No. 141, Original

In the

SUPREME COURT OF THE UNITED STATES

STATE OF TEXAS,

Plaintiff,

v.

STATE OF NEW MEXICO and
STATE OF COLORADO,

Defendants.

OFFICE OF THE SPECIAL MASTER

DECLARATION OF ROBERT J. BRANDES, PH.D., IN SUPPORT OF THE JOINT MOTION OF THE STATE OF TEXAS, STATE OF NEW MEXICO, AND STATE OF COLORADO TO ENTER CONSENT DECREE SUPPORTING THE RIO GRANDE COMPACT

November 14, 2022

I, Robert J. Brandes, declare as follows:

I. INTRODUCTION

1. My name is Robert J. Brandes. I am over the age of 18, have personal knowledge of the facts set forth in this Declaration, and if called as a witness could and would testify competently under oath to such facts.

2. I have Bachelor of Science, Master of Science, and Doctor of Philosophy degrees from the University of Texas at Austin, specializing in the general field of water resources for my graduate studies.

3. I have been engaged in consulting practice since the late 1960s specializing in water resources and related environmental disciplines. Today, I own and operate my consulting business, Robert J. Brandes Consulting, in Austin, Texas. My street address is 6000 Maurys Trail, Austin, Texas 78730.

4. A true and correct copy of my professional curriculum vitae is attached to this Declaration (Attachment 1).

5. I have been retained by Somach Simmons & Dunn, Attorneys at Law, on behalf of the State of Texas ("Texas") to provide consulting services pertaining to hydrologic and water resources matters presented in this case.

6. I have been requested to prepare this Declaration to discuss and describe elements of the Effective El Paso Index ("EEPI").

7. I have reviewed the Declaration of William R. Hutchison, Ph.D., filed contemporaneously with my Declaration, and agree with his statements and opinions expressed therein.

II. BACKGROUND

8. The Effective El Paso Index ("Index" or "EEPI") is the methodology the States of Colorado, New Mexico and Texas have agreed upon to ensure that Texas receives its equitable share of Rio Grande Project water as required under the Decree [Section II.B.2] and the Rio Grande Compact ("Compact").

9. On behalf of Texas, I participated as a primary member of the technical review and support committee that assisted the States' counsel in extensive negotiations and drafting of the Consent Decree and supporting Index appendix, including development of the EEPI. I worked closely with counsel on evaluating the Index methodology and the data supporting the calculations for the Index methodology. The States' final Consent Decree and supporting appendix are a result of my work with counsel and other State technical representatives. The statements in this Declaration are my opinions and derived from my direct involvement in developing the Consent Decree and assisting with compilation and analysis of supporting materials.

10. The Rio Grande Project ("Project") is a federal reclamation project, authorized in the Reclamation Act of June 17, 1902, 32 Stat. 390, and the Rio Grande Project Act of February 25, 1905, 33 Stat. 814, operated by the United States through the Bureau of Reclamation and irrigation districts located in New Mexico and Texas. The Project is the means by which Rio Grande Compact water stored in Elephant Butte Reservoir is delivered to users below the reservoir in New Mexico and Texas, and in Mexico.

11. As detailed in Dr. William Hutchison's Declaration, the EEPI methodology includes provisions for calculating the annual volume of Project water

obligated to Texas ("Index Obligation"), the annual volume of water actually delivered to Texas ("Index Delivery"), and the difference between the Delivery and Obligation, both on an annual and accrued basis ("Index Departure").

12. With the EEPI, the annual delivery of Project water to Texas is defined as the Rio Grande flows delivered and measured at the El Paso stream gage[1] plus the depletions to the Rio Grande resulting from agricultural[2] and domestic-commercial-municipal-industrial ("DCMI")[3] water uses in the Texas portion of the Mesilla basin upstream of the El Paso gage, adjusted for excess flows[4] and deliveries to Mexico at the Acequia Madre[5].

13. The relationship and parameters for determining the Index Obligation for annual deliveries of Project water to Texas is based on historical Project operations and conditions during the period from 1951 through 1978. During this period, allotments of Project water to New Mexico and Texas were based on providing an equal amount of Project water per acre of irrigated land in each of the irrigation districts located in New Mexico and Texas, which translates to approximately 57 percent to New Mexico and 43 percent to Texas. Data from this period have been

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[1] *Rio Grande flows at the El Paso stream gage* represents the total volume of Rio Grande surface water measured at the Rio Grande at El Paso stream gage.

[2] The *Texas Mesilla agricultural depletions* represent the annual volume of Rio Grande water depleted (consumed) as applied irrigation in the Texas Mesilla basin, including consumptive use of Rio Grande surface water and hydrologically connected groundwater applied for irrigation, excluding any return flows to the Rio Grande above the Rio Grande at El Paso stream gage and any return flows to the hydrologically connected aquifer.

[3] The *Texas Mesilla DCMI depletions* represent the annual volume of Rio Grande water and hydrologically connected groundwater depleted by groundwater pumping for domestic, commercial, municipal, and industrial uses, including depletions caused by groundwater pumping from the City of El Paso's Canutillo Well Field and from all other DCMI wells (municipalities, self-supplied domestics, mutual domestics, schools, commercial businesses, industrial facilities, and any other non-agricultural uses.

[4] *Excess flow* means Rio Grande flow at the El Paso stream gage, excluding the delivery to Mexico, that cannot be put to beneficial use in Texas.

[5] The *Delivery to Mexico at the Acequia Madre* represents the annual volume of Rio Grande water delivered by the United States to Mexico pursuant to the Convention of 1906

used to develop the Index Obligation equation that relates the required annual deliveries of Project water to Texas at the El Paso stream gage to the annual release from Elephant Butte Reservoir as measured at the Below Caballo Dam stream gage on the Rio Grande.

14. Dr. Hutchison's declaration discusses the details of how the various components of the EEPI have been derived and quantified and then used to develop the Index Obligation equation for determining required deliveries of Project water to Texas. Dr. Hutchison also discusses calculation of the Index Delivery and the different data used to quantify individual components, and he addresses annual Departure values calculated as the difference between the historical Index Delivery and the corresponding Index Obligation.

15. In this Declaration, I discuss various measures incorporated into the EEPI methodology that consider both annual and accrued Departures for assessing and determining compliance with meeting the Index Obligation for deliveries to Texas.

III. INDEX DEPARTURES

16. In a perfect world, the Index Delivery, which is calculated at the end of a calendar year based on current data for the EEPI components, should equal the Index Obligation, which is calculated at the end of the same calendar year based on the 1951-1978 historical relationship between releases from Caballo Reservoir and deliveries to Texas at the El Paso stream gage. Such is not the case, however, considering variations in hydrologic conditions, Project operations, delivery efficiency, travel time and distance from Caballo Dam to the El Paso stream gage, and other factors. Consequently, differences between the Index

Delivery and the Index Obligation (the Departures) are anticipated and are accounted for within the scope of the overall EEPI methodology.

17. For a given calendar year, the Departure is calculated by subtracting the Index Obligation from the Index Delivery. A Positive Departure equates to an over-delivery, and a Negative Departure equates to an under-delivery. The sum of net Positive Departures that occur over several years is referred to as an accrued Positive Departure; conversely, the sum of net Negative Departures that occur over several years is referred to as an accrued Negative Departure.

18. Historical values of annual Departures can be calculated based on historical values of the Index Obligation and the Index Delivery derived with the EEPI equations. I have calculated these Departures for the 1951-2021 period using values of the Index Obligation and Index Delivery derived by Dr. Hutchison. Consistent with provisions in the Decree, I have set the Departures to zero in years when reservoir releases were less than 200,000 acre-feet [Section II.E.1.a] and have also set the accrued Departures to zero in years when Compact spills occurred [Section II.E.4]. For purposes of this Declaration, I refer to these reduced values as "actual" annual and accrued Departures. Using these reduced Departure values allows more meaningful analyses of the effects of other Departure limitations and triggers included in the Decree. These values are plotted on the graph in Figure 1.

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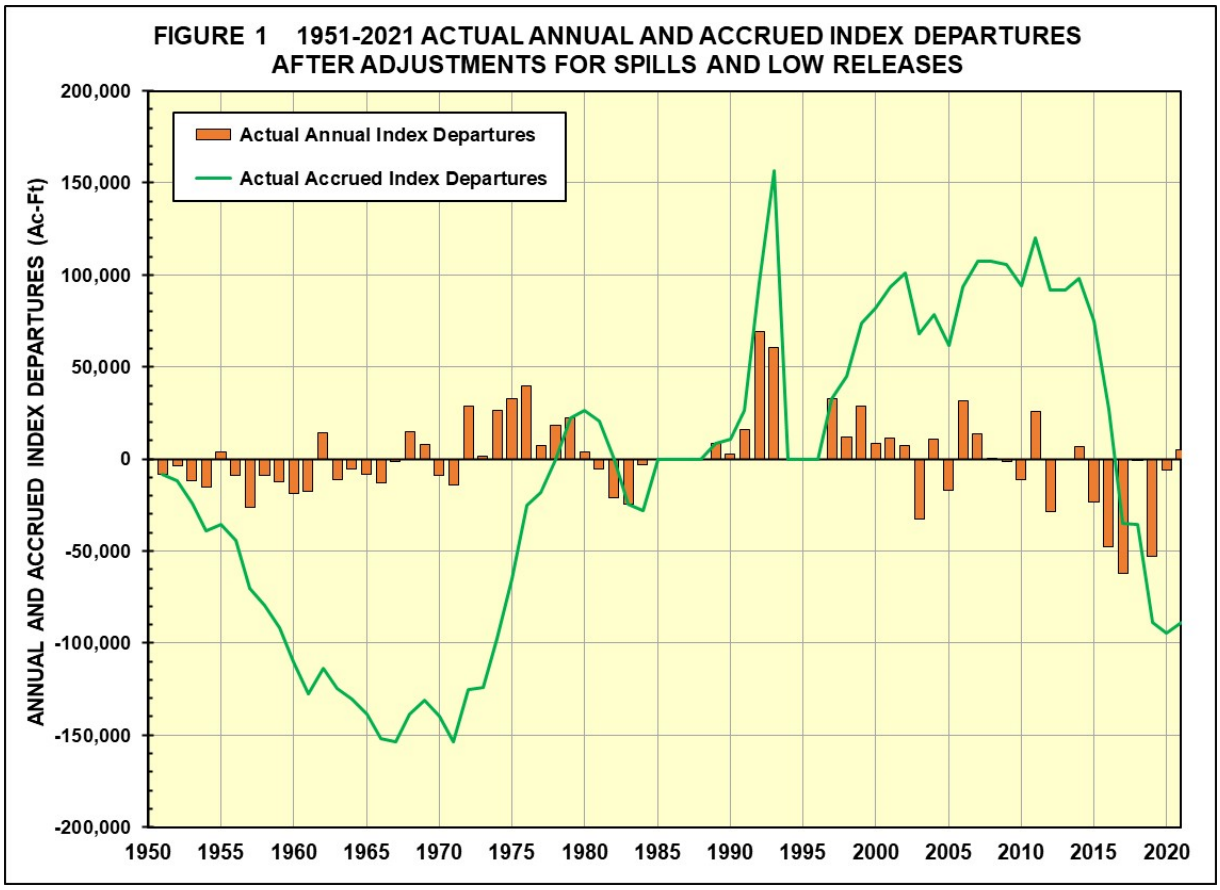


19. On this graph, the plotted bars represent the actual annual Departures, and the solid line represents the actual accrued Departures beginning at zero in 1951 and extending through 2021. While some of these annual Departures are significant, it is important to note that the calculated annual Index Obligation and Delivery values for the 1951-2021 period do not reflect changes in Project operations that will be necessary to be consistent with the Decree; hence, while significant differences between the these Index Obligations and the Index Deliveries are exhibited with these historical data, it is anticipated that these differences are likely to be less once the provisions of the Decree and the EEPI methodology are implemented.

20. As shown in Figure 1, both negative and positive values of the annual Departure occur, generally clustered over multiple years. The Negative Departures are

somewhat indicative of dry conditions with lower river flows and increased delivery losses like during the 1950s and in the most recent years. During the 1980s and 1990s Project water was abundant, and the Project experienced continuous full allocations, which likely contributed to the Positive Departures when releases from Caballo Reservoir may have exceeded actual downstream demands.

21. The data plotted on the graph in Figure 1 illustrate that significant accrued Departures can occur, even after adjusting for spills, and suggest that certain corrective measures are needed as part of the EEPI methodology in order to minimize the adverse effects of extended periods of under-deliveries or over-deliveries.

22. It is important to note that the graph in Figure 1 reflects the nature and extent of Departures based on the 1951-2021 historical period without implementation of the full scope of the EEPI methodology. As detailed in the Declaration of Michael A. Hamman, P.E., filed in this proceeding as part of the resolution of this case, the State of New Mexico has administrative tools and options available at its disposal to meet its obligations under the proposed Decree, and once these measures are implemented by New Mexico, it is expected that the delivery efficiency of the Project with regard to deliveries to Texas will improve.

23. Nonetheless, it is important to limit Negative Departures because they represent shortages in the deliveries of Project water to Texas relative to the Index Obligations, and these under-deliveries are a violation of the Compact if they exceed certain Departure limits and are detrimental to Project water users in Texas.

IV. EEPI OPERATIONAL CONTROLS

24. As illustrated in Figure 1, the historical accrued Departures during the 1951-2021 period reach significant amounts, both negative and positive. The EEPI methodology

incorporates various forms of operational controls that are designed to manage the accrued Departures so that any adverse effects on Project water supplies for either Texas or New Mexico are minimized. A summary of these controls as considered in this Declaration, including rationale for the adopted limits and how the controls are intended to work, are included in the following paragraphs.

25. Limit on Accrued Negative Departure – The upper limit for accrued Negative Departures is set at 150,000 acre-feet for the first five years after entry of the Decree and 120,000 acre-feet thereafter [Section II.C.3.a(i) and (iii)]. Reducing the limit after five years is considered appropriate as New Mexico plans to implement water management strategies that will improve consistency between annual Index Deliveries and annual Index Obligations, thus reducing annual and accrued Departures. As stated in the Decree, exceeding these upper limits on accrued Negative Departures for three consecutive years is considered a violation of the Decree and the Compact by New Mexico, which subjects New Mexico to delivery makeup procedures in addition to other corrective measures included in the EEPI methodology [Section II.C.3.b]. The value of 150,000 acre-feet is based on the historical maximum accrued Negative Departure during the period 1951 through 1978 (see Figure 1), and this approach is consistent with the procedures used to develop the debit limits for Colorado and New Mexico in Article VI of the Compact. Project operations data from the 1951-1978 period have been used as the basis for the relationships and parameters incorporated into the calculation process for the Index Obligation and the Index Delivery, so it is reasonable to use this period for establishing the upper limit on accrued Negative Departures.

26. Cap on Annual Negative Departure - This is set at 112,500 acre-feet for the first five years after entry of the Decree and 90,000 acre-feet thereafter [Section II.C.3.a(ii) and

(iv)]. Again, reducing the limit after five years is considered appropriate as water management strategies will be adopted and implemented by New Mexico. This cap on the annual Negative Departure is consistent with the cap on New Mexico's annual debits in Article VI of the Compact. The cap on the annual debit applied to New Mexico's accrued credit or debit balance under Article VI is equal to 75 percent of New Mexico's maximum accrued debit of 200,000 acre-feet. Similarly, the limits on the annual Negative Departure are equal to 75 percent of the limits on the accrued Negative Departure.

27. Cap on Annual Positive Departure – This is set at 67,500 acre-feet [Section II.C.2]. Having a limit on the annual Positive Departure (over-deliveries to Texas) is consistent with Article VI of the Compact, which has a cap on the annual credit applied to Colorado or New Mexico's accrued debit or credit balance. This lower limit relative to the higher annual limits on the annual Negative Departure is considered justified as it reflects expectations that the Project will be able to be operated more efficiently with regard to minimizing over-deliveries to Texas.

28. Adjustments for Compact Spill – Consistent with Article VI of the Compact which provides for cancelling all accrued debits of Colorado or New Mexico in the event of an actual spill at Elephant Butte Reservoir, or at the time of a hypothetical spill as determined by the Rio Grande Compact Commission, all accrued Departures, both Positive and Negative, are extinguished at the end of a year with a Compact spill [Section II.E.4].

29. Suspension of EEPI During Low Project Supply – When the annual release from Caballo Reservoir is less than 200,000 acre-feet, no Index Obligation or Index Delivery is calculated, and the Departure for that year is set equal to zero [Section II.E.1.a]. Under this condition of low releases from Caballo Reservoir, no meaningful relationships between

releases and deliveries to Texas could be discerned from historical Project operations data; therefore, ad hoc releases will be made consistent with the 57/43 split of Project water between New Mexico and Texas.

30. Cancellation of Accrued Negative Departures – In any year in which the three-year rolling average of the end-of-year allocation balance for the irrigation district in Texas is greater than 180,000 acre-feet, any accrued Negative Departure is cancelled, and the accrued Departure for that year is set equal to the annual Departure for that year [Section II.C.3.c]. If the irrigation district in Texas has maintained a three-year average allocation balance in excess of 180,000 acre-feet, it is reasonable that the district has been able to meet its water demands for three consecutive years and has conserved water to meet its demands in the subsequent year.

31. Upper Limit on Release from Caballo Reservoir – When the annual release from Caballo Reservoir is 790,000 acre-feet or greater, the Index Obligation is calculated using 790,000 acre-feet for the annual release [Section II.E.1.b].

V. EEPI OPERATIONAL TRIGGERS

32. While the EEPI operational controls provide limits on annual and accrued Departures, there are other parameters included with the EEPI methodology that serve as triggers to indicate when certain corrective measures must be implemented to minimize the possibility of reaching the Departure limits. These are discussed below.

a. Accrued Negative Departure Trigger – If the accrued Negative Departure exceeds 80,000 acre-feet at the end of a calendar year, then the following corrective measures are required:

i. New Mexico must implement water management actions to reduce the accrued Negative Departure to 16,000 acre-feet or below within three calendar years after the trigger is reached [Section II.D.2.a]. With the agreement of Texas, New Mexico can transfer part of its annual apportionment from the irrigation district in New Mexico to the irrigation district in Texas to reduce the accrued Negative Departure to 16,000 acre-feet or less. Examples of water management activities that New Mexico is considering are outlined in the Declaration of Michael A. Hamman, P.E.

ii. If New Mexico has not reduced its accrued Negative Departure to 16,000 acre-feet or less during the first three calendar years after the trigger is reached, then during the next three calendar years (years 4-6 after trigger is reached) part of New Mexico's annual apportionment is transferred from the irrigation district in New Mexico to the irrigation district in Texas to reduce the accrued Negative Departure to 16,000 acre-feet or less [Section II.D.2.b]. Transfers and associated Index adjustments will be tracked in a Texas Escrow Account. The irrigation district in Texas has three calendar years from the last year of apportionment transfer to use the Project water transferred from the irrigation district in New Mexico; otherwise, the Escrow Account balance will be set to zero [Section II.D.2.c].

b. Accrued Positive Departure Trigger – If the accrued Positive Departure exceeds 30,000 acre-feet for two consecutive calendar years, then the following corrective measures are required:

i. During the next three calendar years part of Texas's annual apportionment is transferred from the irrigation district in Texas to the irrigation district in New Mexico to reduce the accrued Negative Departure to 16,000 acre-feet or less [Section II.D.3.a].

ii. Transfers and associated Index adjustments will be tracked in a New Mexico Escrow Account. The irrigation district in New Mexico has three calendar years from the last year of apportionment transfer to use the Project water transferred from the irrigation district in Texas, otherwise the New Mexico Escrow Account will be set to zero [Section II.D.3.b].

VI. APPLICATION OF EEPI METHODOLOGY

33. In paragraphs 17 and 20 of this Declaration I explained briefly why the historical annual and accrued Departures are not likely to be repeated if the EEPI methodology is adopted by the Court. I used the historical Project operations data used to produce the graph in Figure 1 also to provide a means to apply and test the EEPI operational controls and triggers described in Sections IV and V above. I have prepared an Excel workbook to perform these calculations for the 1951-2021 period. For simplification, I have assumed that adjustments to accrued Departures involving transfer of part of the apportionment for New Mexico or Texas to the irrigation districts are made during the first three years after the accrued Departure trigger is reached as described in Paragraphs 30.a and 30.b above. Provisions in the Decree

allow New Mexico the option to make these apportionment transfers instead of implementing water management actions to reduce Negative Departures [Section II.D.2.a]. Also, I have assumed that the analyzed conditions begin after the first five years after entry of the Decree so that only the lower values of the maximum annual Negative Departure (90,000 acre-feet) [Section II.C.3.a(iv)] and the maximum accrued Negative Departure (120,000 acre-feet) [Section II.C.3.a(iii)] are engaged.

34. The resulting adjusted accrued Departure curve is plotted on the graph in Figure 2 along with the same actual accrued Departure curve shown on the graph in Figure 1.

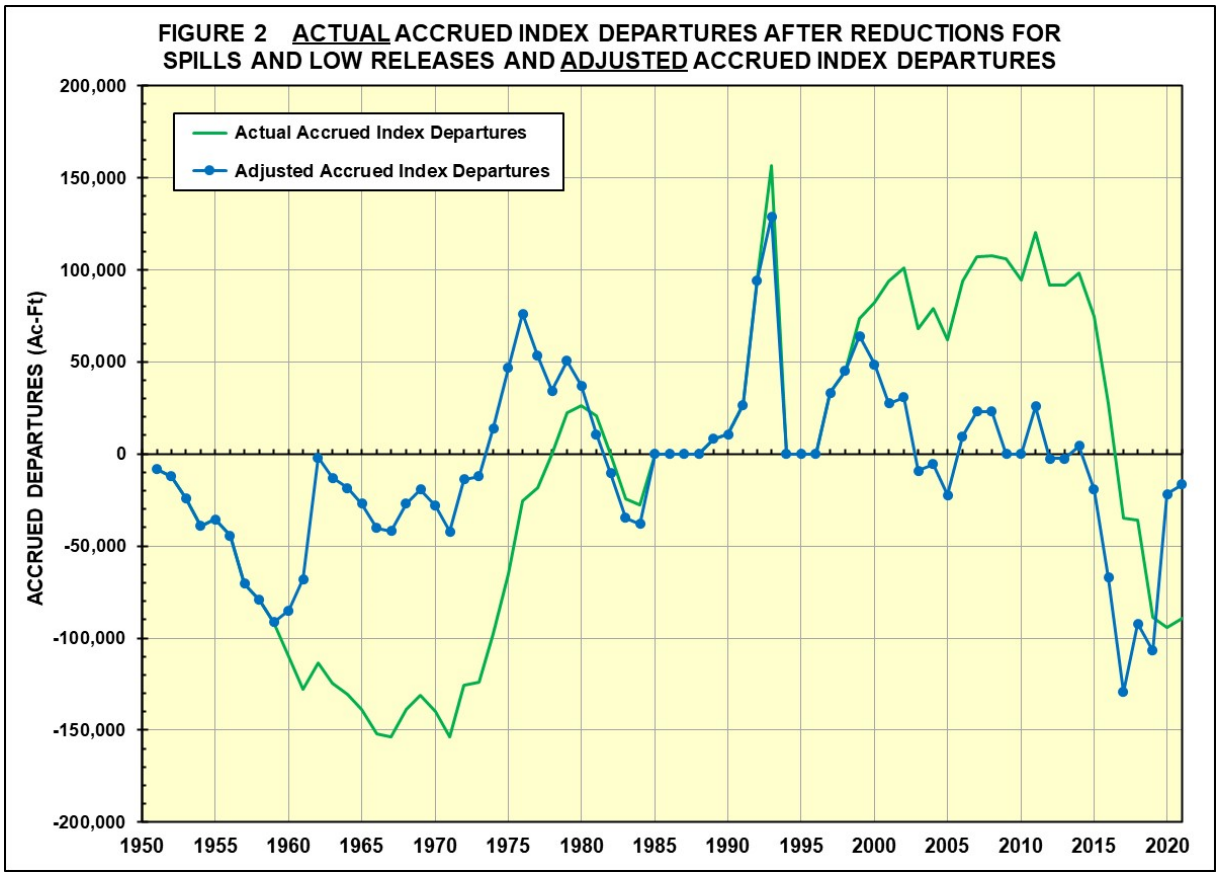
35. As expected, the adjusted accrued Departure curve shown in Figure 2 exhibits reduced maximum negative and positive accrued Departures compared to the actual accrued Departure curve. These reductions result from the apportionment transfers made in response to reaching the accrued Departure triggers and from adjustments made to satisfy the EEPI operational controls.

36. Specific adjustments made to produce the adjusted accrued Departures values plotted in Figure 2 in response to certain operational controls include the following:

a. The annual Departures are set to zero for years with Compact spills. These occur in 1985 through 1988 and in 1994 through 1996.

b. The accrued Negative Departures are set to zero for years when the three-year rolling average of the end-of-year allocation balance for the irrigation district in Texas is greater than 180,000 acre-feet. This occurs in 2009 and 2010.

c. The annual Departure is set to zero for years when the annual release from Caballo Reservoir is less than 200,000 acre-feet. This occurs in 2013.



d. There are no years in which the annual Negative Departures exceed the maximum limit of 90,000 acre-feet, and 1992 is the only year when the cap on annual Positive Departures of 67,500 acre-feet is exceeded (69,077 acre-feet). This value has been replaced with the cap of 67,500 acre-feet.

e. There is one year when the accrued Negative Departures exceed the annual limit of 120,000 acre-feet. This occurs in 2017; however, no

action is required because this limit is not exceeded for three consecutive years as required by the Decree.

37. The annual transfers of apportionments to New Mexico and to Texas that have been made in response to reaching the triggers for accrued Departures are plotted as bars on the graph in Figure 3. As shown on the graph, the apportionment transfers to Texas are made during periods when the higher values of the accrued Negative Departures occur and the trigger of 80,000 acre-feet is reached, whereas the apportionment transfers to New Mexico are made during periods when the higher values of the accrued Positive Departures occur and the two-year average trigger of 30,000 acre-feet is reached. For this application of the EEPI methodology for the 1951-2021 period, the total amount of apportionment transferred to Texas is 278,382 acre-feet during two periods, and the total amount of apportionment transferred to New Mexico is 288,677 acre-feet during three periods.

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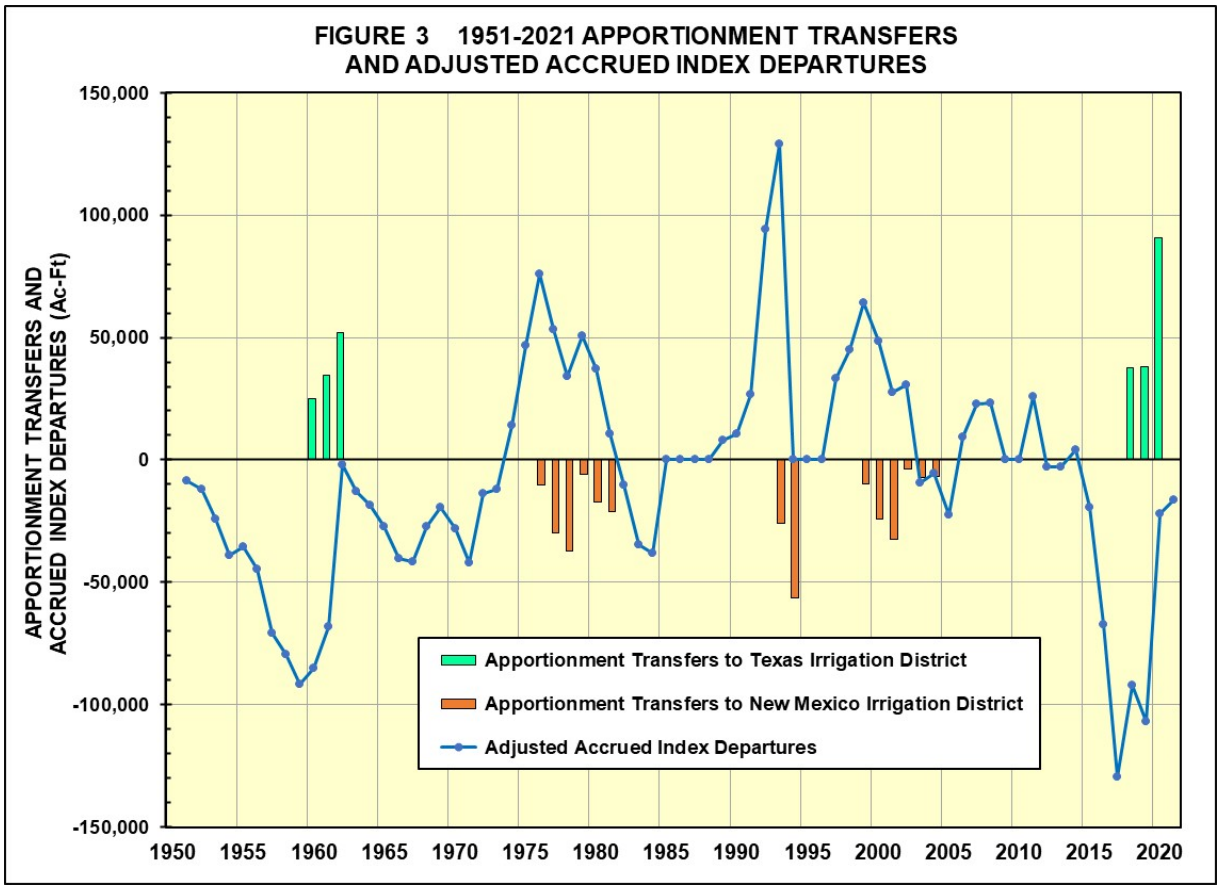

VII. OPINION REGARDING EEPI METHODOLOGY

38. Based on my evaluation and analysis of the EEPI methodology, I am confident that this Index approach is sound and provides a comprehensive procedure for ensuring that deliveries of Project water to Texas will be equitable and will effectively account for under-deliveries to Texas that occur as a result of the depletions of Rio Grande flows caused by groundwater pumping downstream of Caballo Reservoir in New Mexico. Furthermore, New Mexico is protected from excessive over-deliveries of Project water to Texas with apportionment transfers once certain maximum limits are exceeded. Finally, I consider the

EEPI methodology to be an achievable procedure for New Mexico to ensure that Texas receives its equitable apportionment of Project water.

39. I declare under penalty of perjury that the foregoing is true and correct.

Executed this 12th day of November 2022, at Austin, Texas.

Robert J. Brandes, Ph.D.

ATTACHMENT 1

Robert J. Brandes Consulting

Professional Resume

ROBERT J. BRANDES

PERSONAL DATA

Birthplace: East Bernard, Texas
Home Address: 6000 Maurys Trail
Austin, Texas 78730

EDUCATION

Pre-Engineering Curriculum, Southwestern University, 1962-1964
B. S., Civil Engineering, The University of Texas at Austin, 1967
M. S., Civil Engineering, The University of Texas at Austin, 1968
Ph.D., Water Resources, The University of Texas at Austin, 1972

HONORS

Tau Beta Pi, Chi Epsilon, Sigma Xi

EXPERIENCE

Dr. Brandes has been engaged in consulting engineering practice in Texas since the late 1960s, specializing in water resources and related engineering and environmental disciplines. He has represented numerous private, commercial, and governmental entities, providing various planning, analysis, permitting, design, and operational services for a wide range of water projects. He has directed and conducted numerous studies and investigations dealing with surface and ground water hydrology and hydraulics; water resources planning and development; water availability modeling (WAMs), water rights permitting and related issues; municipal, industrial and agricultural water supply; reservoir system operations; rural and urban flooding and stormwater management; water quality; irrigation system analyses; project site development; and environmental impact assessments. His experience encompasses a wide variety of problems involving rivers and streams, lakes and reservoirs, ground water aquifers, wetlands, and bays and estuaries, and he is especially familiar with the development and application of computerized simulation techniques for analyzing water-related phenomena in these systems. Dr. Brandes has prepared and presented testimony and served as an expert witness in judicial proceedings in state and federal courts and in administrative and regulatory hearings conducted by the State Office of Administrative Hearings and Texas natural resources agencies, as well as the Texas Legislature.

PUBLICATIONS

Dr. Brandes has authored or co-authored numerous technical documents and project reports, and he has presented many technical papers and lectures pertaining to water resources and water rights at professional society meetings, water conferences and short courses.

COMMITTEES

Dr. Brandes has served on several committees appointed by Texas state agencies and professional associations dealing with water rights, wastewater reuse, water supply planning, and environmental flow issues. He was chairman of the Science Advisory Committee for the Legislative-appointed Study Commission on Water for Environmental Flows and the Science Advisory Committee for the Governor-appointed Environmental Flows Advisory Committee, and he was vice-chair for the Senate Bill 3 Texas Environmental Flows Science Advisory Committee. He currently is a director and past president of the Texas Water Conservation Association and has served as flood response committee chairman, surface water committee co-chair, water availability modeling committee co-chair, and finance committee member.

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers
Texas Water Conservation Association
American Water Resources Association
American Academy Water Resources Engineers

6000 Maurys Trail
Austin, Texas 78730

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Email: rjbobbrandes@gmail.com

PROFESSIONAL HISTORY

2008 to Present	Principal and Owner; Robert J. Brandes Consulting; Austin, Texas.
2008 to 2015	Senior Consultant; Atkins (formerly PBS&J); Austin, Texas.
2005 to 2008	Principal; TRC/R. J. Brandes Company, Consulting in Water Resources; Austin, Texas.
1994 to 2018	Principal and Director; Crespo Consulting Services, Inc.; Austin, Texas.
1992 to 2005	Principal and Director; Terra Dynamics, Inc.; Austin, Texas.
1984 to 2005	Principal and Owner; R. J. Brandes Company, Consulting in Water Resources; Austin, Texas.
1975 to 1984	Associate and Vice President; Camp Dresser & McKee Inc.; Austin, Texas.
1971 to 1980	Associate, Senior and Principal Engineers and VP; Water Resources Engineers; Austin, Texas.
1970 to 1971	Special Consultant; F. Barry Haskett Investments/Aquarius, Inc.; New York, NY and Zurich, SUI
1968 to 1971	Associate; Frank D. Masch & Associates; Austin, Texas.
1967 to 1970	Research Engineer/Scientist; The Univ. of Texas at Austin, Depart. of Civil Engr.; Austin, Texas.

REPRESENTATIVE PROJECT ASSIGNMENTS

- For the Texas Commission on Environmental Quality, directed and worked on update of the hydrologic data base for the State's water availability model of the Texas and Mexico portions of the Rio Grande Basin.

- For Riverbend Water Resources District, developed naturalized flows for extension of the hydrologic data base for Run 3 and Run 8 versions of the water availability model for the Sulphur River Basin and modified existing water availability models to represent current water rights conditions.

- Directed and performed water availability and project operation studies for the Unappropriated Flows Permit sponsored by the Lower Colorado River Authority, including development and evaluation of alternative project configurations and components, applying water availability models, investigating numerous environmental flow scenarios, working with state regulatory and resource agencies as part of water rights permitting, and coordinating work with client, other project team members, and various environmental groups.

- Directed and performed reservoir water availability and firm yield studies, conceptual dam and spillway design, and project mitigation planning and analyses for the proposed Lake Ralph Hall on the North Sulphur River in Fannin County, Texas, for the Upper Trinity Regional Water District, including preparation of supporting documents for the water rights permit application, coordination of permitting activities with the TCEQ, and presentation of expert testimony in the SOAH permit hearing.

- Directed and performed water availability and project operation studies for the Excess Flow Optimization Project sponsored by the Tarrant Regional Water District, including development and evaluation of alternative project configurations and components, applying water availability models, investigating numerous environmental flow scenarios, preparation of water rights permit application, working with TCEQ as part of water rights permitting, updating District's accounting plan to reflect new permits and amendments, and coordinating work with client and other project team members.

- Served as a special consultant to the State of Texas and the International Boundary and Water Commission through the Texas Water Development Board and the Texas Natural Resource Conservation Commission regarding water deficits incurred by Mexico under the 1944 Treaty between the United States and Mexico and participated in negotiations between the two countries.

- Directed and performed long-range water supply planning for the Lower Colorado River Authority, including analysis of future municipal, industrial and power water demands, identification and evaluation of numerous supply alternatives, and consideration of alternative means for satisfying environmental flow requirements.

- Performed water supply studies for Dow Chemical Company in Brazoria County, Texas, including analysis of DOW's historical and projected water demands and supplies, modification and application of the TCEQ's Brazos Basin water availability model for evaluations of DOW's existing and proposed water supply system, investigated reservoir storage and river pumping requirements to meet specific levels of water demands considering river salinity effects, and provided expert testimony in SOAH permit hearings.

- For City of San Angelo, Texas, provided consulting assistance with several water rights amendments, including water availability analyses, preparation of applications, processing of amendments through TCEQ, expert testimony, and preparation and maintenance of accounting plan for all of the City's water rights.

- Developed naturalized streamflows for the Sulphur, Sabine, Colorado, San Bernard, and Rio Grande River Basins and for the Brazos-Colorado and Nueces-Rio Grande Coastal Basins for the Texas Commission on Environmental Quality as part of the Senate Bill 1 water availability modeling program and direction application of the Texas A&M Water Rights Analysis Package to develop water availability models (WAMs) and simulate water availability for existing water rights under different flow conditions, assumed water rights cancellation, and various levels of wastewater reuse.

- For Lake Chapman water users, performed firm yield analyses of the reservoir and developed an accounting plan to provide an equitable distribution and use of inflows to and storage in the reservoir and to allow equal access to the available water supply from the reservoir among water rights holders and users.

- Directed and performed surface water availability studies for the Lower Colorado River Authority/San Antonio Water System joint Water Supply Project, including development and evaluation of alternative project configurations and components, developing and applying various water availability models to test alternatives, and coordinating work with LCRA/SAWS and project team members and making public presentations.

- Provided hydrologic and water rights permitting support for amendment of Tarrant Regional Water District's permits for diversion of upper Trinity Basin return flows from the Trinity River into Richland-Chambers Reservoir and Cedar Creek Reservoir in order to develop additional firm supply for TRWD customers.

- For the City of Irving, performed assessment of existing water rights and applications for water supplies from Lake Hugo and Kiamichi Creek in Oklahoma, developed and applied water availability model for Kiamichi Basin to assess Lake Hugo firm yield and reliability of water supplies from reservoir under different operating plans, and prepared documentation of findings and study results.

- Performed hydrology, water quality and water supply system operations studies for the Texas Attorney General's Office to support potential Federal litigation regarding the use and ownership of water from the Rio Grande Project in Texas and New Mexico, including the development of a quantity and quality routing models of Project operations.

- For a public power company, evaluated availability and reliability of cooling water supplies for potential power plant projects in the Colorado and Guadalupe River Basins, including application of basin water availability models and simulation of off-channel reservoir operations under different water demand conditions.

- For the Lavaca-Navidad River Authority, examined increased water supplies for industrial users through joint operation of Lake Texana in the Lavaca River Basin with other surface water rights in adjacent basins, including conceptual design and analysis of an off-channel reservoir and development of operating procedures.

- Served as special consultant to the Lower Colorado River Authority with negotiations with the City of Austin to develop a joint settlement agreement regarding future use of water rights and available water supplies, including return flows, from the Colorado River for the next 100 years.

- Served as special consultant to the Lower Colorado River Authority with negotiations with the South Texas Nuclear Project to develop a joint settlement agreement regarding future use of water rights and a dependable supply of water from the Colorado River for the life of the project.

- Served as a special consultant to the International Boundary and Water Commission to provide assistance with review of water conservation plans and other strategies proposed by Mexico to alleviate its water deficit under the 1944 Treaty between the United States and Mexico.

- For the Lower Colorado River Authority, performed water availability analyses and modeling to assess water supplies and strategies in support of regional water supply planning undertaken pursuant to Senate Bill 1 of the 75th Texas Legislature for the Lower Colorado Regional Planning Study (Region K).

- Performed water supply systems operations analyses and water rights/environmental permitting for the proposed Brownsville Weir and Reservoir Project on the Lower Rio Grande, including computer simulations of the hydrologic behavior and performance of the proposed project considering daily historical sequences of streamflows; preparation of an environmental assessment; state water rights and federal 404 permitting support; and meetings and negotiations with regulatory agencies, protestants, and Mexican representatives.

- Directed and performed water availability studies as part of a multidisciplinary team of consultants for the Lower Guadalupe Water Supply Study that was jointly sponsored by the San Antonio River Authority, San Antonio Water System and Guadalupe-Blanco River Authority, including evaluation of alternative project scenarios, applying water availability models, coordinating work project team, and making public presentations.

- Investigated existing and projected surface water supplies and demands for municipal, industrial and irrigation users in the lower and middle Rio Grande Basin, including reservoir simulations and yield analyses under alternative reservoir operating plans and storage allocations, and evaluated Mexican Rio Grande water deficits under the 1944 Treaty, as part of the eight-county Rio Grande Regional Water Planning Study (Region M).

- Represented the State of Texas as a consultant and expert for the State Attorney General's Office regarding State ownership of land in the Texas Panhandle along the Canadian River in a dispute over oil and gas royalties and definition of State property boundary.

- For the City of San Antonio, evaluated alternative scenarios for maintaining springflow conditions required for preservation of endangered species at Comal and San Marcos Springs, analyzed stream channel and spring run hydraulics at Comal Springs, and presented expert witness testimony in Federal District Court.

- Provided consulting assistance to a private water right holder with determining losses and operating procedures associated with adding new diversion points on the Rio Grande in Maverick and Webb Counties for diverting approximately 8,000 acre-feet/year of water for municipal use that was previously authorized for irrigation use near Presidio, Texas upstream of Lake Amistad and assisted with TCEQ permitting activities.

- Inventoried surface and ground water supply sources and facilities on the 21,000-acre Indio-Faith Ranch on the Rio Grande in Maverick and Dimmitt counties in South Texas and developed recommendations and a plan for joint use of the available water supplies and water facilities by two entities owning different parts of the ranch.

- Investigated flooding in Big Fossil Creek watershed caused by upstream development in city of Saginaw and provided expert witness support and testimony for plaintiffs in Tarrant County, Texas law suit.

- Analyzed domestic and agricultural water demands for 112,000-acre Comanche Ranch in Maverick County, Texas, developed water supply plans and facility designs for providing Rio Grande water to meet ranch water demands, and assisted with implementation of various water supply strategies and facilities.

- Analyzed potential downstream flooding caused by warehouse and drainage projects implemented by City of Fredericksburg, represented City in law suits, and developed mitigation measures used in settlement proceeding.

- Evaluated the impacts of upstream artificial recharge projects in the Edwards Aquifer recharge zone on the yield and operations of City of Corpus Christi's reservoirs in the Nueces River Basin, including examination of bay and estuary inflows and system operation with other sources of water supply.

- Analyzed future water supply availability for the Lower Neches Valley Authority considering existing municipal, industrial and irrigation water rights in the Neches River Basin and Federal hydropower water requirements at Sam Rayburn Reservoir, including application of the Neches water availability model.

- Served as special consultant to the Texas Natural Resource Conservation Commission for the evaluation and analyses of various water rights and water resources management models as part of technical advisory team to select a general modeling approach pursuant to the requirements of Senate Bill 1 of the 75th Texas Legislature.

- Analyzed the feasibility (yield and cost) of constructing and operating off-channel reservoir projects for developing new municipal water supplies at various locations throughout the San Antonio and Guadalupe River Basins as part of the South Central Texas Regional Water Planning Study (Region L).

- Investigated causes of flooding of Republic Bank Towers in Dallas, Texas during severe rainfall event for plaintiffs in law suit in Dallas County District Court, including definition of contributing drainage areas, analysis of street inflows to lower level parking areas, and presentation of expert deposition testimony.

- Performed hydrology, hydraulics, drainage and flood control studies and investigations for the City of Fredericksburg as part of a TWDB-sponsored regional flood prevention plan for the City and surrounding area, including drafting of stormwater ordinances, preparation of a drainage criteria manual, and facilities design.

- Performed hydrologic and water rights investigations for the Dallas County Park Cities Municipal Utility District to evaluate the ability of Lake Grapevine in the upper Trinity River Basin to provide a firm water supply under various operating rules and demand scenarios involving other existing water right holders.

- Analyzed surface water issues related to a Medina Lake water rights amendment for the Bexar-Medina-Atascosa Counties Water Control and Improvement District, including analysis of release requirements for instream uses below the lake, evaluation of reservoir yield and operations, and examination of reservoir water quality impacts.

- Analyzed stream flooding and erosion using HEC-2 backwater program and sediment transport methods for the City of Austin on lower Walnut Creek to evaluate the potential erosion impacts of the City's treated wastewater effluent on an adjacent property owner and presentation of expert witness testimony for defendant in Travis County District Court.

- Performed hydrologic and hydraulic investigations involving floodplain reclamation, hydraulic design of flood control facilities, and runoff and flooding simulations for a 2,000-acre residential and commercial development on the West Fork of the Trinity River in Tarrant County, Texas, including Section 404 permitting support.

- Performed hydrology and hydraulic studies of the potential impacts of sand and gravel dredging operations proposed by Sand Supply, Inc. on or near the Brazos River in Fort Bend County, Texas, and the Colorado River in Fayette County, Texas, including assistance with acquisition of permits from the Texas Parks and Wildlife Department, the Texas Natural Resource Conservation Commission and the U. S. Army Corps of Engineers.

- Performed hydrologic and hydraulic studies of runoff control and wastewater retention facilities for confined animal feeding operations (feedlots and dairies) and simulation of combined runoff storage and irrigation operations for effective disposal of contaminated waters under state and federal laws and rules, including analyses for facilities in Erath and Maverick Counties, Texas.

- Performed water quality impact analyses and nonpoint source pollution studies for the Brownsville Public Utilities Board pertaining to a proposed raw water pipeline diversion from a series of existing storage lakes and resacas, including field data collection and water quality sampling, runoff and pollutant transport modeling for a 50-year historical period, and projections of water quality conditions with and without the project.

ATTACHMENT 2

ANALYSIS OF EEPI DEPARTURE ACCOUNTING

Brandes, 11/03/22

INPUT DATA	-90,000	Maximum Annual Negative Departure
	67,500	Maximum Annual Positive Departure
	-120,000	Maximum Accrued Negative Departure (3-Year Average)
	180,000	EP1 3-Year Average Carryover Trigger for Resetting Accrued Negative Departures to Zero
	-80,000	NM Action Trigger for Reducing Accrued Negative Departures
	30,000	RG Project Action Trigger for Reducing Accrued Positive Departures (2-Year Average)
	-16,000	Target for Reducing Accrued Negative Departures After NM Action Trigger Exceeded
	16,000	Target for Reducing Accrued Positive Departures After RGP Action Trigger Exceeded

NOTES

- Denotes Spill Years
- Denotes Extreme Dry Year (< 200K Release)
- Denotes Limit on Annual Positive Departure Exceeded
- Denotes EP1 3-Year Average Carryover Limit Exceeded
- Denotes Maximum Accrued Negative Departure Exceeded

Maximums	
-62,142	
67,500	

Total	Total
278,382	-288,677

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Year	Index Obligation Hutchison Nov. 2022	Annual Delivery Hutchison Nov. 2022	Actual Departure	Accrued Departure	Low Release Year < 200K 1 = Yes 2 = No	Spill Year 1 = Yes 2 = No	Actual Annual Departure Low Release & Spill Years Figure 1	Actual Accrued Departure Low Release & Spill Years Figure 1	Adjusted Annual Departure After Adjust. for < B3 or > B4	Annual Carryover by EP1	3-Year Average Carryover	Adjusted Accrued Departure 3-Year Ave. Carryover > B6	Allocation Transfer Factor	Annual Allocation Transfer	Adjusted Accrued Departure After Alloc. Transfers Figures 2&3	Allocation Transferred to Texas Figure 3	Allocation Transferred to New Mexico Figure 3
1950																	
1951	258,597	250,162	-8,435	-8,435	2	2	-8,435	-8,435	-8,435			-8,435	0.000	0	-8,435	0	0
1952	266,475	262,830	-3,646	-12,081	2	2	-3,646	-12,081	-3,646			-12,081	0.000	0	-12,081	0	0
1953	267,462	255,539	-11,923	-24,004	2	2	-11,923	-24,004	-11,923			-24,004	0.000	0	-24,004	0	0
1954	127,503	112,336	-15,167	-39,171	2	2	-15,167	-39,171	-15,167			-39,171	0.000	0	-39,171	0	0
1955	83,103	86,776	3,673	-35,499	2	2	3,673	-35,499	3,673			-35,499	0.000	0	-35,499	0	0
1956	93,379	84,461	-8,918	-44,417	2	2	-8,918	-44,417	-8,918			-44,417	0.000	0	-44,417	0	0
1957	169,785	143,677	-26,108	-70,524	2	2	-26,108	-70,524	-26,108			-70,524	0.000	0	-70,524	0	0
1958	352,118	343,379	-8,740	-79,264	2	2	-8,740	-79,264	-8,740			-79,264	0.000	0	-79,264	0	0
1959	366,515	354,340	-12,175	-91,439	2	2	-12,175	-91,439	-12,175			-91,439	0.000	0	-91,439	0	0
1960	369,503	350,845	-18,659	-110,098	2	2	-18,659	-110,098	-18,659			-110,098	0.333	-25,121	-84,977	25,121	0
1961	301,808	284,237	-17,572	-127,670	2	2	-17,572	-127,670	-17,572			-127,670	0.500	-34,488	-68,060	34,488	0
1962	329,390	343,387	13,997	-113,673	2	2	13,997	-113,673	13,997			-113,673	1.000	-52,060	-2,003	52,060	0
1963	274,139	263,136	-11,003	-124,676	2	2	-11,003	-124,676	-11,003			-124,676	0.000	0	-13,006	0	0
1964	107,705	102,136	-5,569	-130,245	2	2	-5,569	-130,245	-5,569			-130,245	0.000	0	-18,575	0	0
1965	217,968	209,536	-8,432	-138,677	2	2	-8,432	-138,677	-8,432			-138,677	0.000	0	-27,007	0	0
1966	302,813	289,663	-13,149	-151,826	2	2	-13,149	-151,826	-13,149			-151,826	0.000	0	-40,157	0	0
1967	239,984	238,423	-1,561	-153,387	2	2	-1,561	-153,387	-1,561			-153,387	0.000	0	-41,717	0	0
1968	246,403	261,080	14,677	-138,711	2	2	14,677	-138,711	14,677			-138,711	0.000	0	-27,041	0	0
1969	330,675	338,402	7,726	-130,984	2	2	7,726	-130,984	7,726			-130,984	0.000	0	-19,315	0	0
1970	345,864	337,190	-8,674	-139,658	2	2	-8,674	-139,658	-8,674			-139,658	0.000	0	-27,989	0	0
1971	266,048	251,881	-14,167	-153,825	2	2	-14,167	-153,825	-14,167			-153,825	0.000	0	-42,155	0	0
1972	132,211	160,657	28,446	-125,379	2	2	28,446	-125,379	28,446			-125,379	0.000	0	-13,709	0	0
1973	278,533	280,068	1,535	-123,844	2	2	1,535	-123,844	1,535			-123,844	0.000	0	-12,174	0	0
1974	330,326	356,558	26,233	-97,611	2	2	26,233	-97,611	26,233			-97,611	0.000	0	14,059	0	0
1975	303,706	336,282	32,576	-65,035	2	2	32,576	-65,035	32,576			-65,035	0.000	0	46,635	0	0
1976	345,015	384,665	39,651	-25,384	2	2	39,651	-25,384	39,651			-25,384	0.333	10,201	76,084	0	-10,201
1977	228,855	235,971	7,117	-18,268	2	2	7,117	-18,268	7,117			-18,268	0.500	30,042	53,159	0	-30,042
1978	169,330	187,594	18,264	-4	2	2	18,264	-4	18,264			-4	1.000	37,159	34,264	0	-37,159
1979	265,636	288,074	22,439	22,435	2	2	22,439	22,435	22,439			22,435	0.333	6,082	50,621	0	-6,082
1980	333,465	337,288	3,824	26,259	2	2	3,824	26,259	3,824			26,259	0.500	17,310	37,134	0	-17,310
1981	319,117	313,677	-5,440	20,818	2	2	-5,440	20,818	-5,440			20,818	1.000	21,134	10,560	0	-21,134
1982	330,397	309,424	-20,973	-154	2	2	-20,973	-154	-20,973			-154	0.000	0	-10,413	0	0
1983	336,898	312,521	-24,377	-24,532	2	2	-24,377	-24,532	-24,377			-24,532	0.000	0	-34,790	0	0
1984	339,807	336,591	-3,217	-27,748	2	2	-3,217	-27,748	-3,217			-27,748	0.000	0	-38,007	0	0
1985	352,129	336,626	-15,503	-43,251	2	1	0	0	0			0	0.000	0	0	0	0

ANALYSIS OF EEPI DEPARTURE ACCOUNTING

Brandes, 11/03/22

INPUT DATA	-90,000	Maximum Annual Negative Departure
	67,500	Maximum Annual Positive Departure
	-120,000	Maximum Accrued Negative Departure (3-Year Average)
	180,000	EP1 3-Year Average Carryover Trigger for Resetting Accrued Negative Departures to Zero
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Maximums	
-62,142	
67,500	

Total	Total
278,382	-288,677

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Year	Index Obligation Hutchison Nov. 2022	Annual Delivery Hutchison Nov. 2022	Actual Departure	Accrued Departure	Low Release Year < 200K 1 = Yes 2 = No	Spill Year 1 = Yes 2 = No	Actual Annual Departure Low Release & Spill Years Figure 1	Actual Accrued Departure Low Release & Spill Years Figure 1	Adjusted Annual Departure After Adjust. for < B3 or > B4	Annual Carryover by EP1	3-Year Average Carryover	Adjusted Accrued Departure 3-Year Ave. Carryover > B6	Allocation Transfer Factor	Annual Allocation Transfer	Adjusted Accrued Departure After Alloc. Transfers Figures 2&3	Allocation Transferred to Texas Figure 3	Allocation Transferred to New Mexico Figure 3
1986	409,590	656,157	246,567	203,316	2	1	0	0	0			0	0.000	0	0	0	0
1987	422,358	610,068	187,710	391,026	2	1	0	0	0			0	0.000	0	0	0	0
1988	422,358	482,940	60,582	451,608	2	1	0	0	0			0	0.000	0	0	0	0
1989	396,540	404,785	8,245	459,853	2	2	8,245	8,245	8,245			8,245	0.000	0	8,245	0	0
1990	362,937	365,399	2,462	462,315	2	2	2,462	10,707	2,462			10,707	0.000	0	10,707	0	0
1991	330,191	346,141	15,950	478,265	2	2	15,950	26,657	15,950			26,657	0.000	0	26,657	0	0
1992	377,025	446,101	69,077	547,341	2	2	69,077	95,733	67,500			94,157	0.000	0	94,157	0	0
1993	416,119	476,966	60,846	608,188	2	2	60,846	156,580	60,846			155,003	0.333	26,026	128,977	0	-26,026
1994	422,358	455,418	33,060	641,248	2	1	0	0	0			0	0.500	56,489	0	0	-56,489
1995	422,358	518,583	96,226	737,474	2	1	0	0	0			0	1.000	0	0	0	0
1996	414,746	425,326	10,580	748,054	2	1	0	0	0			0	0.000	0	0	0	0
1997	420,581	453,645	33,064	781,117	2	2	33,064	33,064	33,064			33,064	0.000	0	33,064	0	0
1998	422,358	434,192	11,835	792,952	2	2	11,835	44,898	11,835			44,898	0.000	0	44,898	0	0
1999	395,861	424,657	28,797	821,749	2	2	28,797	73,695	28,797			73,695	0.333	9,623	64,072	0	-9,623
2000	397,406	405,947	8,541	830,290	2	2	8,541	82,236	8,541			82,236	0.500	24,036	48,577	0	-24,036
2001	416,306	427,731	11,425	841,715	2	2	11,425	93,661	11,425			93,661	1.000	32,577	27,425	0	-32,577
2002	421,967	429,142	7,175	848,889	2	2	7,175	100,836	7,175			100,836	0.333	3,805	30,795	0	-3,805
2003	215,627	183,024	-32,602	816,287	2	2	-32,602	68,234	-32,602			68,234	0.500	7,398	-9,205	0	-7,398
2004	184,387	194,910	10,523	826,810	2	2	10,523	78,756	10,523			78,756	1.000	6,795	-5,477	0	-6,795
2005	322,708	305,785	-16,923	809,887	2	2	-16,923	61,833	-16,923			61,833	0.000	0	-22,400	0	0
2006	236,571	268,421	31,850	841,737	2	2	31,850	93,684	31,850	36,200		93,684	0.000	0	9,450	0	0
2007	307,547	321,073	13,525	855,263	2	2	13,525	107,209	13,525	106,982		107,209	0.000	0	22,975	0	0
2008	349,275	349,372	97	855,360	2	2	97	107,306	97	232,882	125,355	107,306	0.000	0	23,072	0	0
2009	362,552	360,897	-1,655	853,705	2	2	-1,655	105,651	-1,655	232,914	190,926	0	0.000	0	0	0	0
2010	347,904	336,458	-11,446	842,259	2	2	-11,446	94,205	-11,446	224,347	230,048	0	0.000	0	0	0	0
2011	216,503	242,396	25,893	868,152	2	2	25,893	120,098	25,893	9,042	155,434	25,893	0.000	0	25,893	0	0
2012	174,444	145,889	-28,555	839,596	2	2	-28,555	91,543	-28,555	5,597	79,662	-2,663	0.000	0	-2,663	0	0
2013	72,997	92,303	19,306	858,902	1	2	0	91,543	0	-6,487	2,717	-2,663	0.000	0	-2,663	0	0
2014	116,761	123,658	6,897	865,799	2	2	6,897	98,439	6,897	2,685	598	4,234	0.000	0	4,234	0	0
2015	194,926	171,298	-23,628	842,171	2	2	-23,628	74,811	-23,628	32,473	9,557	-19,394	0.000	0	-19,394	0	0
2016	263,279	215,530	-47,750	794,421	2	2	-47,750	27,062	-47,750	50,179	28,446	-67,144	0.000	0	-67,144	0	0
2017	313,528	251,387	-62,142	732,279	2	2	-62,142	-35,080	-62,142	202,102	94,918	-129,285	0.000	0	-129,285	0	0
2018	258,424	257,711	-713	731,567	2	2	-713	-35,793	-713	64,466	105,582	-129,998	0.333	-37,724	-92,274	37,724	0
2019	225,248	172,533	-52,714	678,852	2	2	-52,714	-88,507	-52,714	232,915	166,494	-182,712	0.500	-38,137	-106,851	38,137	0
2020	288,591	282,797	-5,794	673,058	2	2	-5,794	-94,302	-5,794	84,812	127,398	-188,507	1.000	-90,851	-21,794	90,851	0
2021	127,885	133,161	5,276	678,334	2	2	5,276	-89,026	5,276			-183,231	0.000	0	-16,518	0	0

FIGURE 1 1951-2021 ACTUAL ANNUAL AND ACCRUED INDEX DEPARTURES AFTER ADJUSTMENTS FOR SPILLS AND LOW RELEASES

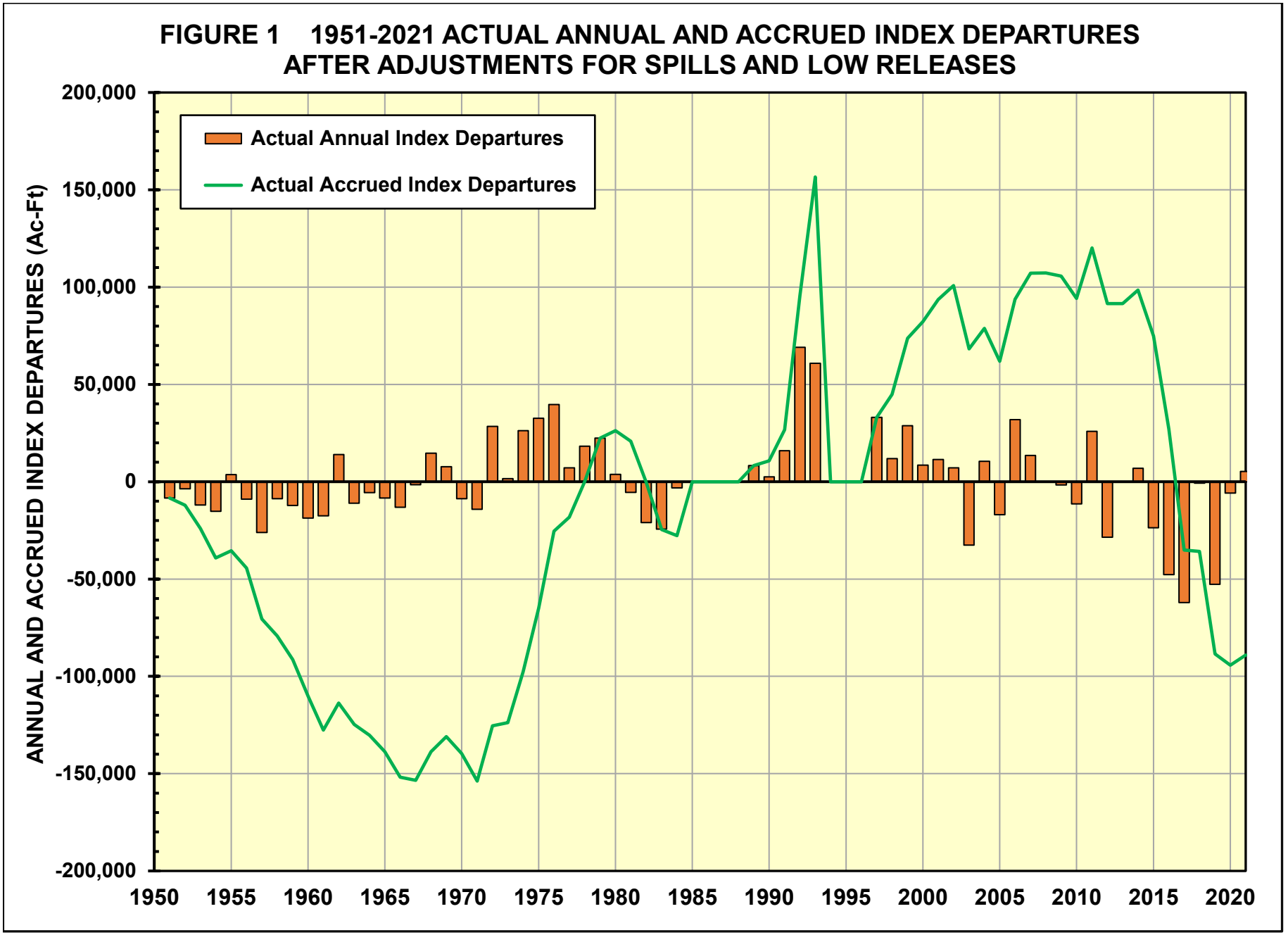

FIGURE 2 ACTUAL ACCRUED INDEX DEPARTURES AFTER REDUCTIONS FOR SPILLS AND LOW RELEASES AND ADJUSTED ACCRUED INDEX DEPARTURES

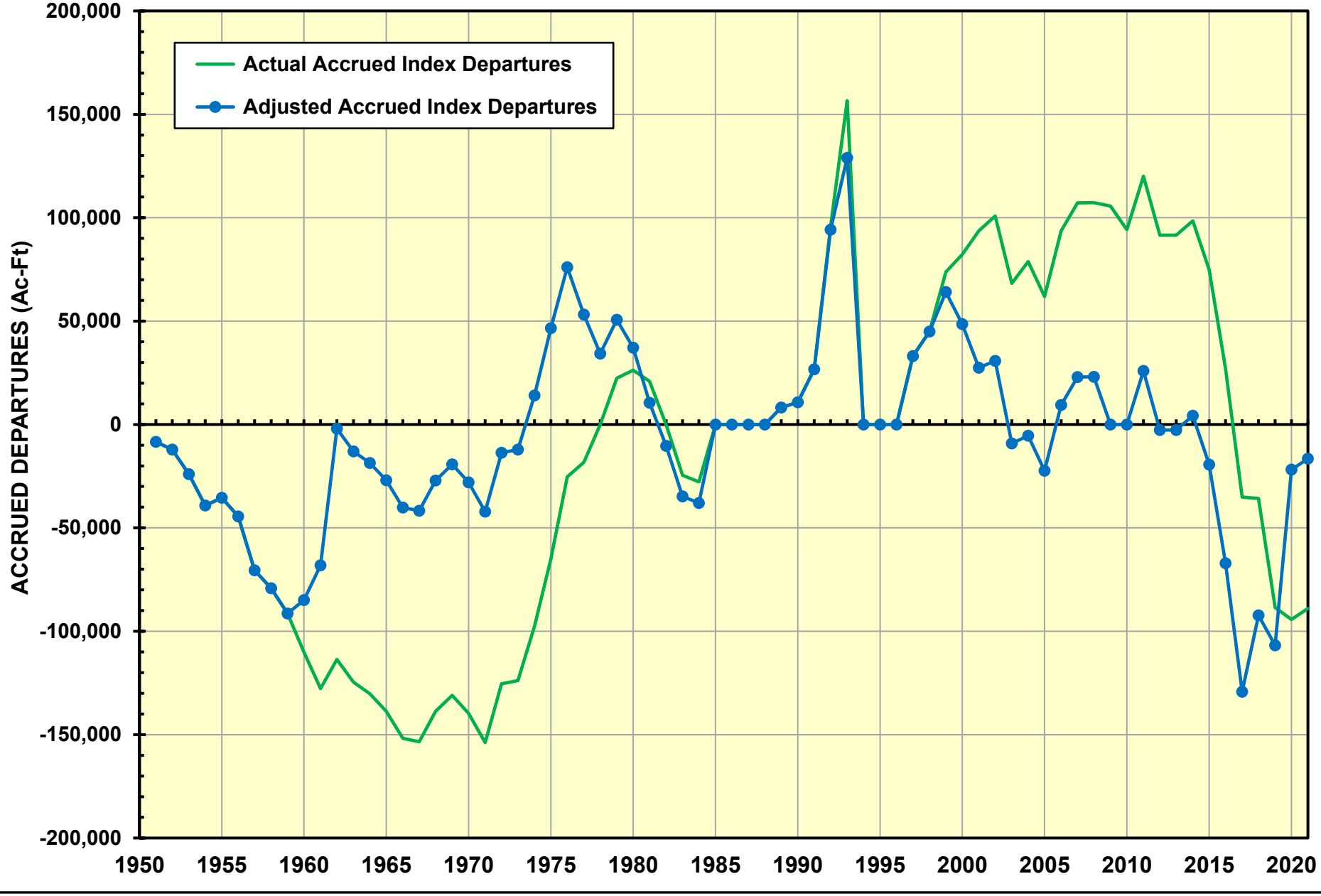

FIGURE 3 1951-2021 APPORTIONMENT TRANSFERS AND ADJUSTED ACCRUED INDEX DEPARTURES