	*2010*	*2015*
MWDOC (Treated Water)	30,743	32,540	38,040	32,230	29,491	26,824
Recycled Water	165	1,884	5,670	6,402	6,858	7,988
Total	**30,908**	**34,424**	**43,710**	**38,632**	**36,349**	**34,812**

2.1.1 Existing Water Rights and Imported Supplies

Table 2-2 provides a summary of existing water rights and entitlements to imported supplies available to MNWD, including a supply from the Baker Water Treatment Plant (WTP) described in Section 2.2.3. MNWD owns capacity rights to regional pipelines that convey imported water from Metropolitan's facilities to MNWD. However, capacity rights in pipelines do not guarantee supply, which is subject to availability from Metropolitan and MWDOC. Additionally, as a matter of practice, Metropolitan does not provide annual contractual entitlements or specific allotments of imported water to its member agencies such as MWDOC or to the local agencies that are supplied by Metropolitan's member agencies. Instead, Metropolitan uses a regional framework whereby its member agencies annually advise Metropolitan how much water they anticipate they will need during the next five years, and an ongoing process is employed by Metropolitan and its member agencies to develop a forecast of future water demands. Through a comprehensive planning process, Metropolitan calculates regional demand projections and, together with information about existing and proposed local projects and effects of conservation, determines the amount of imported and other supplies to secure to meet the demands of its member agencies. Based on this approach, Metropolitan is able to fulfill delivery requests from its member agencies such as MWDOC, and MWDOC is able to fulfill the delivery requests from its water agency members such as MNWD.

Metropolitan's ability to ensure water supply availability and reliability to its member agencies is based in part on its Water Surplus and Drought Management Plan (WSDM). Metropolitan developed and adopted the WSDM Plan

to provide policy guidance and manage regional water supply actions under both surplus and drought conditions to achieve the overall goal of ensuring water supply reliability to its member agencies as set forth in Metropolitan's Regional UWMP and Integrated Water Resources Plan (IRP). The WSDM Plan outlines various water supply conditions and corresponding actions Metropolitan may undertake in response to moderate, serious and extreme water shortages. Under Condition 1, Metropolitan issues a Water Supply Watch and encourages local agencies to implement voluntary dry-year conservation measures and utilize regional storage reserves. Under Condition 2, Metropolitan issues a Water Supply Alert and calls for cities, counties, its member agencies and all other retail water providers to implement extraordinary conservation through drought ordinances and other measures to minimize the use of storage reserves. Under Condition 3, Metropolitan may implement its Water Supply Allocation Plan (WSAP), which allocates available water supplies among its member agencies based on factors such as impacts to retail customers, population and projected growth of particular member agencies, the availability of recycled water and other local supplies, conservation efforts, and other factors. At times when the WSAP is implemented, Metropolitan member agencies do not lose their ability to receive any particular amount of imported water supplies, but instead Metropolitan places limits on the amount of water its member agencies can purchase without facing a surcharge. In turn, MWDOC has also developed a WSAP to allocate imported supplies at the retail level in Orange County. Under these WSAPs, the availability of imported water supplies is based primarily on the need for imported supplies relative to the total need for those supplies within the Metropolitan and MWDOC service areas.

The IRP 2015 Update, developed by Metropolitan, incorporates a balanced approach to stabilize traditional imported water supplies while continuing to evolve local supplies to assure 100% reliability for full-service demands at the retail level. The IRP establishes regional targets for conservation, local supplies, State Water Project (SWP) supplies, Colorado River supplies, groundwater banking and water transfers. The 2015 update to the IRP observes long-term planning for additional future resources, such as storm water capture and seawater desalination, to minimize water shortages and restrictions.

The IRP incorporates three elements to achieve a balance in resource planning:

1. Planning for the future comes with uncertainty as unforeseeable challenges and risks may occur. Metropolitan considers positive and negative situations to analyze in what way supplies can affect future circumstances. The IRP development process provided Metropolitan an opportunity to observe potential challenges and risks identifying nearly 200,000 acre-feet of additional water conservation and supplies.

2. Water agencies develop plans to analyze and prepare for future water supply. Future Supply Actions are necessary actions to prepare for water supply conditions that differ from the original plan, such as water-saving technologies, land acquisition, and new supply alternatives. This action will allow agencies to consider innovative and cost-effective water alternatives for an unforeseeable future.

3. Adaptive water management is an approach for water purveyors to better prepare for the agency's future. Although strategies are established in the present, adaptive management is a quick and cost-effective method for unanticipated events. A history of drought-related supply shortages provoked Metropolitan to seek alternative supplies despite the long-term water strategy established within Southern California.

Using this balanced approach will help ensure that the Southern California region will have adequate supplies to meet future demands while adapting to evolving conditions.

The resource targets for Metropolitan's UWMP include the 2015 IRP Update and planned supply and demand projections developed in collaboration with member agencies. Metropolitan's UWMP contains a water supply reliability assessment that includes a detailed evaluation of the supplies necessary to meet demands over a 25-year period in average, single-dry year, and multiple-dry year periods.

Metropolitan is prioritizing the development of water supply reliability, taking into consideration the current supplies available from the SWP and actions taken to ensure a reliable water supply. The 2015 IRP provides an informative discussion regarding reliable water supply to the year 2040

In response to prolonged drought conditions, in April 2015 Metropolitan declared a Condition 3 shortage and decided to implement its WSAP with the goal of achieving a 15 percent reduction in regional deliveries to its member agencies starting on July 1, 2015. Importantly, Metropolitan has confirmed that implementation of its WSAP merely involves the potential application of a surcharge to those member agencies whose deliveries of water from Metropolitan exceed their allocations, but it does not otherwise prohibit or restrict such deliveries. (Metropolitan WSAP Staff Report, pp. 3-6.)

Table 2-2 lists the highest amount of imported water that MNWD has purchased from MWDOC during the period of FY 2010-11 to FY 2014-15.

Table 2-2: Existing Water Rights and Supply Sources[2]

Existing Supply	Amount (AFY)	Availability	Right	Contract	Ever Used
MWDOC [1]	29,036	X		X	Yes
Recycled Water [2]	12,769	X	X		Yes
Baker WTP [3]	9,400	X		X	Yes

[1] Based on the highest amount purchased during FY 2010-11 to FY 2014-15.
[2] Combined FY2017-18 recycled water supply capacity from SOCWA JRTP and Plant 3A (two active plants) are 9 and 2.4 MGD.
[3] MNWD has capacity rights of 13 cfs (9,400 AFY) in Baker Water Treatment Plant. Baker WTP offsets and reduces amount of purchased Metropolitan treated water from the Diemer Filtration Plant.

2.1.2 Imported Water Deliveries

In FY 2017-18, MNWD received 25,689 AFY of imported water from Metropolitan/MWDOC. MNWD received 23,917 AFY of imported water for FY 2018-19. Metropolitan's principal water sources originate from the Colorado River via the Colorado River Aqueduct and from Northern California through the State Water Project (SWP). For purposes of delivery to MNWD, these raw water sources are treated at the Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through Metropolitan's Lower Feeder and SWP water through the Yorba Linda Feeder. MNWD also receives treated water from the Baker WTP. The Baker WTP receives imported water from Metropolitan and Irvine Lake water. Irvine Lake is supplied with untreated water from Metropolitan and local surface runoff.

MNWD has service connection agreements with Metropolitan's member agency, MWDOC. These agreements entitle MNWD to receive water from available Metropolitan sources via the regional transmission system located in Orange County. MWDOC delivers water from Metropolitan in the amount requested by MNWD, subject to capacity limitations of the service connections and the capacity limits of MNWD in the pipelines. The water is conveyed to MNWD through two Metropolitan-operated transmission mains, the East Orange County Feeder No.2 (EOCF #2) and the Allen-McColloch

[2] Modified version of Table 2-2 in ARCADIS' Agora Arts District Downtown WSA (April 2016)

Pipeline (AMP). MNWD has two service connections to the AMP and nine service connections to the Joint Regional Water Supply System (JRWSS) which is directly supplied from the EOCF #2.

Although pipeline capacity rights do not guarantee the availability of water, pipeline capacity does provide the ability to convey water when it is available from Metropolitan sources to the MNWD system and, therefore, demonstrates not only water supply reliability, but also physical delivery system reliability. All imported water supplies assumed in this document are available to MNWD from existing infrastructure.

Allen-McColloch Pipeline and *South County Pipeline* – The AMP is the primary supply line of imported water from the Diemer Filtration Plant with a terminus in the northern section of Mission Viejo. Metropolitan owns and operates the AMP. MNWD's capacity ownership coming through the AMP, expressed as rate of flow, is 35.1 cubic feet per second (cfs) or 25,430 acre-feet per year. The Agreement for Sale and Purchase of Allen-McColloch Pipeline (Metropolitan Agreement No. 4623) among Metropolitan, MWDOC, MWDOC Water Facilities Corporation and certain other identified participants, including MNWD, dated July 1, 1994 (the AMP Sale Agreement) requires Metropolitan, among other things, to meet MNWD's requests for water deliveries (subject to the availability of water from Metropolitan). The AMP Sale Agreement further requires Metropolitan to augment/increase capacity necessary to meet MNWD projected ultimate service area water demands and other undeveloped lands within MNWD. The South County Pipeline (SCP) conveys water from the AMP to MNWD, Santa Margarita Water District, SCWD, City of San Juan Capistrano, and City of San Clemente. MNWD obtains flow from the SCP at MNWD's takeout (SC-2) and delivers flow to Laguna Hills, Mission Viejo, Laguna Niguel, and Aliso Viejo via the Central Intertie Pipeline (CIP).

East Orange County Feeder No. 2, Joint Transmission Main, and Eastern Transmission Main – The EOCF #2 is a pipeline jointly owned by several local agencies (City of Anaheim, City of Santa Ana, and MWDOC) and Metropolitan, which operates it. The Joint Transmission Main (JTM) conveys imported water from the EOCF#2 to south Orange County. The JTM is jointly owned by MNWD, Irvine Ranch Water District (IRWD), El Toro Water District (ETWD), City of San Juan Capistrano, City of San Clemente, and South Coast Water District (SCWD). The JTM is operated under a contract by SCWD. Originally, MNWD had 45 cfs capacity in the JTM and EOCF #2 but later transferred 2 cfs capacity to ETWD with the de-annexation of Improvement District No. 1 in 1985. MNWD currently has 43 cfs, or 31,150 acre-feet per year of capacity rights in the Joint Regional Water Supply System (JRWSS). MNWD owns 10 cfs (7,244 AFY) of capacity in the Eastern Transmission Main (ETM) which begins as a branch off the JTM near Moulton Parkway and Laguna Hills Drive.

2.1.3 Recycled Water

In 1984, MNWD constructed a 0.6 MGD Advanced Wastewater Treatment Plant (AWT) at the Aliso Water Management Agency (AWMA) plant in Laguna Niguel, currently known as SOCWA Joint Regional Wastewater Treatment Plant (JRTP). This tertiary treatment facility originally produced approximately 350 AFY of water for irrigation at the El Niguel Country Club in Laguna Niguel. In 1989, the AWT facility was expanded from 0.6 to 2.4 MGD of tertiary treatment capacity to service the El Niguel Country Club, Crown Valley Community Park, Laguna Niguel Regional Park, and several greenbelt areas within the City of Laguna Niguel. In 1996, MNWD constructed a second AWT at the JRTP with a capacity of 9 MGD along with an underground recycled water storage tank.

In 1991, MNWD constructed a 2.4 MGD AWT facility at Plant 3A to provide recycled water for irrigation use. This expanded MNWD's recycled water supply capacity to provide maximum-month demands for its recycled water distribution system.

The recycled water distribution system is able to serve recycled water from two water reclamation plants, including: MNWD Plant 3A AWT and SOCWA JRTP, as well as the SCWD which is interconnected to the MNWD distribution system via a storage reservoir.

MNWD currently has 11.4 MGD of tertiary treatment capacity in compliance with Title 22 Recycled Water requirements. MNWD has 9 MGD capacity in the SOCWA JRTP and 2.4 MGD (2,688 AFY) in Plant 3A. MNWD also has 1,000 AF of seasonal storage in the Upper Oso recycled water reservoir for its recycled water distribution system.

In FY 2017-18, MNWD's tertiary-treated recycled water supplies included 6,098 AFY from the JRTP and 1,680 AFY from Plant 3A.

2.2 Projected Future Supplies

While imported water from Metropolitan will continue to meet the majority of MNWD's demands over the next 20 years, MNWD's supply portfolio is changing in a way that will reduce reliance on imported supplies and increase the use of local recycled supplies through planned expansion of MNWD's recycled water distribution system.

MNWD's projected water supplies from 2018 to 2040 are summarized in Table 2-3.

Table 2-3: Projected Water Supply Sources

Water Supply Sources [1]	Fiscal Year Ending Supply (AFY)					
	2018 [3]	*2020*	*2025*	*2030*	*2035*	*2040*
MWDOC (Treated Water)	25,689	23,418	24,768	25,540	26,005	26,005
Baker WTP (Treated Water) [2]	9,400	9,400	9,400	9,400	9,400	9,400
Recycled Water Available	7,778	8,111	10,010	9,998	9,986	9,986
Total	**42,867**	**40,929**	**44,178**	**44,938**	**45,391**	**45,391**

[1] 2020 to 2040 total supply projections are from MNWD's 2015 draft UWMP Table 6-2.
[2] Baker WTP supply offsets and reduces purchased Metropolitan treated water from Diemer Filtration Plant.
[3] Actual data for FY 2017-18

2.2.1 Imported Water

Metropolitan's 2015 UWMP reports on its water supply availability and reliability and identifies projected supplies to meet the long-term demand within its service area. The 2015 UWMP, which is incorporated herein by reference, provides comprehensive information and analyses regarding Metropolitan's supply capacities from 2020 through 2040 under the three hydrologic conditions specified in the UWMP Act: average year, single dry-year, and multiple dry-years.

Colorado River Aqueduct (CRA) supplies include supplies that would result from existing and committed programs and from implementation of the Quantification Settlement Agreement (QSA) and related agreements to transfer

water from agricultural agencies to urban uses. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 million acre-feet (AF) on an as-needed basis.[3],[4]

Metropolitan's SWP supplies have been impacted by the ongoing restrictions on SWP operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on December 15, 2008 and June 4, 2009, respectively (Metropolitan's 2015 UWMP, June 2016). The Drought Operations Plan prepared on April 8, 2014 lays out the proposed operations and conditions of the SWP during multiple dry years to maximize regulatory flexibility while remaining within the boundaries of existing law and regulations (U.S. Bureau of Reclamation, April 2014). In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP water storage and transfer programs. The goal of the storage/transfer programs is to develop additional dry-year supplies that can be conveyed with available storage and pumping capacity to maintain deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

On October 21, 2019, the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued new biological opinions for continued coordinated SWP and Central Valley Project operations, which provide greater flexibility to manage the projects based on real-time conditions and real-time monitoring of fish species. DWR is currently seeking a permit from the California Department of Fish and Wildlife to operate the SWP in a way that protects fish in compliance with the California Endangered Species Act. DWR issued a Draft Environmental Impact Report for Long-Term Operation of the California SWP on November 21, 2019. Similar to the federal biological opinions, the proposed project allows for greater flexibility in managing the SWP based on real-time management. The State of California has announced an intent to sue the federal government over the 2019 biological opinions but has not specified the nature of that suit or when it may file it. While these developments create some uncertainty regarding future supplies, that uncertainty is currently speculative and has yet to impose any actual operational constraints on the SWP that would affect Metropolitan's supplies. Further, both the State and federal permits and proposed action incorporate new science and seek greater flexibility for SWP operations than provided under the 2008 and 2009 biological opinions.

State and federal resource agencies and various environmental and water user entities are currently engaged in developing a plan to modernize Delta conveyance (formerly known as California WaterFix, EcoRestore, the Bay Delta Conservation Plan), aimed at addressing Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. As directed by Governor Newsom in 2019 and building on work already conducted, DWR rescinded the twin tunnel WaterFix program and is pursuing a new environmental review and planning process for a single tunnel solution to modernize Delta conveyance. This approach is consistent with the Governor's April 2019 Executive Order N-10-19 directing state agencies to develop a portfolio of statewide water actions and investments. Modernizing Delta conveyance paired with complementary projects that improve water recycling, recharge depleted groundwater reserves, strengthen existing levee protections and improve Delta water quality will help ensure a resilient water supply for Metropolitan, MWDOC, and the MNWD.

Storage is a major component of Metropolitan's dry year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing its WSAP, is dependent on its storage resources. In developing the supply capabilities for the 2015 UWMP, Metropolitan assumed a simulated median storage level going into each of five-year increments based on the balances of supplies and demands.

[3] Pp. 3-2 of Metropolitan's 2015 UWMP (June 2016).

[4] Irvine Lake is supplied with untreated water from Metropolitan and local surface runoff.

Metropolitan evaluated supply reliability by projecting supply and demand conditions for the single- and multi- year drought cases based on conditions affecting the SWP (Metropolitan's largest and most variable supply). For this supply source, the single driest-year was 1977 and the three-year dry period was 1990-1992.[5]

Metropolitan's analyses are illustrated in Table 2-4, Table 2-5, and Table 2-6, which correspond to Metropolitan's 2015 UWMP's Tables 2-6, 2-4 and 2-5, respectively. These tables show that the region can provide reliable water supplies not only under normal conditions but also under both the single driest year and the multiple dry-year hydrologies for the 20-year time horizon.

5 This analysis is based on Metropolitan's 2015 UWMP (June 2016).

Table 2-4: Metropolitan Average Year Projected Supply Capability and Demands for 2020 to 2040

(Metropolitan, June 2016)

Average Year

Supply Capability[1] and Projected Demands

Average of 1922-2012 Hydrologies

(Acre-feet per year)

Forecast Year	2020	2025	2030	2035	2040
Current Programs					
In-Region Supplies and Programs	693,000	774,000	852,000	956,000	992,000
California Aqueduct[2]	1,555,000	1,576,000	1,606,000	1,632,000	1,632,000
Colorado River Aqueduct					
Total Supply Available[3]	1,468,000	1,488,000	1,484,000	1,471,000	1,460,000
Aqueduct Capacity Limit[4]	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*
Colorado River Aqueduct Capability	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Capability of Current Programs	**3,448,000**	**3,550,000**	**3,658,000**	**3,788,000**	**3,824,000**
Demands					
Total Demands on Metropolitan	1,586,000	1,636,000	1,677,000	1,726,000	1,765,000
IID-SDCWA Transfers and Canal Linings	274,000	282,000	282,000	282,000	282,000
Total Metropolitan Deliveries[5]	**1,860,000**	**1,918,000**	**1,959,000**	**2,008,000**	**2,047,000**
Surplus	**1,588,000**	**1,632,000**	**1,699,000**	**1,780,000**	**1,777,000**
Programs Under Development					
In-Region Supplies and Programs	43,000	80,000	118,000	160,000	200,000
California Aqueduct	20,000	20,000	268,000	268,000	268,000
Colorado River Aqueduct					
Total Supply Available[3]	5,000	25,000	25,000	25,000	25,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**63,000**	**100,000**	**386,000**	**428,000**	**468,000**
Potential Surplus	**1,651,000**	**1,732,000**	**2,085,000**	**2,208,000**	**2,245,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes programs, IID-SDCWA transfer and exchange and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.20 MAF including IID-SDCWA transfer and exchange and canal linings.

[5] Total demands are adjusted to include IID-SDCWA transfer and exchange and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-5: Metropolitan Single Dry Year Projected Supply Capability and Demands for 2020 to 2040

(Metropolitan, June 2016)

Single Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1977 Hydrology
(Acre-feet per year)

Forecast Year	2020	2025	2030	2035	2040
Current Programs					
In-Region Supplies and Programs	693,000	774,000	852,000	956,000	992,000
California Aqueduct[2]	691,000	712,000	723,000	749,000	749,000
Colorado River Aqueduct					
Total Supply Available[3]	1,451,000	1,457,000	1,456,000	1,455,000	1,454,000
Aqueduct Capacity Limit[4]	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*
Colorado River Aqueduct Capability	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Capability of Current Programs	**2,584,000**	**2,686,000**	**2,775,000**	**2,905,000**	**2,941,000**
Demands					
Total Demands on Metropolitan	1,731,000	1,784,000	1,826,000	1,878,000	1,919,000
IID-SDCWA Transfers and Canal Linings	274,000	282,000	282,000	282,000	282,000
Total Metropolitan Deliveries[5]	**2,005,000**	**2,066,000**	**2,108,000**	**2,160,000**	**2,201,000**
Surplus	**579,000**	**620,000**	**667,000**	**745,000**	**740,000**
Programs Under Development					
In-Region Supplies and Programs	43,000	80,000	118,000	160,000	200,000
California Aqueduct	20,000	20,000	198,000	198,000	198,000
Colorado River Aqueduct					
Total Supply Available[3]	155,000	125,000	75,000	25,000	25,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**63,000**	**100,000**	**316,000**	**358,000**	**398,000**
Potential Surplus	**642,000**	**720,000**	**983,000**	**1,103,000**	**1,138,000**

[1] Represents Supply Capability for resource programs under listed year type.
[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
[3] Colorado River Aqueduct includes programs, IID-SDCWA transfer and exchange and canal linings conveyed by the aqueduct.
[4] Maximum CRA deliveries limited to 1.20 MAF including IID-SDCWA transfer and exchange and canal linings.
[5] Total demands are adjusted to include IID-SDCWA transfer and exchange and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

Table 2-6: Metropolitan Multiple Dry Year Projected Supply Capability and Demands for 2020 to 2040

(Metropolitan, June 2016)

Multiple Dry-Year
Supply Capability[1] and Projected Demands
Repeat of 1990-1992 Hydrology
(Acre-feet per year)

Forecast Year	2020	2025	2030	2035	2040
Current Programs					
In-Region Supplies and Programs	239,000	272,000	303,000	346,000	364,000
California Aqueduct[2]	664,000	682,000	687,000	696,000	696,000
Colorado River Aqueduct					
Total Supply Available[3]	1,403,000	1,691,000	1,690,000	1,689,000	1,605,000
Aqueduct Capacity Limit[4]	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*	*1,200,000*
Colorado River Aqueduct Capability	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Capability of Current Programs	**2,103,000**	**2,154,000**	**2,190,000**	**2,242,000**	**2,260,000**
Demands					
Total Demands on Metropolitan	1,727,000	1,836,000	1,889,000	1,934,000	1,976,000
IID-SDCWA Transfers and Canal Linings	274,000	282,000	282,000	282,000	282,000
Total Metropolitan Deliveries[5]	**2,001,000**	**2,118,000**	**2,171,000**	**2,216,000**	**2,258,000**
Surplus	**102,000**	**36,000**	**19,000**	**26,000**	**2,000**
Programs Under Development					
In-Region Supplies and Programs	36,000	73,000	110,000	151,000	192,000
California Aqueduct	7,000	7,000	94,000	94,000	94,000
Colorado River Aqueduct					
Total Supply Available[3]	80,000	75,000	50,000	25,000	25,000
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**43,000**	**80,000**	**204,000**	**245,000**	**286,000**
Potential Surplus	**145,000**	**116,000**	**223,000**	**271,000**	**288,000**

[1] Represents Supply Capability for resource programs under listed year type.

[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

[3] Colorado River Aqueduct includes programs, IID-SDCWA transfer and exchange and canal linings conveyed by the aqueduct.

[4] Maximum CRA deliveries limited to 1.20 MAF including IID-SDCWA transfer and exchange and canal linings.

[5] Total demands are adjusted to include IID-SDCWA transfer and exchange and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

2.2.2 Recycled Water

MNWD's demands for recycled water continue to increase as new services are connected to the recycled water system. MNWD has identified recycled water as its most cost-effective water supply source. Recycled water represents 18% of MNWD's supply. With the planned expansion of MNWD's recycled water distribution system, recycled water will increase to about 22% of the supply by 2040.

MNWD's recycled water system currently provides irrigation supply to 2,670 meters. MNWD also has 1,290 dedicated potable irrigation meters that present an opportunity for conversion to recycled water supply.

MNWD developed a Recycled Water Master Plan to evaluate existing recycled water demands and provide a projection of ultimate recycled water demands, identify potential non-irrigation customers, assess seasonal and operational storage needs, and evaluate opportunities for MNWD to exchange recycled water supply and production with neighboring agencies. The Recycled Water Master Plan was completed in June 2017.

2.2.3 Baker Water Treatment Plant

The Baker WTP is a new 28.1 MGD plant constructed in 2017 at the existing IRWD Baker Filtration Plant site in the City of Lake Forest. The Baker WTP treats raw imported water from Metropolitan and Irvine Lake. Given that the Baker WTP primarily relies on imported raw water from Metropolitan, it does not create a day-to-day new supply but provides increased water supply reliability to southern Orange County by providing locally treated water to customers of IRWD, ETWD, MNWD, SMWD and Trabuco Canyon Water District (TCWD). It minimizes water supply impacts in the event of emergency conditions or scheduled maintenance on the Metropolitan delivery system such as the Diemer Filtration Plant, Lower Feeder Pipeline or AMP. Additionally, the potential exists for the project participants to receive and treat new supply sources to Irvine Lake, when available. Irvine Lake is supplied by untreated water from Metropolitan and local surface runoff. MNWD has a capacity right of approximately 8.4 MGD (9,400 AFY) from the Baker WTP.

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3 Water Demands

This section provides an overview of MNWD's current and projected population and climate conditions which are the main drivers affecting existing and projected water demands. This section also presents the water demand projected for the Project.

3.1 MNWD Service Area

MNWD provides water to a population of approximately 170,000 customers throughout its service area. The MNWD service area is almost entirely developed encompassing most or parts of six cities in southern Orange County: Aliso Viejo, Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, and San Juan Capistrano.

The MNWD service area varies in elevation between 26 feet above sea level at its lowest point to 934 feet at its highest. Interstate 5 bisects MNWD's service area from north to south, with the higher elevations located on the west side. MNWD is bordered by ETWD to the north, Laguna Beach County Water to the west, SCWD to the south and west, San Juan Capistrano to the south and east, and SMWD to the east.

3.1.1 Population

MNWD's current population is estimated at 171,182. The 2018 service area population estimate was calculated by increasing the 2015 MNWD population of 170,326 (from CDR) by 0.29% per year (the 2018-2019 average population increase for Orange County per CDR). MNWD's service area is largely built-out, and minimal changes in land use are anticipated over the next 20 years.

The 2018 to 2040 projections shown in Table 3-1 are based on the 2010 census. It is expected that the growth within MNWD service area will slow to less than one percent growth every five years through 2040.

Table 3-1: Current and Projected Service Area Population

	2018	2020	2025	2030	2035	2040
Population*	171,812	172,876	174,115	175,512	176,539	177,572

* Center for Demographic Research (CDR) at California State University, Fullerton (2012 & 2019). 2018 population is current and the remaining years are projected.

3.1.2 Climate Conditions

The MNWD service area encompasses portions of south Orange County located in an area known as the South Coast Air Basin (SCAB). The SCAB climate is characterized by a "Mediterranean" climate: a semi-arid environment with mild winters, warm summers and moderate rainfall. Table 3-2 shows recent (2007-2015) climate data for the MNWD service area. The service area's average temperature ranges from 54.2°F in December to 74.5°F in August, with an annual average of 63.0°F. The average annual rainfall is 8.41 inches and the average evapotranspiration (ET_0) is 51.79 inches, which is over six times the annual average rainfall. This translates to a high demand for landscape irrigation for homes, commercial properties, parks, and golf courses. Moreover, a region with low rainfall like Southern California is also more prone to drought conditions.

Table 3-2: Average Climate Conditions (2007-2015)*

Month	Standard Monthly Average ET_0 (inches)	Annual Rainfall (inches)	Monthly Average Temperature (°F)
January	2.60	0.91	56.7
February	2.62	1.53	55.1
March	4.06	0.69	58.0
April	4.94	0.46	60.1
May	5.57	0.33	63.1
June	5.86	0.01	66.3
July	6.29	0.08	70.1
August	6.35	0.00	74.5
September	4.99	0.36	70.7
October	3.83	0.63	66.2
November	2.71	0.91	60.4
December	1.98	2.48	54.2
Annual	**51.79**	**8.41**	**63.0**

* CIMIS Station #75

3.2 Existing Water Demands

MNWD maintains approximately 54,777 customer connections to its potable water distribution system. All connections in the service area are metered. Approximately 52% of dedicated irrigation meters are served with recycled water. The largest irrigation sites were first targeted for recycled water conversion due to the economy of scale in meeting larger water consumers' demands.

Table 3-3 summarizes MNWD's existing water demand for FY 2017-18.

Table 3-3: Current Water Demand (FY 2017-18)

Water Demand Type	Fiscal Year 2017-18 Demand (AFY)
Potable Water	25,656
Recycled Water	6,992
Total	**32,648**

3.3 Projected Water Demands

MNWD's most recently adopted 2015 UWMP did not include projected demands associated with the Project, though, a similar development project (i.e. Agora Arts District Downtown project) had been accounted for at this project location. The Project will result in a net increase of approximately 8 AFY of potable water demand as detailed below.

3.3.1 Projected Water Demands from Town Center Project

The Town Center Project proposes new residential units and the redevelopment of the old Orange County Courthouse site by the end of 2023 and is accompanied by a net increase in water demand for MNWD's residential, commercial, and recycled water landscape irrigation customer sectors.

The project will add 275 multi-family residential (MFR) apartments. These residential units will generate approximately 49,500 gallons per day (gpd) or 55 AFY of potable (indoor) water demands (Table 3-4). Commercial potable (indoor) water demand from the Town Center Project is estimated to generate approximately 81,564 gpd or 91 AFY (Table 3-5). The Town Center Project will have 194,644 sq. ft. (4.47 acres) of landscape areas that will be irrigated with 10,705 gpd (12 AFY) of recycled water (Table 3-6). The Town Center Project will also have outdoor fountains and pools that will use 246 gpd (0.3 AFY) of potable water (Table 3-7).

Table 3-4: Town Center Project's Residential Water Demands Projection

Use Category	Dwelling Units (DU)	Water Demand Factor (gpd/DU)	Potable Water Demand (gpd)	Potable Water Demand (AFY)
MFR Apartment	275	180	49,500	55
Total Residential	**275**	**180**	**49,500**	**55**

Table 3-5: Town Center Project's Commercial Water Demands Projection

Use Category	Water Demand Factor (gpd/ksf)	Estimated Footprint (sq. ft.)	Potable Water Demand (gpd)	Potable Water Demand (AFY)
Commercial/Retail	90	78,800	7,092	8
Library	65	10,100	657	1
Office	65	50,400	3,276	4
Restaurant	1,050	67,180	70,539	79
Total Commercial	**395***	**206,500**	**81,564**	**91**

* Average Water Demand Factor = (Total Future Potable Water Demand) / (Total Future Footprint) = (81,564 gpd) / (206.5 ksf)

Table 3-6: Town Center Project's Recycled Water Demands Projection

Use Category	Water Use Factor (gpd/ksf)	Estimated Footprint (sq. ft.)	Recycled Water Demand (gpd)	Recycled Water Demand (AFY)
Landscape	55	194,644	10,705	12
Total Recycled	**55**	**194,644**	**10,705**	**12**

Table 3-7: Town Center Project's Outdoor Potable Water Demands Projection

Use Category	Water Use Factor (gpd/ksf)	Estimated Footprint (sq. ft.)	Potable Water Demand (gpd)	Potable Water Demand (AFY)
Outdoor Water Feature	55	4,469	246	0.3
Total Outdoor (potable)	**55**	**4,469**	**246**	**0.3**

3.3.2 Projected Water Demands including Town Center Project

Table 3-8 presents the 20-year projected water demand for MNWD (from the 2015 UWMP) with demands from the Town Center Project.

Table 3-8: Projected Water Demands with Town Center Project Demand

Water Demand Type	Fiscal Year Ending Demand (AFY)					
	*2018**	*2020*	*2025*	*2030*	*2035*	*2040*
Potable Water	25,656	28,223	28,064	27,637	27,634	27,690
Recycled Water	6,992	7,692	7,656	7,539	7,539	7,554
Total	**32,648**	**35,915**	**35,719**	**35,176**	**35,172**	**35,243**

* Actual demand for FY 2017-2018

4 Supply and Demand Comparison

This section compares water supply and demand projections to determine whether the total projected supplies available to MNWD will be sufficient to meet the projected demands associated with the proposed Project in addition to MNWD's other existing and planned future uses. Metropolitan's 2015 UWMP affirms that the agency can meet 100% of the supply needs of its member agencies through 2040; as a result, MWDOC concludes in its 2015 UWMP that it will be able to meet 100% of the supply needs of its retail agencies during normal, single-dry, and multiple-dry year conditions over the same period. The assessment is done for the years 2020 to 2040 in five-year increments. The supply-demand analyses include the assessment of average-year, single dry-year, and multiple dry-year hydrologic scenarios.

4.1 Average Year

The average year represents average hydrologic conditions. The total demand presented in Table 4-1 represents the sum of MNWD's existing demand projections and the demand projections for the Project (which imposes a 8 AFY net increase in potable water and 10 AFY net increase in recycled water).

As discussed above, MNWD has rights to receive imported water from Metropolitan, through MWDOC, via the regional distribution system. All imported water supplies identified in this section are available to MNWD from existing water transmission facilities. Table 4-1 shows supply and demand projections under normal year conditions. Additional water supplies are projected to be available from Metropolitan, but are not included here since Metropolitan's projected availability of imported supplies meet or exceed total projected demands for Metropolitan's supplies.

Table 4-1: Projected Average Year Supply and Demand, Including Town Center Demands

	Fiscal Year Ending (AFY)					
	*2018**	*2020*	*2025*	*2030*	*2035*	*2040*
Total Demand	**32,648**	**35,915**	**35,719**	**35,176**	**35,172**	**35,243**
Potable Water	25,656	28,223	28,064	27,637	27,634	27,690
Recycled Water	6,992	7,692	7,656	7,539	7,539	7,554
Total Supply	**42,867**	**40,929**	**44,178**	**44,938**	**45,391**	**45,391**
Potable Water	35,089	32,818	34,168	34,940	35,405	35,405
Recycled Water	7,778	8,111	10,010	9,998	9,986	9,986

* Actual demand/supply for FY2017-18

4.2 Single Dry Year

The impacts of single dry-year conditions on water demands in this WSA were determined by the same methodology provided by MWDOC, and as employed by MNWD in its 2015 UWMP. The single dry-year condition increases the demand from the average condition. The methodology focuses on per-capita usage because it removes the influence of growth from the analysis. To determine the "bump factor," MNWD's per- capita usage from FY 2005-2006 thru FY 2014-2015 were used. The single dry bump factor was derived using the highest per-capita usage in the analysis period, divided by average per-capita usage for that period. MNWD's single dry bump factor is 9 percent using FY 2013-14 as the single dry-year.

Table 4-2 provides supply and demand projections for a single dry water year. As indicated above, additional supplies would be available from Metropolitan, but are not included here because Metropolitan's total projected availability of imported supplies during single dry-year periods meet or exceed total projected demands for those supplies as illustrated in Metropolitan's 2015 UWMP.

Table 4-2: Projected Single Dry-Year Supply and Demand

	Fiscal Year Ending (AFY)					
	*2018**	*2020*	*2025*	*2030*	*2035*	*2040*
Total Demand	**32,648**	**39,147**	**38,934**	**38,342**	**38,337**	**38,415**
Potable Water	25,656	31,445	31,278	30,803	30,798	30,861
Recycled Water	6,992	7,692	7,656	7,539	7,539	7,554
Total Supply	**42,867**	**40,929**	**44,178**	**44,938**	**45,391**	**45,391**
Potable Water	35,089	32,818	34,168	34,940	35,405	35,405
Recycled Water	7,778	8,111	10,010	9,998	9,986	9,986

* Actual demand/supply for FY2017-18

4.3 Multiple Dry Years

The impacts of multiple dry-year conditions on water demands in this WSA were determined by the same methodology provided by MWDOC, and as employed by MNWD in its 2015 UWMP. The multiple dry-year condition increases the demand from the average condition and maintains this elevated demand for three years in a row. It was determined that MNWD's multiple year bump factor was 9 percent. MWDOC determined in its 2015 UWMP projections (based on Metropolitan's 2015 UWMP) that it will be capable of providing its customers all their demands for the multiple dry-year condition from 2015 through 2040. Table 4-3 shows supply and demand projections under multiple dry-year conditions.

Table 4-3: Projected Multiple Dry-Years Supply and Demand

		Fiscal Year Ending (AFY)					
		*2018**	*2020*	*2025*	*2030*	*2035*	*2040*
First Year	**Total Demand**	**32,648**	**39,147**	**38,934**	**38,342**	**38,337**	**38,415**
	Potable Water	25,656	31,445	31,278	30,803	30,798	30,861
	Recycled Water	6,992	7,692	7,656	7,539	7,539	7,554
	Total Supply	**42,867**	**40,929**	**44,178**	**44,938**	**45,391**	**45,391**
Second Year	**Total Demand**	**32,648**	**39,147**	**38,934**	**38,342**	**38,337**	**38,415**
	Potable Water	25,656	31,445	31,278	30,803	30,798	30,861
	Recycled Water	6,992	7,692	7,656	7,539	7,539	7,554
	Total Supply	**42,867**	**40,929**	**44,178**	**44,938**	**45,391**	**45,391**
Third Year	**Total Demand**	**32,648**	**39,147**	**38,934**	**38,342**	**38,337**	**38,415**
	Potable Water	25,656	31,445	31,278	30,803	30,798	30,861
	Recycled Water	6,992	7,692	7,656	7,539	7,539	7,554
	Total Supply	**42,867**	**40,929**	**44,178**	**44,938**	**45,391**	**45,391**

* Actual demand/supply for FY2017-18

4.4 Conclusions

In accordance with the foregoing information and analyses, and the standards set forth by Water Code section 10910, et seq., this WSA concludes that the total projected water supplies available to MNWD during normal, single-dry, and multiple-dry water years over the next 20-year period will be sufficient to meet the projected water demands associated with the proposed Project, in addition to MNWD's existing and planned future uses, including agricultural and manufacturing uses.

Nothing in this WSA is intended to create a right or entitlement to water service or any specific level of water service, nor does this WSA impose, expand, or limit any duty concerning the obligation of MNWD to provide service to its existing customers or to any future potential customers. (Water Code § 10914.) Nor does anything in this WSA prevent or otherwise interfere with MNWD's discretionary authority to declare a water shortage emergency in accordance with Water Code section 350, et seq., and/or to take any and all related or other actions authorized by law.

5 References

Center for Demographic Research (CDR) at California State University, Fullerton. 2012.

Center for Demographic Research (CDR) at California State University, Fullerton. 2019.

California Irrigation Management Information System (CIMIS) *Station #75 Irvine, California* <http://www.cimis.water.ca.gov/>

Malcolm Pirnie/ARCADIS. *Moulton Niguel Water District: 2010 Urban Water Management Plan.* June 2011.

Malcolm Pirnie/ARCADIS. *Municipal Water District of Orange County: 2010 Regional Urban Water Management Plan*. June 2011.

ARCADIS. *Agora Arts District Downtown Water Supply Assessment*. April 2016.

ARCADIS. *Municipal Water District of Orange County: 2015 Urban Water Management Plan*. May 2016.

Metropolitan Water District of Southern California. *2015 Integrated Water Resources Plan.* January 2016.

Metropolitan Water District of Southern California. *2015 Urban Water Management Plan.* June 2016.

Moulton Niguel Water District. Draft *2015 Urban Water Management Plan.* March 2016.

Moulton Niguel Water District. *2015 Urban Water Management Plan.* June 2016.

Moulton Niguel Water District. *Request for Proposals: Water Supply Analysis- City of Laguna Niguel Agora Concept Project*. January 2016.

Municipal Water District of Orange County. *2015 Urban Water Management Plan*. May 2016

PSOMAS. *Feasibility of Alternative Seawater Intakes for the Huntington Beach Seawater Desalination Project.* May 2007.

U.S. Bureau of Reclamation, California Department of Water Resources, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Wildlife, State Water Resources Control Board. *Central Valley Project and State Water Project: Drought Operations Plan and Operational Forecast.* April 8, 2014

Western Regional Climate Center (WRCC) Santa Ana Fire Station, California (047888) <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7888>

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